



STUDENT ENTREPRENEURSHIP SUPPORT AT SOUTH AFRICAN UNIVERSITIES

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STUDENT ENTREPRENEURSHIP SUPPORT AT SOUTH AFRICAN UNIVERSITIES

BY

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DECLARATION

I, Riyaad Ismail (216094577), hereby declare that the dissertation “Student entrepreneurship support at South African universities” for the degree Master of Commerce: Business Management is my own work and that it has not previously been submitted for assessment or completion of any postgraduate qualification to another University or for another qualification.



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ABSTRACT

South Africa as a country experiences some of the highest levels of unemployment in the world. High levels of unemployment are especially evident among the youth and graduating students. Entrepreneurship in general, including student entrepreneurship, is seen as a solution to these high levels of unemployment because of its positive impact on job creation, economic growth, and the adoption of new technologies and innovation capabilities. However, as student start-up numbers remain stagnant in South Africa, the effectiveness of university-based student entrepreneurship support is questioned. Furthermore, despite the significance of student entrepreneurship and the support provided to them by universities, research on the subject is limited, especially in a developing country context. Against this background, the primary objective of the current study was to assess the state of university-based student entrepreneurship support at South African public universities.

Based on the literature and underpinned by organisational theory, a university-based entrepreneurship ecosystem (U-BEE) framework was conceptualised. This framework, together with Good, Knockaert, Soppe and Wright's (2018) organisational design elements, namely purpose, activities, structure, and people, was used to guide the empirical investigation.

The current study adopted an interpretivist philosophical stance and is situated in an interpretive research paradigm. An abductive approach to theory development was used and given that the purpose of the study was exploratory, a multi-method qualitative research method was chosen. In addition to a desk research, a multiple-case study research strategy was used, and the study was cross-sectional in nature. Deductive codes and thematic analysis, following the steps of Braun and Clark (2020), were used to analyse the data. The findings of this study were presented in terms of cross-case issues, rather than being case specific to ensure anonymity.

Based on the desk research, the total number of student entrepreneurship support activities offered by each university were calculated and the 26 public universities in South Africa were then ranked from most active to least active in terms of offering these activities. Although actual rankings could not be given, the findings show that the most active universities are much older and also larger in terms of faculty, staff and student numbers, than the least active universities are, suggesting that those ranked at the top have been doing so for much longer, effectively giving them more time to have established such support structures and to obtain the necessary

resources to do so. The findings also suggest that several of the least active universities are historically disadvantaged institutions, which could also influence the nature and extent of support being offered to their student entrepreneurs. Based on this ranking the four most active and the four least active universities in terms of student entrepreneurship support were identified, and these eight universities served as the cases on which further investigation was undertaken.

The findings of this study highlight the challenges experienced by student entrepreneurs during the establishment of their student ventures, as well as those challenges that they are currently experiencing. Challenges during establishment worth noting include the lack of a network, finance, and information on how to start a business; the inability to access the market; and a lack of legal assistance and encouragement from people around them. Moreover, challenges currently being experienced by student entrepreneurs were identified as working long hours, followed by a lack of collateral and a lack of legal assistance.

The findings relating to each of the elements within the conceptualised U-BEE highlight the need for entrepreneurship to be a strategic priority at South African public universities, accompanied by top management buy-in to increase awareness and encourage entrepreneurship among staff, students and other stakeholders. Moreover, the findings call attention to the importance of having a team led by a student entrepreneurship champion whose primary role is to facilitate and coordinate activities relating to student entrepreneurship. Through entrepreneurship being prioritised by universities, having top management buy-in, and a student entrepreneurship champion being appointed, the required resources, support and infrastructure could follow, most notably an entrepreneurship policy, financial support, and an entrepreneurship centre (a central hub for entrepreneurship related activities). As these support structures are established and resources made available, more frequent collaborations among internal entrepreneurship stakeholders themselves could be experienced, as well those with external partnerships. Increased collaborations could in turn lead to improved communication, greater coordination and increased awareness among all existing entrepreneurship stakeholders as well as future student entrepreneurs.

KEYWORDS: student entrepreneurs; entrepreneurial universities; entrepreneurial ecosystems; university-based entrepreneurship ecosystem; organisational design

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CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION AND BACKGROUND

Every university is located in a specific spatial context where the entrepreneurial environment, culture and support in that context influences the intentions of students and the success of their entrepreneurial ventures (Bergmann, Hundt & Sternberg, 2016:54). According to Meyer, Lee, Kelly and Collier (2020:260), universities play a vital role in the development of local and regional entrepreneurship and are recognised as an important source of future entrepreneurs and business ventures. Universities are considered an ideal environment for promoting entrepreneurship as they have access to a large pool of students and graduates (Department of Higher Education and Training, 2017:8). Bergmann *et al.* (2016:55) contend that these young individuals are generally more ambitious and more likely to try something different, such as starting an own business while studying. Shirokova, Osiyevskyy and Bogatyreva (2016:387) suggest that younger people tend to have greater intentions to behave entrepreneurially, thus making universities the ideal environment to encourage entrepreneurship. Furthermore, the focus of many universities is on creating new knowledge and through this knowledge innovative products can be developed and commercialised through new ventures (Jansen, Zande, Brinkkemper, Stam & Varma, 2015:170).

Vekic, Fajsi and Borocki (2019:37) suggest that universities should strive to intensify their efforts in creating an environment where entrepreneurship is fostered and promoted, especially among young individuals. Kozhakhmetov, Nikiforova and Maralbayeva (2016:16) assert that the formation and development of such an environment within a university is not possible without building an effective university entrepreneurial ecosystem. The concept of an entrepreneurial ecosystem helps explain how various actors interact to foster and promote entrepreneurship and innovation in a given region (Galvao, Marques & Ferreira, 2019:137), whereas a university-based entrepreneurial ecosystem (U-BEE) explains how this is done within the context of a university. Jansen *et al.* (2015:173) elaborate that a university-based entrepreneurial ecosystem is any part of the university organisation that focuses on and actively promotes and supports entrepreneurship among staff, students and alumni, as well as those providing entrepreneurial support activities. A university-based entrepreneurial ecosystem

allows for the development of entrepreneurial graduates through teaching, learning, research, and engagement that supports entrepreneurship and innovation among stakeholders (Yusoff, Rajah, Ahmad & Ismail, 2017:894).

Universities that create an environment where entrepreneurship is promoted and supported, and where young entrepreneurs can flourish, are regarded as entrepreneurial universities (Sambo, 2018:208). Similarly, Salem (2014:289) describes entrepreneurial universities as entities that create an environment where entrepreneurship is encouraged among staff, students and graduates. This conducive environment is achieved through ensuring that a culture exists which promotes and embraces entrepreneurship and where the necessary support is available to assist students on their entrepreneurial journeys (Amadi-Echendu, Phillips, Chodokufa & Visser, 2016:23). Furthermore, entrepreneurial universities ensure that entrepreneurial learning is included in their strategic plan and policy, and that such learning allows for alternative ways of obtaining knowledge on entrepreneurship (Amadi-Echendu *et al.*, 2016:23). Entrepreneurial universities not only provide prospective student entrepreneurs with opportunities for entrepreneurial learning, but also with support structures such as incubators, access to finance and physical spaces, where they can work on their business ideas (OECD, 2013:9).

Considering that universities are regarded as an ideal environment to foster and promote entrepreneurship among students, as well as increasing their entrepreneurial intention and chances of success, this study focusses on the student entrepreneurship support provided by South African public universities.

1.2 PROBLEM DESCRIPTION

Youth unemployment is a global problem which has continued to increase over the past decades (Shambare, 2013:449; Bignotti & Le Roux, 2016:1; Ebewo, Shambare & Rugimban, 2017:175). According to Statistics South Africa (2021), the official unemployment rate in South Africa in the first quarter of 2021 was 32.6%, of which 46.3% were youth between the age of 15 and 34. Moreover, Statistics South Africa (2021) reports that the graduate youth unemployment rate for individuals aged between 15 and 34 was 15.5% in the first quarter of 2021. According to Fatoki (2014a:100), the Total Entrepreneurial Activity (TEA) of student entrepreneurs is low and student start-ups are far and few between. Fatoki (2010:87) further asserts that there are too many graduates with too few jobs available, which means that

graduates either need to be creative in finding employment or creative in starting their own businesses and be self-employed.

Given the increasing graduate unemployment rate, the effectiveness of university-based student entrepreneurship support has been questioned as the number of start-up ventures by students has not increased (Morris, Shirokova & Tsukanova, 2017:66). The development of student entrepreneurs is essential as they positively contribute to job creation and economic development (Fadeyi, Oke, Adegbuyi, Ajagbe & Isiavwe, 2015:28; Fatoki, 2014a:100; Ramchander, 2019:2), inevitably leading to reduced graduate unemployment and unemployment, in general (Shambare, 2013:449; Fatoki, 2014b:216). Reducing unemployment is especially vital in the South African context, where the unemployment rate is high (Nicolaides, 2011:1044; Atiase, Mahmood, Wang & Botchie, 2018:644; Toerien, 2021:1). Furthermore, Hamilton and Mostert (2019:157) assert that student entrepreneurs play a vital role in changing the economic landscape of South Africa, which in turn will lead to the social and economic empowerment of the youth (Ndedi, 2014:463). Self-employment through entrepreneurship has a positive impact on not only per capita income growth and poverty reduction (Fatoki, 2014c:294) but through student entrepreneurship can also lead to the development of new technologies and an increase in innovation capabilities (Atiase *et al.*, 2018:647).

Despite the positive impact of student entrepreneurship, the aim of universities has always been to develop graduates that are employable to others, rather than preparing them for innovative or creative employment options such as entrepreneurship (Nicolaides, 2011:1045). Shambare (2013:449) adds that students lack an interest in entrepreneurship which is most likely due to them preferring the guaranteed income from formal employment rather than the risks associated with entrepreneurship. Nicolaides (2011:1045) argues that this needs to change and institutions of higher education, including universities, should aim to develop students with an entrepreneurial spirit who want to create work for themselves, rather than to work for others.

Although both universities and students could benefit from institutions of higher education being more entrepreneurially focussed, it is evident that the majority of South African public universities do not have a structured way of implementing entrepreneurial support (Department of Higher Education and Training, 2017:9). University management has no strategic direction regarding student entrepreneurship support, as it is not a strategic priority for most (Department

of Higher Education and Training, 2017:9). Student entrepreneurs are more likely to be successful if they have the necessary support, develop the necessary skills, and are exposed to practical experience relevant to their ventures (Shambare, 2013:450). Student entrepreneurs face many challenges including a lack of financial resources, support and assistance, profitable opportunities and complex start-up procedures (Iwu, Ezeuduji, Eke & Tengeh, 2016:174, Morris *et al.*, 2017:70, Thamahane, Chetty & Karodia, 2017:3). Given these challenges and the little focus given by universities to develop entrepreneurial skills such as perseverance, resilience and self-efficacy (Ramchander, 2019:1), Shambare (2013:451) contends that universities are not doing enough to support student entrepreneurs.

Despite the significance of student entrepreneurship and the need for universities to support them, student entrepreneurship support has been the subject of little research (Breznitz & Zhang, 2019:855). For example, Bergmann *et al.* (2016:54) note that far less research has been conducted on student start-ups than academic start-ups, even though student start-ups occur more frequently. Breznitz and Zhang (2019:856) add that the majority of research on entrepreneurship in a university setting focuses almost exclusively on licensing patents and creating spin-offs from staff, rather than on student entrepreneurs. Yusoff *et al.* (2017:892) assert that although various aspects of university-based student entrepreneurship support have been studied, there is a lack of research regarding the students' perception of this support and the support structures that need to be in place to create a conducive environment.

To date, several university-based entrepreneurial ecosystem (U-BEEs) models or frameworks have been published in literature, highlighting the elements for an entrepreneurially conducive environment within universities (Rice, Fetters & Greene, 2014; Miller & Acs, 2017; Wright, Siegel & Mustar, 2017; Sherwood, 2018; Tiemann, Fichter & Geier, 2018; Novela, Syarief, Fahmi & Arkeman, 2021). However, it has been noted that elements within a U-BEE and the relationships between them vary depending on regional and local conditions (Malecki, 2017:5; Xie & Zhang, 2019:15); and that the elements contained in existing U-BEE models are not always appropriate for all regions (Allahar & Sookram, 2019b). As a result, various research calls have been made to conduct research on U-BEEs in developing country contexts (Lahikainen, Kolhinen, Ruskovaara & Pihkala, 2019; Xie & Zhang, 2019; de Araujo Ruiz, Martens & da Costa, 2020), on universities within the broader entrepreneurial ecosystem (Morris *et al.*, 2017; Wright *et al.*, 2017:910; Sherwood; 2018:240), and on the interaction and relationships between the elements within the U-BEE (Malecki, 2017).

Given the importance of student entrepreneurship support and the apparent ineffectiveness of universities to provide it, as well as the research calls made by several authors, the research question posed for this study is as follows:

How are South African public universities supporting student entrepreneurship?

1.3 RESEARCH OBJECTIVES

In order to address this research question, several research objectives were formulated. Research objectives are clear statements which define the goals that a researcher would like to achieve throughout a study (Saunders & Lewis, 2012:21). The sections that follow present the primary, secondary (SO) and methodological objectives (MO) of this study.

1.3.1 PRIMARY OBJECTIVE

The primary objective of the study was to assess the state of university-based student entrepreneurship support at South African public universities.

1.3.2 SECONDARY OBJECTIVES

To achieve the primary objective of this study, three secondary objectives (SO) were formulated, namely:

- SO¹ To rank the 26 South African public universities in terms of student entrepreneurship support;
- SO² To describe university-based student entrepreneurship support offered by South African public universities;
- SO³ To identify start-up (establishment) and current operational challenges facing student entrepreneurs at South African public universities.

1.3.3 METHODOLOGICAL OBJECTIVES

To achieve the primary and secondary objectives of this study, six methodological objectives (MO) were formulated, namely:

- MO¹ To undertake a theoretical investigation into the nature and importance of student entrepreneurship and the challenges faced;
- MO² To undertake a theoretical investigation into student entrepreneurship support at universities and the various U-BEEs models and frameworks;
- MO³ To propose a conceptual framework for investigating student entrepreneurship support at South African public universities;
- MO⁴ To determine the most appropriate research methodology for addressing the identified research problem and research objectives;
- MO⁵ To undertake an empirical investigation and gather the necessary data;
- MO⁶ To provide conclusions and to make recommendations on best practices regarding student entrepreneurship support to South African public universities.

1.4 RESEARCH DESIGN AND METHODOLOGY

In order to describe the methodological choices made and how the research was undertaken in the current study, the framework of Saunders, Lewis and Thornhill (2016:124), or the research onion, was used. The layers of the onion from the outside inwards are (i) philosophies; (ii) approaches; (iii) methodological choices; (iv) strategies; (v) time horizon; and (vi) techniques and procedures (Saunders, Lewis & Thornhill, 2019:124). The research design and methodology adopted are described extensively in Chapter Four of this study.

1.4.1 RESEARCH PHILOSOPHY, RESEARCH PARADIGM AND APPROACH TO THEORY DEVELOPMENT

In this study, an interpretivist philosophical stance was adopted, and the study is positioned in the interpretive paradigm. An interpretivist philosophical stance was deemed appropriate as the researcher wished to gain in-depth knowledge and understanding of university-based student

entrepreneurship support through the subjective viewpoints of entrepreneurship stakeholders (Antwi & Hamza, 2015:218). Furthermore, an interpretive paradigm was appropriate as the researcher assumed that subjective knowledge constitutes acceptable knowledge and that the experiences of individuals are investigated in a subjective manner (Callaghan, 2016:88; Rahi, 2017:2).

The current study followed an abductive approach to theory development. This approach was followed to gain a rich understanding of the university-based student entrepreneurship support provided by South African universities. An abductive approach was considered appropriate because new concepts could come to light during the interviews, which could then be added to the interview protocols for subsequent interviews.

1.4.2 METHODOLOGICAL CHOICES, RESEARCH STRATEGY AND TIME HORIZON

The methodological choices made by a researcher are largely influenced by the purpose of the research project (Bhattacharjee, 2012:5; Saunders *et al.*, 2016:174; Ragab & Arisha, 2018:6). The purpose of the current study was exploratory in nature. Given this purpose the choice of a multi-method qualitative methodology was made.

A desk research was undertaken to investigate what each of the 26 South African public universities are offering in terms of student entrepreneurship support. The findings of this desk research address the first secondary objective (SO¹), namely to identify the most and least active South African public universities by ranking their current student entrepreneurship support activities. The four universities with the most student entrepreneurship support activities and the four universities with the least student entrepreneurship support activities were then selected as cases for further investigation in this study.

In addition to a desk research, an exploratory embedded multiple case study research strategy was chosen for the current study as it allowed the researcher to gain valuable in-depth information regarding the cases concerned (Gog, 2015:38), and insights into the issue being investigated (Nelson & Martin, 2013:13), namely student entrepreneurship support provided by the participating South African public universities.

Due to time and budget constraints, data was gathered over a short period by conducting interviews with applicable stakeholders at various universities at one particular point in time. The study was therefore cross-sectional in nature as it focused on events that were currently happening while the research was being conducted.

1.4.3 TECHNIQUES AND PROCEDURES

In order to collect and analyse the secondary and primary data in the current study, the multiple case study procedure of Yin (2014) was followed. This procedure consisted of several steps. According to Yin (2014:60), the first step, define and design, includes three sub-steps, namely developing theory, selecting cases and designing the case study protocol. These steps, as applied in the current study, are elaborated on in Chapter Four (Section 4.7.1). After the define and design step, as suggested by Yin (2014:60) the researcher continued with the next steps when adopting a multiple-case study strategy. These steps included (i) preparing to collect case study evidence; (ii) collecting the case study evidence; (iii) analysing the case study evidence; and (iv) writing up the individual case reports. How these steps were undertaken in the current study are presented and described in Chapter Four (Section 4.7.2). After the findings focussing on the specific cross-case issues were written up, the researcher then had to draw cross-case conclusions, modify the theory, develop policy implications, and write the cross-case report (Yin, 2014:60). These steps, as applied in the current study, are presented and described in Chapter Four (Section 4.7.3).

1.4.4 TRUSTWORTHINESS

The term “trustworthiness” refers to the quality, authenticity, and truthfulness of the findings in a qualitative study, which in turn has an impact on the degree of trust and confidence readers have in these findings (Cypress, 2017:254). Four measures are most often used to assess the trustworthiness of a qualitative study, namely credibility, dependability, transferability, and confirmability (Anney, 2015:276; Quinlan, Babin, Carr, Griffin & Zikmund, 2015:259; Hays, Wood, Dahl & Jenkins, 2016:174; Cypress, 2017:255). These measures were used in the current study and are described and justified in more detail in Chapter Four (Section 4.8).

1.4.5 ETHICAL CONSIDERATIONS

To ensure that no harm was done to humans, the proposed study was subjected to the research ethics procedures set out by the Nelson Mandela University's Research Ethics Committee for Humans prior to the study commencing (see Annexure A). In addition, the researcher ensured that the guidelines for ensuring confidentiality, anonymity, and voluntary consent were adhered to. The strategies adopted for each are described in detail in Chapter Four (Section 4.9).

1.5 SCOPE AND DEMARCATION OF THE STUDY

The primary objective of this study was to assess the state of university-based student entrepreneurship support at South African public universities. However, not all 26 South African public universities were included in the study. A desk study was first conducted to determine the university-based student entrepreneurship support currently offered at all 26 public universities in South Africa. From the findings of the desk study, the four most active and four least active universities in terms of student entrepreneurship support were selected to participate. Specific focus was on student entrepreneurship support provided by the eight South African public universities and excluded staff entrepreneurship support. Student entrepreneurship support was that which aimed to assist students with the establishment and operation of their business ventures. This study did not focus on entrepreneurial universities as a whole, but rather on student entrepreneurship, which is an element thereof. Moreover, not all staff and students at these eight universities were interviewed. Only currently registered students who were entrepreneurs and between the age of 18 and 35 were interviewed, as well as staff who were involved with student entrepreneurship support.

The study was also demarcated in terms of the student entrepreneurship support investigated at each of the participating universities. Although various U-BEEs have been developed (see Chapter 2, Section 2.3.3), the researcher has conceptualised another (see Figure 3.1) more appropriate for the South African context. Only those elements within the conceptualised U-BEE framework were investigated at the participating universities. Moreover, although numerous organisational design elements have been presented by various authors (see Chapter 2, Section 2.3.5), the design of student entrepreneurship support in this study was explored in terms of the organisational design theory elements of Good, Knockaert, Soppe and Wright (2018), namely purpose, activities, structure and people.

1.6 SIGNIFICANCE OF THE STUDY

The extant literature suggests that a lack of research on student entrepreneurship and student entrepreneurship support provided by universities, exists (Breznitz & Zhang, 2019:855). Furthermore, several calls have been made to conduct research on U-BEES in developing country contexts (Lahikainen *et al.*, 2019; Xie & Zhang, 2019; de Araujo Ruiz *et al.*, 2020), on universities within the broader entrepreneurial ecosystem (Morris *et al.*, 2017; Wright *et al.*, 2017:910; Sherwood; 2018:240), and on the interaction and relationships between the elements within the U-BEE (Malecki, 2017).

Considering this lack of research and the research calls made, this study aims to assess the state of university-based student entrepreneurship support at South African public universities through an ecosystem approach. To identify key support activities, a U-BEE framework is conceptualised, and the organisational design elements of Good *et al.* (2018), namely purpose, activities, structure, and people, are used to investigate the design and structure of this support. Through this aim and approach the study adds to the existing body of knowledge on university-based student entrepreneurship support and U-BEES. More specifically, this study highlights the various support activities that should be in place to create a conducive environment where university student entrepreneurs in a developing country context can flourish.

Based on the findings of this study, the extant literature, as well as recommendations made by participants, best practices are identified for each element within the conceptualised U-BEE framework. These best practices can guide various internal and external entrepreneurship stakeholders to effectively and efficiently design and structure entrepreneurship support provided at South African public universities. The findings also highlight the challenges experienced by student entrepreneurs in establishing and operating their businesses, as well as the challenges experienced by internal entrepreneurship stakeholders in providing student entrepreneurship support. Knowledge of best practices and an awareness of challenges faced, allows for the student entrepreneurship support offered by universities to be improved and the needs of student entrepreneurs to be better met.

1.7 CLARIFICATION OF KEY CONCEPTS

Key concepts used in the current study are clarified below.

1.7.1 STUDENT ENTREPRENEUR

In this study, the term student entrepreneur refers to an individual between the age of 15 and 34, who is registered as a student at a South African public university, and at the same time is in the process of establishing or is currently operating their own business (Nielsen & Gartner, 2017:136; National Youth Policy, 2020:21).

1.7.2 PUBLIC UNIVERSITY

In South Africa the term public university refers to an institution of higher education which has been established, deemed to be established or declared as such by the Higher Education Act (South Africa, 1997), and as a result, receives a subsidy from the government (Bangani, 2018:40).

1.7.3 ENTREPRENEURIAL ECOSYSTEM

In this study, an entrepreneurial ecosystem refers to a system consisting of several interdependent elements that exist within an entrepreneurial environment, and together they create an environment that is conducive to entrepreneurship (Segers, 2015:2; Stam & Spigel, 2016:1; Sherwood, 2018:239).

1.7.4 UNIVERSITY-BASED ENTREPRENEURSHIP ECOSYSTEMS

The term university-based entrepreneurship ecosystems refer to the internal and external interrelated elements of a university, which together strives to create a conducive environment for student and staff entrepreneurs (Wright *et al.*, 2017:910).

1.7.5 ORGANISATIONAL DESIGN

In this study, the term organisational design refers to the process of identifying the most appropriate design to increase the effectiveness and efficiency of an organisation (Burton & Obel, 2018:2).

1.8 STRUCTURE OF THE STUDY

In Chapter One, the introduction and background to the study has been presented. The underlying problem statement was described, and a lack of research on student entrepreneurship support identified. The chapter continued by presenting the primary, secondary and methodological objectives of the study. Thereafter, a brief summary of the research design and methodology adopted was provided. The study's scope and demarcation were presented and its significance was highlighted. The chapter concluded by clarifying key concepts and outlining the structure of the chapters to follow.

Chapter Two presents a literature review and commences with an overview of student entrepreneurship, focusing on the nature and importance thereof. Moreover, the challenges experienced by students in starting their own businesses are also explored. Thereafter, previous research conducted on student entrepreneurship support in general, as well as in South Africa, is discussed. The chapter concludes by presenting the theories underpinning the current study as well as the various university-based student entrepreneurship ecosystem models and frameworks identified in the literature.

In Chapter Three, the conceptual framework for the current study is presented. The framework consists of two environments: the internal entrepreneurship environment and the external entrepreneurship environment. The various elements in these environments are described and their inclusion in the framework justified. The conceptual framework also highlights the formal and informal collaborations between the elements within the internal entrepreneurship environment, as well as the collaborations between the elements within the internal entrepreneurship environment and the external entrepreneurship environment. These relationships are also described and justified.

In Chapter Four, the research design and methodology adopted in this study is presented. The chapter commences by describing the research philosophy and paradigm in which the study is situated. Thereafter, the approach to theory development and the methodological choices made are described. The research strategy utilised and the time horizon of the study are also elaborated on. Thereafter, the techniques and procedures adopted to gather, analyse and present the data are described. The chapter concludes by explaining how the trustworthiness of the processes followed and data gathered were ensured and by describing the ethical considerations taken.

Chapter Five is the first of four chapters presenting the empirical findings. In Chapter Five the procedure followed to rank the 26 South African public universities is described, and their rankings presented. After the rankings are presented, the eight universities selected as cases are described. Thereafter, the participants interviewed are described and their biographical information presented. Given that student entrepreneurs are central to the conceptual model, they are described in more detail.

In Chapter Six the findings relating to the university environment and culture, and the various co-curricular entrepreneurship support activities are presented, whereas in Chapter Seven, the findings relating to specific elements of support within the internal entrepreneurship environment are presented.

Chapter Eight presents the findings pertaining to collaborations between the elements in the internal entrepreneurship environment, as well as those relating to collaborations between the internal elements and the external entrepreneurship environment are provided and discussed. The chapter concludes by presenting the findings relating to the external entrepreneurship environment in general.

Chapter Nine provides a summary of the study as a whole and highlights where the objectives of the study have been achieved. Thereafter, the findings are discussed and best practices are presented. The contributions of this study are highlighted and the limitations experienced pointed out. Some final remarks conclude that chapter and the study as a whole.

CHAPTER TWO

STUDENT ENTREPRENEURSHIP AND UNDERLYING THEORETICAL FRAMEWORKS

2.1 INTRODUCTION

As indicated in Chapter One, the primary objective of this study is to assess the state of university-based student entrepreneurship support at South African public universities. In this chapter, a literature review on student entrepreneurship is provided, focusing on the nature and importance thereof. Moreover, the challenges experienced by students in starting their own businesses are also explored. Thereafter, previous research conducted on student entrepreneurship support in general, as well as in South Africa, is discussed. The chapter concludes by presenting the theories underpinning the current study and describes the various university-based student entrepreneurship ecosystem models identified in the literature.

2.2 AN OVERVIEW OF STUDENT ENTREPRENEURSHIP

In the sections to follow, the nature of student entrepreneurship is firstly presented, focusing on defining the terms ‘entrepreneurship’ and ‘student entrepreneurship’, as well as identifying the various types of entrepreneurs. Thereafter, the importance of student entrepreneurship is discussed, followed by the challenges experienced by student entrepreneurs. The final section presents multiple studies that have been conducted focusing on student entrepreneurship support in general, as well as in South Africa specifically.

2.2.1 THE NATURE OF ENTREPRENEURSHIP AND STUDENT ENTREPRENEURSHIP

According to Mwatsika, Kambewa and Chiwaula (2018:455), there are various definitions of entrepreneurship, and the one used depends on one’s understanding of the concept. Ndedi (2014:464) defines entrepreneurship as a process that is followed to fulfil needs, pursue opportunities, and overcome social challenges through innovation, and this process involves starting or expanding a business. Similarly, Maroufkhani, Wagner and Ismail (2018:545) describe entrepreneurship as a process in which an individual is creative, innovative and willing

to take risks to ultimately enhance economic activity. Mwatsika *et al.* (2018:455) provide a conceptual definition of entrepreneurship, which is also adopted by classical and neoclassical economic theorists, being that entrepreneurship is the function and process of coordinating, organising, and directing factors of production to produce economic value (goods and services).

The individual who undertakes the process of entrepreneurship and performs entrepreneurial activities is known as an entrepreneur (Ndedi, 2014:465). Mwatsika *et al.* (2018:455) explain that there are numerous definitions associated with the term ‘entrepreneur’ based on what the entrepreneur does, what is being produced and the individuals’ characteristics. Based on what an entrepreneur does, an entrepreneur is described as someone who purchases raw materials at a certain price in order to sell those raw materials at a higher price, either in the same form or in combination with other raw materials (Mwatsika *et al.*, 2018:455). Moreover, based on what an entrepreneur produces, Mwatsika *et al.* (2018:455) describe an entrepreneur as a founder of an own business. An entrepreneur is also described based on certain characteristics (Mwatsika *et al.*, 2018:455; Ramchander, 2019:2) such as being resourceful, independent, persuasive, confident, and creative (Ndedi, 2014:465; Venter, Urban, Beder, Oosthuizen, Reddy & Venter, 2015:46). Furthermore, an entrepreneur is characterised as having risk-taking propensity, a high need for achievement, and an internal locus of control (Ndedi, 2014:465; Venter *et al.*, 2015:46). In addition to the aforementioned, an entrepreneur may also possess many other characteristics (or traits). However, Fadeyi *et al.* (2015:30) assert that what most entrepreneurs have in common is their commitment to innovation rather than their characteristics (personality traits).

In addition to various definitions of an entrepreneur, there are also different types of entrepreneurs. Entrepreneurs can be categorised according to their mission or objective, development stage, motivation and growth potential (Alam, 2019:2). Table 2.1 presents the different types of entrepreneurs according to these categories.

Table 2.1: Types of entrepreneurs

	Category	Descriptions	Source
Mission/ Objective	Commercial entrepreneurs	Main objective is to generate a profit through developing products and/or services that customers are willing to pay for.	Alam (2019:2)
		Also known as a for-profit entrepreneur who establishes a business where the ultimate objective is to generate a profit, which is then generally distributed to shareholders.	Venter <i>et al.</i> (2015:551)
	Social entrepreneurs	Innovators whose primary objective is to create social change or address social needs, with little to no mention of economic value creation.	Alam (2019:2)
		Mainly motivated by a desire to improve and change detrimental socio-economic, educational, environmental or health conditions.	Bosch, Tait & Venter (2018:73)
		Establishes a non-profit organisation to meet society's social needs, where profits are regarded as a means to an end, not the ultimate objective.	Venter <i>et al.</i> (2015:551)
Development Stage	Nascent entrepreneurs	Are in the process of setting up a business, of which they will be an owner, that has not made payments to themselves for more than three months.	Alam (2019:2)
		In the process of taking steps to establish a business (e.g., developing a business plan, looking for equipment or location, organising a start-up team).	Bergmann & Stephan (2013:946)
		Conducting 'pre-launch' processes such as sourcing and processing data and information, valuating the viability of the opportunity and acquiring start-up capital.	Bosch <i>et al.</i> (2018:72)
		Individuals who are still busy establishing their businesses.	Bosma, Hill, Somers, Kelley, Levie & Tarnawa (2019:26)
	New business owners	Own or co-own a business that has made payments to themselves for more than three months but less than 42 months.	Alam (2019:2)
		Have established their businesses but have not been the owners for longer than three and a half years.	Bergmann & Stephan (2013:946)
		Have established and commenced with their operations for longer than three months.	Bosch <i>et al.</i> (2018:72)
		Individuals who have started and run their own business for less than three and a half years.	Bosma <i>et al.</i> (2019:26)
	Established entrepreneurs	Own or co-own a business that has made payments to themselves for more than 42 months.	Alam (2019:2)
		Established entrepreneurs are those individuals who have been the owners of a business for longer than three and a half years.	Bergmann & Stephan (2013:946)
Individuals who have started and run their own business for longer than three and a half years.		Bosma <i>et al.</i> (2019:26)	

Table 2.1: Types of entrepreneurs (cont.)

	Category	Descriptions	Source
Motivation	Necessity-driven entrepreneurs	Establish a business and become entrepreneurs as they do not have other options for work.	Alam (2019:2)
		Pushed into starting their own business because of unsatisfactory alternatives (e.g., high unemployment rate).	Zhang & Acs (2018:774)
		Started their businesses because they do not have any other choice for reasons such as inability to find another job or have been retrenched.	Bosch <i>et al.</i> (2018:73)
	Improvement-driven opportunity (IDO) entrepreneurs	Establish a business and engage in entrepreneurship because they wish to be independent or increase their income.	Alam (2019:2)
		Start a venture in pursuit of a business opportunity such as financial success or self-realisation.	Zhang & Acs (2018:774)
		Enter the market and start their own businesses in pursuit of an opportunity to increase their income or gain independence, even while having other job opportunities.	Bosch <i>et al.</i> (2018:73)
Growth Potential	Subsistence entrepreneurs	Establish a business to earn themselves a subsistence income and have no intention of growing the business to the point of creating jobs for other individuals.	Alam (2019:2)
		Independent small-scale income activities with little to no business management experience and still needs support and training in terms of management skills.	Bosch <i>et al.</i> (2018:72)
		Businesses have an extremely low growth trajectory and exist only to provide income for the entrepreneur for basic day-to-day survival.	Kuratko (2016:550)
	Growth entrepreneurs (gazelles)	Aim to establish large, vibrant businesses that provides subsistence income to the owners and provides jobs for others.	Alam (2019:2)
		Pursue high growth and innovative opportunities, which are usually high technology intensive.	Bosch <i>et al.</i> (2018:72)
		Pursue an exponential growth trajectory, creating massive job opportunities, significant market share, and generating huge revenues.	Kuratko (2016:551)
	Constrained gazelles	Share the same skills and behaviours as growth entrepreneurs but experience the same low-capital and low-profit traits of subsistence entrepreneurs, indicating untapped entrepreneurial potential.	Alam (2019:2)

Source: Authors own construction

In addition to describing entrepreneurs according to the categories in Table 2.1, Alam (2019:3) posits that age is another category to consider. Otache (2019:924) acknowledges a relationship between an individuals' age and entrepreneurial activities, asserting that younger, more energetic people are more inclined to invest their time and money in starting their own businesses. This argument is based on the fact that start-up businesses can take some time before returns are yielded and risk failure, which is not a chance older people are willing to take (Otache, 2019:924). In contrast, Stephan, Hart and Drews (2015:5) argue that there is no significant evidence that a systematic relationship exists between age and growth ambition. Nevertheless, Stephan *et al.* (2015:5) still contend that necessity-driven entrepreneurs tend to be somewhat older than opportunity-driven entrepreneurs. Alam (2019:3) asserts that older entrepreneurs are more likely to be successful as they have had more time to gain experience, build a network, and gather the resources required to start and grow their own businesses.

In the context of the current study, however, youth entrepreneurship is particularly worth noting because of the high levels of youth unemployment in both developed and emerging economies (Alam, 2019:1). Dzisi (2014:5) asserts that youth entrepreneurship deserves increased attention because of these high levels of youth unemployment. There is, however, no agreed-upon definition for the word 'youth' in the term youth entrepreneurship (Green, 2013:1; Dzisi, 2014:5). According to Green (2013:1), the term youth usually refers to individuals between the age of 16 and 24, but this varies between countries. In European countries, for example, youth are regarded as individuals between the age of 15 and 29, while in Japan and Korea individuals are considered youths until the age of 34 (Green, 2013:1). The United Nations, International Labour Organisation and the World Bank all refer to individuals between the age of 15 and 24 as youths (Bersaglio, Enns & Kepe, 2015:59). According to the National Youth Policy (2020:21), the term youth in South Africa refers to individuals between the age of 15 and 35.

Considering the definitions of entrepreneurship, an entrepreneur and youth as discussed above, the concept of youth entrepreneurship in the South African context and as applicable to the current study refers to any individuals between the age of 15 and 35 who are establishing or are operating their own business(es).

According to Marchand and Hermens (2015:267), student entrepreneurship is related to youth entrepreneurship. Student entrepreneurship is defined as the process followed by students who identify as an entrepreneur to establish a business alongside their university studies (Marchand

& Hermens, 2015:269; Bergmann *et al.*, 2016:54; Nielsen & Gartner, 2017:136). Fatoki (2014a:101) explains that student entrepreneurship is a programme that teaches students what entrepreneurship is, how to become successful entrepreneurs, and the skills and knowledge required to be their own boss. Fatoki (2014a:101) further claims that students who attend entrepreneurial modules at university are not necessarily student entrepreneurs as student entrepreneurs have to be in the process of or already have established their own business.

Gupta and Gupta (2017:36) identify three categories for describing student entrepreneurs, namely (i) students who are enrolled in entrepreneurship courses; (ii) students who are currently in the process of preparing a business plan for a new or existing business; and (iii) students who are involved in academic coursework while operating a business at the same time. Furthermore, Bergmann *et al.* (2016:54) distinguish between three types of student entrepreneurs, (i) registered students at a university who are in the process of establishing a business (nascent entrepreneurs), (ii) registered students at a university who are already operating a business that they have established, and (iii) individuals who have recently completed their qualifications and used the knowledge gained through their studies or research to establish a business.

For the current study, student entrepreneurs will be regarded as individuals between the ages of 15 and 35 and who are registered students at a South African public university. Alongside their university studies, they must also either be in the process of establishing a business or operating their own business(es) already.

2.2.2 THE IMPORTANCE OF STUDENT ENTREPRENEURSHIP

Irrespective of the type or category of entrepreneur, the important contribution they make are highlighted by several authors (Fadeyi *et al.*, 2015:28; Fatoki, 2014a:100; Ramchander, 2019:2). All types of entrepreneurs, including student entrepreneurs, are known to positively impact employment (job) creation, economic growth, and the adoption of new technologies and innovation capabilities.

According to Ndedi (2014:464), small and medium-sized businesses established by entrepreneurs contribute substantially to job creation and income generation in both developed- and developing countries. Hamilton and Mostert (2019:158) suggest that an entrepreneurial culture should be evident in a country to motivate individuals to start their own businesses,

become self-employed, and hopefully employ others. Roman and Maxim (2017:993) assert that newly created entrepreneurial businesses have accounted for almost half of new jobs in the Organisation for Economic Co-operation and Development (OECD) countries over the last decade. According to Nicolaides (2011:1044), an increase in student entrepreneurs will inevitably lead to job creation. Student entrepreneurship is also seen as a means to decrease graduate unemployment and unemployment, in general (Shambare, 2013:449; Fatoki, 2014b:216). Reducing unemployment is especially vital in the South African context, where the unemployment rate is high (Nicolaides, 2011:1044; Atiase *et al.*, 2018:644; Toerien, 2021:1). Dhaliwal (2016:4266) explains that as businesses established by student entrepreneurs grow, the impact on the unemployment rate increases as more and more persons are employed. Thus, by establishing more student entrepreneurial ventures, the unemployment rate would decrease directly through self-employment and indirectly through the employment of individuals (Dhaliwal, 2016:4266).

The importance of entrepreneurship to economic development is also highlighted (Atiase *et al.*, 2018:647). When high quality, creative and innovative entrepreneurs are evident in a nation, there is a greater chance that new ideas will be converted into practical actions which will, in turn, lead to economic development (Ghina, Simatupang & Gustomo, 2014:1). Nicolaides (2011:1044) suggests that any form of entrepreneurship drives economic growth, which is particularly important when an unfavourable business climate prevails. According to Hamilton and Mostert (2019:157), student entrepreneurs play a vital role in changing the economic position of South Africa, which in turn leads to social and economic empowerment of the youth (Ndedi, 2014:463). Self-employment through entrepreneurship has a positive impact on per capita income growth and poverty reduction (Fatoki, 2014c:294). Ndedi (2014:464) asserts that through self-employment, students can earn their livelihood and improve their standard of living, leading to a reduction in the poverty level through student entrepreneurship.

Entrepreneurship can also lead to the development of new technologies and an increase in innovation capabilities (Atiase *et al.*, 2018:647). Atiase *et al.* (2018:647) mention that Africa is faced with numerous challenges such as ineffective transportation systems, low agricultural productivity, and a lack of sustainable and efficient technology for development purposes. Through the creativity and innovativeness of entrepreneurs, new products are designed which leads to increased efficiency and better quality (Dhaliwal, 2016:4267). Entrepreneurs also develop new and innovative ideas that reduce obsolete systems and technologies, improve the quality of life, and increase morale among individuals (Dhaliwal, 2016:4267).

Despite the vital contribution made by student entrepreneurs, they continue to face several challenges in becoming entrepreneurs and establishing their own businesses (Shambare, 2013:450). These challenges are elaborated on in the next section.

2.2.3 CHALLENGES FACING STUDENT ENTREPRENEURS

Studies show that the level of entrepreneurial intention among South African students is low (Fatoki, 2010:1). These low levels of entrepreneurial intentions among students have been attributed to a lack of capital, skills and support, as well as the risks involved with starting an own business (Fatoki, 2010:1). Furthermore, Morris *et al.* (2017:65) assert that although universities' focus on entrepreneurship has increased, student start-up rates remain relatively low. According to Ebewo *et al.* (2017:176), these low start-up rates can be ascribed to a lack of interest and or experience on the part of students to engage in entrepreneurial activities. Student entrepreneurs also face several challenges that inhibit their interest or hinder their efforts to engage in entrepreneurial activities, several of which are elaborated on below.

According to Sandhu, Sidique and Riaz (2011:441), student entrepreneurs struggle to obtain funding from formal institutions, such as banks, because most do not have collateral (Sandhu *et al.*, 2011:441). Thamahane *et al.* (2017:3) further assert that it is difficult for entrepreneurs, including student entrepreneurs, who are in the process of starting a business to convince investors to invest in a business that does not yet exist. Studies show that accessing finance is the most significant challenge facing student entrepreneurs in South Africa (Fatoki, 2010:92; Viviers, Solomon & Venter, 2013:14; Iwu *et al.*, 2016:174). The inability to access funding is one of the primary reasons' students abandon their entrepreneurial pursuits, as students lack personal savings, collateral, and established credit histories (Morris *et al.*, 2017:70).

In a study conducted by Fatoki (2010:92), it was also found that students lack the necessary skills to establish and operate businesses. Shambare (2013:450) suggests that this lack of business skills is due to universities following a traditional theory approach to teaching entrepreneurship, leaving students without the required practical knowledge to establish and operate a business. Shambare (2013:451) elaborates further, indicating that at the university level, the method of teaching entrepreneurship, as well as the syllabi and content, are not adequate for preparing students to engage in entrepreneurial activities. For example, little focus is given to developing entrepreneurial skills such as perseverance, resilience and self-efficacy

(Ramchander, 2019:1). Gupta and Gupta (2017:39) add that most lecturers have always been in the academic world and have no entrepreneurial experience, making it difficult for them to connect theoretical knowledge to practice. Furthermore, it has been found that most academic staff follow a traditional classroom method when teaching entrepreneurship (Co & Mitchell, 2006:351; Radipere, 2012:11021). Viviers *et al.* (2013:8) agree by adding that entrepreneurial education in South Africa, in terms of content and methods, does not appear to achieve the outcome desired.

Fatoki and Oni (2014:589) assert that although some students want to pursue a career in entrepreneurship, they are often not encouraged by lecturers and other university staff. According to Nicolaides (2011:1045), the aim of universities has always been to instil a notion in students that they need to graduate and seek employment in the private sector at large corporations, rather than the need to graduate and seek innovative or creative employment options. As a result, it is well documented (Shambare, 2013:450; Ramchander, 2019:3) that most students would rather choose a career where there is a guaranteed income of formal employment than becoming entrepreneurs and start their own businesses. For example, although some entrepreneurship modules aim to provide students with the necessary skills to become entrepreneurs, students still perceive that it is first necessary to become employees before starting their own business (Jibane, 2019:56).

According to Shambare (2013:451), students also lack the necessary entrepreneurship support while attending university. Although universities claim that entrepreneurship and business creation is regarded as important, most universities fail to live up to the idea of actually supporting and motivating their student entrepreneurs (Shambare, 2013:451). Similarly, Brixiova, Ncube and Bicaba (2015:14) contend that student entrepreneurs lack a supportive infrastructure such as incubators to assist them in transforming their business ideas into entrepreneurial actions. It is further argued that universities do not provide a safe environment where student entrepreneurs can experiment with new ideas and follow their passions (Alves, Fischer, Schaeffer & Queiroz, 2019:98). Ndedi (2013:130) suggests that the lack of student entrepreneurship support or inefficiency thereof can be attributed to the high costs involved in establishing such support. Ndedi (2013:130) further adds that the institution's entrepreneurial culture influences the student entrepreneurship support provided. Moreover, Viviers *et al.* (2013:6) find that many students are unaware of the university-based student entrepreneurship support provided. It is this challenge relating to student entrepreneurship support at the university level that is the focus of the current study.

2.2.4 PREVIOUS RESEARCH ON STUDENT ENTREPRENEURSHIP SUPPORT

Several international and national studies have investigated the challenges associated with student entrepreneurship support at university level, some of which are discussed below.

2.2.4.1 International Studies on Student Entrepreneurship Support

Various international studies have been conducted on the student entrepreneurship support provided by universities, as well as the support required by student entrepreneurs (Choi, Park, Cho & Chu, 2017; Morris *et al.*, 2017; Shirokova, Osiyevskyy, Morris & Bogatyreva, 2017). Several of these studies are elaborated on below.

In their study, Choi *et al.* (2017) explore the relationship between universities investing in student entrepreneurial activities and the number of student founders starting own businesses. A nationwide panel data set collected by a government agency in South Korea was used to investigate this phenomenon (Choi *et al.*, 2017). Their results showed a positive effect on the number of student founders when universities invest in student entrepreneurship support activities (Choi *et al.*, 2017). The student entrepreneurship support activities invested in included financial support, entrepreneurship dedicated courses, entrepreneurship dedicated staff and faculty members, university entrepreneurship clubs, and entrepreneurship incubators and centres (Choi *et al.*, 2017). Choi *et al.* (2017:4) recommend that the primary aim of entrepreneurship education should be to encourage students to start their own businesses so that they can create their own employment and provide employment for others. Choi *et al.* (2017:5) also note that an increase in the number of faculty members with entrepreneurship knowledge would result in greater student access to advisors and mentors, leading to a cultural shift within universities where innovation is encouraged and appreciated. Moreover, the more entrepreneurship experience faculty members have, the better suited they would be to advise inexperienced student entrepreneurs on entrepreneurial journeys (Choi *et al.*, 2017:5).

Morris *et al.* (2017) developed a model and hypotheses concerning the impact of university entrepreneurial context on student start-up activity. The Global University Entrepreneurial Spirit Students' Survey (GUESS) database from 25 countries was used during this study (Morris *et al.*, 2017). A positive relationship between (i) entrepreneurship curricular programmes and student start-up activities; and (ii) entrepreneurship co-curricular activities and

student start-up activities was found during this study (Morris *et al.*, 2017). In contrast, a negative relationship was found between student entrepreneurship financial support and student start-up activities (Morris *et al.*, 2017). The negative relationship between financial support and student start-up activities is, however, moderated if the students have prior business experience (Morris *et al.*, 2017). The co-curricular activities included in this study were (i) entrepreneurship workshops and networking events; (ii) contact with potential investors; (iii) business plan competitions; (iv) entrepreneurship mentoring and coaching; and (v) a contact point for entrepreneurial issues (Morris *et al.*, 2017). Morris *et al.* (2017:69) note that co-curricular activities, such as business plan competitions, internships and incubators, provide students with opportunities to gain practical experience, while mentorship and coaching programmes, entrepreneurship clubs, and networking events provide them with opportunities to network with and gain entrepreneurial knowledge from experienced entrepreneurs. Morris *et al.* (2017:69) explain further that co-curricular programmes provide students with information, knowledge, legitimacy, trust and emotional support throughout the entrepreneurial process, which stimulates a number of successful student start-ups. The inability to access funding is one of the primary reasons why students stop pursuing their entrepreneurial journey, as students lack personal savings, collateral, and established credit histories (Morris *et al.*, 2017:70). Morris *et al.* (2017:70) found that the most common funding sources for student entrepreneurs includes family members, friends, credit cards, and savings, which usually prove inadequate.

A study conducted by Shirokova *et al.* (2017) investigated the role of university-related entrepreneurship offerings and students' prior business experience on their intentions to become entrepreneurs. Utilising the Global University Entrepreneurial Spirit Students' Survey (GUESS), the study consisted of a sample size of 2 179 student entrepreneurs from 26 countries (Shirokova *et al.*, 2017). It was found that there is a positive relationship between students' intentions and success of partaking in entrepreneurial activities and the university-related entrepreneurship offerings (Shirokova *et al.*, 2017). The university-related entrepreneurship offerings were categorised according to the following areas: curricular programmes, co-curricular programmes, and financial support (Shirokova *et al.*, 2017). Shirokova *et al.* (2017:918) note that there are various methods and techniques used to teach formal entrepreneurship education. They can, however, be classified according to three classifications (i) *about*; (ii) *for*; and (iii) *through* entrepreneurship. These techniques are discussed in more detail in Chapter Three (Section 3.2.1.3). It is worth noting that Shirokova *et al.* (2017:918) assert that most curricula are focused heavily on knowledge *about* entrepreneurship. According

to Shirokova *et al.* (2017:919), co-curricular activities include entrepreneurial mentorship programmes, incubators, entrepreneurship clubs, entrepreneurship seminars, business plan competitions, and pitching competitions. In terms of financial support, Shirokova *et al.* (2017:921) report that mainstream sources of financing are inaccessible to student entrepreneurs, as they do not have a history to which banks and investors can assess their riskiness and entrepreneurial capabilities. Lastly, it was also found that students with prior business experience in the field of their own start-up tend to have a better understanding of how funds should be used after sourced, whereas inexperienced student entrepreneurs are more likely to experiment with their financial resources (Shirokova *et al.*, 2017:922).

Moreover, several studies have focused explicitly on investigating university-based entrepreneurial ecosystems, frameworks or models (Rice *et al.*, 2014; Miller & Acs, 2017; Wright *et al.*, 2017; Sherwood, 2018; Tiemann *et al.*, 2018; Novela *et al.*, 2021). These studies are elaborated on below.

Rice *et al.* (2014) investigated the development and sustainable growth of U-BEEs by conducting a qualitative multiple-case study including three universities from the United States of America, one from Latin America, one from Europe and one from Asia. The entrepreneurship ecosystem elements evident at all six of these universities included leadership, organisational infrastructure and resources (Rice *et al.*, 2014). Rice *et al.*'s (2014) ecosystem is elaborated on in more detail in Section 2.3.3.1.

Miller and Acs (2017) utilised the Frederick Jackson Turner Frontier Thesis of American Democracy to develop a framework to investigate a university campus in the United States of America (University of Chicago) as an entrepreneurial ecosystem. The characteristics of the Turner's Frontier, evident in a university entrepreneurship ecosystem, include available assets, liberty and diversity while creating entrepreneurial opportunities for students (Miller & Acs, 2017). The internal entrepreneurship support identified and focused on during the study by Miller and Acs (2017) included mentors, test markets, co-curricular entrepreneurship activities, seed funding, networking opportunities, technology stations, student and faculty support, and entrepreneurship education. The external actors identified include the local entrepreneurship ecosystem, angel and venture capital investors, external start-ups, corporations, local government, professional services, incubators, and accelerator programmes (Miller & Acs, 2017). The ecosystem of Miller and Acs (2017) is further discussed in Section 2.3.3.2.

Wright *et al.* (2017) suggest that a general framework to effectively investigate and understand the ecosystem required to create a conducive environment for student entrepreneurs is lacking. Consequently, their study focused on developing such a framework highlighting various university mechanisms that facilitate student entrepreneurship (Wright *et al.*, 2017). Based on their study, Wright *et al.* (2017) developed a university ecosystem for student start-ups with the following elements: the university environment, the external context, and evolution over time. Moreover, within the university environment, specific elements were also evident, including entrepreneurs, support, investors, as well as the activity continuum from pre-incubator/accelerator programmes to incubator/accelerator/science parks (Wright *et al.*, 2017). The ecosystem of Wright *et al.* (2017) is further discussed in Section 2.3.3.3.

Sherwood (2018) conducted a study investigating the entrepreneurial ecosystem from a university perspective and its connection to the broader ecosystem. The study had four objectives, (i) to provide a description of entrepreneurship ecosystems and where universities fit in; (ii) to elaborate on the university's role and strategies employed to contribute to the broader entrepreneurship ecosystem; (iii) to investigate the concept of U-BEEs and the elements that should be evident; and (iv) to draw out implications for practice and research (Sherwood, 2018). Sherwood (2018) indicated seven elements that need to be evident within a U-BEE, with faculty, staff and student entrepreneurs at the centre. These entrepreneurs are surrounded by the following elements (i) formal entrepreneurship education; (ii) funding resources such as seed capital; (iii) extra-curricular activities such as entrepreneurship hubs, clubs and competitions; (iv) a technology transfer office (TTO); (v) community engagement such as mentoring, internships, and events; and (vi) bridging mechanisms such as consulting. More details regarding the ecosystem by Sherwood (2018) can be found in Section 2.3.3.4.

Tiemann *et al.* (2018) developed a conceptual framework based on an interactive paradigm to investigate the support systems that should be in place at a university to create a conducive entrepreneurial environment. To develop this conceptual framework, they conducted a qualitative multi-case study at four universities in the United States of America and Germany, based on 41 good practice examples (Tiemann *et al.*, 2018:83). Their conceptual framework encompasses three major categories, including the internal interaction between elements within the university environment, the external context, as well as the interactions between the internal and external environment (Tiemann *et al.*, 2018:91). The ecosystem of Tiemann *et al.* (2018) is further discussed in Section 2.3.3.5.

Most recently, Novela *et al.* (2021) conducted a study aimed at developing a conceptual entrepreneurial university model using a systems approach. The model consists of actors, enablers, entrepreneurial activities, outputs, and outcomes (Novela *et al.*, 2021:178). Novela *et al.* (2021:179) also identified several elements of an entrepreneurial university model, including actors, university governance, entrepreneurial activities, entrepreneurial outputs, support needed, and challenges. The ecosystem of Novela *et al.* (2021), the elements, as well as their sub-elements, are described in more details in Section 2.3.3.6.

Several studies have also focussed on investigating the U-BEEs of specific universities (Etzkowitz, Germain-Alamartine, Keel, Kumar, Smith & Albats, 2018; Matt & Schaeffer, 2018; Allahar & Sookram, 2019b; Suryanto, 2019; Xie & Zhang, 2019; Shil, Shahriar, Sultana, Rahman & Zayed, 2020). Two of these studies (Etzkowitz *et al.*, 2018; Allahar & Sookram, 2019b) focused on the transition of traditional universities to entrepreneurial universities. Etzkowitz *et al.* (2018) investigated Stanford University and first considered Stanford's origins, followed by the innovation gap that was experienced. Thereafter, the focus of their study shifted towards the entrepreneurship support offered by Stanford to assist their student and staff entrepreneurs in bridging the innovation gap (Etzkowitz *et al.*, 2018). Two universities, namely the University of the West Indies (UWI) and the University of Trinidad and Tobago (UTT), were investigated in a study conducted by Allahar and Sookram (2019b). They investigated how these two universities effectively designed and delivered entrepreneurship education and support, taking into consideration the collaboration between university, industry and government (triple helix) (Allahar & Sookram, 2019b).

Matt and Schaeffer (2018) explored the challenges faced by universities in developing an entrepreneurial ecosystem, focusing on the mechanisms used to expand the ecosystem to include student entrepreneurship. The study consisted of a longitudinal study on the University of Strasbourg (Matt & Schaeffer, 2018). It was found that internal changes to the operations of the universities were necessary to include more student entrepreneurship support activities, explicitly noting a centre for student entrepreneurship and student incubators (Matt & Schaeffer, 2018). Other student entrepreneurship support initiatives included (i) mentoring; (ii) support from other ecosystem actors; (iii) co-workspaces; (iv) funding possibilities; (v) student placement within a start-up project; (vi) student mutual funds; (vii) legal support; and (viii) a possible student entrepreneurship scholarship (Matt & Schaeffer, 2018:14). Moreover, changes in a TTO's service offering also needed to occur to include that of transferring knowledge and

assistance to student entrepreneurs (Matt & Schaeffer, 2018). Matt and Schaeffer (2018:28) note that TTO's play a vital role in supporting researchers and post-doctoral students in establishing their own businesses; however, the majority of TTOs do not consider supporting student entrepreneurs.

Suryanto (2019) conducted a study investigating the entrepreneurship support structures being offered by Padjadjaran University in Bandung, Indonesia, as well as the strategies that could be implemented to create a U-BEE. At least six different support structures were found at the university, including a business incubator centre, an entrepreneurship centre, entrepreneurship priority (entrepreneurship education compulsory for all students), and three entrepreneurship programmes (Mandiri Entrepreneurship Programme, Impact Entrepreneur Programme, and Development of Entrepreneur Student Programme) (Suryanto, 2019:4). Strategies identified that could be implemented to create a U-BEE included curriculum policy, improving the quality of entrepreneurship lectures, accelerating downstream research products, and collaborating with other institutions (Suryanto, 2019:4).

Xie and Zhang (2019) conducted an empirical investigation on Zhejiang University in China to test an evaluation system model for U-BEEs. The evaluation system model consists of four first-level indicators, followed by another 14 second-level indicators and 33 third-level indicators (Xie & Zhang, 2019:8). These indicators are presented in Table 2.2.

Table 2.2: U-BEE evaluation system model

Level 1 Indicators	Level 2 Indicators	Level 3 Indicators
Ecological diversity	Student participation	The current proportion of students receiving entrepreneurship guidance and training.
		The number of awards from entrepreneurship competitions at or above the provincial level for students in the past three years.
		Number of graduates who chose to start their own businesses.
	Teacher participation	Number of full-time teachers in innovation and entrepreneurship education courses.
		Number of full-time innovation entrepreneurship guidance service staff at the university level.
		Number of teachers participating in innovation and entrepreneurship guidance training annually.
	Participation of extra-mural teacher	Number of extra-mural teachers who participated in assisting student entrepreneurs in that year.
	Institutional organisational participation	The number of courses for innovation and entrepreneurship education in current teaching departments.
		Is there a school of entrepreneurship or something similar?
		Number of entrepreneurship-related associations currently.
Number of current entrepreneurship teams.		
Synergistic symbiosis	Synergistic symbiosis degree of university-school	Number of innovation and entrepreneurship spaces such as customer space, innovation base, etc.
		Total amount of funds provided by university for entrepreneurship-related activities for faculty and students.
	Synergistic symbiosis degree of teacher-student	Total number of joint venture projects between teachers and students in that year.

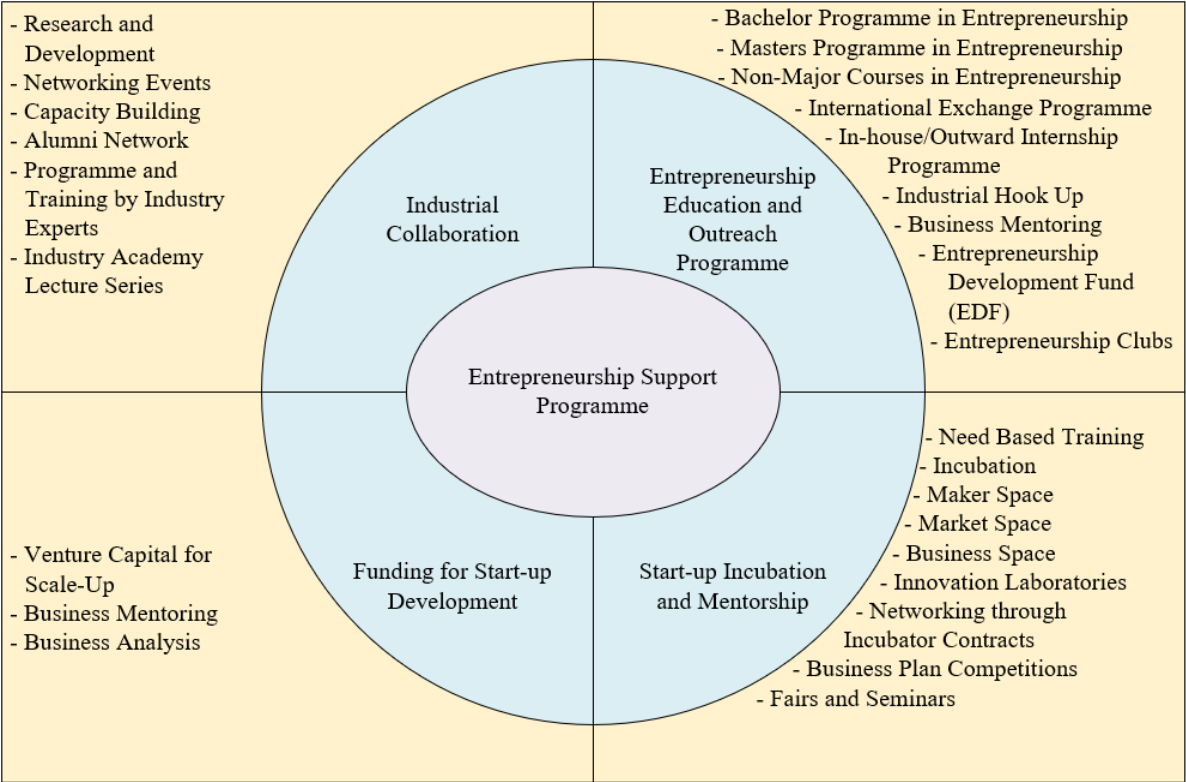
Table 2.2: U-BEE evaluation system model (cont.)

Level 1 Indicators	Level 2 Indicators	Level 3 Indicators
Network interaction	Interaction degree of government and university	The number of policies and documents issued by provincial and municipal governments on entrepreneurship in that year.
		Number of Maker Space Alliance jointly established by the university and local government.
	Interaction degree of enterprise and university	Are there R&D Centres jointly established between the university and enterprises?
		Times that entrepreneurs were invited to give lectures on campus.
		Total project funds between the university and enterprises of the year.
	Interaction degree of alumni and university	Alumni donation ranking.
		Total alumni donations in terms of entrepreneurship.
		The total number of alumni currently serving as CEO or actually holding shares of a company.
	Interaction degree of technology transfer network and universities	Current total number of technology transfer branches.
		Number of national technology transfer demonstration institutions.
Self-evolution	Platform maturity	The total area of the special venues for university-level entrepreneurship education (square meters).
		Current total number of innovative entrepreneurship scholarships.
	Project's progress	Number of projects stationed in business incubation bases and university science parks in recent three years.
		Number of projects currently being incubated.
	Strategic importance	Is there a school leader directly responsible for the overall planning of entrepreneurship work or not?
		The relevant policies on entrepreneurship issued by the university.
	Achievement degree	The total number of "Internet +" awards received nationwide and provincially in that year.
		Ranking in Hurun's Richest Creative Chinese University Ranking.
		Ranking in the Top 100 of the most innovative universities in China.

Source: Xie and Zhang (2019:8)

In their study, Shil *et al.* (2020) focused on identifying the elementary actors that support and boost entrepreneurship activities within a university environment. After identifying the elementary actors, they developed a conceptual framework to support entrepreneurship programmes (see Figure 2.1). Their framework was used to investigate the support being provided by Daffodil International University in Bangladesh and consists of four main elements, namely (i) entrepreneurship education and outreach programme; (ii) start-up incubation and mentorship; (iii) funding for scale-up; and (iv) industrial collaboration (Shil *et al.*, 2020:5). The various initiatives identified in their study to support student entrepreneurs within each of the main elements are listed in Figure 2.1.

Figure 2.1: Shil, Shahriar, Sultana, Rahman and Zayed’s (2020) Entrepreneurship Support Programme



Source: Shil *et al.* (2020:6)

2.2.4.2 National Studies on Student Entrepreneurship Support

Numerous studies have also been conducted on student entrepreneurship in South Africa. The majority of these, however, have focused on student entrepreneurship education (Co & Mitchell, 2006; Radipere, 2012; Jibane, 2019; Ramchander, 2019) and student entrepreneurial

intention (Fatoki, 2010; Viviers *et al.*, 2013; Fatoki, 2014c). To date, only a few studies have focused on student entrepreneurship support and university-based student entrepreneurship support ecosystems at public universities in South Africa (Davies, 2001; Viviers *et al.*, 2013; Sambo, 2018; EDHE Baseline Study, 2019).

Davies (2001) investigated how higher education institutions in South Africa could enhance the quality of student entrepreneurship support being provided. The focus was firstly on the formal education element (Davies, 2001:33). It was suggested that entrepreneurship education should effectively change the mindsets of students from wanting to be employees to employers, equipping them with the necessary practical business skills and knowledge to do so, and ensuring that practical aspects are included within formal entrepreneurial education (Davies, 2001:33). Secondly, Davies (2001:33) notes that higher education institutions need to go beyond providing entrepreneurship education and should take an active stance in assisting student entrepreneurs in establishing and improving their businesses. Davies (2001:33) asserts that a more active approach could include (i) providing the required infrastructure; (ii) assisting with prototype building; (iii) assisting with strategic planning; (iv) helping the students implement quality control over their products; and (v) providing networking events while acting as an intermediary between student entrepreneurs and external investors and corporations.

Viviers *et al.* (2013) investigated the knowledge, demand, utilisation and satisfaction of university-based student entrepreneurship support at 15 South African universities. Viviers *et al.* (2013:1) found that very few students intended to become entrepreneurs immediately after graduating. However, almost a third indicated an intention to pursue entrepreneurship as a career five years after graduating (Viviers *et al.*, 2013:1). The majority of the students were satisfied with the entrepreneurship offerings provided by their respective universities, but more effective marketing of these supports was required as only a few students were aware of what support was available (Viviers *et al.*, 2013:1).

Sambo (2018) focused on assessing the climate for entrepreneurship at universities in South Africa. Sambo (2018:198) presented a structure that includes four elements within the university environment to support entrepreneurs, including centres for entrepreneurship and small business development, TTOs, student bodies, and research and innovation units. Six universities in South Africa were also identified as successfully building entrepreneurial systems, including the University of Johannesburg, the University of Pretoria, Durban

University of Technology, the University of Cape Town, the University of the Witwatersrand, and the University of the Western Cape (Sambo, 2018:199). Various characteristics were also identified, which are evident at a university where an entrepreneurial system has been built successfully, such as having a tolerance for failure, risk-taking propensity, resource availability, management support, and reward for innovation (Sambo, 2018:201).

In 2016, the Department of Higher Education and Training established a programme called the Entrepreneurship Development in Higher Education (EDHE), which focuses on student entrepreneurship, entrepreneurship development in academia, and developing entrepreneurial universities (Entrepreneurship Development in Higher Education, 2021). In 2019, the EDHE conducted a National University Entrepreneurship Ecosystem Baseline Study which provided insights into all 26 South African public universities' entrepreneurship ecosystems (EDHE Baseline Study, 2019:4). The EDHE baseline report (EDHE Baseline Study, 2019:4) found that academic entrepreneurship has received a lot of attention and is doing well. However, there is still work to be done regarding entrepreneurship education and support delivered to the students and student entrepreneurs (EDHE Baseline Study, 2019:4). It is suggested that universities in South Africa need to provide a more practical approach to educating, encouraging and supporting entrepreneurship among students (EDHE Baseline Study, 2019:4). The findings of the baseline study indicated that of the 26 public universities in South Africa, 56% had entrepreneurial activities within a department, 28% offered entrepreneurship courses, 28% had student activities such as clubs, groups or competitions focusing on student entrepreneurship, 20% had entrepreneurship degree programmes, and 12% had no evidence of any entrepreneurial activities being provided (EDHE Baseline Study, 2019:13).

As is evident from the EDHE Baseline Study (2019), as well as several international studies, much research on student entrepreneurship support takes place within the context of U-BEES. To date, various U-BEES have been proposed. The common theory underlying these ecosystems is that of systems theory. Systems theory and several of these U-BEES mentioned above are described below.

2.3 SYSTEMS THEORY AND UNIVERSITY-BASED ENTREPRENEURIAL ECOSYSTEMS

The previous section provided an overview of student entrepreneurship, focusing on the nature and importance thereof, the challenges faced by student entrepreneurs and the previous research on student entrepreneurship support. This section firstly explain the theory underlying entrepreneurial ecosystems and U-BEEs, namely systems theory. Thereafter, several existing U-BEE frameworks and building blocks for entrepreneurially supportive universities identified in the literature are elaborated on. Lastly, organisational theory, which is used in the current study to obtain greater insight into the organisation and design of a U-BEE, is discussed.

2.3.1 SYSTEMS THEORY

The theory underlying U-BEEs is that of systems theory. A system is defined by Turner and Baker (2019:3) as a group of independent items or elements forming a unified whole, which regularly interact, focusing on a common purpose. Lai and Lin (2017:2) further explain that systems are based upon the structures and relationships that exist through interaction that occurs between various components. A system consists of four common characteristics, including (i) a group of elements; (ii) interdependent relationships between these elements and the environment; (iii) the whole is greater than the sum of the parts (elements); and (iv) a link exists between the function or purpose of the various elements, and the group as a whole (Cordon, 2013:13). According to Cordon (2013:13), systems can be differentiated based on whether they are open or closed, or simple or complex.

Systems are described as open when interaction exists between the system and its environment (Cordon, 2013:16; Lai & Lin, 2017:5). Communication between the various elements within the open system allows for adaptation when changes occur in the environment (Lai & Lin, 2017:5). Turner and Baker (2019:4) further elaborate that the elements within an open system freely exchange information and resources with its environment and can be directly influenced by both internal and external factors from the system. In contrast, systems are closed when the system exists in isolation from its environment, and no interaction occurs (Cordon, 2013:16; Turner & Baker, 2019:4).

In a simple system, elements are regarded as being in or close to equilibrium, negating the need to investigate the relationships and interactions between the various elements, focusing instead on studying each element in isolation (Roundy, Bradshaw & Brockman, 2018:2). A complex system contains various other micro-systems, forming a more extensive and more complex network of systems (Cordon, 2013:14). Roundy *et al.* (2018:2) explain that the elements within a complex system are not at equilibrium, and more focus is on the dynamic relationships and interactions between the various elements.

Two different system theories exist, namely (i) General Systems Theory (GST); and (ii) Complex-Adaptive Systems (CAS). The General Systems Theory is based on the argument that a system should be looked at as a whole rather than investigating the various elements that make up a system in isolation (Cordon, 2013:16). The idea is to provide a general theory that can identify universal principles to be applied to any system, regardless of the characteristics of the various elements (Cordon, 2013:16; Turner & Baker, 2019:3). Turner and Baker (2019:3) argue that the General Systems Theory approach is not the most effective for investigating social systems. This argument is due to (i) the strict boundaries between the elements within a system that is required when using the General Systems Theory approach, which is not always easy to do in complex organisations or systems; (ii) General Systems Theory is regarded as being too mechanic; and (iii) General Systems Theory is suggested to be a tool to measure natural sciences, rather than social sciences which comprise of humans with free will, making systems unpredictable (Turner & Baker, 2019:3).

Complex-Adaptive Systems is comprised of various levels of hierarchies and networks (elements or components), which can adapt to changes experienced by other elements within the system, as well as the environment (Cordon, 2013:17; Roundy *et al.*, 2018:2). This adaptability is crucial due to organisations' settings and systems being quite chaotic, with numerous changes occurring, leading to non-linear and spontaneous interactions (Lai & Lin, 2017:7). Systems are non-linear, with feedback loops that amplify and grow the effects of decisions and actions on the results required or expected (Cordon, 2013:18; Turner & Baker, 2019:8). Complex-Adaptive Systems' primary focus is on the systems' ability to adapt itself through self-organisation, learning, and reasoning, which is one of the significant differences between GST and CAS (Cordon, 2013:17). Through self-organisation, the elements within a system do not just passively adapt to changes in the environment, but an active role is taken within each element to ensure that specific adaptations occur (Lai & Lin, 2017:7). Self-

organisation plays a vital role in the ability of the elements within a system to adapt to changes, as the whole system's performance is not only dependent on a single component (Roundy *et al.*, 2018:3). Cordon (2013:17) does warn, however that although a system is not only dependent on one single element, if disruptions were to occur somewhere in the system, the system's cohesiveness and functionality could be affected depending on the severity of the disruption. Roundy *et al.* (2018:2) found the complex-adaptive systems theory approach more appropriate when a researcher wished to investigate entrepreneurial ecosystems. Entrepreneurial ecosystems are elaborated on in the paragraphs that follow.

2.3.2 ENTREPRENEURIAL ECOSYSTEMS

A natural ecosystem refers to living and non-living organisms that interact with one another to create a system (Rice *et al.*, 2014:483; Isenberg, 2016:566). However, the term "ecosystem" has shifted from being used in the ecological and natural sciences only to also being frequently used within the social sciences (Isenberg, 2016:567; Malecki, 2017:1; Cavallo, Ghezzi & Balocco, 2019:1295). In the context of the social sciences, an ecosystem refers to a complex system with numerous entities or elements that interact with one another to achieve a common goal (Cavallo *et al.*, 2019:1295). Isenberg (2016:567) contends that humans are unique actors within an ecosystem, as they have more complex intentions and influences over how to respond to changes in the environment. An ecosystem is also believed to be mostly self-organising and self-sustaining, which has led to an increased interest in economic development by using entrepreneurship ecosystem terminology (Isenberg, 2016:568).

An entrepreneurial ecosystem is defined as a system consisting of several interdependent elements in the entrepreneurial environment, which together creates a conducive environment for entrepreneurs (Stam & Spigel, 2016:1; Roundy *et al.*, 2018:2). Furthermore, an entrepreneurial ecosystem is described as a conceptual framework focusing on fostering entrepreneurship and innovation (Segers, 2015:2). Malecki (2017:7) note that an entrepreneurial ecosystem can be regarded as a seedbed for nascent entrepreneurs. However, some entrepreneurial ecosystems can be sector-specific in terms of the businesses they support (Malecki, 2017:7).

There are two main aspects of an entrepreneurial ecosystem: the interaction between the actors within the ecosystem is a dimension of complexity, and the goal of an entrepreneurial ecosystem is to increase the number of new start-ups (Cavallo *et al.*, 2019:1299). Cavallo *et al.*

(2019:1299) explain that while living organisms are at the heart of ecosystems within natural sciences, systemic conditions such as networks, leadership, finance, talents, knowledge, and support services are at the heart of ecosystems within the sphere of the social sciences. The basic idea of an entrepreneurial ecosystem is the coordination of various interactive and interrelated elements within the entrepreneurial environment to promote and support entrepreneurship (Sherwood, 2018:239).

Although entrepreneurship is regarded as local in nature, it is frequently done at a national level when investigating entrepreneurial ecosystems, as distant resources and networks can also be critical to such an ecosystem's performance (Malecki, 2017:8). According to Isenberg (2016:569), policymakers measure the performance of an entrepreneurial ecosystem in terms of the number of start-ups being created, as start-ups are seen as a way to achieve economic development and prosperity. However, it is important to note that start-ups may struggle to grow in terms of employment and revenue, thus leading to not all start-ups significantly contributing to economic development (Isenberg, 2016:570). Malecki (2017:5) asserts that it is vital to investigate the interactions and relationships between the entrepreneurial ecosystem components, as changes in the environment would lead to changes in the type of components in the ecosystem and the relationships and interactions between them. Atiase *et al.* (2018:646) emphasise that a healthy entrepreneurial ecosystem will ensure that resources are allocated where they will be used most productively and will drive total factor productivity through innovation. Several authors argue that more focus should be on universities within the broader entrepreneurial ecosystem to establish a more conducive environment for student entrepreneurs (Morris *et al.*, 2017:65; Wright *et al.*, 2017:910, Sherwood, 2018:240).

According to Morris *et al.* (2017:68), the university environment can be conceptualised as an entrepreneurial ecosystem. A U-BEE is defined as the interplay between various elements within a university's ecosystem aimed at increasing the number of student start-ups and the quality and success thereof (Yusoff *et al.*, 2017:893). Jansen *et al.* (2015:173) elaborate that a U-BEE is any part of the university organisation focusing on and actively promoting and supporting entrepreneurship among staff, students and alumni and includes those participating in entrepreneurial activities. It is important to note that based on the description of an ecosystem, the elements within the U-BEE ecosystem have an interdependent relationship, and coordination and open communication are required to operate effectively and efficiently (Morris *et al.*, 2017:68).

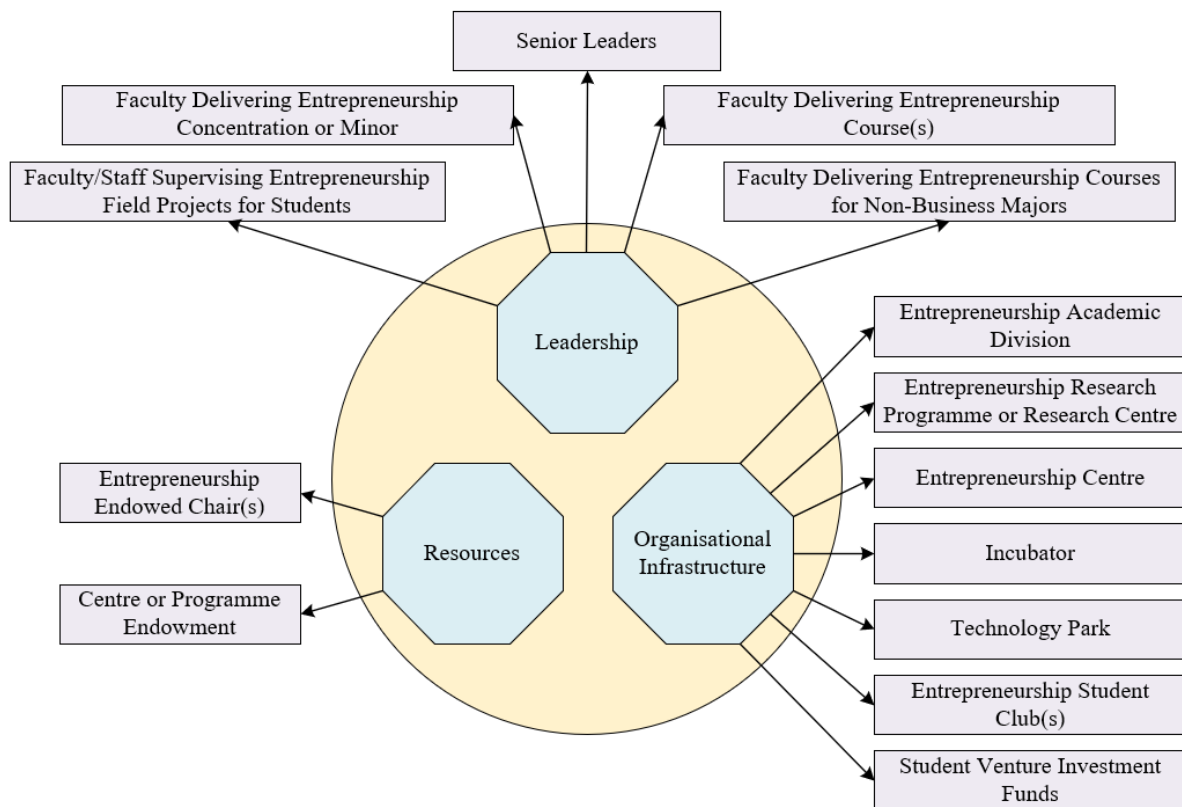
2.3.3 UNIVERSITY-BASED ENTREPRENEURIAL ECOSYSTEMS/ FRAMEWORKS/MODELS

Various models and frameworks exist in the literature describing the elements of a U-BEE. These elements must work together to create a conducive environment for entrepreneurs to flourish within a university context. In the sections to follow, six different U-BEEs are described, including those of Rice *et al.* (2014); Miller and Acs (2017); Wright *et al.* (2017); Sherwood (2018); Tiemann *et al.* (2018); and Novela *et al.* (2021).

2.3.3.1 Rice, Fettes and Greene’s (2014) University-Based Entrepreneurial Ecosystem

Rice *et al.* (2014:487) describe a U-BEE model consisting of three elements: leadership, organisational infrastructure, and resources (see Figure 2.2). Rice *et al.* (2014:489) do, however, note that these elements differ in terms of what they consist of and their functions, and would depend on the strategic objectives of the specific university. The sections to follow briefly describe the aforementioned elements.

Figure 2.2: Rice, Fettes and Greene’s (2014) U-BEE



Source: Rice *et al.* (2014)

The first element relates to leadership. Rice *et al.* (2014:489) found that it is imperative to have the buy-in and support of senior leaders within the university environment to ensure a U-BEE's success. The element "leadership" includes senior leaders, faculties delivering entrepreneurship courses and modules to both business- and non-business majors, faculty delivering entrepreneurship concentration or minor, and faculty or staff supervising entrepreneurship field projects for students (Rice *et al.*, 2014:487). Support provided by individuals in leadership positions can take various forms, such as strategic commitment (stating entrepreneurship as a priority in the strategic plan), championing (advocacy for entrepreneurship initiatives), celebrating success (recognition of individuals involved in entrepreneurial activities), developing and supporting programmatic and faculty leaders (supporting staff involved with entrepreneurial initiatives), and providing resources (acquisition and allocation of both financial and non-financial resources) (Rice *et al.*, 2014:489). It is vital to note that developing a successful and sustainable U-BEE also requires administrative staff support (Rice *et al.*, 2014:489).

The second element of Rice *et al.*'s (2014) U-BEE model relates to organisational infrastructure. An effective and robust organisational infrastructure is essential for developing a successful and sustainable U-BEE (Rice *et al.*, 2014:493). Various types of organisational infrastructure could exist at universities that are focused on entrepreneurship, but the focus of most is on (i) advancing and managing entrepreneurship initiatives; (ii) teaching and curriculum development; and (iii) outreach (Rice *et al.*, 2014:493). According to Rice *et al.* (2014:487), organisational infrastructure includes entrepreneurship education, entrepreneurship programmes and research centres, incubators, technology parks, entrepreneurship societies, and a student venture investment fund. It would be challenging to develop a sustainable U-BEE if the ecosystem's elements constantly struggle to secure the resources to survive (Rice *et al.*, 2014:496).

The third element of the U-BEE model relates to resources. Resources include an entrepreneurship endowed chair and a centre or programme endowment (Rice *et al.*, 2014:487). The objective of these endowment chairs and programmes is to obtain the required financial resources to support entrepreneurship at the university from, for example, donors, sponsors and government agencies (Rice *et al.*, 2014:499).

According to Rice *et al.* (2014), each element within the U-BEE provides certain support or services. These are summarised in Table 2.3.

Table 2.3: Services/support given by U-BEE elements

Ecosystem Elements	Services/Support
Senior leaders	Provide the strategic vision highlighting entrepreneurship as a priority in the strategic plan.
	Allocate resources in the form of staff and funding to implement the strategic vision.
	Raise the credibility and visibility of the various elements in the U-BEE.
Faculty	Deliver entrepreneurship courses to both business- and non-business majors.
	Conduct research specifically related to entrepreneurship.
	Supervise student projects related to entrepreneurship.
Entrepreneurship academic division	Coordinate academic offerings.
	Ensure that high-quality entrepreneurship education is being provided.
	Coordinate faculty development.
Entrepreneurship research programme or centre	Deliver research findings beneficial to student entrepreneurs.
	Attract funding from government agencies, foundations, and companies to support entrepreneurship-related activities.
	Encourage and support collaboration within the university, as well as among universities.
Entrepreneurship centre	Establish and manage a network consisting of individuals interested in supporting entrepreneurship.
	Sponsor networking events, business plan competitions, and guest speaker series.
	Provide access to mentors and advisors, as well as funding such as angel and venture funds.
	Raise visibility and credibility of entrepreneurship and the elements in the U-BEE.

Table 2.3: Services/support given by U-BEE elements (continued)

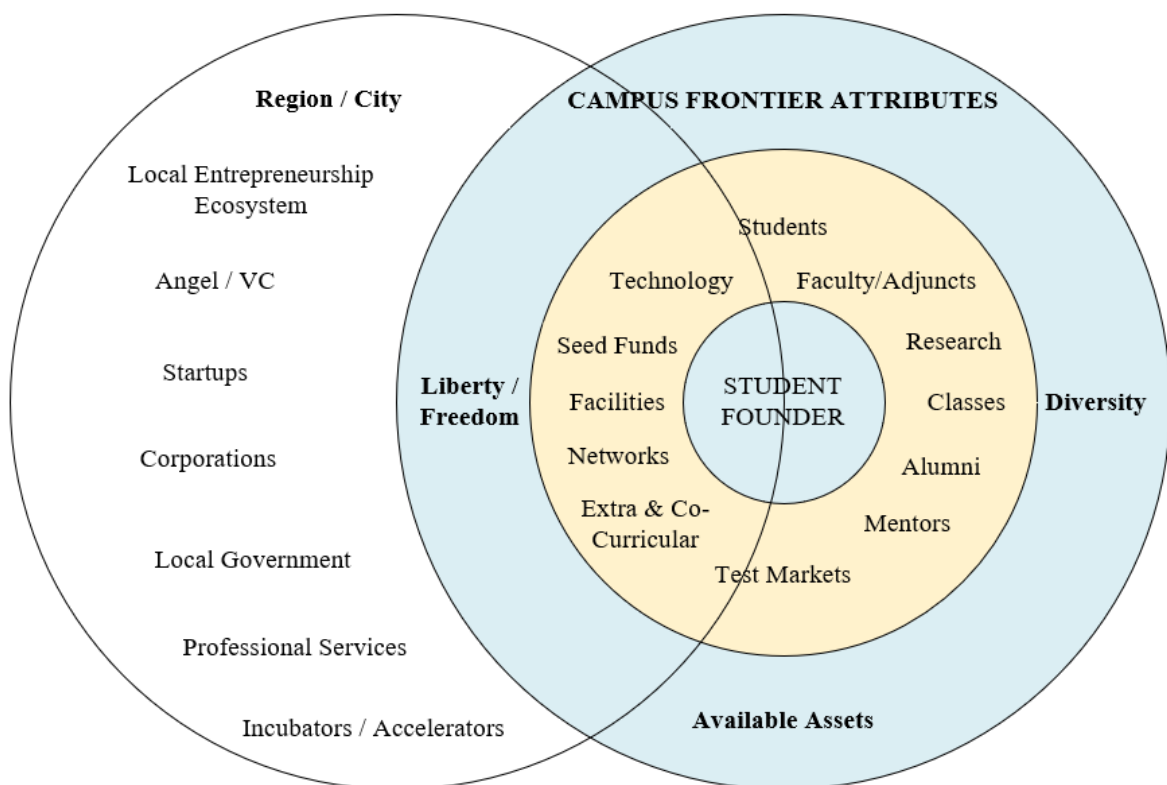
Ecosystem Elements	Services/Support
Incubator programme	Provide access to mentorship and advisors.
	Provide a network including both internal and external actors providing expertise, facilities, and investments.
	Raise visibility and credibility of entrepreneurship, and the elements in the U-BEE.
	Provide training seminars and workshops within the incubator focusing on entrepreneurship-related activities.
	Provide co-working spaces and infrastructure.
	Provide internship opportunities for students who wish to become entrepreneurs and start their own businesses.
Technology park	Provide similar services and support as the incubators, but more focused on mature companies.
	Assist students who have graduated from the incubator.
	Provide both temporary and permanent employment for students and graduates of entrepreneurship programmes.
Entrepreneurship clubs	Support student-to-student learning.
	Encourage collaboration between various actors within the U-BEE.
Student venture investment fund	Act as a potential source of funding for students who wish to start their own businesses.
	Provides students with the opportunity to learn about venture investing.

Source: Rice *et al.* (2014:487)

2.3.3.2 Miller and Acs' (2017) University-Based Entrepreneurial Ecosystem

Miller and Acs (2017) proposed a U-BEE model consisting of four layers with student founders at the system's centre (see Figure 2.3). The layers surrounding the student founders are first, the campus environment and the support provided, followed by the campus frontier attributes, and lastly, the external context influencing student entrepreneurship (Miller & Acs, 2017:81). These layers are described below in more detail.

Figure 2.3: Miller and Acs' (2017) U-BEE



Source: Miller and Acs (2017)

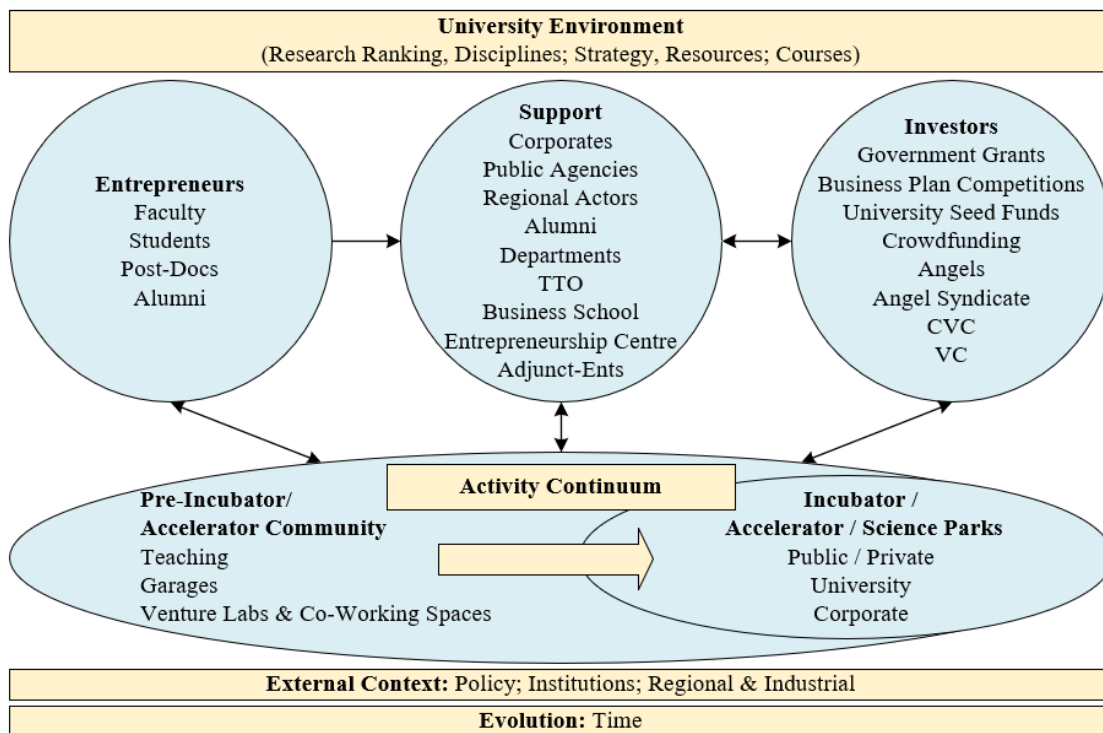
At the centre of this U-BEE model is the student founders. There is no distinction made between the student's field or level of study, as the effort to start a business places them at the centre (Miller & Acs, 2017:81). The layer surrounding the student founders is the campus environment and the support provided by the university to student entrepreneurs (Miller & Acs, 2017:81). Miller and Acs (2017:81) assert that these supports could come in various forms, including a TTO, seed funding, extra- and co-curricular, and mentors. The next layer is labelled the campus frontier attributes, including liberty/freedom, diversity, availability of assets, and the assistance available to student entrepreneurs to begin the firm-formation process (Miller & Acs, 2017:81).

Miller and Acs (2017:80) explain that while diversity refers to the demographics of the students such as their age, ethnicity, the field of study, education level, and so forth; readily available assets refer to the wide range of resources available to the student entrepreneurs such as courses, co-curricular activities; faculty support research, laboratories, and so forth. Furthermore, liberty/freedom represents the student's ability to freely choose their own path and resources to utilise (Miller & Acs, 2017:81). The outer layer refers to the external context, including the local entrepreneurship ecosystem, angel investors, existing start-ups, corporations, local government, professional services, incubators, and accelerators (Miller & Acs, 2017:81). Although the external context and the resources available to student entrepreneurs external to the university environment play a vital role in the entrepreneurial ecosystem, students usually prefer to engage with the university setting's resources to allow for more liberty and openness (Miller & Acs, 2017:82).

2.3.3.3 Wright, Siegel and Mustar's (2017) University-Based Entrepreneurial Ecosystem

Wright *et al.* (2017) propose an ecosystem for student start-ups which considers seven different elements, namely (i) The university environment; (ii) Entrepreneurs; (iii) Support; (iv) Investors; (v) Activity continuity; (vi) External context; and (vii) Evolution (see Figure 2.4). These elements are further elaborated on in the sections to follow.

Figure 2.4: Wright, Siegel and Mustar's (2017) U-BEE



Source: Wright *et al.* (2017)

a) University Environment

The element university environment refers to the research ranking, strategy and resources of the institution, as well as the disciplines and courses offered focusing on entrepreneurship (Wright *et al.*, 2017:912). Wright *et al.* (2017:912) assert that the heterogeneity among universities has a vital impact on the nature of U-BEEs and the extent and types of resources that can effectively be made available to support student entrepreneurs. It is also important to note that the historical trajectory and culture has an impact on the nature and extent of support being offered to student entrepreneurs, as some universities are teaching-focused, while others are research-oriented (Wright *et al.*, 2017:912).

b) Entrepreneurs

The entrepreneurs element refers to the wide variety of entrepreneurs in a university entrepreneurship ecosystem, including undergraduate and postgraduate student entrepreneurs, alumni entrepreneurs, post-doc entrepreneurs, and faculty entrepreneurs (Wright, 2017:917).

Faculty and alumni who have become entrepreneurs play a crucial role in the ecosystem, having the required experience to act as role models and mentors for emerging student entrepreneurs (Wright *et al.*, 2017:917). Wright *et al.* (2017:917) elaborate that alumni can serve as mentors or coaches, while societies organise networking events and create avenues for student entrepreneurs to connect with internal and external stakeholders.

The element entrepreneurs has a one-way arrow leading towards the element support and a two-way arrow leading towards the activity continuum. Wright *et al.* (2017:917) assert that existing entrepreneurs can provide general support and continuous support throughout the activity continuum to entrepreneurs who are just starting on their entrepreneurial journey. This ability to provide such support indicates why the element entrepreneurs has arrows leading into the support and activity continuum, suggesting that they can add to those elements. The arrow from the activity continuum also leads back to the entrepreneur, highlighting the support given to entrepreneurs as they move through the activity continuum.

c) Support

The element support refers to the support mechanisms in place to assist student entrepreneurs on their entrepreneurial journey, which Wright *et al.* (2017:916) suggest can be provided by internal and external university actors. Internal actors would include administrative staff involved with the commercialisation of research, business schools, departments, university entrepreneurship centres, and TTOs (Wright *et al.*, 2017:916). Internal university actors can support student entrepreneurs through funding, technology transfer regarding intellectual property and patenting, networking events where students can meet potential investors and successful entrepreneurs, mentorship, and formal entrepreneurship education (Wright *et al.*, 2017:916). External actors include alumni, adjunct professors, corporations, foundations, and public agencies, at a regional or national level, that are supporting student entrepreneurship (Wright *et al.*, 2017:916). Wright *et al.* (2017:916) assert that external university actors can support student entrepreneurs through sponsorships and awards, hosting business plan competitions, presenting external entrepreneurship mentoring and training sessions, and providing financial support and equipment.

Three arrows point to and from the support element, a one-way arrow from entrepreneurs, a two-way arrow from investors, and a two-way arrow from the activity continuum. The one-way arrow coming from the element entrepreneurs highlights those existing entrepreneurs are also providers of support to other entrepreneurs, while the arrow coming from investors indicates the funding support from internal and external investors. The arrow from the element support to investors points out that some support actors might be investors. The two-way arrows between the support element and the activity continuum element indicate the collaboration between these elements, as the support is offered throughout the activity continuum.

d) Investors

The investors element refers to the various sources from which student entrepreneurs can obtain funding for start-up businesses (Wright *et al.*, 2017:902). Wright *et al.* (2017:914) categorise the sources of funding according to three categories, including (i) venture capital firms (VCs) and corporate venture capital firms (CVC); (ii) business angels and angel syndicates; (iii) government grants, business plan competitions, university seed funds, and crowdfunding. Although Wright *et al.* (2017:914) acknowledge VCs and CVCs as potential sources of funding for student start-ups, the chances of student entrepreneurs obtaining funding from VCs is unlikely as the minimum investment thresholds are often out of reach for most student entrepreneurs. Business angels (and angel syndicates) are described as individuals who invest their own money in new or growing privately owned businesses, which could be a source of capital for student start-ups (Wright *et al.*, 2017:914). This method of obtaining funding is not only beneficial from a financial viewpoint but also a knowledge viewpoint, as angel investors generally also provide their experience, network, and strategic advice to the start-up (Wright *et al.*, 2017:914). Other funding sources for student start-ups include government grants, business plan competitions, university seed funds, and crowdfunding (Wright *et al.*, 2017:914). Wright *et al.* (2017:914) point out that while government grants are sometimes available to student entrepreneurs, universities tend to provide seed capital to help start-up student entrepreneurs and host business plan competitions where winners receive funding to develop their proposed ventures. Crowdfunding has also increased in popularity for student entrepreneurs to generate capital to start their own businesses (Wright *et al.*, 2017:915). The students pitch their ideas to various investors on a crowdfunding platform to generate modest amounts of funding (Wright *et al.*, 2017:715). Wright *et al.* (2017:915) do, however, indicate that these funds are usually only released to the founders if the target amount has been reached within a specific amount of time.

There are two two-way arrows from the element investors, indicating mutual beneficial collaboration between the support and investors element, as well as the activity continuum and investors element.

e) Activity continuum

The element activity continuum encompasses various activities available that assist student entrepreneurs as they pass through the numerous stages or phases of business development, from pre-incubators/accelerator community to incubators/accelerators/science parks (Wright *et al.*, 2017:917). Pre-incubation usually involves a more hands-on teaching approach as well as entrepreneurship garages, venture laboratories, and co-working spaces, which essentially focus on helping student entrepreneurs develop their business ideas (Wright *et al.*, 2017:918). After students complete the pre-incubation/accelerator community stage, they continue to the incubators/accelerators/science parks stage (Wright *et al.*, 2017:918). These incubators, accelerators and science parks are essential for supporting student entrepreneurs because they assist them in shaping their business ideas further and in identifying possible investors and potential markets to enter (Wright *et al.*, 2017:917). Incubators focus on providing office space and in-house business support services, product development support, access to networks of entrepreneurs, and the provision of finance (Wright *et al.*, 2017:917). Accelerator programmes and science parks are described as organisations established to overcome some of the shortcomings of incubators, such as focusing more on the education and mentoring aspects (Wright *et al.*, 2017:917). These incubators, accelerators and science parks can either be publicly or privately run, as well as be part of the university or closely linked to corporations (Wright *et al.*, 2017:918).

Three two-way arrows connect the activity continuum element to the entrepreneurs, support and investor elements. These arrows have been described above. However, these arrows between all three elements and the activity continuum could indicate that the aforementioned element is the central point of the U-BEE, where all other actors are brought together.

f) External Context

Wright *et al.* (2017:913) also consider various contextual factors that influence a U-BEE. These contextual factors are accounted for by the element external context. The external context accounts for institutions outside the university and national policy, as well as regional and industrial actors (Wright *et al.*, 2017:911). Wright *et al.* (2017:913) provide examples of national policies, such as those focusing on faculty and student spin-offs, as third stream income for universities and those emphasising the importance of developing human capital by creating student-driven businesses. Moreover, it is also suggested that family, friends, and peers greatly influence a student's intention to take entrepreneurial action, and the provision of local support such as incubators or accelerators could affect their chances of achieving success (Wright *et al.*, 2017:913). The ease of starting a business, and the access to customers, suppliers, finance, human capital, and a variety of other resources is highly dependent on the country, regional, and industrial contexts (Wright *et al.*, 2017:913).

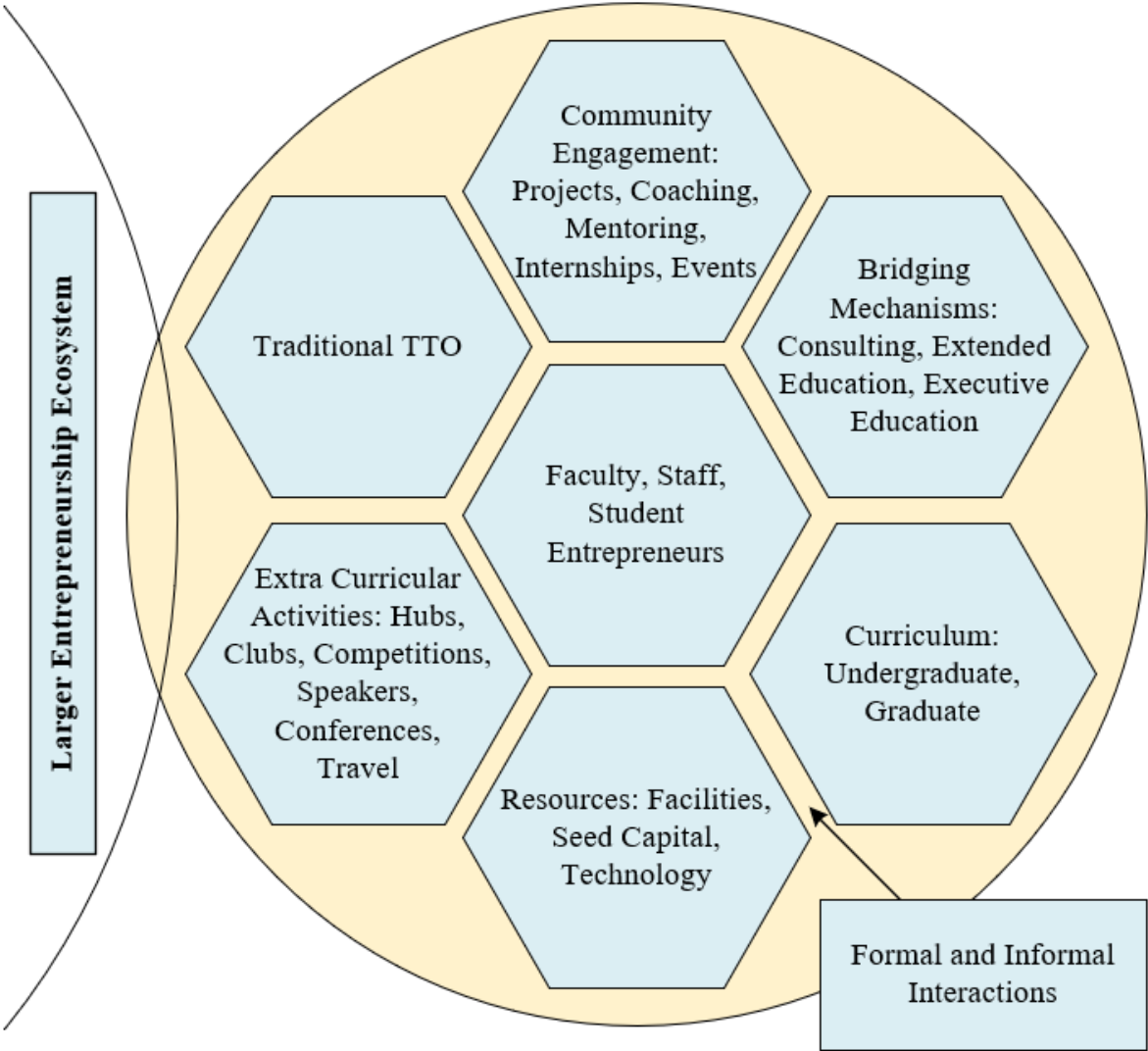
g) Evolution

The element evolution focuses on the importance of the time dimension and accounts for how the entrepreneurial ecosystem evolves over time (Wright *et al.*, 2017:913). Wright *et al.* (2017:913) assert that it takes time to gather the resources and establish a sustainable and efficient U-BEE, and the path followed might not always be linear as failures might occur and challenges need to be overcome. Technological advances over the years have also positively impacted the amount of entrepreneurship support being offered to students (Wright *et al.*, 2017:913).

2.3.3.4 Sherwood's (2018) University-Based Entrepreneurial Ecosystem

Sherwood (2018:244) proposes a U-BEE model with various elements that together create a conducive environment for entrepreneurs at universities (see Figure 2.5).

Figure 2.5: Sherwood’s (2018) U-BEE



Source: Sherwood (2018)

From Figure 2.5 it can be seen that the environment internal to the university includes several ecosystem elements, namely people (faculty, staff, student entrepreneurs), a TTO, extra-curricular activities, resources, curriculum, bridging mechanisms, and community engagement (Sherwood, 2018:244). Sherwood (2018:244) also accounts for the interaction between the elements in the internal U-BEE and the larger external entrepreneurship ecosystem. These various elements are summarised in Table 2.4.

Table 2.4: Elements of Sherwood’s (2018) U-BEE

Element	Description
Faculty, staff and student entrepreneurs	Refers to faculty, staff and student entrepreneurs who are either considering starting their own businesses, in the process of starting their own businesses or have already established their own businesses.
Technology transfer office	Focuses on intellectual property and supporting academics and students in commercialising their research through licencing and patenting.
Extra-curricular activities	Includes activities such as hubs, clubs, incubators, accelerators, travel, societies and speakers, as well as business plans and pitching competitions.
Resources	Facilities, equipment, seed capital, and technology available to both staff and student entrepreneurs, to assist them in establishing and operating their businesses.
Curriculum	University’s accredited courses (theoretical and practical) to educate students on entrepreneurship.
Bridging mechanisms	Extended education and lifelong learning, faculty or staff consulting, and executive education programmes.
Community engagement	Various coaching and mentoring programmes available to both student and staff entrepreneurs, networking events, as well as internship and project opportunities.

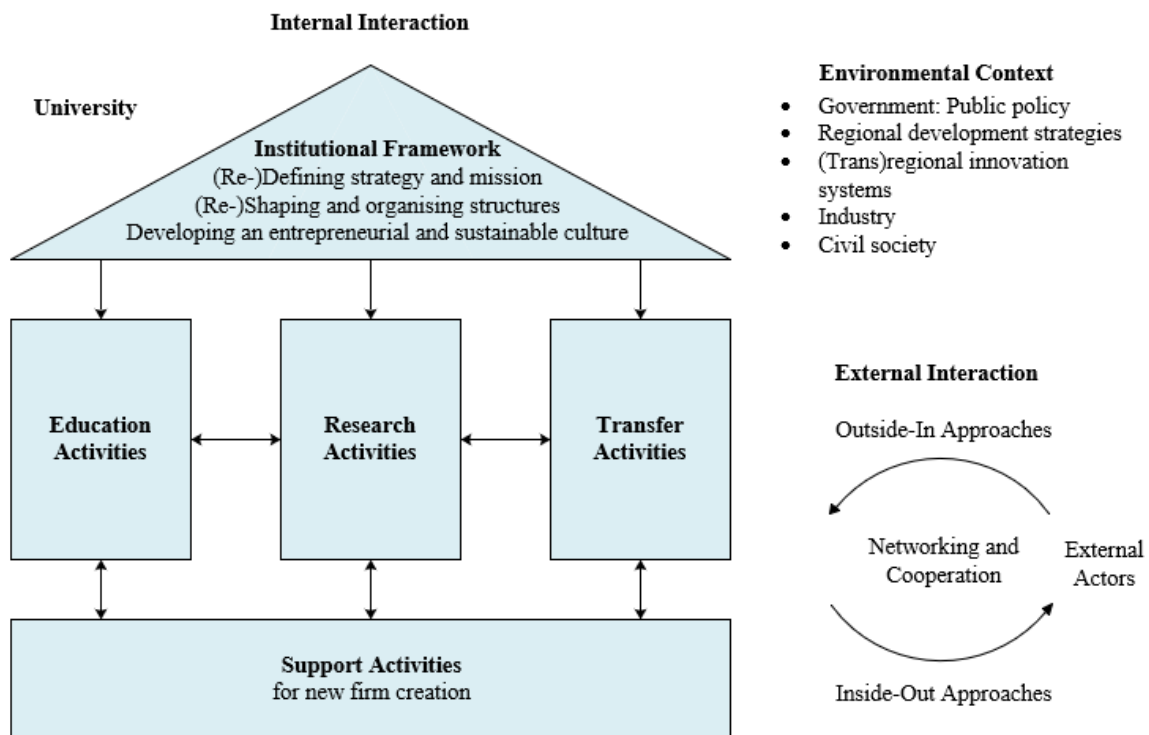
Source: Sherwood (2018)

In addition to the various elements, Sherwood’s (2018:244) U-BEE model also considers the formal and informal interactions between the ecosystem elements. Formal interactions include shared board membership, co-working arrangements, consulting and buyer-supplier relationships (Sherwood, 2018:242). In contrast, informal interactions include networking events, gatherings after work, and by chance meet-ups at conferences and community events (Sherwood, 2018:242). Moreover, provision is also made for an overlap between the internal U-BEE and the broader entrepreneurship ecosystem. This overlap accounting for the interaction between the internal and external support is provided to assist student and staff entrepreneurs (Sherwood, 2018:244). Sherwood (2018:261) contends that an increase in student entrepreneurs injected into the larger entrepreneurial ecosystem is likely to occur by providing students with entrepreneurial knowledge and skills. Sherwood (2018:261) further points out that universities act as a link between the students within the university and external actors supporting entrepreneurs.

2.3.3.5 Tiemann, Fichter and Geier's (2018) Conceptual Framework

Based on their study among universities in the United States of America and Germany, Tiemann *et al.* (2018) developed a conceptual framework to analyse a university's support system for sustainable entrepreneurship (see Figure 2.6). Their conceptual framework encompasses three major categories including the internal interaction between elements within the university environment, the external context, as well as the interactions between the internal and external environment (Tiemann *et al.*, 2018:91). Moreover, the university is also divided into five internal elements. Each of the aforementioned categories is elaborated on below.

Figure 2.6: Tiemann, Fichter and Geier's (2018) University support system for sustainable entrepreneurship



Source: Tiemann *et al.* (2018:91)

The internal university environment includes the institutional framework, education activities, research activities, transfer activities and support activities (Tiemann *et al.*, 2018:91). The institutional framework refers to the strategy and mission of the university, the shaping and organising structures of the university and the development of an entrepreneurial and sustainable culture (Tiemann *et al.*, 2018:91). Tiemann *et al.* (2018:91) assert that a top-down approach is essential for sustainable entrepreneurship at a university as top management can influence and promote an entrepreneurial culture.

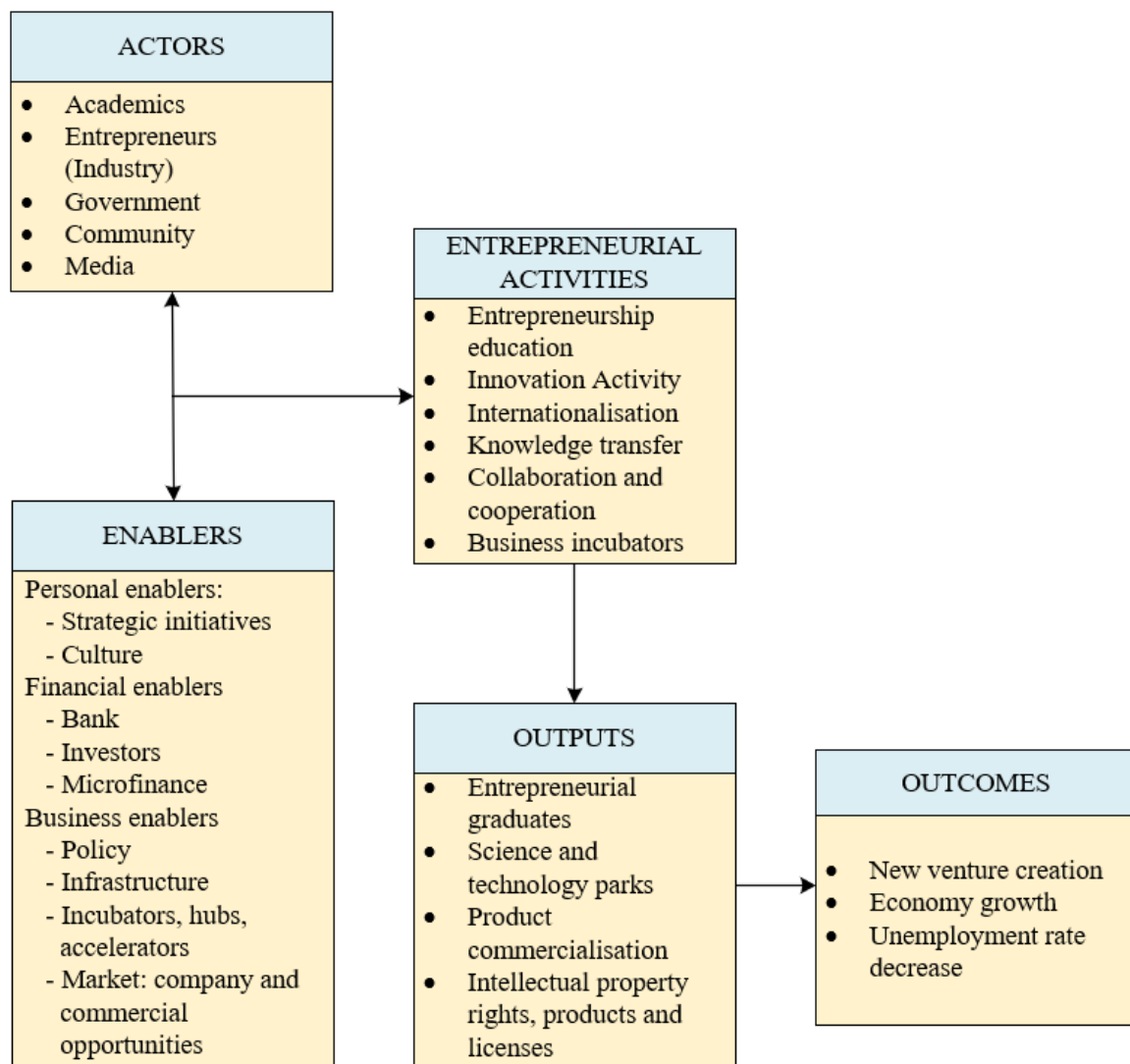
The conceptual framework also includes entrepreneurship education activities, entrepreneurship research activities and transfer activities (Tiemann *et al.*, 2018:91). According to Tiemann *et al.* (2018:91), transfer activities are divided into three categories, namely the (i) inside-out activities which focus on knowledge transfer to industry partners, TTOs, patenting and licensing; (ii) networking and cooperation activities which focus on joint research and developmental project with external partners; and (iii) outside-in activities which focus on industry partners as mentors and the participation of entrepreneurs and industrial partners in extra-curricular courses (Tiemann *et al.*, 2018:91). The final element, support activities for new venture creation, includes mentorship programmes, infrastructure support, incubators and accelerator programmes and university entrepreneurship centres (Tiemann *et al.*, 2018:92). The conceptual model also acknowledges that the five internal elements are mutually dependent on the external environment, highlighting the role of government public policy, regional development strategies, (trans)regional innovation systems, industry and civil society (Tiemann *et al.*, 2018:91).

Three different university strategies relating to entrepreneurship were identified, a top-down approach, a bottom-up approach, and a combined approach (Tiemann *et al.*, 2018:102). In a top-down approach, university management defines the strategy relating to entrepreneurship, the support provided and the entrepreneurship culture (Tiemann *et al.*, 2018:102). In a bottom-up approach supporting activities are based on initiatives by individual staff members and students according to their own interests and competencies (Tiemann *et al.*, 2018:102). According to Tiemann *et al.* (2018:102), a combined approach is evident when both a top-down and bottom-up approach occur simultaneously.

2.3.3.6 Novela, Syarief, Fahmi and Arkeman's (2021) University-Based Entrepreneurship Ecosystem

Based on their research, Novela *et al.* (2021) also developed a U-BEE model (see Figure 2.7), consisting of actors, enablers, entrepreneurial activities, outputs and outcomes.

Figure 2.7: Novela, Syarief, Fahmi and Arkeman's (2021) U-BEE



Source: Novela *et al.* (2021:178)

Their model is similar to the other U-BEEs described in the sections above in that three of the elements, namely actors, entrepreneurial activities, and enablers, account for initiatives similar to those in the elements of other U-BEEs described. This similarity is evident from the various sub-elements within each of the main elements, as listed in Figure 2.7. The ecosystem of Novela *et al.* (2021), however, differs from the other U-BEEs as it also includes outputs and outcomes as elements.

Novela *et al.* (2021:179) also propose a more comprehensive entrepreneurial university model consisting of six elements: actors, university governance, entrepreneurial activities, entrepreneurial outputs, supports needed, and challenges. Each of these elements also consist

of various sub-elements. They elaborate further on the various sub-elements within each element by ranking them according to the level of influence (driving power) they have on the other sub-elements (Table 2.5)

Table 2.5: Elements and sub-elements of an entrepreneurial university model

Elements	Sub-elements	Level
Actors	Top level management	7
	Faculty and staff	6
	Students	6
	Alumni	6
	Local Government	5
	Regulators	5
	Industry	5
	Media	4
	Community	3
	Research institute	2
	Parents	1
University governance	Vision and Mission	4
	Strategic Planning	4
	Leadership	4
	Organisational culture	4
	Collective entrepreneurial action	4
	Internal policies in finance, human resources and operations	3
	Capability of entrepreneurs	3
	Independence of spirit	3
	Good university governance concept implementation	2
	Total quality management implementation	1
Entrepreneurial activities	Collaboration with industry	4
	Developing soft-skills to support hard skills	3
	Coaching on start-up business	3
	Entrepreneurship education	3
	Innovation activities	2
	Activities of knowledge transfer	1
	Internationalisation	1

Table 2.5: Elements and sub-elements of an entrepreneurial university model (cont.)

Elements	Sub-elements	Level
Entrepreneurial outputs	Student and graduate entrepreneurs	5
	Product commercialisation	4
	Patents from business or research	3
	Copyrights of research output by faculty and students	3
	Business incubator integrated with industry	3
	Science and technology parks	2
Supports needed	Cooperation between university-industry-government	5
	Adequate resources in terms of experts, funds and facilities	5
	Accurate data to support innovative research in 5 to 10 years	4
	Support infrastructure for technology development	3
	Industry involvement in absorbing research output from university	2
	Support from research centre in local and national related with research output	1
Challenges	Commitment of top management level	5
	Lack of stakeholder trust in the university	5
	Lack of supportive internal culture	4
	Lack of entrepreneurial capacity from inside university	3
	Unsupported ranking system to be entrepreneurial	2
	Unprepared technology infrastructure	1
	Downstream of research output from university	1

Source: Novela *et al.* (2021:179)

From Table 2.5 it can be seen that the sub-element top management, within the element actors, has the most driving power to increase awareness and encourage entrepreneurship among staff and students (Novela *et al.*, 2021:180). With top management having the most driving power (level 7), a top-down approach to encouraging entrepreneurship at a university is necessary (Novela *et al.*, 2021:180). The sub-elements that have the most driving power in encouraging entrepreneurship within the element university governance, include vision and mission, strategic planning, leadership, organisational culture, and collective entrepreneurial action (Novela *et al.*, 2021:180). Novela *et al.* (2021:180) explain that vision, mission and leadership are vital aspects to encourage innovation and entrepreneurial agendas throughout all university levels. Collaboration with industry is the sub-element with the most driving power in the element entrepreneurial activity (Novela *et al.*, 2021:180). Novela *et al.* (2021:180) further

determine that collaboration with industry has a high driving power to increase awareness and encourage entrepreneurship among staff and students, as in Indonesia, for example, industry assists universities to align themselves better with the needs of practice. Within the element entrepreneurial output, student and graduate entrepreneurs are ranked the highest in terms of driving power to increase awareness and encourage entrepreneurship among staff and students (Novela *et al.*, 2021:180). The two sub-elements that were found to have the most driving power in terms of increasing and encouraging entrepreneurship among staff and students within the element supports needed were cooperation between university-industry-government and adequate resources in terms of experts, funds and facilities (Novela *et al.*, 2021:180). Finally, within the element challenges, the sub-elements commitment of top management level and lack of stakeholder trust in the university had the most driving power in affecting the level of encouragement staff and students have in entrepreneurship (Novela *et al.*, 2021:181). Novela *et al.* (2021:181) explain that the lack of top management commitment will result in the absence of a clear direction for the university, which will affect all other elements within the U-BEE.

2.3.4 BUILDING BLOCKS FOR ENTREPRENEURIALY SUPPORTIVE UNIVERSITIES

In addition to various elements identified in the U-BEE frameworks and models described above, several authors have also identified multiple blocks for building an entrepreneurially supportive university (Graham, 2014; Human Resource Development Council of South Africa, 2014; Morris, Kuratko & Pryor, 2014, Elia, Secundo & Passiante, 2017). These building blocks are presented in Table 2.6.

Table 2.6: Building blocks for university-wide-entrepreneurship

Authors	Building Blocks	Descriptions
Graham (2014)	University senior management	Strong university leadership and governance committed to actively promoting and supporting clear and prominent entrepreneurship and innovation agendas.
	University departments	An academic culture that acknowledges, supports and encourages entrepreneurial behaviour among staff and students, who champion entrepreneurship throughout the university, and provide curricular and co-curricular support in terms of entrepreneurship.
	University-led entrepreneurship and innovation activity	Entrepreneurship support structure is established and run by employees of the university to actively support student and staff entrepreneurs throughout each phase of their personal entrepreneurial growth.
	Student-led entrepreneurship and innovation activity	An empowered and well-connected student-led entrepreneurial community which benefits from sustained low-level funding, mentorship, and a direct connection with university top management.
	External entrepreneurship and innovation community	A strong relationship built on mutual trust and benefit, with external actors who support entrepreneurs and play a visible and influential role in university life.
Human Resource Development Council of South Africa (2014)	Strategy	A broad understanding of entrepreneurship as a strategic objective, accompanied by top management, focusing on entrepreneurship education and start-up support, including entrepreneurial attitudes, behaviour and skills, and enhancing growth entrepreneurship. Clear incentives and rewards should also be outlined for entrepreneurship educators who actively support graduate entrepreneurship.
	Resources	Financial resources should be made available to ensure that enough staff is employed to actively be involved in entrepreneurship-related activities and send them on continuous development programmes to enhance their skills and knowledge.
	Support infrastructure	It consists of three major supports, (i) a dedicated entrepreneurship structure that closely collaborates and coordinates entrepreneurship activities and support between various faculties; (ii) incubation is available, either internally or externally, and (iii) there is close cooperation between the university and external business start-up and entrepreneurship support organisations.
	Entrepreneurship education	It should be progressively integrated into the curricula, using creative teaching methods which should be tailored to the needs of undergraduates, graduates, and post-graduates, as well as the pre-start-up phase, start-up phase, and growth phase. Active recruitment should be practised for certain specialised entrepreneurship modules.
	Start-up support	Student entrepreneurs have access to mentoring and private financing obtainable through networking and dedicated events, and external support from businesses and alumni.
	Evaluation	Regular performance measurements of entrepreneurial activities should be conducted through a formal system, evaluating and monitoring the immediate (post-course), mid-term (graduation), and long-term (alumni and post-start-up) impact.

Table 2.6: Building blocks for university-wide-entrepreneurship (cont.)

Authors	Building Blocks	Descriptions
Morris, Kuratko & Pryor (2014)	Academic champion	An individual with both political skills and an entrepreneurial mindset to drive entrepreneurship and be the leader of a team who ensures that a clear vision regarding entrepreneurship is present throughout all university disciplines.
	Definition	A clear conceptual definition across all disciplines of what entrepreneurship entails is important, as it would enhance communication, coordination, and cross-collaboration.
	Purpose	A clear and common purpose of entrepreneurship should exist, which transcends encouraging collaboration across disciplines and focuses on fostering an entrepreneurial mindset.
	Shared learning	Documents and mechanisms should be available to share best practices and common mistakes in terms of providing entrepreneurship support and activities among various disciplines to enhance effectiveness and efficiency.
	Structure	It can either be centralised, decentralised, or a hybrid, but a structure is needed where consistent leadership and coordination is available.
	Supporting infrastructure	Administrative resources should be available such as offices, secretarial support and equipment, as well as faculty fellowship programmes where faculty members are paid a stipend for a limited time to be involved in entrepreneurial projects.
	Curricular model	Should be a well-designed curricular model which includes (i) knowledge base in entrepreneurship such as concepts, frameworks, and terminology; (ii) common offerings available to all students; and (iii) disciplinary-distinct courses.
	Co-curricular model	Includes business plan and pitching competitions, incubators, mentoring programmes, business consulting projects, entrepreneurship clubs, and experiential learning opportunities designed to meet business students' needs and students from other disciplines, such as engineering and art students.
	Outcomes and metrics	A formal evaluation and monitoring system should exist to track the performance of the entrepreneurial activities offered at the university, evaluate whether goals and targets are being met, and see where improvement and more attention is required.
	Incentives	Appraisal criteria need to recognise entrepreneurial activity to incentivise faculty members to support entrepreneurship activities and get involved in cross-disciplinary collaborations. These incentives could include research grants, administrative support, and publicly recognised achievements.
	Proactive publicity	Success stories should be shared and celebrated as it conveys a sense of momentum and reinforces the value created for the university, which could lead to more buy-in from top management.
	Resource model	A budget should be developed that explicitly pays for university-wide efforts in terms of entrepreneurial activities to ensure that funding is available when a specific faculty or school wishes to provide entrepreneurial support or activities.

Table 2.6: Building blocks for university-wide-entrepreneurship (cont.)

Authors	Building Blocks	Descriptions
Elia, Secundo & Passiante (2017)	Leadership and governance	Entrepreneurship should explicitly be present in the university, indicating top-management commitment while encouraging a conducive environment for entrepreneurial behaviour. A model should also exist where entrepreneurial activities are coordinated and integrated and where departments and faculties enjoy autonomy regarding the entrepreneurial support and activities they provide.
	Organisational capacity, people and incentives	The university raises awareness of the value and importance of entrepreneurship by ensuring that various funding sources are available to support entrepreneurial development, incentivising and recognising stakeholders who actively support entrepreneurial agendas, and investing in staff development in terms of entrepreneurship.
	Entrepreneurship development in teaching and learning	Providing education that focuses on “for” entrepreneurship rather than “about” entrepreneurship, promoting action learning based on real-world experiences, and ensuring that entrepreneurship education stimulates the development of entrepreneurial mindsets and skills.
	Pathway for entrepreneurs	Dedicated resources such as mentors, incubators, and private funding are provided to assist students in gaining more practical experience in entrepreneurship. The university also publicly celebrates the success of both staff and student entrepreneurs.
	University – business/external relationships for knowledge exchange	Strong collaboration exists between the university and external actors who support entrepreneurs, such as external incubators and science parks. The university also encourages student and staff entrepreneurs to partner with a wide range of stakeholders.
	The entrepreneurial university as an internationalised institution	Internationalisation is a key part of the university entrepreneurial strategy, through which the university attracts international and entrepreneurial staff and demonstrates internationalisation in its approach to teaching and actively participating in international networks.
	Measuring the impact of the entrepreneurial university	A monitor and evaluation system should be in place to assess various performance indicators, such as (i) the impact of its entrepreneurial strategy on regional development; (ii) the engagement in entrepreneurial teaching and learning; (iii) the number of entrepreneurial ideas that have been generated; (iv) the number of ideas that have been turned into prototypes or market offerings; (v) number of newly generated companies and the number of people that they employ; and (vi) the results generated in terms of intellectual property value.

Source: Authors own construction

Common among the descriptions of the various building blocks presented in Table 2.6 are (i) university leadership and governance, (ii) entrepreneurship champion(s), (ii) entrepreneurship included in curricula, (iii) co-curricular entrepreneurship activities, (iv) resources and incentives, (v) internal and external collaboration, and (vi) evaluation.

Strong university leadership and governance in promoting entrepreneurship are vital building blocks for an entrepreneurially supportive university. Top management can ensure that innovation and entrepreneurship are included as a strategic objective of the university (Graham, 2014:43; Human Resource Development Council of South Africa, 2014:98). Elia *et al.* (2017:40) note that it is the commitment of top management that encourages an environment conducive to entrepreneurial behaviour, which in turn influences the entrepreneurial culture of the university as a whole (Graham, 2014:15).

In addition to university leadership, the role of an entrepreneurship champion(s) in building a university supportive of entrepreneurship is also highlighted. It is recommended that entrepreneurship be strategically positioned at the centre of university activities and should be driven and led by a dedicated entrepreneurship champion (Human Resource Development Council of South Africa, 2014:15). Graham (2014:38) explains that well-connected champions that drive entrepreneurship are essential for inspiring and establishing a vision for change. Morris *et al.* (2014:61) claim that although the ultimate success of entrepreneurship at university level requires a well-coordinated team, the influence of a well-respected champion, who combines political skills and an entrepreneurial mindset, will enhance entrepreneurial activities.

Important for an entrepreneurially supportive university is for entrepreneurship education to be included in the curricula provided to students (Graham, 2014:43; Human Resource Development Council of South Africa, 2014:99; Morris *et al.*, 2014:63; Elia *et al.*, 2017:40). Elia *et al.* (2017:34) argue that entrepreneurship education should focus on education *for* entrepreneurship rather than education *about* entrepreneurship. More creative teaching methods should be utilised and tailored to the needs of undergraduates, graduates, and post-graduates, as well as the pre-start-up, start-up, and growth phase student entrepreneurs (Human Resource Development Council of South Africa, 2014:99).

Co-curricular activities focusing on entrepreneurship are also essential for an environment conducive to student entrepreneurship (Graham, 2014:43; Human Resource Development Council of South Africa, 2014:64; Morris *et al.*, 2014:63). Co-curricular activities can either be university staff or student-driven and should be designed to meet both business and non-business students' needs (Graham, 2014:55; Morris *et al.*, 2014:63). These co-curricular activities can include business plans and pitching competitions, incubators, mentoring programmes, business consulting projects, entrepreneurship clubs, and experiential learning opportunities (Morris *et al.*, 2014:63).

To create an entrepreneurially supportive university which provides the necessary curricular and co-curricular support, resources must be available. Incentives should be offered to encourage entrepreneurial activities in general (Human Resource Development Council of South Africa, 2014:98; Morris *et al.*, 2014:63; Elia *et al.*, 2017:34). According to Morris *et al.* (2014:63), a budget should be developed that explicitly pays for university-wide efforts to implement entrepreneurial supportive activities. These resources include infrastructure support such as administrative resources (offices, secretarial support and equipment) and programmes where faculty members are rewarded for their involvement in entrepreneurial projects (Morris *et al.*, 2014:63). Appropriate incentives are essential to encourage staff members to actively support entrepreneurship activities, including research grants, administrative support, and publicly recognised achievements (Human Resource Development Council of South Africa, 2014:98; Morris *et al.*, 2014:64).

Internal and external collaboration between various entrepreneurship stakeholders is also of great important for a university to be supportive of entrepreneurship. Stakeholders within universities should specifically not operate in silos (Morris *et al.*, 2014:64; Elia *et al.*, 2017:34). Communication, coordination and cross-collaboration should exist between faculties in a university and best practices for entrepreneurship support should be shared to enhance effectiveness and efficiency (Human Resource Development Council of South Africa, 2014:35; Morris *et al.*, 2014:64). Close co-operation and collaboration between the university and external stakeholders who provide entrepreneurship support is also essential, and staff and students should be encouraged to partner with a wide range of external stakeholders (Elia *et al.*, 2017:34).

In addition, it is important to have an extensive monitoring and evaluation system to ensure that entrepreneurship support is being provided as effectively and efficiently as possible (Human Resource Development Council of South Africa, 2014:99; Morris *et al.*, 2014:65; Elia *et al.*, 2017:34). Such a system is crucial as it allows the university to measure the impact of the support being provided and highlight where more attention and improvements are required (Morris *et al.*, 2014:65). According to Elia *et al.* (2017:34) performance indicators could include the numbers of ideas generated, ideas turned into prototypes and newly created businesses, as well as how many people these businesses employ. Other performance indicators could include the university-wide effort on entrepreneurship, interdisciplinary collaborations that result in publications focusing on entrepreneurship, and the development of entrepreneurship modules (Morris *et al.*, 2014:65).

2.3.5 ORGANISATIONAL THEORY

Several U-BEE models or frameworks were elaborated on in the paragraphs above, and numerous building blocks were identified. In order to achieve the objectives of the current study, organisational theory is drawn on to provide greater insights into the structure and design of such a U-BEE.

Organisations are defined as systems of coordinated action among individuals with diverse knowledge, interests, and responsibilities to attain a collective goal (Onday, 2016:88). Jones (2013:24) further explains that an organisation is a coordination between individuals and a grouping of resources to produce goods and services to obtain something they value or desire. Organisational theory is described by Burton and Obel (2018:2) as a positive science that explains the structure, behaviour and effectiveness of an organisation as it currently is. Moreover, organisational theory is a knowledge system that aims to investigate and explain the structure, group and individual behaviour, operations, and functions within an organisation (Jones, 2013:30; Onday, 2016:89). Like organisations, entrepreneurship ecosystems are also described as systems; therefore, organisational theory can be used to explain the structure, behaviour and effectiveness of a U-BEE.

Kinderen and Kaczmarek (2020:315) identify various organisational theories, including the classical theory, the human relations theory, and the contingency theory. The classical theory is based upon the belief that there is only one best way to organise an organisation for production, which can only be found through systematic, scientific inquiry (Onday, 2016:90). The focus is mainly on the formal structure, hierarchy of management and technical know-how (Kinderen & Kaczmarek, 2020:315). Kinderen and Kaczmarek (2020:315) assert that the human relations theory emphasises the importance of informal relationships among people and considers their needs, motivations, attitudes, and behaviour. Lunenburg (2013:39) indicates that the contingency organisational theory is based on the belief that there is not just one specific way all organisations can be designed to be effective, but that the design would depend on the internal and external environment of the organisation. Organisational theory provides the theoretical underpinnings for organisational structure, organisational culture and organisational design (Jones, 2013:30; Burton & Obel, 2018:2), each of which are elaborated on below.

According to Kinderen and Kaczmarek (2020:315), organisational structure refers to how an organisation divides its labour into different groups with various tasks and responsibilities, coordinating to achieve similar goals. Similarly, Lunenburg (2013:21) describes organisational structure as the arrangement of people and tasks to achieve organisational goals. Organisational structure also describes the authority that each individual or group possesses and their ability to make decisions regarding resource allocation and which opportunities to pursue (Foss, Lyngsie & Zahra, 2015:35). Bolman and Deal (2017:44) assert that an organisation's structural design depends on its circumstances, including goals, strategy, technology, and environment.

Whitehead (2018:1694) explains that organisations operate according to certain rules and policies, which in turn influence their organisational cultures. Odiakaose (2018:23) describes culture as observable artefacts, values and assumptions through which a group of individuals are distinguished from another. These observable artefacts could include the dress code adopted by the individuals, how people interact with one another, and the physical setting of the environment (Odiakaose, 2018:23). Organisational culture is described by Jones (2013:30) as a set of shared values and norms that guide how internal employees interact with each other and the interaction with customers and the community external to the organisation. Odiakaose (2018:24) elaborates that organisational culture refers to individuals' collective behaviour within an organisation, their beliefs and values, and focuses on the leadership styles adopted within that organisation. The culture set forth by an organisation has a direct impact on how

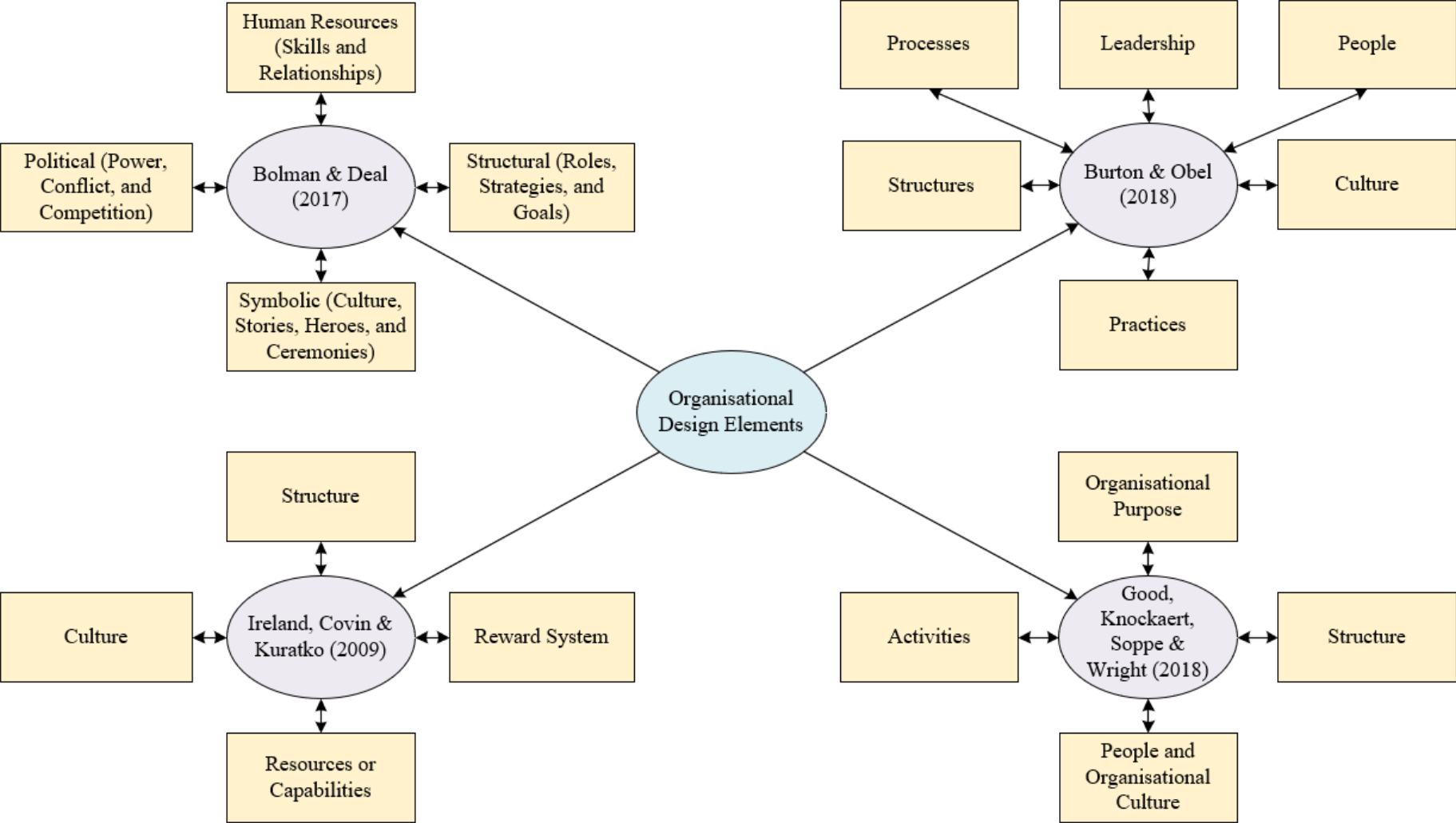
individuals perceive, think, behave, and provide meaning (Whitehead, 2018:1700). Moreover, depending on the adopted organisational culture, a positive or negative effect can be experienced in terms of the organisation's overall performance, outputs and innovation (Odiakaose, 2018:26; Vnoučková & Urbancová, 2020:57). It has been found that organisational culture directly impacts the openness to change experienced by employees and positively influences their knowledge creation (Vnoučková & Urbancová, 2020:56). Lastly, Jones (2013:201) asserts that a competitive advantage can be achieved in the industry in which the organisation operates by having the appropriate organisational culture.

Considering that the culture set forth by the organisation has an impact on the overall performance of the organisation and employees, Vnoučková and Urbancová (2020:57) recommend that a reasonable amount should be budgeted for employee development which should be seen as an investment, rather than an expense. Various negative effects in the workplace could be experienced if an improper organisational culture is set forth, including working inefficiently, workplace conflicts, high employee turnover, and ineffective communication (Vnoučková & Urbancová, 2020:57). Jones (2013:31) asserts that organisational structure and culture are the *means* adopted by an organisation in order to achieve its goals. In contrast, organisational design focuses on *how* and *why* the various means were chosen (Jones, 2013:31). The concept of organisational design is elaborated on below.

Organisational design refers to the process that is followed to create a structure and culture which best fits the organisational purpose, strategy, and environment (Lunenborg, 2013:21). Organisational design is a normative science through which recommendations are made regarding the most appropriate design to increase an organisation's effectiveness and efficiency (Burton & Obel, 2018:2). Good *et al.* (2018:2) describe organisational design as a framework that synthesises insights and theories from organisational and management research. Burton and Obel (2018:1) assert that an organisation's design influences both the organisation's performance and the employees therein. Thus, it is important to investigate the most effective and efficient way of designing an organisation (Burton & Obel, 2018:1). In the current study, the organisation being investigated is the university-based student entrepreneurship support ecosystem as a whole.

Several authors contend that specific elements should be considered during the process of organisational design. These elements are summarised in Figure 2.8.

Figure 2.8: Organisational Design Elements



Sources: Ireland, Covin and Kuratko (2009); Bolman and Deal (2017); Burton and Obel (2018); Good *et al.* (2018).

Bolman and Deal (2017:20) identify four categories of elements, namely structural (roles, strategies, and goals), human resources (skills and relationships), political (power, conflict, and competition) and symbolic (culture, stories, heroes, and ceremonies) elements. However, Burton and Obel (2018:3) suggest that structures, processes, people, culture, leadership and practices are the main elements within organisational design.

Ireland *et al.* (2009:30) define an organisational design that explicitly focuses on entrepreneurship as “Pro-Entrepreneurship Organisational Architecture”. The pro-entrepreneurship organisational architecture describes how an organisation’s entrepreneurial strategic vision is translated into entrepreneurial processes and behaviours (Urban, 2012:522). The pro-entrepreneurship organisational architecture elements include structure, culture, resources or capabilities, and reward systems (Ireland *et al.*, 2009:24).

Various description of the organisational design elements are summarised in Table 2.7.

Table 2.7: Organisational design elements

Authors	Organisational Design Elements	Description
Ireland, Covin & Kuratko (2009)	Structure	The arrangement of authority, communication, and workflow, of which Ireland <i>et al.</i> (2009) recommend greater organicity (decentralised decision making, less formal, wide spans of control, and loose adherence to rules and policies).
	Reward system	Reward systems are established by top- or middle management to encourage more productivity and higher innovation levels, which would most likely lead to an increase in entrepreneurial behaviour.
	Resources or capabilities	While resources refer to what an organisation has, whether tangible or intangible, capabilities are when these resources are combined to achieve the organisation's goals and accomplish tasks.
	Culture	The recommended entrepreneurial organisational culture includes being well organised, highly committed, prepared to take responsibility, open to change and innovation, and receiving top management support in terms of resources and autonomy.
Bolman & Deal (2017)	Human resources (skills and relationships)	The skills, attitudes, energy, commitment and talent of employees are vital resources that can either make or break an organisation; thus, it is important to invest time and resources to develop committed and talented employees.
	Structural (roles, strategies, and goals)	The structure of an organisation is the blueprint for expectations and exchanges among individuals internal to an organisation and the external constituencies, which both enhance and constrain what an organisation can do.
	Symbolic (culture, stories, heroes, and ceremonies)	Symbols are described as anything that stands for or suggests something other than their general intrinsic or apparent use, which, among other things, can instil hope, belief, and faith.
	Political (power, conflict, and competition)	Scarce resources need to be allocated to individuals within an organisation, which leads to conflict, competitions, and negotiations to arise to obtain those resources.

Table 2.7: Organisational design elements (cont.)

Authors	Organisational Design Elements	Description
Burton, Obel & DeSanctis (2011)	Goals	The focus is on two fundamental goals, including (i) efficiency, where the primary focus is on inputs, use of resources, and costs, and (ii) effectiveness, where the focus is on outputs, the products and services being provided and revenues.
	Strategy	The strategy reflects the management’s assessment of the organisation’s current situation and how they plan on achieving the organisational goals.
	Structure	Structure refers to the organisational complexity in terms of the number of different subunits or departments, the organisational hierarchy, the autonomy each department experiences and the communication among them.
	Processes	Processes focus on the organisation’s task designs, where the work is decomposed into subtasks, and coordination exists among those subtasks to achieve organisational goals.
	People	The people element focuses on (i) the number of individuals working for the organisation, which can be measured by simply counting the number of staff, and (ii) the professionalism of those individuals, which is the skills and capabilities that they bring to the organisation.
	Coordination and control systems	Coordination and control systems bring together the various elements within an organisation’s structure to increase collaboration and responsiveness to changes in the environments and task demands.
	Incentive mechanisms	Incentive mechanisms, which can either be monetary or non-monetary, are in place to motivate and encourage employees to take action or behave in a particular manner, leading to the achievement of organisational goals.
Good, Knockaert, Sopper & Sopper (2018)	Organisational purpose	Organisational purpose refers to the main reason for an organisation’s existence and what it would like to achieve, while activities are the tasks performed to fulfil its purpose.
	Structure	The organisational structure element refers to the ownership and governance structure of the organisation, the size of the organisation, as well as the physical location thereof.
	People and organisational culture	The people and organisation culture element refers to the key individuals employed by the organisation, the reward systems in place, and the internal organisational culture.
	Activities	Activities refer to all the tasks performed by the employees to fulfil the purpose of the organisation and the different products and services being offered.

Source: Authors own construction

In light of Table 2.7, Good *et al.* (2018:2) assert that although authors use different terminology for the various organisational design elements, considerable overlap exists. Good *et al.* (2018:2) suggest that the elements proposed consistently deal with organisational purpose, activities, structure, and people and organisational culture. For this reason, the elements suggested by Good *et al.* (2018) are adopted to provide greater insights into the organisation and design of a U-BEE in the current study.

The current study assumes that the support provided to student entrepreneurs and the various stakeholders providing this support are embedded in an organisation. The organisation being investigated in the current study is that of a student entrepreneurship ecosystem within a South African public university. To provide greater insights into the structure and design of this organisation (i.e., the U-BEE), Good *et al.*'s (2018:2) design elements are used, namely organisational purpose, activities, structure, and people. These design elements underlie the conceptual framework, which is elaborated on in Chapter Three. Although Good *et al.* (2018) labels the fourth element, people and organisational culture, for the purpose of this study, the label people is only used. The element is labelled people only because an internal organisational culture underlies the entire student entrepreneurship ecosystem within a South African public university and is accounted for elsewhere in the conceptual framework developed.

2.4 SUMMARY

Chapter Two presented an overview of entrepreneurship and student entrepreneurship. Moreover, previous research on student entrepreneurship was discussed, and various U-BEEs and their building blocks were elaborated on. This chapter concluded by describing organisational theory, which, together with systems theory, provides the theory underpinning the current study.

Chapter Three presents and describes the conceptual framework adopted to achieve the objectives of this study.

CHAPTER THREE

UNIVERSITY-BASED STUDENT ENTREPRENEURSHIP SUPPORT CONCEPTUAL FRAMEWORK

3.1 INTRODUCTION

In Chapter Two, a literature review on student entrepreneurship was provided, focusing on the nature and importance thereof. Moreover, the challenges experienced by students in starting their own businesses were explored. Thereafter, previous research on student entrepreneurship support in general and in South Africa was discussed. The chapter concluded by describing organisational theory, which, together with systems theory, provides the theory underpinning the current study.

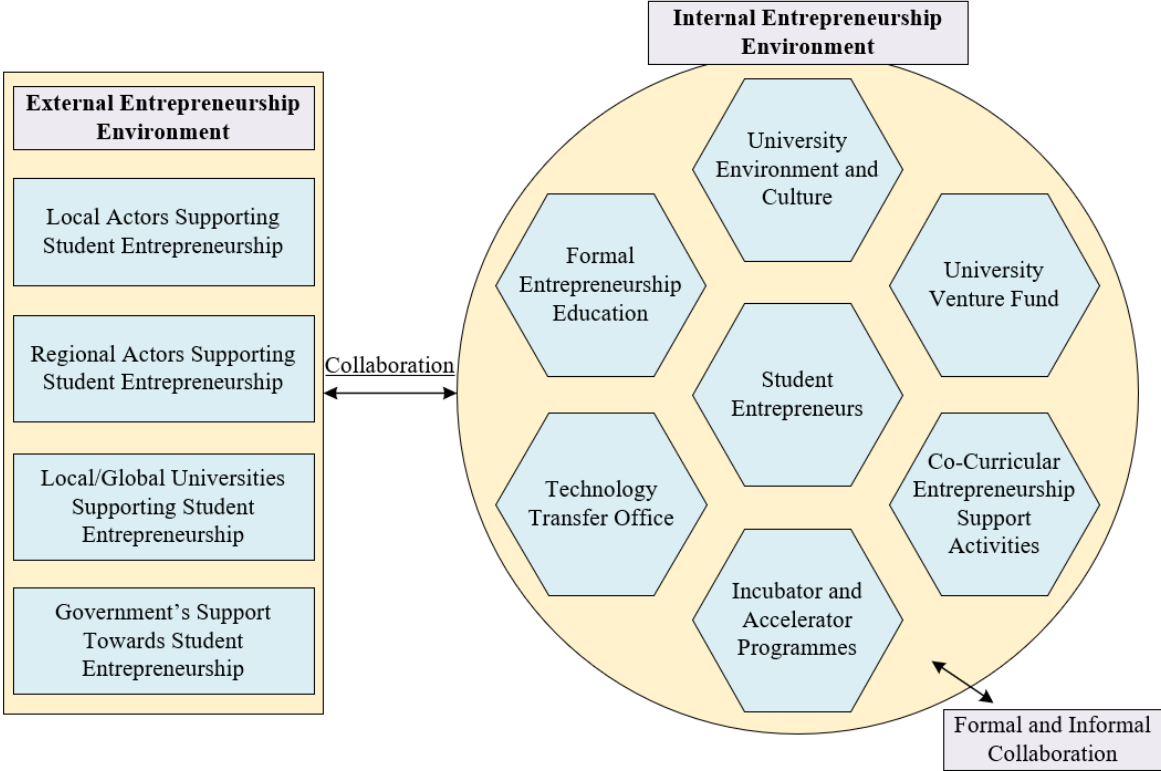
Based on the literature and various U-BEEs described in Chapter Two, Chapter Three presents the conceptual framework for the current study. In addition, each of the concepts within the conceptual framework and the relationships between them are described and justified.

3.2 CONCEPTUAL FRAMEWORK FOR THE CURRENT STUDY

A university-based student entrepreneurship support framework was conceptualised for the current study. In general, a conceptual framework refers to a system of concepts, beliefs, and assumptions that guides a researcher through the research process, presenting key factors, variables, or constructs, as well as the relationships between them (Grant & Osanloo, 2014:17; Casanave & Li, 2015:107). Tamene (2016:51) asserts that a conceptual framework is a conception or model of what a researcher plans to investigate, the presumed relationships between the concepts, and why it is being investigated. The purpose of a conceptual framework is to (i) guide the design of a study; (ii) assess and refine the goals of a study; (iii) develop relevant research questions; (iv) select appropriate data collection methods; and (v) identify potential validity threats (Tamene, 2016:51). Moreover, Imenda (2014:193) contends that a conceptual framework serves four purposes, including (i) helping the researcher identify the main concepts or variables in a study; (ii) providing guidance in terms of the methodological approach to be adopted; (iii) providing guidance regarding data collection, analysis, and interpretation; and (iv) guiding future research.

Using the various university-based entrepreneurial ecosystem models presented in Chapter Two (Section 2.3.3), as well as Good *et al.*'s (2018) elements of design theory, the following framework (see Figure 3.1) has been conceptualised to achieve the objectives of the current study. More specifically, this conceptual framework will be used to identify best practices and challenges faced by universities in providing support to student entrepreneurs. Each of the concepts (or elements) proposed in the conceptualised university-based student entrepreneurship support framework are described in terms of their purpose, activities, structure, people, and culture.

Figure 3.1: University-based student entrepreneurship support conceptual framework



Source: Authors own construction

The conceptual framework proposed for the current study describes a university-based student entrepreneurship support ecosystem in terms of two environments: the internal entrepreneurship environment and the external entrepreneurship environment. On the right-hand side of the framework is the internal entrepreneurship environment, which includes various elements internal to the university. Similar to Miller and Acs' (2017) U-BEE model, student entrepreneurs are at the centre of the internal entrepreneurship environment in the conceptualised university-based student entrepreneurship support framework. The element

student entrepreneur is surrounded by several other elements: university environment and culture, formal entrepreneurship education; co-curricular entrepreneurship support activities; incubator and accelerator programmes; technology transfer office (TTO); and a university venture fund. On the left-hand side of the framework is the external entrepreneurship environment, which includes several elements external to the university. These include local actors supporting student entrepreneurship, regional actors supporting student entrepreneurship, local/global universities supporting student entrepreneurship, and government's support towards student entrepreneurship.

Moreover, the conceptual framework also highlights the formal and informal collaborations between the elements in the internal entrepreneurship environment and the collaboration between the elements in the internal entrepreneurship environment and those in the external entrepreneurship environment. These collaborations could include the sharing of physical resources and the provision of services as well as the sharing of knowledge and information (Bischoff, Volkmann & Audretsch, 2018:39).

A more detailed description of these elements that make up the conceptualised university-based student entrepreneurship support framework is discussed in the next section. Where applicable, the organisational design elements of Good *et al.* (2018), namely purpose, activities, structure, people are adopted to facilitate these descriptions.

3.2.1 INTERNAL ENTREPRENEURSHIP ENVIRONMENT

As mentioned above, the right-hand side of the framework refers to the internal entrepreneurship environment, which includes various elements internal to the university. In the paragraphs that follow, each of these elements are described and their inclusion in the framework conceptualised for the current study justified.

3.2.1.1 University Environment and Culture

Every university is located in a specific spatial context which constitutes its internal environment. The entrepreneurial culture of and support in this internal environment influences students' entrepreneurial intentions and the success of their entrepreneurial ventures (Bergmann *et al.*, 2016:54). The internal university environment is of specific importance because

universities can significantly influence the entrepreneurial propensity of their students (Bergmann *et al.*, 2016:54). Within this internal environment, universities can mobilise their vast resources to encourage and support entrepreneurship among students (Department of Higher Education and Training, 2017:9).

According to Vekic *et al.* (2019:37), universities should strive to intensify their efforts in creating an internal environment where entrepreneurship among students is supported and promoted. Universities that create such an internal environment are regarded as entrepreneurial universities (Sambo, 2018:208).

A supportive internal university environment is one where entrepreneurship is encouraged among staff, students and graduates (Salem, 2014:289) and entrepreneurial learning is included in their strategic plan and policy (Amadi-Echendu *et al.*, 2016:23). Such an internal environment allows for the development of entrepreneurial graduates through teaching, learning, research, and engagement (Yusoff *et al.*, 2017:894).

In addition, the culture that exists internal to the university promotes and embraces entrepreneurship and provides the necessary support to students to assist them on their entrepreneurial journey (Amadi-Echendu *et al.*, 2016:23). Such support includes entrepreneurial education and support structures such as incubators, access to finance, and physical space where student entrepreneurs can work on their business ideas (OECD, 2013:9), amongst others.

3.2.1.2 Student Entrepreneurs

From Figure 3.1 it can be seen that student entrepreneurs are at the centre of the internal entrepreneurship environment. As described in Chapter Two, student entrepreneurs can be categorised according to three classifications, (i) registered students at a university who are in the process of establishing a business (nascent entrepreneurs), (ii) registered students at a university who are already operating a business that they have established, and (iii) individuals who have recently completed their qualifications and used the knowledge gained through their studies or research to establish a business (Bergmann *et al.*, 2016:54). For the current study, student entrepreneurs are regarded as individuals between the ages of 15 and 35 and who are registered students at a South African public university. Alongside their university studies, they are also either in the process of establishing a business or operating their own business(es) already.

As explained in Chapter Two (Section 2.2.2), there are various reasons why student entrepreneurship is important. Student entrepreneurs positively impact employment (job) creation, economic growth, and the adoption of new technologies and innovation capabilities (Fadeyi *et al.*, 2015:28; Fatoki, 2014a:100; Ramchander, 2019:2). Moreover, student entrepreneurs are also at the centre of both Miller and Acs' (2017) and Sherwood's (2018) U-BEE models emphasising the importance of this element and supporting its inclusion at the centre of the framework conceptualised for the current study. Miller and Acs (2017:81) contend that the efforts of student entrepreneurs to establish high-growth firms is what earns them the position at the centre of their U-BEE. Sherwood (2018:246) asserts that entrepreneurs, whether faculty, staff or students, should be placed at the centre of a U-BEE as they are the individuals who will make use of and benefit from the support that surrounds them. Although not in the centre, Wright *et al.*'s (2017) U-BEE model starts with entrepreneurs (faculty, students, post-docs, and alumni) on the left-hand side, indicating that without entrepreneurs the support being provided would be redundant. Lastly, Novela *et al.* (2021:179), conclude that students have a significant driving power in terms of increasing awareness and encouraging entrepreneurship among other students and staff.

3.2.1.3 Formal Entrepreneurship Education

Entrepreneurship education is described as the teaching and learning of entrepreneurship and the required skills to start a business (Kusmintarti, Thoyib, Maskie & Ashar, 2016:26). According to Galvao, Ferreira and Marques (2017:19), entrepreneurship education involves programmes or processes through which individuals are given the competencies to recognise business opportunities and provide them with the knowledge and skills required to use their strengths to seize these opportunities. In the current study, a differentiation is made between formal and informal entrepreneurship education. Tiemann *et al.* (2018:104) explain that formal entrepreneurship education is embedded in the formal structure of the curriculum and includes accredited degrees, certificates, modules or programmes specifically focusing on entrepreneurship (Mohamad, Lim, Yusof & Soon, 2015:877; Sherwood, 2018:260). In contrast, informal entrepreneurship education focuses more on self-experience and includes independent learning skills, mentoring approaches and social networking (Mohamad *et al.*, 2015:877). Informal entrepreneurship education is offered outside the formal structure of the curriculum as co-curricular activities (Tiemann *et al.* 2018:104). Given this differentiation, informal entrepreneurship education falls under the element co-curricular entrepreneurship support activities (see Section 3.2.1.7) in the current study.

Hechavarria and Ingram (2015:89) assert that there has been a rise in entrepreneurship education being offered by universities, as the demand for entrepreneurial activities, technology transfer and innovation has increased. This rise in demand has led to the expansion of existing tertiary programmes to include entrepreneurship in the curriculum, the development of new tertiary programmes focusing on business creation, and the establishment of totally new universities, with their primary focus being on entrepreneurship and venture creation (Hechavarria & Ingram, 2015:89). Entrepreneurial education plays a vital role in shaping the attitudes and skills of individuals, and the culture experienced within a university setting (Human Resource Development Council of South Africa, 2014:88). Shambare (2013:450) notes that entrepreneurship education is vital to creating awareness of entrepreneurship as a career option.

Given the rise in demand for formal entrepreneurship education, as well as the importance thereof, several studies (Rice *et al.*, 2014; Miller and Acs, 2017; Wright *et al.*, 2017; Sherwood, 2018; Tiemann *et al.*, 2018; Shil *et al.*, 2020; Novela *et al.*, 2021) have included formal entrepreneurship education as an element in their U-BEE models. According to Sherwood (2018:260), the most visible strategy adopted at universities to support student entrepreneurship is formal education programmes. Sherwood (2018:261) contends that entrepreneurship education is vital as it encourages new thinking about entrepreneurship as part of the supply chain that eventually spills over into the larger ecosystem. There is also a positive relationship between entrepreneurship education and entrepreneurship outcomes (Wright *et al.*, 2017:910; Sherwood, 2018:264). Shil *et al.* (2020:2), for example, assert that entrepreneurship education plays a vital role in developing entrepreneurial attitudes. According to Novela *et al.* (2021:176), formal entrepreneurship education is a central element to a U-BEE as it fosters innovation among students.

The purpose of offering formal entrepreneurship education is to increase students' awareness of entrepreneurship as a viable career option and to equip them with the required skills to start their own businesses (Radipere, 2012:11016; Ghina *et al.*, 2014:1; Shah, Amjed & Jaboob, 2020:2). Shah *et al.* (2020:2) further explain that entrepreneurship education aims to equip students with the knowledge, skills, abilities, and capacities required to become self-employed entrepreneurs rather than paid employees. It is suggested that formal entrepreneurship education should effectively change the mindsets of students from wanting to be employees to employers, and that it should equip them with the necessary practical business skills and knowledge to do so (Davies, 2001:33).

According to Balan and Metcalfe (2011:369), entrepreneurship education involves three types of education, namely (i) education about entrepreneurship; (ii) education for entrepreneurship; and (iii) education through (in) entrepreneurship (see Table 3.1).

Table 3.1: Education about, for, and through entrepreneurship

	About	For	Through
Objectives	Teach entrepreneurship concepts (theoretical)	Inspire individuals to become entrepreneurs	Foster an entrepreneurial mindset
Main focus	Knowledge	Skills	Attitudes
Participation	Passive	Active/Participative	Active/Reflective
Assessment	Formal (Examinations)	Develop promising business plans	Discover potential opportunities
Entrepreneurial propensity	Uncertain	Start new businesses	Become entrepreneurs

Source: Kakouris and Liargovas (2020:8)

Education *about* entrepreneurship aims to create awareness among students about entrepreneurship as a possible career option and tries to change students’ mindsets from wanting to be employees to wanting to start their own businesses (Sirelkhatim & Gangi, 2015:5). According to Kakouris and Liargovas (2020:4), education *about* entrepreneurship is based on a more theoretical perspective to provide individuals with a general understanding of the concepts related to entrepreneurship. Hoppe, Westerberg and Leffler (2017:754) note that the *about* approach to entrepreneurship education is adopted in the traditional academic sense of teaching entrepreneurship and focusses on entrepreneurship as a phenomenon.

Sirelkhatim and Gangi (2015:5) assert that education *for* entrepreneurship is usually presented through practical-orientated courses aimed at encouraging students and increasing their intentions to be entrepreneurs. The aim is primarily to provide individuals with the required knowledge and skills to start their own businesses (Balan & Metcalfe, 2011:369; Kakouris & Liargovas, 2020:4). When following the education *for* entrepreneurship approach, the question posed is, “What are the competencies required by students to start their own businesses and be entrepreneurs?” (Hoppe *et al.*, 2017:753).

Education *through* entrepreneurship focuses on graduating entrepreneurs, developing entrepreneurial competencies among students, and supporting their new venture creations (Sirelkhatim & Gangi, 2015:5). Education *through* entrepreneurship is an experiential approach that usually entails students going through an actual entrepreneurial learning process (Kakouris

& Liargovas, 2020:4). Fatoki and Oni (2014:586) found that with *through* entrepreneurship education, students gain the necessary skills to become entrepreneurs and positively impact their entrepreneurial intention.

Entrepreneurial education can be provided through various methods and should include both theoretical lecture-based methods as well as practical, action-orientated methods (Balan & Metcalfe, 2011:370). According to Galvao *et al.* (2017:20), traditional lectures, case studies, and business plan developments are the most popular teaching methods used in entrepreneurship education. As proposed by Sirelkhatim and Gangi (2015:6), the most popular teaching methods and curricular content associated with the different types of entrepreneurship education are summarised in Table 3.2.

Table 3.2: Entrepreneurship education methods and curricular content

No.	Methods/Content	About Entrepreneurship	For Entrepreneurship	Through Entrepreneurship
1	Business plan	✓		
2	Marketing	✓		
3	Small business management	✓		
4	Case studies	✓		
5	Finance	✓		
6	Guest speakers	✓		
7	Simulations		✓	
8	Networking		✓	
9	Product development		✓	
10	Opportunity recognition		✓	
11	Selling and sales		✓	
12	Team building		✓	
13	Generating ideas		✓	
14	Role-playing		✓	
15	Incubators			✓
16	Mentoring			✓
17	Internships			✓
18	Pitching ideas			✓

Source: Sirelkhatim and Gangi (2015:6)

Recent years have seen increasing criticism in management education of the disconnect between entrepreneurship education and entrepreneurship practice (McGuigan, 2016:42). Traditional lectures are seen as less effective and more practical approaches to teaching entrepreneurship are encouraged (Galvao *et al.*, 2017:20). Galvao *et al.* (2017:19) note, however, that even 70 years after entrepreneurship education first began, it is still at an early stage of development and no standard structure or best practice in terms of providing such education exists.

From Table 3.2 it can be seen that various teaching methods can be used and curricula content included when teaching entrepreneurship, and educators are starting to realise the importance of teaching entrepreneurship in a more efficient and more effective manner (McGuigan, 2016:41). According to Gedeon (2014:247), entrepreneurship educators need to spark transformative personal growth, desired learning outcomes as well as change in attitudes and values among their students (Gedeon, 2014:247). Gedeon (2014:235) notes, however, that entrepreneurship educators often lack expertise in entrepreneurship and that extra training and support should be available to equip them with entrepreneurial skills and knowledge required. Otache (2019:931) found a positive relationship between entrepreneurship education and students' entrepreneurial intentions. This relationship and impact are more significant when entrepreneurship education is taught by lecturers who are perceived to be entrepreneurially inclined by the students, as lecturers are often seen as role models (Otache, 2019:932). However, lecturers do not necessarily have to start their own businesses to be able to teach entrepreneurship as successful external entrepreneurs can also be approached to act as guest lecturers to share their knowledge, skills, and experiences with students (Otache, 2019:932).

3.2.1.4 Incubator and Accelerator Programme

A university incubator is an ecosystem that undertakes various activities and provides resources to support entrepreneurs in establishing their businesses (Covelli, Morrissette, Lindee & Mercier, 2020:118). Moreover, a university incubator can be regarded as a hub where like-minded entities (entrepreneurs, support staff, and private/public companies) come together to create a supportive and conducive environment for start-up businesses (Covelli *et al.*, 2020:118). Sherwood (2018:265) assert that an incubator is usually a property with small work units, focusing on providing a wide variety of business development support and a conducive environment for business start-ups. In contrast, accelerators are described by Wright *et al.*

(2017:917) as extensions of incubators focusing more on education and mentoring. Breznitz and Zhang (2019:856) describe accelerators as organisations focused on accelerating the process of starting a business, predominantly through the provision of education and mentoring in the context of an intensive programme of limited duration. The most fundamental difference between incubator and accelerator programmes is the duration of the support provided (Cohen, 2013:19; Crişan, Salanță, Beleiu, Bordean & Bunduchi, 2021:63).

According to Matt and Schaeffer (2018:11), the number of university-led business incubators has increased substantially since the 2000s. These incubators have become a popular mechanism to promote and facilitate business start-ups and growth (Sherwood, 2018:265). Moreover, Guerrero, Urbano and Gajon (2020:757) contend that university incubators are essential university support to drive and promote entrepreneurship and innovation processes. According to Wright *et al.* (2017:917), incubators and accelerators play a pivotal role in the success of student start-ups as their business ideas are further shaped and they are assisted in identifying potential investors and markets. Within a mission-based university, developing partnerships, providing mentorship, and positively impacting the community are vital elements within the strategic plan (Covelli *et al.*, 2020:118). University-based incubators offer programmes that create opportunities for meeting strategic goals and objectives, and are thus beneficial to start-up businesses and the university as a whole (Covelli *et al.*, 2020:118). Incubators and accelerator programmes are included as elements in several U-BEE models (Wright *et al.*, 2017; Shil *et al.*, 2020; Novela *et al.*, 2021), emphasising the importance of such support structures.

Incubators, focusing on innovation, job creation and social cohesion, are established to promote entrepreneurship and enhance economic and social development (Ndedi, 2014:468; McAdam, Miller & McAdam, 2015:2; Allahar & Sookram, 2019b:251). Furthermore, they are established to support the development of small businesses and to provide incubation programmes that assist prospective entrepreneurs in changing their business ideas into actual business ventures (Covelli *et al.*, 2020:118). Cohen (2013:21) contends that incubators provide a safe space where nascent ventures can be nurtured and allowed to grow. This is supported by Pellegrini and Sheehan (2021:186) who indicate that incubators are designed to accelerate the growth and success of entrepreneurial start-ups. According to Sherwood (2018:265), an incubator is a dynamic business development process that provides various activities to reduce the failure rate of early-stage start-up businesses as well as speed up the growth of start-up businesses and turn them into generators of employment and wealth.

Although the purpose of accelerators is very similar to that of incubators, they also aim to speed up market interaction to increase the rate at which promising entrepreneurs adapt and learn (Cohen, 2013:21). As shown by Drori and Wright (2018:2), accelerators exist to provide an intensive, limited-period educational programme which includes mentoring and networking opportunities to accelerate the start-up process of new business creations. Moreover, Lange and Johnston (2020:1564) explain that the purpose of accelerators is to provide resources and assistance to viable start-up businesses in order to accelerate their start-up process.

According to Good *et al.* (2018:7), various activities are undertaken by incubators and accelerator programmes, including actively searching and attracting university start-ups, defining selection criteria for possible participants, and determining the graduation requirements from programs, which could either be time based or performance based. In addition, incubators and accelerator programmes undertake several other activities and provide various resources to assist entrepreneurs in starting up their businesses (Allahar & Sookram, 2019b:251). These are summarised in Table 3.3.

Table 3.3: Incubator and accelerator programme activities and resources

Activity	Sources
Access to training	Covelli <i>et al.</i> (2020:118)
Business advice and services	Cohen (2013:20), Culkin (2013:638); Ndedi (2014:468); Pellegrini & Sheehan (2021:186)
Access to potential clients and supplier database	Ndedi (2014:468)
Networking opportunities with seasoned entrepreneurs, mentors, and venture capitalists	Cohen (2013:20), Culkin (2013:638); Jamil, Ismail & Mahmood (2015:155); Covelli <i>et al.</i> (2020:118); Pellegrini & Sheehan (2021:186)
Mentorship	Ndedi (2014:468); Covelli <i>et al.</i> (2020:118); Pellegrini & Sheehan (2021:186)
Capital/Funding	Jamil <i>et al.</i> (2015:155); Pellegrini & Sheehan (2021:186)
Office and workspace	Cohen (2013:20); Ndedi (2014:468); Jamil <i>et al.</i> (2015:155); Covelli <i>et al.</i> (2020:118); Pellegrini & Sheehan (2021:186)
Services related to intellectual property	Cohen (2013:20); Jamil <i>et al.</i> (2015:155); Pellegrini & Sheehan (2021:186)

Source: Authors own construction

The various activities undertaken by university-based incubators are usually available to students through registering and being part of an incubation programme (Murray, 2019:3). Being part of an incubation programme involves entrepreneurs being guided through a

systematic process to establish their business ventures (Covelli *et al.*, 2020:118). Covelli *et al.* (2020:118) assert that it typically takes up to three years for students to graduate from such incubation programmes, while Cohen (2013:21) suggests a duration of between one and five years. By being part of an incubation programme, students get the opportunity to link their theoretical knowledge, obtained either through formal academic entrepreneurship education or from the incubation programme itself, with practical exposure (Radipere, 2012:11016; Gwija, Eke & Iwu, 2014:12). Individuals who are part of an incubation programme also enjoy the benefits of a large network base consisting of other entrepreneurs in the programme, external entrepreneurs, actors in the industry and external business partners (Good *et al.*, 2018:7).

The organisational structure of a university incubator concerns how it is owned and governed, as well as the physical location thereof. Good *et al.* (2018:8) assert that incubators are typically owned by a range of actors and can either be situated within a university's affiliated science park or near research departments. McAdam *et al.* (2015:7) add that incubators can also, in some cases, be situated in the TTOs of a university. An incubator's governance structure depends on whether the incubator is a for-profit or a non-profit organisation (Jamil *et al.*, 2015:155; Good *et al.*, 2018:8). Jamil *et al.* (2015:155) stipulate that the majority of incubators within university and research institutions are non-profit organisations. These university incubators are usually financed through (i) a proposed budget presented by the university, (ii) external grants, and (iii) funds from university-based research foundations (Pellegrini & Sheehan, 2021:189). By receiving funding through these methods, Pellegrini and Sheehan (2021:189) note that university incubators are less dependent on whether the start-ups established through their incubator programmes are successful or not. Successful start-ups are, however, required to make the incubators more financially viable (Pellegrini & Sheehan, 2021:189). Incubators are typically governed as a separate legal entity, with a management team and a board of directors (Good *et al.*, 2018:8). Gozali, Masrom, Haron and Zagloel (2015:129) propose five dimensions that need to be evident in the governance of an incubator, including (i) an experienced incubator manager; (ii) a board of directors; (iii) a noted advisory council; (iv) concise program milestones; and (v) dynamic and efficient business operations.

The number of people (staff) employed at an incubator varies according to the different support provided and how often the incubator relies on external service providers (Good *et al.*, 2018:8). The persons employed by an incubator are generally able to provide vital guidance and advice to prospective entrepreneurs and should have collaborative, project management and

networking skills (Good *et al.*, 2018:9). Murray (2019:4) asserts that in order to achieve the goals and objectives of an incubator, dedicated persons (staff) need to be employed, and suggests that several key stakeholders are necessary for an incubator to be successful (see Table 3.4).

Table 3.4: Key incubator stakeholders

Key Stakeholders	Description/Duties
The board	Should be composed of key stakeholders who bring diversity and the required skills and knowledge to make vital strategic decisions.
The enterprise manager	<p>Oversees the day-to-day operations of the facility.</p> <p>Tasks could include, but are not limited to:</p> <ul style="list-style-type: none"> • Assessing viability and developing business ideas; • Providing access to funding; • Identifying and developing key partnerships; • Developing a credible, high profile business award programme; and • Coordinating a broad range of business development workshops and seminars.
The enterprise executive	<p>Assist the enterprise manager with the day-to-day operation of the facility, acting as a deputy enterprise manager.</p> <p>Tasks could include, but are not limited to:</p> <ul style="list-style-type: none"> • Assisting clients with routine administrative support; • Managing the bookings of the workshops and the seminars; • Ensuring smooth administration of the facility; and • Managing payments.
The incubator tenant	These individuals are in charge of ensuring that all ad hoc events at the incubators run smoothly, such as the workshops and seminars.
Key partners	<p>Individuals or entities with a vested interest in the incubator, providing valuable insights and services, but also have their own specific agendas.</p> <p>Examples of key partners include, but are not limited to:</p> <ul style="list-style-type: none"> • The university; • Business schools; • Chamber of Commerce; • Training providers; and • Private and public funders.

Source: Murray (2019:4)

3.2.1.5 Technology Transfer Office

According to Munari, Pasquini and Toschi (2015:950), the transfer of technological knowledge developed within a university to the market has experienced an increase in attention in recent years. This increase in attention is specifically evident at universities where economic development is included as one of the university’s goals, referred to as a ‘third mission’ of the

university (Croce, Grilli & Murtinu, 2014:690; Aragoes-Beltran, Poveda-Bautista & Jimenez-Saez, 2017:19; Bolzani, Munari, Rasmussen & Toschi, 2020:338). This goal exists in addition to education and research (Croce *et al.*, 2014:690; Aragoes-Beltran *et al.*, 2017:19; Bolzani *et al.*, 2020:338). Aragoes-Beltran *et al.* (2017:19) assert that universities now face two challenges, (i) demonstrating social commitment and efficient budgetary expenses to society, and (ii) being active in terms of the development of third mission activities in order to attract new financial resources. To assist with the transfer of technological knowledge developed within a university to the market environment, universities have started to establish what is known as Technology Transfer Offices (TTOs) (Weckowska, 2015:62). These TTOs are regarded as the structures responsible for managing the third mission activities of universities (Aragoes-Beltran *et al.*, 2017:19). Other terms used for such offices include ‘Knowledge Transfer Offices’, ‘Industrial Liaison Offices’, ‘Offices of Technology Licensing’, and ‘University Technology Transfer Offices’ (Brescia, Colombo & Landoni, 2016:134). Considering the vital part TTOs play in a university’s ability to meet their ‘third mission’, as well as the fact that TTOs are elements in several other U-BEE models (Rice *et al.*, 2014; Wright *et al.*, 2017; Sherwood, 2018; Tiemann *et al.*, 2018; Novela *et al.*, 2021), TTOs have been included as an element in the university-based student entrepreneurship support framework conceptualised for the current study.

According to Good *et al.* (2018:5), the purpose of a TTO is to protect the university’s proprietary rights to generate returns and to support the pre-commercialisation of inventions. TTOs are usually established to assist a university in achieving its goal of creating positive impacts through science commercialisation (Baglieri, Baldi, Tucci, 2018:51). Bolzani *et al.* (2020:336) explain that university TTOs exist to support the commercialisation of research results, which is usually done through spin-outs, spin-offs, licensing, and contracts with industry.

Fitzgerald and Cunningham (2016:1238) suggest that the mission statement (purpose) of a TTO should include the following:

- (i) To facilitate the transfer of discoveries made by university staff and students to the market environment;
- (ii) To promote economic development;
- (iii) To recruit, retain, and reward faculty staff and graduate students;

- (iv) To establish relationships with individuals and businesses in the industry;
- (v) To generate income for the university, technology transfer office and inventors;
- (vi) To generate funding support;
- (vii) To serve as a centre for all matters regarding intellectual property; and
- (viii) To facilitate the creation of spin-out companies.

A university's TTO performs various roles and is responsible for numerous activities. According to Weckowska (2015:63), the roles of a TTO are to:

- (i) Encourage the disclosure of inventions that can potentially be commercialised;
- (ii) Manage the university's intellectual property;
- (iii) Identify licensees and/or investors;
- (iv) Secure resources for intellectual property development and exploitation; and
- (v) Intermediate among scientists, businesses, and university administrators.

Furthermore, some of the many activities that are the responsibility of and undertaken by a TTO are summarised in Table 3.5. One of the initiatives employed through a TTO to assist staff and student entrepreneurs with funding is a university venture fund (Croce *et al.*, 2014:691). A university venture fund is considered a separate element in the framework conceptualised for the current study and is elaborated on in Section 3.2.1.6 that follows.

Table 3.5: TTO activities

Activity	Sources
Encourage researchers to participate in technology commercialisation.	Aragones-Beltran <i>et al.</i> (2017); Jefferson, Maida, Farkas, Alandete-Saez & Bennett (2017)
Build trust and relationships with researchers.	Huyghe, Knockaert, Wright & Piva (2014); Jefferson <i>et al.</i> (2017)
Identify high potential technologies.	Huyghe <i>et al.</i> (2014); Aragones-Beltran <i>et al.</i> (2017); Jefferson <i>et al.</i> (2017)
Secure funding or other resources where more research is required through a university venture fund.	Croce <i>et al.</i> (2014); Gubitta, Tognazzo & Destro (2016)
Determine the most appropriate intellectual property rights strategy.	Boh, De-Haan & Strom (2016); Aragones-Beltran <i>et al.</i> (2017); Jefferson <i>et al.</i> (2017)
Assess commercialisation potential of technologies.	Schaeffer & Matt (2016); Boh <i>et al.</i> (2016); Jefferson <i>et al.</i> (2017)

Table 3.5: TTO activities (cont.)

Activity	Sources
Develop a licensing strategy.	Boh <i>et al.</i> (2016); Jefferson <i>et al.</i> (2017)
Engage in spin-off creation.	Lundqvist (2014); Jefferson <i>et al.</i> (2017)
Engage in internal and external network building.	Schaeffer & Matt (2016); Jefferson <i>et al.</i> (2017)
Determine the commercialisation strategy relating to licensing, spin-offs, and research contracts.	Berbegal-Mirabent, Garcia & Ribeiro-Soriano (2015); Aragoes-Beltran <i>et al.</i> (2017)

Source: Good *et al.* (2018)

According to Aragoes-Beltran *et al.* (2017:21), the size and magnitude of TTOs have increased over the past decade. As such, the structure of these offices in terms of ownership and governance and their physical locations has become more complex. The optimal design of a TTO would differ among universities depending on the history of the university, its goals and characteristics, as well as the external environmental factors (Schoen, Potterie & Henkel, 2014:437). Good *et al.* (2018:8) propose that a university's TTO can be internally integrated within a university's administration, a fully-owned external organisation, or an external organisation owned by more than one university. In addition, Battaglia, Landoni and Rizzitelli (2017:46) note that TTOs can adopt one of three types of organisational structures: a centralised structure, a decentralised structure, or a semi-centralised structure. In a centralised structure, decision making, and coordination in TTOs are done by a small team of executives (Battaglia *et al.*, 2017:46). A centralised structure does not always lead to the TTO being a facilitator of commercialisation but rather acts as an administrative intermediary to bring technology a step closer to the market (Battaglia *et al.*, 2017:46). Bolzani *et al.* (2020:340) suggest that traditional centralised TTOs are often subject to a robust administrative oversight, limiting the autonomy of staff in terms of decision making, the scope of activities, commercialisation strategies, and incentive systems. According to Alessandrini, Klose and Pepper (2013:209), a shortcoming of a centralised structure is that it could negatively impact the relationships between TTO staff, researchers and students. This negative impact could severely affect the success of the TTO (Alessandrini *et al.*, 2013:209). With a decentralised structure, a greater level of autonomy is established for the development of relationships with industry, which decreases the chance of potential conflicts of interest between research, teaching, and commercialisation activities (Brescia *et al.*, 2016:135; Bolzani *et al.*, 2020:340). Furthermore, in a decentralised structure, the responsibility for technology transfer activities is located close to the faculties or research groups it aims to assist (Brescia *et al.*, 2016:135).

Another term used to describe the semi-centralised structure of a TTO is a ‘hybrid TTO model’ (Huyghe *et al.*, 2014:291; Brescia *et al.*, 2016:135). A hybrid TTO model is a combination of a centralised and a decentralised structure (Huyghe *et al.*, 2014:291). A hybrid TTO is established at the central level of a university, with a more decentralised TTO being closer to the research groups or faculties (Huyghe *et al.*, 2014:291). Battaglia *et al.* (2017:46) suggest that a hybrid model is the best type of structure for a TTO as it involves the division of tasks that enhance coordination capabilities and information processing capacity and promotes a good incentive alignment among divisions.

Jefferson *et al.* (2017:1311) note that the employees and people within a TTO are the core component for its success. According to Good *et al.* (2018:8), the number of people working in a TTO is dependent on the structure adopted and could vary between 5 and 100 employees. A balance between technical business and legal skills is required from these employees, as TTOs are faced with diverse demands (Jefferson *et al.*, 2017:1311). TTO employees usually have some business and marketing skills, prior entrepreneurial experience, experience in intellectual property rights, an understanding of the academic environment, and the ability to develop beneficial relationships with industry actors (Good *et al.*, 2018:9). When employing individuals in the TTOs, industry experience with regards to managing budgets is also important (Gubitta *et al.*, 2016:391). This experience increases the level of confidence venture capitalists have working with TTOs (Gubitta *et al.*, 2016:391). Moreover, a TTO manager must also be able to understand and reconcile the interest of various parties, including the institution and academics, as well as the industry partners (Jefferson *et al.*, 2017:1311).

3.2.1.6 University Venture Fund

A university venture fund is defined as a fund that either formally or informally collaborates with a university to provide seed and early-stage funds to support technology transfer and commercialisation of university and public research results (Good *et al.*, 2018:3). Croce *et al.* (2014:690) explain that university venture funds are directly affiliated with a parent university. These parent universities invest capital, through these university venture funds, in specifically selected companies which are generally regarded as having high growth potential. Munari *et al.* (2015:952) explain that university venture funds are seed and early-stage funds with the deliberate and explicit mission of investing in university start-ups, focusing predominantly on technology transfer and commercialisation.

According to Munari *et al.* (2015:949), there are considerable risks associated with the validation, industrialisation, and commercialisation of university-generated inventions. Due to the high transaction costs, significant asymmetric information in early-stage start-ups, and uncertainty of the success of the projects, a funding gap is experienced, as funding sources such as venture capitalists are reluctant to invest (Munari *et al.*, 2015:949). Croce *et al.* (2014:690) assert that university venture funds are the most direct initiatives to overcome the funding gap challenge. As university venture funds are seen as the most direct initiative to overcome the funding gap challenge, as well as being an element in several U-BEE models (Rice *et al.*, 2014; Miller & Acs; 2017; Wright *et al.*, 2017; Sherwood, 2018; Shil *et al.*, 2020), university venture funds are included as an element in the framework conceptualised for the current study.

According to Croce *et al.* (2014:691), the purpose of a university venture fund is twofold, namely that of investing equity capital into companies whose technologies are close to the scientific fields in which the faculties specialise; and utilising the revenue generated through these investments to enhance the commercialisation of technology developed by university staff or students. Good *et al.* (2018:5) point out that the purpose of a university venture fund is also to develop and support local and regional economic development.

A university fund is tasked with undertaking various activities to support academic and student entrepreneurs. These activities include (i) establishing relationships with both local innovation actors such as universities and incubators, as well as with potential investors; (ii) acquiring funds from private and public actors; (iii) developing strategic investment plans and deciding in which companies to invest; and (iv) monitoring the performance of the companies in which investment has been made (Good *et al.*, 2018:7; Pierrakis & Saridakis, 2019:854).

The organisational structuring of a university venture fund is that it can either be internally managed through a university's TTO or externally through a standalone organisation with executive teams of professionals who have industry experience dealing with venture capital companies and the private sector (Croce *et al.*, 2014:691). Munari *et al.* (2015:956) contend that internally managed university venture funds are typically only associated with that single university, but there are some cases where internally managed university venture funds are jointly managed between several universities.

University venture funds vary in size, but there are two benefits of having a large fund, including (i) having the ability to diversify investments into a broader range of companies and providing more companies with financial resources at the same time, and (ii) attracting more professional and highly skilled venture capital investors to manage the funds (Munari *et al.*, 2015:969). The staff (people) involved with an internally managed university fund are usually less experienced than traditional venture capital fund managers. Thus, it is generally recommended to try and involve co-investors with greater levels of experience in managing venture funds (Good *et al.*, 2018:9).

3.2.1.7 Co-Curricular Entrepreneurship Support Activities

Co-curricular entrepreneurship support activities are described by Preedy (2017:2) as activities taking place outside the formal curriculum of a university that have an enterprise or entrepreneurship focus, do not provide any academic credits, and participation is optional. Morris *et al.* (2017:69) explain that co-curricular entrepreneurship support activities are co-curricular activities that tend to be experiential in nature and allow students to apply the theory and content learned in the classroom to practice. These co-curricular activities allow students to gain practical experience, leading to an expanded knowledge base, increased self-confidence, and a greater chance of subsequent actions (Morris *et al.*, 2017:69).

The availability of various co-curricular entrepreneurship support activities at a university increases students' entrepreneurial intentions, as well as their chances of successfully starting their own businesses (Arranz, Ubierna, Arroyabe, Perez & Arroyabe, 2017:1986). Similarly, Morris *et al.* (2017:70) posit that co-curricular support activities can increase student start-up activities. Co-curricular activities are an essential part of the entrepreneurial pathway to actual practice and should be combined with curricular courses to provide both theoretical and practical learning (Morris *et al.*, 2017:69; Tiemann *et al.*, 2018:104). Sherwood (2018:261) asserts that co-curricular entrepreneurship support activities benefit (prospective) entrepreneurs and all other elements within the U-BEE as well as the larger entrepreneurial ecosystem through knowledge spill overs. Given the positive influence that co-curricular entrepreneurship support activities have on entrepreneurial intentions and start-up success, as well as several authors including co-curricular entrepreneurship support in their U-BEE models (Wright *et al.*, 2017; Sherwood, 2018; Tiemann *et al.*, 2018), this element is included in the framework conceptualised for the current study.

Arranz *et al.* (2017:1986) assert that the purpose of co-curricular entrepreneurship support activities is to enhance the entrepreneurial culture among staff and students and provide the information and support that is required for students to take entrepreneurial action successfully. Co-curricular entrepreneurship support activities provide valuable experiential and social learning opportunities and provide opportunities for students to develop their autonomous learning capabilities (Preedy, 2017:1).

Several of these co-curricular entrepreneurship support activities have been identified in the literature and are summarised in Table 3.6.

Table 3.6: Co-curricular entrepreneurship support activities

Co-Curricular Support Activities	Description	Sources
Providing financial support	Financial support, either internally from the university, or externally, in the form of grants, seed funding, loans, and equity and non-equity investments.	Pittaway, Falcon, Aiyegbayo & King (2010); Viviers <i>et al.</i> (2013); Arranz <i>et al.</i> (2017); Morris <i>et al.</i> (2017); Matt & Schaeffer (2018)
Conferences and seminars dedicated to entrepreneurship	Conferences and seminars with the deliberate focus on entrepreneurship, student entrepreneurship, or university-based student entrepreneurship support.	Arranz <i>et al.</i> (2017)
Internships in existing businesses	Short- to medium term internships in real businesses provide valuable insights on how a business should be run and provide the students with practical work experience.	Pittaway <i>et al.</i> (2010); Arranz <i>et al.</i> (2017); Morris <i>et al.</i> (2017)
Business simulations/games	Simulations and games that incorporate business management concepts and entrepreneurship allow students to enhance their skills in a creative and interactive manner while still being in a relatively safe environment.	Pittaway <i>et al.</i> (2010); Arranz <i>et al.</i> (2017)
Facilities and infrastructures for entrepreneurs	Co-working spaces where students have access to workspace, meeting facilities, and a place to operate their businesses from.	Arranz <i>et al.</i> (2017)
Entrepreneurial spirit and values (Culture)	A supportive culture in terms of entrepreneurship evident from the university itself, including management, staff, and students, to increase the interest of entrepreneurship as a career option.	Arranz <i>et al.</i> (2017); Matt & Schaeffer (2018)
Entrepreneurship Competitions	Competitions that provide a stimulus for entrepreneurial activities such as business plan or pitching competitions, where students not only stand a chance to win seed money to help fund their business ideas, but also gain valuable entrepreneurial knowledge and skills.	Viviers <i>et al.</i> (2013); Morris <i>et al.</i> (2017); Preedy (2017); Matt & Schaeffer (2018)
Mentorship	Individuals providing suggestions and recommendations to other (prospective) entrepreneurs based on their experiences, failures and mistakes, so that they can avoid them.	Pittaway <i>et al.</i> (2010); Viviers <i>et al.</i> (2013); Morris <i>et al.</i> (2017)
Entrepreneurship clubs and societies	Student-led activities which enhance formal entrepreneurship education through the provision of additional space outside of the curriculum where students can take part in entrepreneurial initiatives.	Pittaway <i>et al.</i> (2010); Pittaway, Gazzard, Shore & Williamson (2015); Morris <i>et al.</i> (2017)
Workshops	Workshops can be formal and informal, focusing on educating new entrepreneurs, creating publicity, fostering an entrepreneurial culture, and providing practical assistance.	Pittaway <i>et al.</i> (2010); Pruett (2012)
Entrepreneurship and networking events	These are events where like-minded individuals can get together and meet other individuals who could potentially assist them through the process of establishing their businesses, such as mentors, business partners or individuals who could assist them financially.	Viviers <i>et al.</i> (2013); Preedy (2017)

Source: Authors own construction

Although the co-curricular entrepreneurship support activities offered by the different universities could be more or less the same, their description, purpose, structure and the people involved vary depending on several factors (Fichter & Tiemann, 2018:514). These factors include access to funding, the number of staff members available and their willingness to provide support, as well as the effectiveness of activity coordination (Preedy & Jones, 2015:1003). Hofer and Potter (2010:11) contend that the purpose, structure, and people involved in co-curricular support activities will also differ among universities depending on their entrepreneurship objectives. These objectives could include but are not limited to (i) generating entrepreneurial attitudes, behaviour, and skills among students; (ii) promoting student start-ups; (iii) commercialising research outputs; (iv) promoting technology-intensive start-ups; and (v) generating revenue for the university (Hofer & Potter, 2010:11).

3.2.2 EXTERNAL ENTREPRENEURSHIP ENVIRONMENT

As mentioned above, the left-hand side of the framework conceptualised for the current study refers to the external entrepreneurship environment, which concerns actors outside the university environment that provide support to student entrepreneurs in the internal environment. These actors include local and regional actors, other local, national and international universities, and national government. According to Murray (2019:5), there are a wide variety of external actors that universities can partner with to support student entrepreneurship. These actors include Chambers of Commerce, local and regional government, training providers, external funders, business support agencies, employability services and the wider business community. Bischoff *et al.* (2018:22) also identify several external stakeholders, namely enterprises, financial institutions, support services, external incubators and accelerators, science and technology parks, and partner universities. Murry (2019:5) notes, however, that key partners have their own agendas that may not align with that of the universities they partner with.

Tiemann *et al.* (2018:92) assert that elements within a university-based entrepreneurial ecosystem are mutually dependent on the external environment, specifically the university, government, and industry interaction. Wright *et al.* (2017:912) point out that the government specifically influences a U-BEE through its policy stances towards university entrepreneurship and its objectives concerning the role of universities. A favourable government climate for entrepreneurship allows universities a more flexible environment to provide support to their

student entrepreneurs (Theodoraki, Messeghem and Rice, 2018:158). Wright *et al.* (2017:912) also highlight the influence that external actors have on the U-BEE as a result of the support they provide to assist student entrepreneurs. A strong local, regional, and global presence with the business-, investment-, and alumni community, as well as strong relationships with other universities and government agencies, provides a university with a broader range of opportunities to increase the effectiveness and efficiency of the support they offer to their student entrepreneurs (Rice *et al.*, 2014:491).

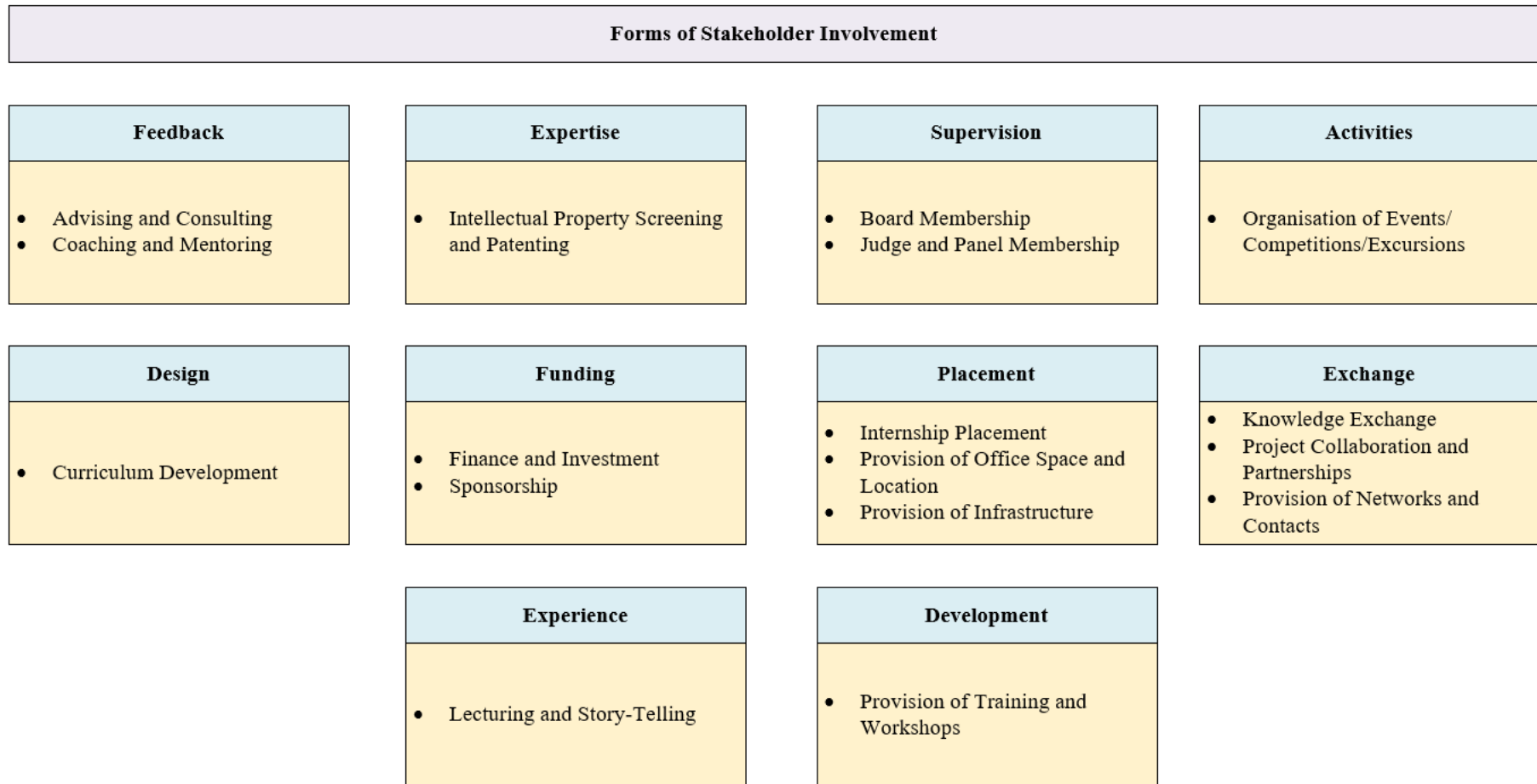
Given the important influence that the external entrepreneurship environment has on a U-BEE, and because of its inclusion in several other U-BEE models (Miller & Acs, 2017; Wright *et al.*, 2017; Sherwood, 2018; Tiemann *et al.*, 2018), the external entrepreneurship environment has been included in the framework conceptualised for the current study.

Support provided by local and regional actors includes advisory services such as legal, accounting, marketing, media, business planning, prototype development, and product testing (Rice *et al.*, 2014:498). In addition to advisory services, external actors also provide critical information, leading to more entrepreneurial opportunities (Beyhan & Findik, 2018:1352). Wright *et al.* (2017:913) note that local and regional actors assist universities in supporting student entrepreneurs, especially during the early stages when universities are in the process of establishing such support structures. In return for the support of actors in the external environment universities contribute to the establishment of businesses in the region and to the pool of student entrepreneurs who potentially establish businesses in these regions (Rice *et al.*, 2014:498).

Local and regional universities (Rice *et al.*, 2014:483; Bischoff *et al.*, 2018:29) are also a source of support for student entrepreneurship. According to Bischoff *et al.* (2018:34), collaborations between universities can be formal and informal and includes the (i) exchange of best practices or engagement in strategic partnerships; (ii) the hosting of joint conferences; (iii) joint or mutual participation in events, training or bootcamps in the field of entrepreneurship; (iv) research projects focusing on entrepreneurship; and (v) mutual exchange of students within entrepreneurship education programmes.

External actors and other stakeholders provide support to U-BEEs in many ways. Bischoff *et al.* (2018:30) describes this support in terms of several forms of involvement. These forms of involvement are summarised and presented in Figure 3.2

Figure 3.2: Entrepreneurship stakeholder involvement



Source: Bischoff *et al.* (2018:30)

3.2.3 COLLABORATIONS IN AND BETWEEN THE ENTREPRENEURSHIP ENVIRONMENTS

Ecosystems are described as complex systems with numerous entities or elements that interact and collaborate with one another to achieve a common goal (Cavallo *et al.*, 2019:1295). As in the case of natural ecosystems, interactions and collaborations between the elements of a U-BEE also take place. The university-based student entrepreneurship support framework conceptualised for the current study proposes that these interactions and collaborations take place between the elements within the internal university environment, as well as between the elements within the internal university environment and external environment.

3.2.3.1 Internal environment collaborations

According to Morris *et al.* (2014:62), universities must ensure that cross-campus initiatives take place and have the common purpose of encouraging entrepreneurship stakeholders from different departments and disciplines to collaborate on supporting prospective and existing student entrepreneurs. These collaborations can either be formal, including (i) shared board memberships, (ii) co-working arrangements, (iii) consultations, and (iv) joint events and workshops; or informal including (i) networking events, (ii) community and training events, and (iii) gatherings after work (Sherwood, 2018:242).

According to Sherwood (2018:259), existing student entrepreneurs should collaborate with other elements in a U-BEE to enhance access by others to the support needed (Sherwood, 2018:259). Wright *et al.* (2017:917), for example, assert that existing student entrepreneurs can provide general and continuous support throughout the activity continuum to those who are just starting on their entrepreneurial journey. Existing student entrepreneurs can act as mentors and coaches that assist prospective and nascent entrepreneurs in establishing their own businesses, they can create start-ups on campuses and invite others to become part of an entrepreneurial network, and they can act as instructors or guest speakers at workshops (Bischoff *et al.*, 2018:32; Sherwood, 2018:259).

Bischoff *et al.* (2018:33) contend that student organisations such as entrepreneurship clubs or societies often collaborate with incubators and TTO's to jointly host entrepreneurship competitions, workshops, and networking events. These clubs and societies also collaborate

with formal entrepreneurship education staff members and existing student entrepreneurs, who act as guest lecturers, coaches, and mentors during co-curricular activities (Bischoff *et al.*, 2018:33). Collaboration between formal entrepreneurship education and TTOs is also encouraged. Morris *et al.* (2014:52) suggests that students and staff from diverse disciplines should collaborate with TTOs to find market applications for university research and technological developments, and then establish businesses around those applications.

Morris *et al.* (2014:52) posit that although university-wide entrepreneurship collaborations are vital, they are not easy to sustain as the various elements within a U-BEE tend to operate in silos. Allahar and Sookram, (2019a:22) suggest that universities incentivise and encourage staff members to provide student entrepreneurship support and to collaborate with the other elements within the U-BEE in doing so (Allahar & Sookram, 2019a:22). Reward or incentive systems can, however, positively or negatively affect collaborations that exist, and the systems adopted should be considered carefully (Morris *et al.*, 2014:52; Hayter, Nelson, Zayed & O'Connor, 2018:1060). Possible methods include (i) the change of hiring practices, (ii) annual appraisals, (iii) tenure processes, (iv) increase in salaries, (v) provision of graduate assistants, (vi) entrepreneurial activities included in appraisal criteria, (vii) availability of research grants for research focusing on entrepreneurship, and (viii) public recognition (Morris *et al.*, 2014:64)

3.2.3.2 Internal environment collaborations with external environment

Several authors (Belitski & Heron, 2017:173; Beyhan & Findik, 2018:1352; Ferreira, Fayolle, Ratten & Raposo, 2018:3) contend that collaborations between universities, industry and the government are essential to create a conducive entrepreneurial environment for students and staff. Belitski and Heron (2017:173) assert that university-industry-government collaborations are a vital boundary condition for U-BEE performance, explicitly mentioning the commercialisation of knowledge. This collaboration between the university, industry and government is known as the “Triple Helix” (Allahar & Sookram, 2019b:248). External collaborations also benefit students and staff in several ways, such as increased access to funding, expertise in product and business development, commercialisation and market knowledge, and employment/internship opportunities (Amadi-Echendu *et al.*, 2016:28). Allahar and Sookram (2019b:255) note that although universities need government and industry support to ensure the sustainability of a conducive entrepreneurial environment within the university, universities are still responsible for their own financial independence.

In a study conducted by Bischoff *et al.* (2018:30), three different approaches to stakeholder collaboration in a U-BEE were identified. These approaches include a (i) centralised approach; (ii) decentralised approach; or (iii) mixed approach (see Table 3.7) (Bischoff *et al.*, 2018:30). Ferreira *et al.* (2018:4) recommend that universities develop a formal structure that supports cross-disciplinary collaboration, where various key stakeholders can discuss ideas and coordinate action.

Table 3.7: Approaches to stakeholder collaboration

Approach	Description
Centralised approach	<ul style="list-style-type: none"> • A central hub coordinates most entrepreneurship-related activities and respective stakeholder collaborations. • Designated positions for entrepreneurship exist, including key persons who drive and coordinate activities.
Decentralised approach	<ul style="list-style-type: none"> • Minimal university-wide coordination of entrepreneurship activities exists. • Entrepreneurship stakeholders have freedom and autonomy when organising entrepreneurship activities, and coordination occurs on an informal, individual basis.
Mixed approach	<ul style="list-style-type: none"> • A combination of the centralised and decentralised approach, where moderate coordination exists with sporadic communication between actors. • A central hub for entrepreneurship activities exists, with key actors outside the hub. • Coordination and collaboration are both formal and informal.

Source: Bischoff *et al.* (2018:30)

3.3 SUMMARY

In Chapter Three, the conceptual framework adopted to investigate and describe the university-based student entrepreneurship support offered at South African public universities was presented. The chapter continued by describing the framework, which consists of two environments: the internal entrepreneurship environment and the external entrepreneurship environment, and all the elements within each of these environments. The collaborations in and between the two entrepreneurship environments were also described.

In Chapter Four, the research design and methodology utilised in this study is described and justified. This chapter will provide information on how the research was conducted in order to achieve the primary, secondary, and methodological objectives of the current study.

CHAPTER FOUR

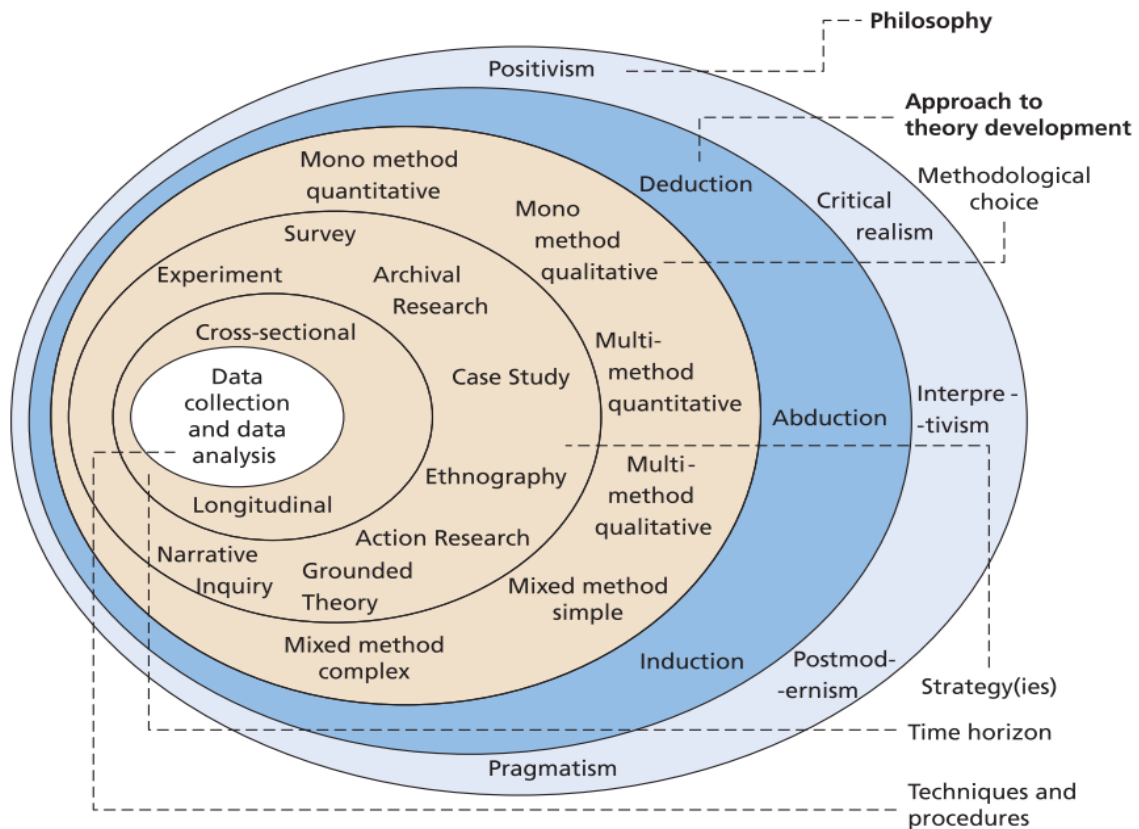
RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

As mentioned in Chapter One, the primary objective of this study is to assess the state of university-based student entrepreneurship support at South African public universities. This chapter will expand on how the researcher went about conducting the research for this study by describing the research design and methodology used. When conducting research, a research design is vital as it guides the researcher in identifying the appropriate philosophical assumptions, as well as in planning the procedures of inquiry, and methods to collect and analyse the data required to answer the research questions (Odoh & Chinedum, 2014:17; Creswell & Creswell, 2018:40). Creswell and Creswell (2018:40) emphasise the importance of choosing the correct research design to address the research questions presented in a study, as different questions warrant different designs (Odoh & Chinedum, 2014:16).

To describe the research design adopted and how the research was undertaken in the current study, the framework of Saunders *et al.* (2019:130), or the research onion, was used. Palic, Vignali, Hallier, Stanton and Radder (2015:53) describe the research “onion” framework as a metaphor for describing the procedure followed and the choices made by a researcher while conducting a study. The layers of the onion (see Figure 4.1), from the outside inwards, are (i) philosophies; (ii) approach to theory development; (iii) methodological choices; (iv) strategies; (v) time horizon; and (vi) techniques and procedures (Saunders *et al.*, 2019:124). Each of these layers are described and applied to the current study in the paragraphs that follow.

Figure 4.1: The research onion framework



Source: Saunders *et al.* (2019:130)

4.2 RESEARCH PHILOSOPHY AND RESEARCH PARADIGM

As can be seen in Figure 4.1, the first layer of the research onion is the research philosophy. The term research philosophy is defined by Palic *et al.* (2015:54) as “the system of beliefs and assumptions adopted by a researcher in the process of knowledge development”. Saunders *et al.* (2019:130) propose three fundamental assumptions that distinguish between different research philosophies, namely ontological, epistemological and axiological assumptions. These assumptions assist a researcher in understanding research questions, deciding on which methods to adopt and how to analyse the data collected (Saunders *et al.*, 2019:130). Rahi (2017:1) explains that ontology refers to how individuals regard the nature of reality, which can either be characterised by social order or constant change. In the current study, the researcher believes that the social world is one of multiple meanings, interpretations and realities (Saunders *et al.*, 2019:145). Thus, the researcher assumes that entrepreneurial stakeholders within university entrepreneurship ecosystems possess multiple social meanings and experiences.

Epistemology focuses on the connection between the researcher and that being studied and whether an objective or subjective approach would be best suited (Tumele, 2015:68). Moreover, Saunders *et al.* (2019:133) assert that epistemology refers to assumptions regarding knowledge and what constitutes acceptable, valid and legitimate knowledge. In the current study, the researcher assumes that subjective knowledge constitutes that which is acceptable and that the experiences of individuals are investigated in a subjective manner, where the focus is more on narratives, stories, perceptions and interpretations (Saunders *et al.*, 2019:145). Thus, the subjective in-depth knowledge of entrepreneurship stakeholders at the various universities were collected in this study.

Biedenbach and Jacobsson (2016:140) assert that axiology refers to the influence of the researcher and participant's ethical values on the study being conducted. Thus, axiology focuses on what individuals regard as desirable and good for society (Biedenbach & Jacobsson, 2016:140). In the current study, the researcher assumes that the values and beliefs of the participants will differ. Moreover, the values and beliefs of the researcher could also differ from those of the participants, which could have an influence on the study. These differences in values and beliefs are also a reason why a subjective approach is adopted, as such an approach allows for in-depth data from the viewpoint of participants to be collected.

Five philosophical research positions are proposed by Saunders *et al.* (2019:144), namely positivism, critical realism, interpretivism, postmodernism and pragmatism, each with their own ontological, epistemological, and axiological assumptions. Through positivism, it is presumed that only events that can be observed and measured objectively will lead to credible data that can be used to generalise to a population (Palic *et al.*, 2015:16). A quantitative approach is generally adopted with a positivism philosophical stance and includes a large sample size (Saunders *et al.*, 2019:144). In critical realism, reality is the most crucial philosophical consideration, which is external and independent from the observations and experiences of individuals (Saunders, 2019:147). Tumele (2015:75) notes that through critical realism, an individual does not just accept reality as it happens, but instead focuses on why things are as they are. According to Bryman (2012:30), interpretivism denotes an alternative approach to positivism, where it is essential to understand and respect the differences between individuals and their role as social actors. When an interpretivist philosophical stance is adopted, the reality is understood and studied from a subjective view, whereby knowledge and meaning are acts of interpretation that differ between individuals (Antwi & Hamza, 2015:218).

Postmodernism moves away from just focusing on objectivism and subjectivism and emphasises the role of language and of power relations, questioning accepted ways of thinking (Saunders *et al.*, 2019:149). According to Merriam and Tisdell (2016:11), postmodernists believe that explanations for the way things are are nothing but a myth or grand narrative. Postmodernists further believe that there is no “one truth” but rather “multiple truths” as to why events occur and accept the diversity and plurality of the world (Merriam & Tisdell, 2016:11). Saunders *et al.* (2016:143) assert that a pragmatist philosophical stance is appropriate when theories, concepts and ideas are only of relevance if they support action. A researcher who adopts a pragmatist philosophical stance aims to contribute practical solutions to a research problem (Saunders *et al.*, 2016:143). Rahi (2017:1) asserts that when a pragmatist philosophical stance is adopted, both quantitative and qualitative approaches can be utilised to ensure that the best techniques and procedures are adopted to answer the research questions.

The concepts research philosophy and research paradigm are often used interchangeably in the research methodology literature. According to Saunders *et al.* (2019:143), there tends to be little agreement on the label’s “philosophy” and “paradigm”, and their overlap of use leads to them being used interchangeably. However, where a research philosophy is described as “the system of beliefs and assumptions adopted by a researcher in the process of knowledge development” (Palic *et al.*, 2015:54), a research paradigm is described as a system that provides a research framework for researchers to understand a phenomenon and why it occurs (Eshlaghy, Chitsaz, Karimian & Charkhchi, 2011:108). Rahi (2017:1) further adds that a research paradigm is a set of agreements about how researchers understand a problem, view the world and conduct research. There are four types of paradigms presented by Saunders *et al.* (2016:133), including (i) the functionalist paradigm; (ii) the interpretivist paradigm; (iii) the radical structuralist paradigm; and (iv) the radical humanist paradigm.

Researchers adopting a functionalist paradigm believe that reality is independent of those who research it and that one should remain objective when conducting research (Starnawska, 2017:250). Saunders *et al.* (2019:141) assert that a functionalist paradigm is most likely to be underpinned by a positivist research philosophy. Moreover, Starnawska (2017:249) notes that a quantitative approach is usually employed with a functionalist paradigm. Through the interpretivist paradigm, reality is viewed by attaching subjective values to experiences and objects (Callaghan, 2016:88; Rahi, 2017:2). Antwi and Hamza (2015:218) note that the interpretivist paradigm is underpinned by observation and interpretation, while phenomena are

studied by focusing on the meanings that people assign to them. Meaning oriented methodologies, such as interviews and participant observations, that rely on a subjective relationship between the researcher and the participant, are usually adopted when an interpretivist paradigm is used (Antwi & Hamza, 2015:219). Saunders *et al.* (2019:142) assert that through a radical structuralist paradigm, a researcher attempts to study structural patterns within an organisation, such as hierarchies, and reports on how these hierarchies might cause structural domination and oppression. The radical structuralist paradigm is similar to the functionalist paradigm in the sense that both are based on objective reality; however, the structuralist paradigm assumes a radical change perspective and therefore focuses on the systematic relationships within a realist social reality (Callaghan, 2016:84). Conversely, the radical humanist paradigm takes a subjective approach to develop a sociology of radical change (Starnawska, 2017:249). While also concerned with the issues of power, politics, domination, and oppression, such as the radical structuralist paradigm, a subjective ontology is adopted in a radical humanist paradigm, emphasising the importance of social constructs, language, and processes (Callaghan, 2016: 91; Saunders *et al.*, 2019:142).

Given the ontological, epistemological, and axiological assumptions of the researcher, an interpretivist philosophical stance was adopted. The study is positioned in the interpretive paradigm. An interpretivist philosophical stance was deemed appropriate for this study as the researcher wished to gain in-depth knowledge and understanding of university-based student entrepreneurship support through the subjective viewpoints of entrepreneurship stakeholders (Antwi & Hamza, 2015:218). Moreover, the researcher believed that this support being offered by the respective universities would be perceived and experienced differently by the various entrepreneurship stakeholders (Saunders *et al.*, 2019:149). Furthermore, an interpretive paradigm was deemed appropriate as the researcher assumed that subjective knowledge constitutes acceptable knowledge and that the experiences of individuals are investigated in a subjective manner (Callaghan, 2016:88; Rahi, 2017:2). Semi-structured interviews, for example, were conducted in this study to gain valuable subjective insights into the nature of student entrepreneurship support provided by South African universities and how effective staff and students perceive it to be. As suggested by Antwi and Hamza (2015:218), interviews are a recommended data collection method for an interpretive paradigm. The data gathered was also subjectively analysed to explore student entrepreneurship support in-depth and in its natural context and to identify best practices in terms of this support.

In the section to follow, the next layer of the research onion, namely approach to theory development, is explored and applied to the current study.

4.3 APPROACH TO THEORY DEVELOPMENT

According to Palic *et al.* (2015:16), the approach to theory development adopted by a researcher depends on the availability of existing theory before the study is conducted. Three approaches to theory development can be followed, namely deductive, inductive and abductive (Palic *et al.*, 2015:16; Saunders *et al.*, 2019:152). Saunders and Lewis (2012:108) describe a deductive approach as one that involves the testing of theoretical propositions and the relationships between dependent and independent variables. In a study where deductive reasoning is adopted, the relationships between predetermined variables or subjects are explored through the testing of hypotheses (Bengtsson, 2016:10). Saunders and Lewis (2012:109) assert that through an inductive approach, theories are developed by analysing the data which has been collected. Merriam and Tisdell (2016:19) further extend that in order to develop the theories, pieces of information from interviews, documents or observations are collected and grouped according to various larger themes to move from the particular to the general. Bhattacharjee (2012:94) warns, however, that inductive conclusions are only hypotheses that may be disproven and that although deductive conclusions are stronger, they may also be incorrect if based on an incorrect premise. An abductive approach is a combination of the inductive and deductive approaches, where a researcher moves back and forth between theory and data (Saunders *et al.*, 2016:148). Saunders *et al.* (2019:153) further explain that an abductive approach is adopted when data is collected to explore a phenomenon, identify themes, and explain patterns in order to generate a new or modify an existing theory, which is subsequently tested through data collection. After having described and understood the world from the participants' view by adopting an abductive approach to theory development in qualitative research, Bryman (2012:401) asserts that it is vital that a researcher comes to a socially scientific account of the social world as seen from participants' perspectives.

The current study followed an abductive approach to theory development. This approach was followed to gain a rich understanding of the university-based student entrepreneurship support provided by South African universities. Creswell (2013:45) asserts that in qualitative research, an abductive approach is applicable when researchers inductively build patterns and themes by

organising the data in more abstract units of information and then deductively compare these patterns and themes to previous data. An interactive collaboration among the researchers and participants typically exists in order to shape the themes that emerge from this process (Creswell, 2013:45). Eisenhardt (1989:539) claims that the benefits of this approach are that the researcher has a head start with data analysis and can make adjustments during the data collection period as there is an overlap of data collection and data analysis. An abductive approach was considered appropriate because new concepts may have come to light during the interviews, which could then be added to the interview protocols for subsequent interviews. For the current study, a hypothesis was not required to commence the research, and a theoretical framework, namely organisational design theory, was used to guide the researcher through the study. The abductive approach was also used to allow the research design to evolve because the different stakeholders interviewed had different perspectives and value systems, thus, making it difficult to predict the outcome of interactions. Once the empirical research was completed, theoretical explanations for the findings were provided by comparing them to the extant literature.

4.4 METHODOLOGICAL CHOICES

The process that researchers follow to conduct their studies, to gather and interpret their data, and present their findings is referred to as their research methodology (Ismail, 2017:145). This process can be done through either adopting a mono-method, mixed-methods, or multi-methods (Saunders *et al.*, 2016:166) approach. A mono-method methodology is adopted when a researcher implements either a qualitative or a quantitative method. Making use of mixed methods involves the use of both qualitative and quantitative methods to gather and analyse data (Melnikovas, 2018:39). Saunders *et al.* (2016:166) assert that multi-methods involve the use of more than one quantitative or qualitative method in a study.

Quantitative research methods are usually used by researchers who wish to gather data using an objective approach through structured questionnaires (Rahi, 2017:2). Saunders *et al.* (2016:165) note that the term “quantitative” refers to any data collection technique or data analysis procedure that generates or uses numerical data. Through the use of quantitative methods, most researchers focus on investigating cause-and-effect relationships between dependent and independent variables, which are then used to make predictions and generalisations (Antwi & Hamza, 2015:221).

When a researcher requires in-depth data, qualitative methods are usually adopted (Rahi, 2017:2). According to Saunders *et al.* (2016:165), the word “qualitative” is associated with any non-numerical data collection technique or data analysis procedure. Qualitative research is often conducted by adopting an abductive approach, where inductive inferences are developed and deductive ones are tested iteratively throughout the study (Saunders *et al.*, 2016:168). Table 4.1 below presents the research philosophies, approaches to theory development, and research strategies commonly associated with quantitative and qualitative research methods.

Table 4.1: Characteristics of quantitative and qualitative research methods

	Research Philosophy	Approach to Theory Development	Common Research Strategies
Quantitative research methods	<p>Mostly associated with a positivist philosophical stance, especially when used with predetermined highly structured data collection techniques.</p> <p>However, it can also fall in the categories of realist and pragmatist when adopting a mixed-method approach.</p>	<p>Typically associated with a deductive approach to theory development. However, it may also incorporate an inductive approach.</p>	<ul style="list-style-type: none"> • Questionnaires • Structured interviews • Structured observations
Qualitative research methods	<p>Mostly associated with an interpretivist philosophical stance as the focus is on subjectivity.</p> <p>However, it can also fall in the categories of realist and pragmatist when adopting a mixed-method approach.</p>	<p>While both inductive and deductive approaches to theory development can be adopted with qualitative research, the most common is an abductive approach.</p>	<ul style="list-style-type: none"> • Action research • Case study research • Ethnography • Grounded theory • Narrative research.

Source: Saunders *et al.* (2016:166)

The methodological choices made by a researcher is largely influenced by the purpose of the research project, which can be exploratory, descriptive, or explanatory (Bhattacharjee, 2012:5; Saunders *et al.*, 2016:174; Ragab & Arisha, 2018:6). In an exploratory study, open questions are generally posed in order to investigate what is happening and to gain knowledge about the topic of interest (Saunders *et al.*, 2016:174; Ragab & Arisha, 2018:6). Saunders and Lewis (2012:110) further elaborate that a researcher chooses to conduct an exploratory study if the aim is to discover general information about a topic that is not understood clearly. Moreover, Bhattacharjee (2012:5) pose that there are three scenarios for when an exploratory study is

conducted, which is when the study aims (i) to scope out the magnitude of the specific phenomenon being investigated; (ii) to generate initial ideas regarding the phenomenon; and (iii) to test the feasibility of conducting further investigation into the specific phenomenon. According to Saunders *et al.* (2016:174), both the research questions of a study, as well as the questions posed in the data collection process, would usually start with the terms ‘How’ and ‘What’ when conducting an exploratory study. An exploratory study can include various methods, such as literature reviews, interviewing industry experts, conducting in-depth individual interviews, or focus group interviews (Saunders *et al.*, 2016:175). As the purpose of an exploratory study is to clarify the understanding of a situation, these interviews would usually either be semi-structured or unstructured and rely on in-depth, quality contributions from the participants (Saunders *et al.*, 2016:176).

Through a descriptive study, the researchers aim to gain an accurate profile of a phenomenon, individuals or events (Ragab & Arisha, 2018:6). The research questions in a descriptive study typically start with ‘Who’, ‘What’, ‘Where’, ‘When’, and ‘How’ (Saunders *et al.*, 2016:175). Saunders *et al.* (2016:175) further assert that it is vital that the researchers have a clear picture of the phenomenon being studied before initiating the data collection process in a descriptive study. Saunders and Lewis (2012:111) suggest that a descriptive study usually involves measurable, quantifiable data, leading to questionnaire surveys, interviews and the reanalysis of secondary data being the most commonly used research methods in a descriptive study.

Explanatory research takes descriptive research a stage further, with the purpose being to investigate why an event or phenomenon is occurring and establish relationships between key variables (Saunders & Lewis, 2012:113; Ragab & Arisha, 2018:6). The research questions posed in an explanatory study most likely start with the terms ‘How’ or ‘Why’ (Bhattacharjee, 2012:6; Saunders *et al.*, 2016:176). Depending on the focus of the study, Saunders and Lewis (2012:113) assert that both quantitative and qualitative research methods can be adopted in an explanatory study. When quantitative values can be attached to the key variables being investigated and can be subjected to statistical tests, a quantitative research method would be appropriate (Saunders & Lewis, 2012:113). However, when a study focuses on why an event or phenomenon is occurring, and the data is based on differing attitudes or beliefs, it may be difficult to quantify, and qualitative research might be more appropriate (Saunders & Lewis, 2012:113). Yin (2018:44) adds that the preferred research methods with explanatory studies typically include case studies, history, or experiments.

The purpose of the current study was exploratory in nature. The primary objective was to assess the state of university-based student entrepreneurship support at South African public universities. Moreover, the research question posed in this study was “How are South African public universities supporting student entrepreneurship?” which corresponds with the suggestion made by Saunders *et al.* (2016:174) that research questions in an exploratory study usually start with the terms “How” or “What”. Given the purpose of the current study, the choice of a multi-method qualitative methodology has been made. According to Sekaran and Bougie (2016:43), a qualitative methodology is appropriate when conducting an exploratory study. Furthermore, the methodology is described as multi-methods because the data concerning student entrepreneurship support provided at South African universities were collected using two qualitative methods: desk research and semi-structured interviews. A multi-method qualitative methodology is also appropriate for the current study as an abductive approach to theory development has been adopted (Creswell, 2013:45).

4.5 RESEARCH STRATEGY

According to Saunders *et al.* (2016:177), the term “strategy” refers to a plan of action to achieve a goal, and a “research strategy” refers to a plan of action adopted to answer the questions posed for a research study. Similarly, Rahi (2017:2) describes a research strategy as a general plan followed by a researcher to achieve the goals of a study, namely, to answer the research questions. The purpose of a research strategy is to guide a researcher in choosing the appropriate set of data collection methods necessary to answer the research question posed and to meet the research objectives (Saunders *et al.*, 2016:177; Melnikovas, 2018:39). According to Yin (2014:9), there are three conditions to consider when deciding on which research strategy to make use of in a study, namely (i) the type of research question that needs to be answered by the researcher; (ii) the extent of control the researcher requires over the phenomenon being investigated; and (iii) whether the researcher mainly focuses on contemporary events or historical events. Saunders *et al.* (2016:169) explain that the research strategies commonly used with qualitative research include action research, narrative research, grounded theory, and case study research.

Adams, Khan and Raeside (2014:7) assert that the objective of action research is to address a problem in a practice-based setting. Merriam and Tisdell (2016:4) explain that with action research, participants are involved in the research process, and different strategies and

interventions are conducted within a situation. The impact of these different strategies are then documented to find the most effective solutions to practice-based problems (Merriam & Tisdell, 2016:4). Although action research can provide rich and worthwhile experiences for those involved, it is a demanding strategy in terms of the time and resources required (Saunders *et al.*, 2016:192). According to Merriam and Tisdell (2016:24), when a grounded theory strategy is adopted, a researcher does not only attempt to understand a specific phenomenon but also builds substantive theory regarding the phenomenon of interest. Researchers attempt to predict and explain the behaviour of individuals or events by developing an abstract theory through a process consisting of multiple stages of data collection and analysis (Creswell & Creswell, 2018:50). Saunders *et al.* (2016:197) urge researchers to consider the amount of time they have to conduct a study, their access to data, as well as their level of competence when choosing to adopt a grounded theory strategy as it can be time-consuming, intensive and reflective.

Yin (2016:140) explains that in narrative research, the main focus is on understanding the participants' reality through analysing spoken words or phrases, as well as the nonverbal portions of the conversation, such as the individuals' tone of voice, pauses and behaviour. A narrative research strategy is adopted when a researcher believes that the experiences of a participant can be better gathered and analysed through them telling a complete story, rather than following specific interview questions which are fragmented (Saunders *et al.*, 2016:197). Chronological connections and the sequencing of events, as told by the narrator, are preserved to connect the events, actions and consequences over time in order to enrich understanding (Saunders *et al.*, 2016:198). Creswell and Creswell (2018:272) assert that a narrative research strategy is similar to telling a story, where structural devices, such as a plot, setting, activities, climax and outcome, are employed.

A case study research strategy is adopted by researchers who wish to explore an event or phenomenon in-depth and in its natural context to gain an understanding of a complex issue (Crowe, Creswell, Robertson, Huby, Avery & Sheikh, 2011:1; Ridder, 2017:282). Ragab and Arisha (2018:16) describe a case study research strategy as an empirical inquiry through which contemporary phenomena are investigated within a real-life context. Moreover, Yin (2014:17) adds that a case study research strategy relies on multiple sources of evidence and benefits from previously developed theoretical propositions.

The case study research strategy has been chosen for the current study as it allows the researcher to gain valuable in-depth information regarding the cases concerned (Gog, 2015:38), and insights into the issue being investigated (Nelson & Martin, 2013:13), namely student entrepreneurship support provided by the participating South African universities. Furthermore, this strategy was chosen over the other strategies as it gives the researcher insights into how the present depends on the past (Odoh & Chinedum, 2014:20), namely an understanding of how the past has possibly influenced the student entrepreneurship support currently being provided by the participating South African universities. The case study strategy is described in more detail in the paragraphs that follow.

According to Yin (2018:41), there are three categories of case studies, namely descriptive case studies, exploratory case studies and explanatory case studies. Yin (2018:380) asserts that a descriptive case study is when a complete description of a single event or phenomenon is presented within its context. When a descriptive case study is adopted, the primary research objective of the study is to better understand the case itself as the case is regarded as exceptional or atypical (Nelson & Martin, 2013:13). Nelson and Martin (2013:13) explain that with an exploratory case study, the case itself is secondary, with the primary focus being on gaining insights into a particular issue or to refine a theory. The case itself is not of much interest but is investigated for the light it sheds on a wider issue (Nelson & Martin, 2013:13). When adopting an explanatory case study strategy, the primary research objective is to identify causes and explain outcomes (Nelson & Martin, 2013:13; Tumele, 2015:72). Yin (2018:381) adds that in an explanatory case study, the researcher wishes to explain why and how certain conditions came to be.

An exploratory case study was considered most appropriate for this study as the researcher wished to gain insights into a particular issue within the cases selected (Nelson & Martin, 2013:13). The primary focus was on the state of university-based student entrepreneurship support being offered at the participating universities (cases), and not the universities themselves. Moreover, the focus was on the university-based student entrepreneurship support ecosystem, which consists of several internal and external elements or entities that offer student entrepreneurship support in a university context.

When adopting a case study strategy, a researcher can either focus on a single case or on multiple cases, allowing for comparisons to be made between the cases selected (Saunders & Lewis, 2012:117; Quinlan *et al.*, 2015:146; Ridder, 2017:283). According to Harrison, Birks,

Franklin and Mills (2017:13), a case is the entity of interest within a case study. Yin (2018:68) extends that the type of case(s) selected in a case study depends on research questions or propositions and could either include a single individual or entity or groups of individuals or entities. When a single case strategy is adopted for a study, only one case is selected to investigate in order to answer the research questions posed (Saunders *et al.*, 2016:186; Yin, 2018:97). A single case study strategy is often used when the case is extreme or unique (Saunders *et al.*, 2016:186). Moreover, a single case strategy is appropriate when a longitudinal study is being conducted, where the case selected is investigated at two or more different points in time (Yin, 2018:98).

Although Ridder (2017:283) claims that the essence of a case study lies in the in-depth nature of a singular case, the multiple-case study strategy is regarded as being more robust and compelling (Yin, 2014:57). Crowe *et al.* (2011:2) and Merriam and Tisdell (2016:40) describe a multiple case study strategy as a collective case study, where multiple cases are investigated, either simultaneously or sequentially, to gain a broader understanding of a particular issue. Although a multiple case study strategy requires more resources and time than a single case study strategy, it is preferred as it can support stronger findings and the overall study is considered more robust (Nelson & Martin, 2013:38; Yin, 2014:57). Adams *et al.* (2014:98) explain that a multiple case study research strategy is usually adopted when a researcher wishes to follow a comparative approach to identify best practices. Ridder (2017:282) adds that by adopting a multiple case study strategy, the researcher wishes to identify similarities and differences between the case selected, which can have a vital impact on the findings of the study. Multiple cases also allow for replication between cases and are seen as a means of corroboration of propositions (Ridder, 2017:282).

A multiple case study strategy was adopted in the current study. This strategy was appropriate because the researcher wished to gain a broader understanding of the university-based entrepreneurship support offered at the participating universities (Crowe *et al.*, 2011:2; Merriam & Tisdell, 2016:40). Moreover, the researcher wished to identify similarities and differences among the participating universities in terms of the support offered (Ridder, 2017:282), which would allow for best practices to be identified (Adams *et al.*, 2014:98). A multiple case study strategy was also deemed appropriate as multiple cases support stronger findings, and the overall study is considered more robust (Nelson & Martin, 2013:38; Yin, 2014:57).

According to Yin (2018:96), single and multiple cases can further be categorised as holistic or embedded. An embedded case study exists when there are multiple subunits being investigated within the cases selected in a study (Saunders *et al.*, 2016:187; Yin, 2018:99). It is important to note that the embedded subunits must be within or part of the case being studied, otherwise it would not be considered as a subunit (Yin, 2018:99). An embedded case study design is commended for assisting the researcher in maintaining a case study's focus and allowing for significant opportunities for extensive analysis and enhancing insights into the case (Yin, 2018:100). Yin (2018:100) emphasises the importance of the researcher returning to the larger unit of analysis, and that the focus should not only be on the subunits. In contrast, a holistic case study is when the global nature of an organisation or case is investigated, and no other subunits within a case is specifically focused on (Saunders *et al.*, 2016:187). Yin (2018:100) asserts that a holistic design would be appropriate when no logical subunits can be identified or when the theory underpinning a study is of a holistic nature. Researchers are, however, warned that a disadvantage of a holistic case study design is that it might be too abstract, lacking sufficient clear measures (Gog, 2015:39; Yin, 2018:100).

For the current study, an embedded case study design was adopted as various subunits within each of the cases were investigated (Saunders *et al.*, 2016:187; Yin, 2018:99), namely (i) the university environment and culture; (ii) co-curricular entrepreneurship support activities; (iii) elements in the internal entrepreneurship environment; and (iv) collaborations and external entrepreneurship environment.

4.6 TIME HORIZON

According to Saunders and Lewis (2012:123), an important factor to consider when conducting a study is whether the study should be a 'snapshot' undertaken at a particular time, known as a cross-sectional study, or a series of 'snapshots' undertaken over a given period, known as a longitudinal study. Cross-sectional studies usually require less time and money to conduct than longitudinal studies and are beneficial when researchers experience constraints regarding access to resources and time (Ismail, 2017:148). Saunders *et al.* (2016:200) assert that many case studies are based on interviews that are conducted over a short period.

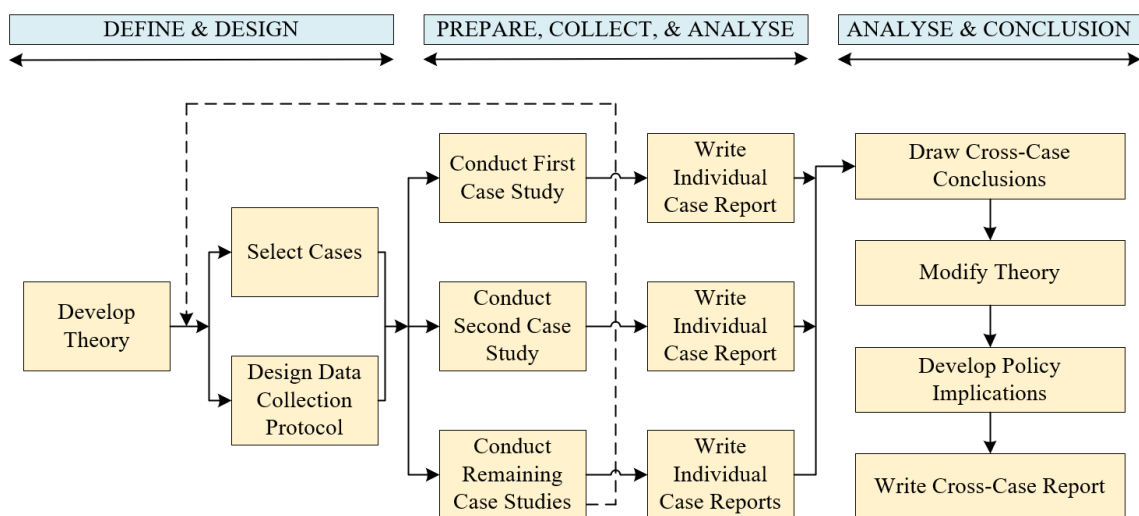
Due to time and budget constraints, data was gathered over a short period by conducting interviews with applicable stakeholders at various universities at one particular point in time. Thus, a cross-sectional study was adopted focusing on events that were currently happening while the research was being conducted.

4.7 TECHNIQUES AND PROCEDURES

The final layer of the research “onion” framework deals with the techniques and procedures followed by the researcher to gather data from secondary (literature review) and primary sources (empirical investigation), as well as to how the data is analysed (Saunders *et al.*, 2019:130). Secondary data is described by Palic *et al.* (2015:83) as data that has been collected and reported on by previous researchers on topics that are semi-related to the one being investigated. Secondary data can save a researcher time and money and is very useful for a comparative analysis (Saunders *et al.*, 2016:330). According to Collis and Hussey (2014:196), primary data is gathered from an original source. Walliman (2011:69) adds that primary data refers to that which is observed, experienced, or recorded by a researcher while an event is occurring.

In order to collect and analyse the secondary and primary data in the current study, the multiple case study procedure (see Figure 4.2) of Yin (2014:60) was followed. These techniques and procedures followed are elaborated on in the sections that below.

Figure 4.2: The multiple case study procedure



Source: Yin (2014:60)

4.7.1 DEFINE AND DESIGN

According to Yin (2014:28), the first major step in a multiple case study strategy deals with defining various components within a research design. These various components include (i) the case study's questions; (ii) its propositions, if any; (iii) its unit(s) of analysis; (iv) the logic of linking the data to the propositions; and (v) the criteria for interpreting the findings.

Saunders *et al.* (2016:42) explain that it is vital for a researcher to clearly define the research question of a study, as it presents the phenomenon that will be studied. The research questions of a study will influence the literature that will be reviewed, the research design, approach to sampling, data collection methods adopted, and analysis techniques utilised as well as the reporting format (Saunders *et al.*, 2016:42).

As previously explained, the purpose of this study was exploratory in nature. The research question of this study was, "How are South African public universities supporting student entrepreneurship?" which corresponds with the suggestion made by Saunders *et al.* (2016:174) and Yin (2014:29) that research questions in exploratory studies and in a case study strategy usually start with the terms "How" or "What".

Yin (2014:30) asserts that study propositions help guide a researcher as to what needs to be examined within the scope of a study. A proposition adopted in the current study is that organisations are designed in a manner that influences their performance (Organisational Design Theory). Considering this proposition, the organisational design elements of Good *et al.* (2018) were adopted, namely purpose, activity, structure, and people (see Chapter 2, Section 2.3.5). These elements were selected to investigate how each of the eight universities selected as cases in this study are organised to support student entrepreneurship.

Long (2011:2) explains that a unit of analysis is the entity (who or what) a researcher is studying. Palic *et al.* (2015:28) note that a unit of analysis can be an individual person, group, organisation, or part of an organisation. For this study, the unit of analysis was the university-based student entrepreneurship support ecosystem, which is part of the universities selected as cases. Based on the conceptual framework proposed for this study, the unit of analysis was bounded by the various entities that offer student entrepreneurship support at the universities, both internally and externally.

Yin (2014:35) notes that it is important for a researcher to know how the data collected will be linked to the propositions adopted in the study. The data relating to the student entrepreneurship support being provided at the participating universities were collected according to Good *et al.*'s (2018) design elements. As such, data relating to the purpose, activities, structure and people for each student entrepreneurship support investigated in this study was gathered and explored.

According to Yin (2014:36), it is important for a researcher to identify and address rival explanations for the findings of a study, as the more rival explanations are addressed and rejected, the stronger the findings of the study will be. The rival explanations adopted in the current study include the following:

- The four most active universities in terms of student entrepreneurship support selected as cases in this study could be providing the most support activities because they have access to more resources and have been offering support for a longer period of time.
- The least active universities in terms of student entrepreneurship support selected as cases in this study could be less active due to a lack of interest in entrepreneurship from students, historical challenges faced and a lack of resources.
- Although the least active universities in terms of student entrepreneurship support are providing the least number of support activities, their activities could be representative of best practices.

These rival explanations are noted and will be considered when writing the case study reports.

According to Yin (2014:60), the step, define and design, includes three sub-steps, namely, developing theory, selecting cases, and designing the case study protocol. These steps are further elaborated on and applied to this study in the sections to follow.

4.7.1.1 Develop theory

According to Yin (2014:60), the starting point of a case study is theory development. The aim of theory development at the start is to create a sufficient blueprint for a study in order to guide a researcher in the research design process and determine the appropriate data collection and analysis procedure (Yin, 2014:39). Ridder (2017:293) identifies three basic elements to theory, including the components (concepts and constructs) used to identify the elements to be investigated, the relationships between these components, and the boundaries limiting the generalisability of the theory. When a researcher attempts to develop theory, a research strategy is adopted to identify new elements and relationships within a tentative theory, and explore how the mechanisms operate, which explain the phenomenon more precisely (Ridder, 2017:299). A good theoretical framework assists a researcher in identifying and defining important variables or constructs to focus on in a specific situation relevant to the problem at hand (Merriam & Tisdell, 2016: 86; Sekaran & Bougie, 2016:82). Crowe *et al.* (2011:7) add that a theoretical framework also assists in integrating different sources of data and examining emerging themes. Yin (2014:39) recommends doing an in-depth literature review on topics related to a study so as to gain as much knowledge as possible regarding existing theories before choosing an appropriate theoretical framework.

In the current study, a literature review was undertaken to gather as much knowledge about the components being investigated (concepts and constructs) as possible, namely student entrepreneurship, student entrepreneurship support and U-BEEs, and their relationships. Online journals, articles, various websites, and books were used to gather secondary data to conduct the literature review. As Yin (2014:39) suggested, after conducting the literature review, an underpinning theory for this study was chosen, namely organisational design theory. This underpinning theory was chosen to guide the researcher in investigating how university-based student entrepreneurship support at South African universities is designed (structured). More specifically, the organisational design elements of Good *et al.* (2018) were chosen, namely purpose, activities, structure and people (see Chapter 2, Section 2.3.5 for more information regarding these organisational design elements).

The literature review conducted was presented in Chapter Two and Chapter Three. In Chapter Two, an overview of entrepreneurship and student entrepreneurship was presented. Moreover, previous research on student entrepreneurship was discussed, and various U-BEEs and their

building blocks were elaborated on. The chapter concluded by describing organisational theory, which, together with systems theory, provides the theory underpinning the current study. Considering the various U-BEEs presented in Chapter Two (Section 2.3.2), a framework was conceptualised to guide the researcher in selecting the appropriate focus areas to investigate at each of the participating universities. This conceptual framework was elaborated on in Chapter Three (Section 3.2).

4.7.1.2 Select cases

Crowe *et al.* (2011:5) assert that it is vital to make the correct selection of cases to investigate in case study research. The case selection process aims to ensure that the researcher identifies the chosen cases accurately before starting with the formal data collection process so as to ensure that the data collected is viable for the study being conducted (Yin, 2014:95). Crowe *et al.* (2011:5) emphasise that cases are not selected to be a representation of a population but are chosen for their unique characteristics, which are of interest to the researcher. In order to select the cases for a case study, the appropriate sampling technique should be used.

Rahi (2017:3) indicates that there are two approaches to sampling, namely probability and non-probability sampling. Adams *et al.* (2014:73) explain that in probability sampling, all the elements within the population have an equal chance of being selected. In contrast, non-probability sampling is an approach through which elements are selected based on personal judgement and which meet specific criteria (Adams *et al.*, 2014:73). The sampling techniques in probability sampling include simple random sampling, systematic random sampling, stratified random sampling, cluster sampling, and multi-stage sampling (Saunders & Lewis, 2012:134; Rahi, 2017:3). Convenience sampling, snowball sampling, quota sampling, purposive (judgement) sampling and theoretical sampling are various sampling techniques in non-probability sampling (Saunders & Lewis, 2012:137; Rahi, 2017:3). Since case studies mostly focus on developing theory rather than testing hypotheses and making generalisations, non-probability purposive sampling techniques are appropriate (Eisenhardt & Graebner, 2007:27). Non-probability purposive sampling is described by Sekaran and Bougie (2016:248) as a sampling technique whereby elements are purposefully selected from the population as they meet specific criteria to participate in the study and thus can provide the desired information required.

Eisenhardt (1989:573) suggests that cases that are likely to replicate or extend emergent theory should purposefully be selected through theoretical sampling. Following Eisenhardt's (1989:573) suggestion, a theoretical non-probability sampling technique was used to select eight South African public universities to participate in the current study. A theoretical sampling technique in case studies is described by Gentles, Charles, Ploeg and McKibbin (2015:1779) as a process in which the selection of cases is guided by the evolving theory and is only done after some data has already been collected. This definition coincides with Yin (2018:97) who asserts that the cases selected within a case study should be related to the theory or theoretical propositions adopted in a study.

The number of cases sampled (eight universities) in the current study was based on the following considerations. Stake (2006:22) asserts that the benefits of a multiple-case study strategy will be limited if fewer than four cases or more than ten cases are investigated. Less than four cases will provide too little interactivity between cases, whilst more than ten cases will lead to an overwhelming amount of uniqueness which a research team might not be able to handle, and the reader might not understand (Stake, 2006:22). To qualify as one of the eight cases in the current study, the universities had to be one of the 26 public universities in South Africa. The eight cases selected were also chosen based on their unique characteristics which were of interest to the researcher (Crowe *et al.*, 2011:5). These eight cases consisted of the four public universities in South Africa that appear to be 'most active' in terms of providing student entrepreneurship support and the four public universities in South Africa that appear to be the 'least active' in terms of providing student entrepreneurship support. The terms 'most active' and 'least active' in this context refer to the number of student entrepreneurship support activities being provided by these universities.

In order to identify the eight cases to participate in the current study, desk research was undertaken to investigate what each of the 26 South African public universities offers in terms of student entrepreneurship support activities. The 26 public universities in South Africa are presented in no particular order in Table 4.2.

Table 4.2: List of the 26 public universities in South Africa

Cape Peninsula University of Technology	Central University of Technology Free State	Mangosuthu University of Technology
Durban University of Technology	Nelson Mandela University	North-West University
Tshwane University of Technology	Sefako Makgatho Health Sciences University	Sol Plaatje University
Rhodes University	University of Cape Town	University of Fort Hare
University of Johannesburg	University of KwaZulu-Natal	University of Limpopo
University of Mpumalanga	University of Pretoria	University of South Africa
University of Stellenbosch	University of the Free State	University of the Western Cape
University of the Witwatersrand	University of Venda	University of Zululand
Vaal University of Technology	Walter Sisulu University for Technology	

Source: Universities South Africa (2020)

The researcher firstly commenced by searching various terms associated with entrepreneurship on the respective university websites, as well as conducting a google search on the university name and adding those terms afterwards. The search terms used to investigate the student entrepreneurship support being provided by the 26 public universities in South Africa were guided by the title, objectives and conceptual framework of the study, as well as literature. If any new student entrepreneurship support activities emerged during the desk research, they were included in the search terms utilised. This process was done for each of the 26 public universities in South Africa (see Chapter 5, Table 5.1)

The search results were then analysed using INVIVO coding and tabulated in an Excel spreadsheet according to the various student entrepreneurship support activities. After the search results were analysed and grouped according to their specific support activities, everything was brought together and tabulated on one spreadsheet to assist the researcher in comparing the 26 public universities against one another (see Chapter 5, Table 5.2).

Based on the desk research results, the total number of student entrepreneurship support activities for each university was calculated by adding up the amount of support that the specific university was providing. Thereafter, the 26 public universities in South Africa were ranked and compared against one another in terms of the total number of student entrepreneurship support activities provided. Based on the ranking process undertaken, the four

most active in terms of student entrepreneurship support and the four universities least active were identified (See Chapter 5, Section 5.2). It is these eight universities that serve as the cases selected for this study. The cases, in general, are described in more detail in Chapter Five.

According to Yin (2014:53), each case can consist of various units of analysis, which refers to the subunits of a case being investigated. As previously indicated, for this study, the unit of analysis was the university-based student entrepreneurship support ecosystem, which is part of the selected cases. Based on the conceptual framework adopted in this study, the unit of analysis was bounded by the various entities that offer student entrepreneurship support at the universities, both internally and externally. Moreover, the units of observation for this study were the specific participants purposefully selected to be interviewed at the eight universities. These participants were selected as they are entrepreneurship stakeholders at the universities selected as cases and include individuals from the following categories:

- A member of top management (Deputy-Vice Chancellor or Dean) who is knowledgeable about, involved in or tasked with student entrepreneurship issues;
- A staff member who has been tasked to promote student entrepreneurship;
- A staff member at the incubator who deals with student entrepreneurs;
- A staff member at the TTO;
- An academic involved in entrepreneurship education; and
- Student entrepreneurs (identified and recommended by student entrepreneurship promotor).

4.7.1.3 Design the case study protocol

Palic *et al.* (2015:73) assert that a case study protocol is more than just the questionnaire or instrument to be used in the study, but also indicates the rules and procedures to be followed in using the protocol. Connelly (2016:435) contends that rules and procedures are essential in a study as it ensures readers that the study is worthy of consideration. Moreover, Gaya and Smith (2016:534) add that the use of a protocol increases the integrity, credibility and reliability of case study research. Yin (2014:85) presents four major sections to include in a case study protocol, namely an overview of the case study, the data collection procedures, the data collection questions and a guide for the case study report.

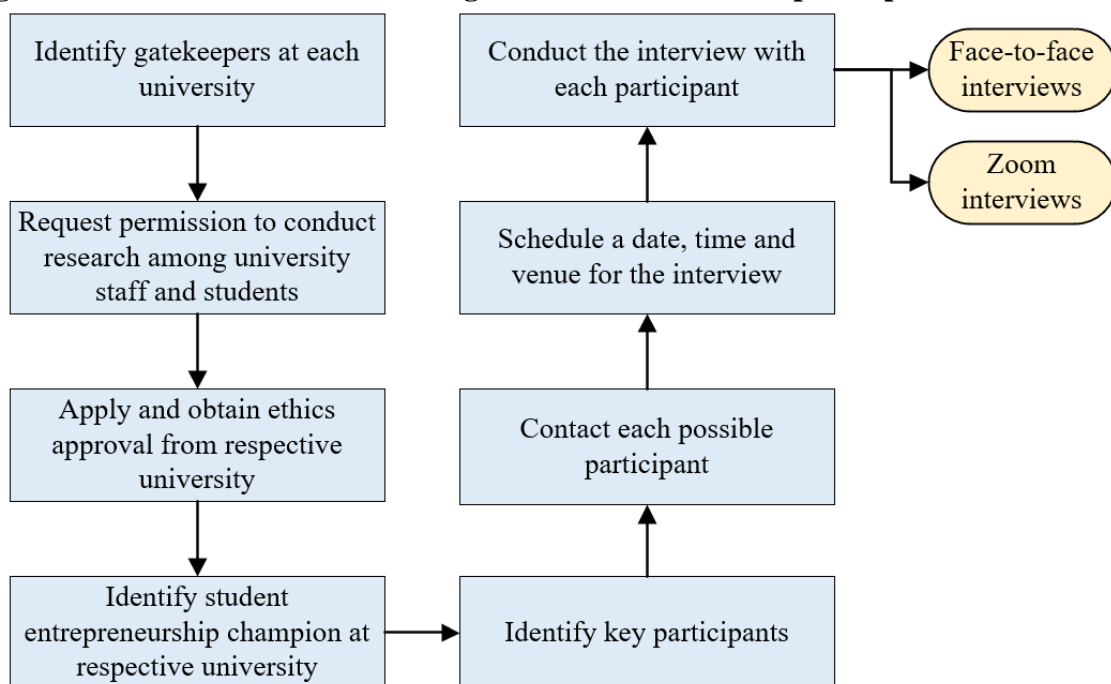
In the overview of the case study section of the protocol, it is essential to provide a brief background to the study, highlight what the aim and goals of the study are and identify who the audience is (Yin, 2014:86). According to Yin (2014:301), the audience refers to the individuals who assess or read the case study report after the research has been conducted, for example, a thesis committee, academic colleagues, policy makers, community leaders and funders or sponsors. As recommended by Yin (2014:87), the researcher in the current study compiled an introductory letter which provided a brief background to the study, highlighted the aims and goals of the study, and identified which specific individuals were being approached and why. This letter was compiled to ensure that every participant contacted knew what the study was about and how they were contributing to its success.

The second section of the interview protocol focused on the data collection procedures followed by the researcher to gain access to the various cases under investigation, the resources required, and how the scheduling of interviews was made (Gaya & Smith, 2016:535; Yin, 2014:89). The procedure followed in the current study to gain access to the cases (eight universities) and the participants (units of observation) is illustrated in Figure 4.3. The researcher first had to identify the gatekeepers at each of the eight universities from whom permission was requested via email (see Annexure B) to conduct research among the respective university's staff and students. Attached to this email was a letter of introduction to the gatekeepers, explaining what the study was about, the importance thereof, why they were chosen as cases, and the benefits and risks involved (see Annexure C). Thereafter, the researcher had to apply for and obtain ethical clearance from each of the participating universities. The process of obtaining ethics approval took six months, starting in June 2020 and ending in November 2020. After research ethics approval was obtained, the researcher then identified a student entrepreneurship champion (staff member who has been tasked to promote student entrepreneurship) at each university, who then assisted the researcher in identifying other potential participants to be interviewed (See Annexure D for an example of the email requesting assistance in identifying other potential participants). Each potential participant was then sent an email (see Annexure E) with the ethics approval received from the Nelson Mandela University (see Annexure A) and their university attached, as well as an introductory letter (see Annexure F) providing background to the study and requesting their participation.

Yin (2014:89) asserts that it is vital that the researcher has access to all the required resources before scheduling any interviews with the identified participants. In this study, the resources required depended on the approach adopted to collect the data from the participants. When the participants were interviewed using the electronic application called Zoom, the researcher had to ensure that the participants had access to a computer with a webcam and a fast internet connection. When the interviews were conducted face-to-face, a recording device to record the interviews for accurate transcription purposes, was needed.

When a potential participant indicated that they were interested and willing to participate, they were again contacted via email to schedule an interview, namely, to establish a date, time and venue (depending on face-to-face or Zoom interviews) that would suit them. Attached to this email was the consent form (see Annexure G), which had to be signed and sent back before the date and time of the interview. Prior to undertaking the interviews, the researcher also confirmed that the required resources would be accessible to participants at the time needed. The interviews were either conducted face-to-face or by using Zoom and depended on the state of the Covid-19 and lockdown situation in South Africa at that time. The interviews commenced on the 18th of October 2020, and all interviews were completed by the 14th of April 2021. The process took six months. More details regarding the interviewees (participants) and the interviews undertaken are given in Chapter Five (see Section 5.4)

Figure 4.3: Procedure followed to gain access to cases and participants



Source: Authors own construction

The third section of the case study protocol (data collection questions) focussed on the questions posed to interviewees and guided the researcher through the interview process (Gaya & Smith, 2016:535). In the current study, semi-structured interviews were conducted to collect data from the participants identified (entrepreneurship stakeholders). Therefore, an interview protocol was designed. Jacob and Furgerson (2012:1) describe an interview protocol as a list of interview questions that guide the interviewer in terms of what needs to be said before, during and after the interview has been conducted. Although an interview protocol is desirable under all circumstances, it is not always required (Yin, 2014:84). An interview protocol is important, however, when adopting a multiple-case study strategy (Yin, 2014:84) because the same questions are asked of participants from the different cases in order to enable comparisons between case findings to be made (Adams *et al.*, 2014:98). For the purpose of this study, six interview protocols were developed.

Five interview protocols were developed to gather data from university staff members identified as entrepreneurship stakeholders at their respective universities, namely a protocol for each of the following: top management (see Annexure H); student entrepreneurship champion/promotor (see Annexure I); academic staff (see Annexure J); incubator or accelerator staff (see Annexure K); and technology transfer office staff (see Annexure L). These five protocols consisted of six main headings, which were posed to participants depending on their position and expertise (see Table 4.3).

Table 4.3: Sections of the interview protocol

Sections	Completed by
1. General information about the participant	All participants
2. Introductory questions about the university	Student entrepreneurship champion/promotor
3. University (student) entrepreneurship support	Student entrepreneurship champion/promotor
4. Different elements in university entrepreneurship support	
4.1 Co-curricular entrepreneurship support	Top management & student entrepreneurship champion/promotor
4.2 Formal entrepreneurship education	Academic staff
4.3 Incubator and accelerator programme	Incubator or accelerator staff
4.4 TTO	Technology Transfer Office staff
4.5 University venture fund	Top management & Technology Transfer Office staff

Table 4.3: Sections of the interview protocol (cont.)

Sections	Completed by
5. Collaboration among different actors in supporting student entrepreneurship	All participants
6. Entrepreneurship support outside the university	All participants

Source: Authors own construction

The purpose of these interview protocols was to gain insights from staff members, who are entrepreneurship stakeholders, on the university-based student entrepreneurship support provided by their universities.

A single interview protocol was also developed to gather data from student entrepreneurs at the selected universities (see Annexure M). This protocol consisted of seven main sections, including (i) general information of the participant; (ii) education; (iii) work experience; (iv) the student start-up; (v) support received; and (vi) challenges experienced; and (vii) support received. The questions that were asked during these interviews were aimed at gaining insights into the types of businesses established by the student, the challenges they experience(d), the support they receive(d), and their perceptions of the support provided by their university.

The final section of the case study protocol is a guide for the case study report (Yin, 2014:93). The aim of this section is to outline the desired format for the case study report and its intended purpose (Gaya & Smith, 2016:535). A case study report is a document that presents the research conducted in both textual and non-textual formats (tables, figures, charts, drawings, and other graphics) (Yin, 2014:178).

Yin (2014:187) presents six illustrative structures to consider when preparing a case study report, including linear-analytic, comparative, chronological, theory-building, suspense and unsequenced. A linear-analytic structure is suitable for most researchers and starts with the problem at hand, which is followed by relevant previous literature on the topic (Grauer, 2012:76). Thereafter, the methods used, data collection process, data analysis procedure and findings, are presented, which is followed by a conclusion and recommendations section (Grauer, 2012:76). Researchers commonly adopt a linear-analytic structure at the university level, where the main audience is a thesis or dissertation committee (Yin, 2014:188). When a comparative structure is used, the same procedure for data collection and data analysis is

repeated for multiple cases so as to present a comparison between different cases, either in terms of literal replication or theoretical replication (Saunders *et al.*, 2016:634). When using a chronological structure, case study evidence is presented in chronological order, which is beneficial when events are studied over time (Saunders *et al.*, 2016:635). Saunders *et al.* (2016:635) assert that when using a theory-building structure, the emphasis is placed on the emergence of data collection and analysis, the refinement of research ideas and the development of themes, relationships and explanations. A theory-building structure is relevant with both explanatory and exploratory case studies that are concerned with theory-building (Yin, 2014:189). The suspense structure, which is most appropriate for explanatory case studies, inverts the linear-analytic structure and commences with the main outcomes of the case study and the significance thereof, continuing with an in-depth explanation of the presented outcomes (Grauer, 2012:76). Finally, with an unsequenced structure, the sequence in which the chapters or sections of a case study are presented is of little importance as it does not alter the descriptive value of the study (Yin, 2014:189). Although the sequence of the chapters or sections is of little importance, the researcher must still comply with the test of completeness, ensuring that all the key topics are covered well enough within the overall collection of chapters or sections (Yin, 2014:189).

In the current study, the structure of the case study report followed a combination of a linear structure and a comparative structure. These structures were adopted as the case study report was presented as a dissertation, and comparisons were made between the student entrepreneurship support offered by the participating university (cases). According to Lune and Berg (2017:2015), a traditional academic research report structure should consist of (i) a title page, (ii) the abstract, (iii) introduction, (iii) literature review, (iv) methodology, (v) findings or results, (vi) discussions or conclusions, (vii) references, and (viii) appendices.

4.7.2 PREPARE, COLLECT AND ANALYSE

After the define and design step, as suggested by Yin (2014:60), the researcher continued with the next steps when adopting a multiple-case study strategy. These steps included (i) preparing to collect case study evidence; (ii) collecting the case study evidence; (iii) analysing the case study evidence; and (iv) writing up the individual case reports. In the sections to follow, these steps are further elaborated on and applied to the current study.

4.7.2.1 Preparing to collect case study evidence

Yin (2014:72) asserts that it is vital for a researcher to be well prepared before starting the data collection procedures, as the demands of a case study strategy on the intellect, ego and emotions of a researcher are far greater than any other research method. Essential traits of a case study researcher include being able to ask the right questions, being a good listener, having a firm grasp of the issues being studied, and being able to avoid biases by being sensitive to contrary evidence (Yin, 2014:73). To reduce irrelevant information being collected, crucial questions should be planned before the interview commences, but the researcher should remain flexible to ask probing questions as the interview progresses (Yin, 2016:29). In order to ask the right questions, the researcher must have a good understanding of the issues being studied, which is achieved through conducting an extensive literature review (Yin, 2016:30). When gathering the data, a researcher must be a good listener, not only focusing on the spoken words but also taking note of the participants' mood, friendliness, and body language (Adams *et al.*, 2014:147). Yin (2016:28) asserts that with qualitative research, the phrase 'reading between the lines' with documents, and 'listening between the lines' with interviews is relevant as the researcher always needs to suspect that something is between the lines, something that may reveal a participants' intentions, motives, or deeper meaning. Yin (2014:76) emphasises the importance of a researcher not shying away from contrary findings, as such findings are just as important as supportive findings and should also be reported in the study.

Yin (2014:96) suggests that the data collection process be piloted as this will assist a researcher in improving the essential traits described above and refine the data collection process. Adams *et al.* (2014:146) also argue that it is beneficial to pre-test one's data collection process as such testing will reveal errors or problems in the process and provide the researcher with an opportunity to make corrections prior to commencing with the actual data collection.

In the current study, the researcher piloted the data collection process among several entrepreneurship stakeholders from Nelson Mandela University. Entrepreneurship stakeholders (staff and students) were interviewed to ensure that the questions posed were relevant and easy to understand by the participants. Moreover, conducting pilot interviews allowed the researcher to practice and improve his interviewing and listening skills, which are required to conduct the case study interviews successfully. While piloting the data collection process, the researcher ascertained that not all questions in the initial interview protocol were

applicable to all respondents. Several protocols were then developed as described in Section 4.7.1.1.

4.7.2.2 Collecting case study evidence

Yin (2014:103) asserts that a good case study draws evidence from several sources. Therefore, evidence from three common sources was collected for the current study, namely documents, observations and interviews. In the sections to follow, each source of evidence utilised is elaborated on.

a) Documents

According to Saunders *et al.* (2016:183), a document is a durable repository for textual, visual and audio representation. Yin (2016:156) advocates that it is beneficial for a researcher to review relevant documents before conducting an interview, as this reduces interruptions to ask questions for answers which are readily available. In the current study, the researcher reviewed various organisational documents and websites to gain knowledge on the types of student entrepreneurship support being provided by each of the eight universities prior to undertaking the interviews. These documents included the university prospectuses, entrepreneurship policies (if available), and the strategic plan of the university. In the current study, evidence from these documents and websites assisted with case selection, interview preparation and case analyses.

Prior knowledge of the student entrepreneurship supports available at the participating universities allowed the interviews conducted in the current study to follow a conversational approach and keep interruptions to a minimum. Moreover, having prior knowledge enabled the researcher to ask appropriate probing questions when necessary. Furthermore, data gathered from university documents and websites were also used when analysing the cases. This data was also reported on and, where applicable, used to corroborate interview data.

b) Observations

In this study, observations were also used for collecting evidence from the participating universities. Observations are described by Saunders *et al.* (2016:354) as the systematic viewing, recording, analysis and interpretation of how individuals, items and organisations behave and operate. There are two approaches to observations, namely participant observation and structured observation (Sekaran & Bougie, 2016:130). Participant observation occurs when a researcher participates in the activities being conducted by those being observed by becoming a member of the observed group (Sekaran & Bougie, 2016:130). Saunders *et al.* (2016:358) identify four different types of participant observations, namely complete participant, complete observer, observer-as-participant, and participant-as-observer. In comparison to participant observation, structured observation involves a more structured way of collecting the data to be used, and the goal is to quantify behaviour and not to investigate why it happens (Saunders *et al.*, 2016:366). In the current study, the researcher adopted the participant observation approach and, more specifically, the observer-as-participant type. When a researcher becomes an observer-as-participant the primary focus is on observing rather than participating in the activities of those being observed. Furthermore, why the researcher is making observations is known to the subjects being observed (Saunders *et al.*, 2016:359).

In the current study, the researcher paid close attention to observing the body language and facial expressions of the participants while the interviews were being conducted. As almost all interviews were conducted electronically using Zoom, these observations proved problematic in certain instances. The video quality varied between interviews and impacted the researchers' ability to accurately record the body language and facial expressions of all participants.

c) Interviews

Yin (2014:110) asserts that an essential source of data for case study research is the undertaking of interviews. Interviews resemble guided conversations, allowing for a flexible data collection process (Walliman, 2011:99; Yin, 2014:110). Saunders *et al.* (2016:388) describe an interview as a purposeful conversation held between an interviewer and interviewees, consisting of unambiguous and concise questions that are asked to gain valuable insights.

There are three forms of interviews: structured interviews, unstructured interviews, and semi-structured interviews (Saunders *et al.*, 2016:390). According to Sekaran and Bougie (2016:114), a structured interview has questions that are prepared in advance to obtain the information required. A structured interview usually consists of an introduction, a set of questions asked in a logical order, and suggestions for probing questions (Sekaran & Bougie, 2016:115). In contrast, an unstructured interview does not have a planned sequence of questions (Sekaran & Bougie, 2016:114). Walliman (2011:99) explains that a semi-structured interview is a combination of both a structured and unstructured interview, where questions are asked in a logical order to gather the information required but allows for conversation to occur freely and for open questions. Bryman and Bell (2011:473) assert that if a multiple case study strategy is adopted, such as in the current study, a semi-structured interview is most suitable to ensure cross-case comparability. In the current study, semi-structured interviews were used to collect the necessary data. Using semi-structured interviews allowed the researcher more flexibility to approach each participant differently while still ensuring that all relevant data was collected (Noor, 2008:1604). Semi-structured interviews also allowed for the gathering of detailed information through the use of open-ended questions (Quinlan *et al.*, 2015:131).

Over and above the open-ended questions posed to the participants, Likert-type scales and closed-ended questions were also utilised, whereby participants were verbally requested to indicate their responses. These types of questions for collecting data (Likert-type scales and closed-ended questions) were included in the interview protocol based on the following arguments. Case study researchers (such as Eisenhardt, 1989 & Yin, 2018) recommend the use of both qualitative and quantitative data in case study research to achieve synergistic benefits associated with the two types of data. In addition, from a statistical perspective, Likert-type scales are actually considered ordinal and “the numbers utilised in ordinal scales are really non-quantitative because they indicate only relative positions in an ordered series” (Hair *et al.*, 2014:5). Thus, Likert-type scales were used in the current study to more easily compare and contrast cases with each other. In addition, Merriam and Tisdell (2016:117) recommend that researchers avoid questions that would lead to simple ‘yes’ or ‘no’ answers as very little to no information is gathered through such a response. It is further argued that yes/no questions constrain the interviewee, as the scope of the conversation cannot be extended (Wang & Yan, 2012:238). Thus, Likert-type scales were used in the current study to gather more in-depth responses and to gauge the extent of agreement of participants. For example, these scales

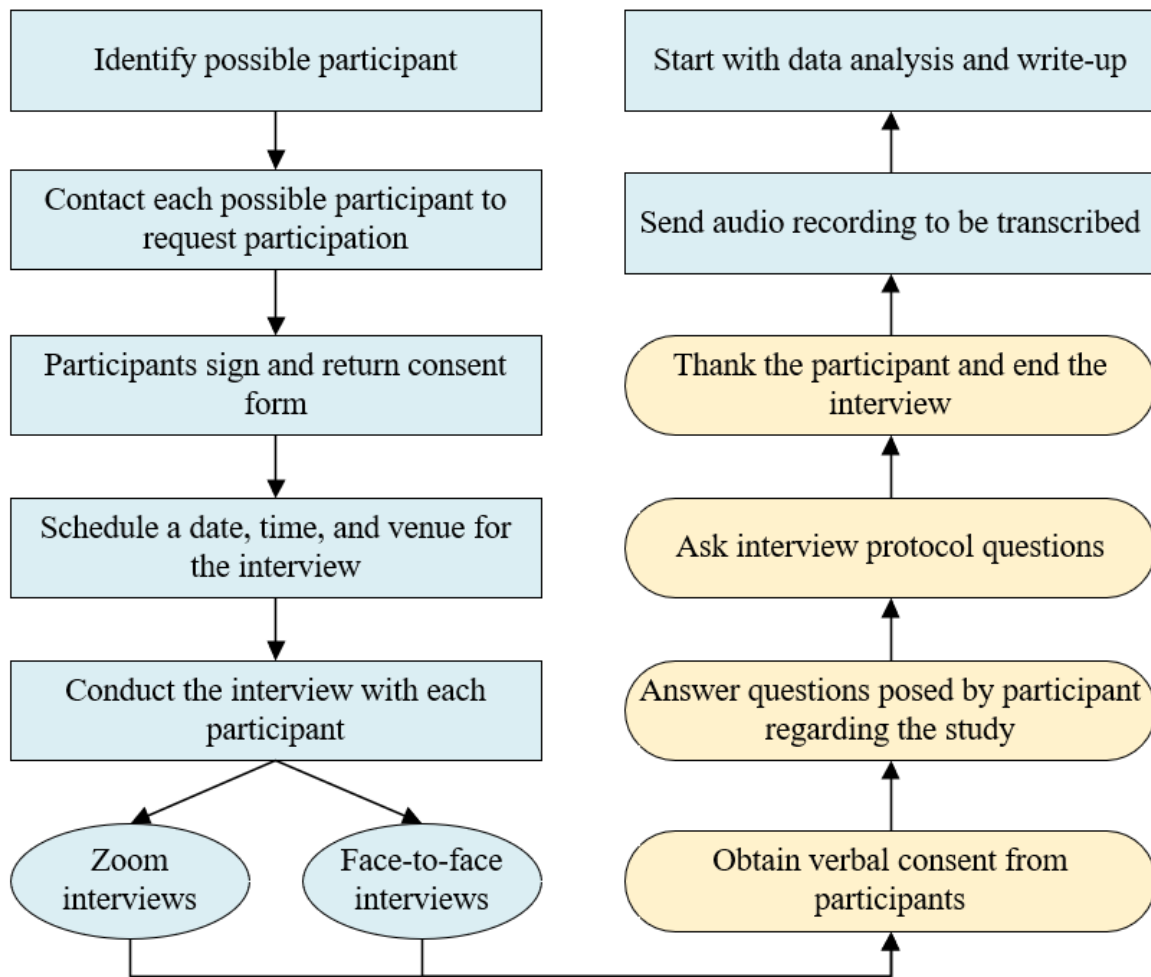
measured the perceived level of agreement, importance or views on certain statements of participants. Such questions were, however, followed up with probing questions.

Although various authors (Wang & Yan, 2012:238; Merriam & Tisdell, 2016:117) advise against using simple yes/no questions as they are considered restrictive in qualitative research, the researcher still made use of them, as well as pre-determined options (based on previous literature). However, to overcome the restrictiveness of these closed-ended questions, follow-up open questions were posed to give participants opportunities to elaborate on their responses. Examples of where pre-determined options were used include when participants were required to indicate the type of entrepreneurship strategy adopted by their respective university and whether specific entrepreneurship support was being offered. Existing strategies and types of support were listed as options based on those identified in the literature.

The various Likert-type scales and yes/no questions posed can be found in the interview protocols attached as Annexure H to Annexure M.

The semi-structured interviews conducted with participants were either done face-to-face or by means of Zoom. The method adopted depended on the participant and the Covid-19 situation at the time of setting up the interviews. The procedure followed by the researcher during the data collection stage is described next (see Figure 4.4).

Figure 4.4: Procedure followed to approach, set up and conduct interviews



Source: Authors own construction

Although the researcher had planned to conduct all interviews in person (face-to-face), only one of the 38 interviews were conducted as such. This change in plan was due to the Covid-19 pandemic and the restrictions it imposed. This one face-to-face interview took place prior to Covid-19 restrictions being implemented and formed part of piloting the interview protocol. This was the first participant to be interviewed for this study. Written and verbal consent was obtained before the interview commenced. Consent to audio-record the interview was requested in both the consent form as well as verbally before the interview commenced. The participant was assured that the audio-recording was only to ensure accurate transcription of the interview and was to be destroyed after being transcribed. After the interview was conducted, the recording was transcribed, and the necessary changes to the protocol were made. A follow-up electronic (Zoom) interview was conducted with this participant when the protocol was finalised to obtain missing information.

As domestic travel was restricted due to the Covid-19 situation at the time of undertaking the interviews, the technological application called Zoom was used to conduct the other 37 interviews. Zoom is a collaborative, cloud-based video-conferencing service through which two or more individuals can securely conduct and record online meetings (Zoom, 2020). Zoom provided the researcher with the ability to conduct the interviews with geographically dispersed participants through the use of a computer, laptop or mobile device, which overcame the barrier experienced through the restriction of travel (Archibald, Ambagtsheer, Casey & Lawless, 2019:2). The researcher firstly requested the participation of an individual through an email (see Annexure E), consisting of a letter of introduction (see Annexure F) and a consent form (see Annexure G). The individual was then informed that the interview would be conducted using the application Zoom and that they would need a device and data to participate in the interview. An offer to purchase data for those who did not have it was made. The consent form had to be read and signed by the participant and sent back to the researcher before the interview took place. Consent from the interviewees to audio-record the interview was requested both verbally before the interview commenced as well as in the consent form. The interviewee was assured that the audio-recording was only to ensure accurate transcription of the interview and would be destroyed after being transcribed. When a date and time was confirmed, the researcher sent an email to the individuals containing details regarding the Zoom meeting, including a personal link to join the meeting, the meeting ID and the meeting password.

After the interviews were conducted, the audio recordings were sent to a professional transcriber to be transcribed onto MS Word. Transcriptions were necessary to ensure that the researcher could easily analyse the data gathered during the interview process. The data analysis process and the writing up of cases are explained in the sections to follow.

4.7.2.3 Analysing case study evidence

In this section, the case study approach to analysing and reporting the data collected is described, and the data analysis techniques adopted are elaborated on.

a) Case study approach

Yin (2014:184) explains that when a multiple-case study strategy is adopted, each case is firstly analysed and reported on individually. These individual reports are usually separated into different sections or chapters in a study. However, Yin (2014:186) adds that even though a multiple-case study incorporates more than one case, reporting can be done in a format where cross-case issues are presented in various sections or chapters. Presenting cross-case issues in various sections or chapters will, therefore, result in information relating to individual cases being dispersed throughout each chapter (Yin, 2014:186).

In the current study, cross-case issues are presented in different chapters, as summarised in Table 4.4.

Table 4.4: Content of chapters as per cross-case issues

Chapter	Cross-Case Issue	Description of Findings
Chapter 5	University rankings based on current support and student entrepreneurs: backgrounds, experiences and entrepreneurial endeavours	The procedure followed to rank the 26 South African public universities are described, and their ranking presented. They are ranked from the most active (most entrepreneurship support activities offered) to the least active (least entrepreneurship support activities offered). Based on this ranking, the four most active and four least active universities were selected to serve as cases for the remainder of this study. The student entrepreneurs participating in the current study are described in terms of their backgrounds, experiences, and entrepreneurial endeavours. In addition, their challenges experienced, and perceptions of legitimacy, as well as their awareness of entrepreneurship support offered both internal and external to their universities, are also described.
Chapter 6	University environment and culture, as well as the co-curricular entrepreneurship support activities	The findings relating to two elements of the internal entrepreneurship environment are presented, namely, the university environment and culture and the various co-curricular entrepreneurship support activities offered. The findings pertaining to these two elements are presented first and together as they provide a broad overview of how entrepreneurship is perceived and the support offered in the context of this study.
Chapter 7	Other elements in the internal entrepreneurship environment	The findings relating to the other elements in this internal environment are presented namely formal entrepreneurship education, incubator and accelerator programmes, TTOs and university venture funds.
Chapter 8	Collaborations and external entrepreneurship environment	The findings relating to the collaborations between the elements within the internal environment are presented. Furthermore, the findings relating to the left-hand side of the conceptual framework, namely the external entrepreneurship environment, are also presented.

Source: Authors own construction

Through presenting cross-case issues in different chapters, summary information about the individual cases is either completely omitted or presented in abbreviated vignettes (Yin, 2014:186). The aforementioned format of the presentation was considered most appropriate given the confidentiality and anonymity requirements of the participating universities.

b) Data analysis technique

Yin (2014:132) defines data analysis as a process that “consists of examining, categorising, tabulating, testing, or otherwise recombining both quantitative and qualitative evidence to address the initial propositions of a study”. Palic *et al.* (2015:25) recommend that researchers conduct data analysis to better understand the primary data collected and to enhance the conclusions drawn from a study. Quinlan *et al.* (2015:337) infer that although content analysis, discourse analysis or documentary analysis can be used when adopting a case study research strategy, a thematic analysis technique is usually appropriate. Therefore, a thematic analysis, using the research software Atlas.ti, was undertaken to analyse the data gathered in the current study.

Thematic analysis involves identifying patterns and themes within qualitative data to answer the research questions of a study. (Saunders *et al.*, 2016:579). The six phases suggested by Braun and Clarke (2020:331) to conduct a thematic analysis are used in the current study. These six phases are described in Table 4.5. Although six phases are outlined, as suggested by Braun and Clarke (2020:331), they were not followed rigidly in the current study because as the analytical process unfolded, it became increasingly recursive in nature, and the different phases blended to some degree.

Table 4.5: Six phases to conduct a thematic analysis

Phase	Description
Phase 1: Data familiarisation and writing familiarisation notes	The researcher must read and re-read the interview transcripts and make notes as the researcher continues reading.
Phase 2: Systematic data coding	Data must be organised in a meaningful and systematic way, using codes to reduce data into smaller groups with similar meanings.
Phase 3: Generating initial themes from coded and collated data	Significant and interesting patterns within the codes developed are grouped into themes.
Phase 4: Developing and reviewing themes	These themes are reviewed and modified to ensure that they make sense and that the correct data is categorised under the relevant themes.

Table 4.5: Six phases to conduct a thematic analysis (cont.)

Phase	Description
Phase 5: Refining, defining and naming themes	The themes are defined to identify the essence of each theme and to determine what aspect each theme captures.
Phase 6: Writing the report	The researcher must write up a report on the findings from the thematic analysis.

Sources: Braun and Clarke (2006:87); Maguire and Belahunt (2017:3355-3361); King and Brooks (2018:228); Braun and Clarke (2020:331)

The researcher in the current study firstly (phase one) familiarised himself with the data collected by reading and re-reading the transcriptions of the interviews conducted (King & Brooks, 2018:228) with the entrepreneurship stakeholders at the eight universities. The researcher also made notes while reading through the transcriptions for ease of reference going forward. In phase two, the data was organised in a meaningful and systematic way, using codes to reduce data into smaller groups with similar meanings (Maguire & Belahunt, 2017:3355). The researcher then continued with phase three, which involved grouping significant and interesting patterns within the codes. These groups were then developed into themes (Maguire & Belahunt, 2017:3357). Thereafter, in phase four, the themes were reviewed and modified to ensure that they made sense and that the correct data was categorised under the relevant themes (Maguire & Belahunt, 2017:3357). In phase five, the themes were defined to identify the essence of each theme and to determine what aspect each theme captured (Braun & Clarke 2006:87). In phase five, the researcher also conducted a detailed analysis of each theme so as to identify the story behind each one (Braun & Clarke, 2006:92). In the final phase, the researcher reported on the findings of the thematic analysis (Maguire & Belahunt, 2017:3361). These findings are reported in Chapters Five to Eight of the current study.

As previously mentioned, the participants also indicated responses on Likert-type scales and responded to several yes/no questions. These responses were analysed and used for triangulation purposes. As such, both qualitative and quantitative type data was used in this case study research, as recommended by Eisenhardt (1989) and Yin (2018), but no statistical analysis was undertaken to determine any cause-and-effect relationships or to confirm or deny hypotheses. The data from the Likert-type scales, as well as the closed-ended questions, were analysed and presented in terms of frequencies, specifically modes and averages. Calculating frequencies made comparisons between participant responses within the same university, as well as between universities, easier.

c) Writing up the case

According to Yin (2014:194), there are three important procedures to consider when writing up the case study reports for a study, namely the specific tactics for starting a composition, whether the case identities should remain anonymous, and the review procedure to be followed for increasing construct validity. When writing up the reports for a study, Yin (2014:195) recommends that a researcher start drafting portions of the report as early as possible and adapt the sections as the study continues. In the current study, the researcher drafted both the literature chapters (Chapter Two and Chapter Three) and the methodology chapter (Chapter Four) prior to undertaking the data collection process. As the study continued, the researcher adapted these chapters accordingly. Moreover, for ease of reference, the descriptive data obtained for each case was tabulated as soon as the transcriptions were returned from the transcriber. Once the interviews with stakeholders from the four most active cases were completed and transcribed, the researcher started drafting the chapters relating to the various cross-case issues under investigation. At the same time, interviews with stakeholders from the four least active cases were continuing. Once these interviews were completed, the data gathered was added to the relevant draft chapters.

When deciding on whether case identities should remain anonymous or not, two levels of anonymity were considered by the researcher when writing up the case study reports, namely whether the identity of the case(s) would be disclosed, as well as whether the identity of the individuals within the case(s) would be revealed (Crowe *et al.*, 2011:7). The most desirable approach is to disclose the identities of cases and individual participants as this provides other researchers with the opportunity to become familiar with the cases (Yin, 2014:197). However, anonymity was an important factor to consider in the current study as the findings could have repercussions for the cases under investigation (Yin, 2014:197). Fear of harm caused (i.e., reputation) through the findings emanating from the study (Walliman 2011:48) was a concern raised by several of the participating universities who specifically requested that the names of the university and those of participants were kept anonymous so as to reduce any possible risks. Thus, pseudonyms were used in the current study to ensure both confidentiality and anonymity of cases and participants. Table 4.6 presents the pseudonyms used for the participating universities and Table 4.7 presents the pseudonyms used for participants from each university.

Table 4.6: University pseudonyms

	Most Active Universities				Least Active Universities			
University pseudonyms	Uni-A	Uni-B	Uni-C	Uni-D	Uni-W	Uni-X	Uni-Y	Uni-Z

Source: Authors own construction

Table 4.7: Participant pseudonyms

Position at University	Participant Pseudonyms
Top Management	*-TM
Student Entrepreneurship Champion/Promotor	*-SEC/P
Academic Staff	*-AS
Incubator Staff	*-IS
Technology Transfer Officer	*-TTO
Student Entrepreneur	*-SE
* = University Pseudonym; example: Uni-A-TM	

Source: Authors own construction

According to Nelson and Martin (2013:44), when considering the review procedure to be followed for increasing construct validity, a researcher must ensure that the case study report is of high quality. A high-quality case study report can be ensured by allowing a draft version thereof to be reviewed by one's participants, which contributes to ensuring that the data collected has been interpreted and reported correctly (Nelson & Martin, 2013:44). After an interview was conducted, the audio-recording thereof was sent to a professional transcriber for transcriptions. Thereafter, a summary of the transcription was emailed to the participant to ensure that the information gathered was correct. Upon completion of the draft chapters, they were reviewed more than once by the researcher's supervisor.

To ensure that a high-quality case study report has been compiled, the researcher made use of Hyett, Kenny and Swift's (2014:4) checklist for assessing the quality of a case study report (see Table 4.8). Hyett *et al.* (2014:4) developed this checklist based on the recommendations of Stake (1995), Merriam (2009) and Creswell (2013).

Table 4.8: Checklist for assessing the quality of a case study report

Relevant for all qualitative research		
1. Is the report easy to read?	2. Does it fit together, each sentence contributing to the whole?	3. Does the report have a conceptual structure?
4. Are issues developed in a series and scholarly way?	5. Have quotations been used effectively?	6. Has the writer made sound assertions, neither over- or under-interpreting?
7. Are headings, figures, artefacts, appendices, indexes effectively used?	8. Was it edited well, then again with a last-minute polish?	9. Was sufficient raw data presented?
10. Is the nature of the intended audience apparent?	11. Does it appear that individuals were put at risk?	
Highly relevant to qualitative case study research		
12. Is the case adequately defined?	13. Is there a sense of story to the presentation?	14. Is the reader provided with some vicarious experience?
15. Has adequate attention been paid to various contexts?	16. Were data sources well-chosen and in sufficient number?	17. Do observations and interpretations appear to have been triangulated?
18. Is the role and point of view of the researcher apparent?	19. Is empathy shown for all sides?	20. Are personal intentions examined?
21. Is the case study particular?	22. Is the case study descriptive?	23. Is the case study heuristic?
24. Was the study design appropriate to methodology?		

Source: Hyett *et al.* (2014:4)

4.7.3 ANALYSE AND CONCLUDE

After the individual chapters focussing on the specific cross-case issues were written up, the researcher then drew cross-case conclusions, modified the theory, developed policy implications, and wrote the cross-case report (Yin, 2014:60). These steps are further elaborated on in the sections to follow.

4.7.3.1 Draw cross-case conclusions

After undertaking the thematic analysis, a cross-case synthesis technique was adopted to identify the various cross-case patterns. A cross-case synthesis technique can only be utilised when a multiple-case study strategy is adopted, as these cross-case patterns are identified by comparing the data gathered from one case against the data from another (Crowe *et al.*, 2011:7;

Yin, 2014:164). Merriam and Tisdell (2016:234) assert that the researcher attempts to build a general explanation which fits all the individual cases, as the details of each case may differ. Eisenhardt (1989:540) suggests that a researcher can either select categories/dimensions within each case and search for similarities and differences between the various cases, or select pairs of cases to be compared with each other. The similarities and differences between the cases are explored through a systematic comparison in a cross-case analysis, providing evidence of how they might affect the findings of a study (Ridder, 2017:282). Creswell (2013:199) and Nelson and Martin (2013:53) recommend that a researcher create a Word table in which the data and themes from the individual cases can be displayed according to a uniform framework. Such a method will provide the researcher with the opportunity to identify similarities and differences more efficiently in order to draw cross-case conclusions (Creswell, 2013:200). Nelson and Martin (2013:53) note that when Word tables are used to examine cross-case data, argumentative interpretation is relied upon rather than numeric tallies.

As suggested by Eisenhardt (1989:540), in the current study, the researcher selected categories/dimensions within each case and searched for similarities and differences between the various cases. These categories (referred to as elements in the current study) were (i) the student entrepreneurs: backgrounds, experiences and entrepreneurial endeavours, (ii) university environment and culture, (iii) co-curricular entrepreneurship support activities, (iv) other elements in the internal entrepreneurship environment, including formal entrepreneurship education, incubator and accelerator programmes, TTOs, and university venture funds, (v) as well as collaborations and the external entrepreneurship environment. More specifically, the various student entrepreneurship support activities provided by the participating universities, as described under the various categories, were compared to identify similarities and differences as well as challenges faced. Within each category, the themes that developed from this comparison were populated into an Excel spreadsheet which enabled the researcher to summarise the findings and compare them between the cases with ease.

4.7.3.2 Modify theory

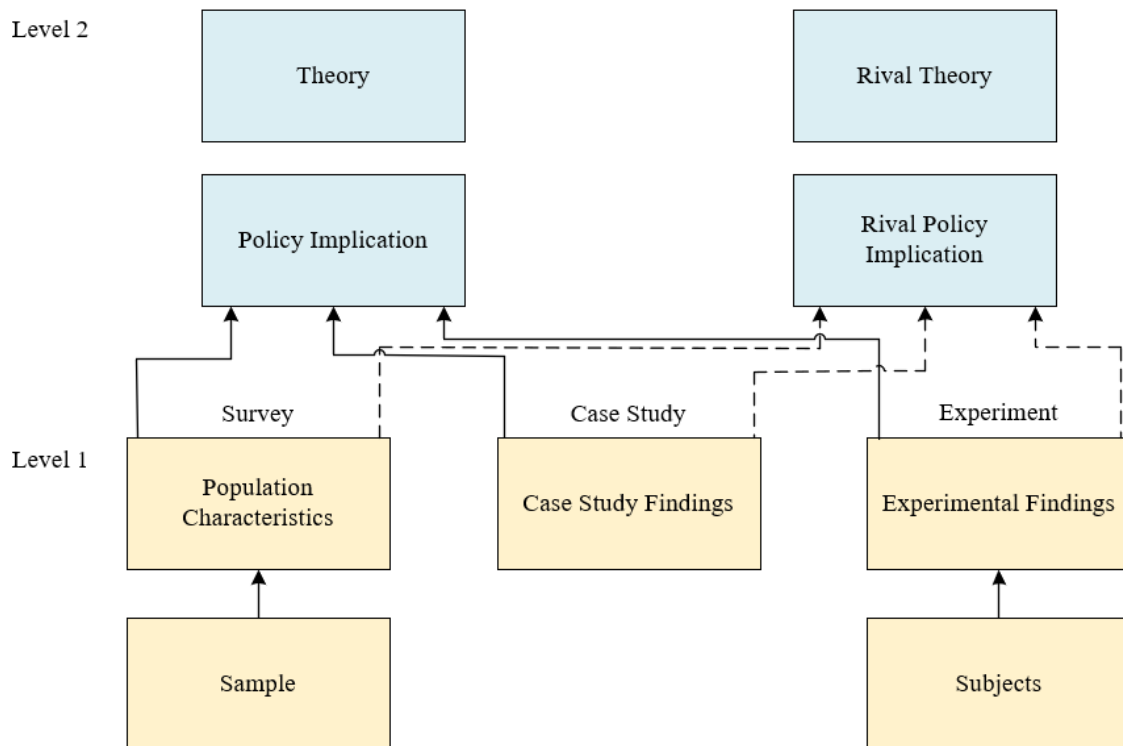
According to Yin's (2014:60) multiple case study procedure, after the data has been analysed and cross-case conclusions have been drawn, the next step is to modify the theory (if applicable). As explained previously, the theory underpinning the current study is organisational design theory. Organisational design theory explains the structure, behaviour,

and effectiveness of an organisation, as it currently is (Burton & Obel, 2018:2). More specifically, the elements in organisational design theory as presented by Good *et al.* (2018) underpin the current study, namely (i) organisational purpose, (ii) activities, (iii) structure, and (iv) people. As the current study was exploratory in nature, modifying the theory was not considered applicable to the current study. However, insights relevant to organisational design theory highlighted by the findings of the current study are noted during the process of analysing and interpreting the data.

4.7.3.3 Develop policy implications

Yin (2014:42) indicates that a researcher should aim towards analytic generalisations (level two) rather than statistical generalisation (level one) when conducting case studies (see Figure 4.5). On level one, inferences are made about a population based on empirical data collected from a sample through statistical generalisations (Yin, 2014:40). At level two, a researcher should focus on analytical generalisations based on either corroborating, modifying, rejecting, or advancing the theoretical concepts referenced in a study or by presenting new concepts that arose upon completing a study (Yin, 2014:41). Nelson and Martin (2013:16) distinguish between the two types of generalisation techniques by stating that analytic generalisation is used in case study research to generalise beyond the level of the specific case, but not to universalise such as with statistical generalisation.

Figure 4.5: Making inferences: Two levels



Source: Yin (2014:41)

Levings (2014:44) suggests that a multiple case study strategy is more appropriate than a single case study strategy when considering generalisation, as the analytic benefits are greater and generalisability is expanded when conclusions are similar. Replication is an approach to generalisation, with cases carefully being selected to either provide literal replication or theoretical replication (Nelson & Martin, 2013:17). Ebneyamini and Moghadam (2018:4) assert that literal replication occurs when cases are selected where the theory would predict similar results, while theoretical replication is when cases are selected where the theory points to contrary results but for predictable reasons. Of the eight South African public universities selected as cases for this study, four represented the most active universities, and four represented the least active universities in terms of student entrepreneurship support. The predicted results from the current study were that the most active universities were developing and supporting the most student entrepreneurs and offered the most student entrepreneurship support activities. Moreover, the four least active universities were more likely to experience significant challenges to support their student entrepreneurs, leading to less student entrepreneurship support being provided and a reduced number of student entrepreneurs being developed. It can be suggested that how the four most active universities are providing student

entrepreneurship support can serve as a guide to how student entrepreneurship support should be provided. Moreover, it can be assumed that the efficiency and effectiveness of the support being provided by the other universities should increase if such measures and procedures are adopted.

4.7.3.4 Write cross-case report

In the final step suggested by Yin (2014:60), the researcher must compile a cross-case report from the cross-case conclusions. Saunders *et al.* (2016:647) assert that rather than each case being described and explained individually in a cross-case report, cross-case conclusions and the findings from the comparison between the cases should be presented. In this study, the cross-case report dealt with the following categories, case rankings and sample descriptions (Chapter Five), university environment and culture and co-curricular support activities (Chapter Six), other elements in the internal entrepreneurship environment (Chapter Seven), and collaborations and the external entrepreneurship environment (Chapter Eight). The similarities and differences between the eight universities in terms of these categories were presented and discussed in the cross-case report. The report also focussed on how the various support activities offered by the participating universities were structured and implemented and how this differed between them.

4.8 TRUSTWORTHINESS

Saunders *et al.* (2016:204) assert that the quality of all studies should be taken seriously by researchers in order for the study to be accepted as credible. According to Cypress (2017:254), there are two terms to consider when judging the quality of a study, namely rigour and trustworthiness. Rigour relates to the researcher being as exact, thorough, and accurate as possible throughout the study (Cypress, 2017:254). Hays *et al.* (2016:173) further elaborate that rigour involves the systematic approach to designing the research as well as analysing, interpreting and presenting the data. Rigour is associated with terms such as internal validity, external validity, reliability, and objectivity, which are used as measures of quality in quantitative studies (Ali & Yusof, 2011:30; Cypress, 2017:254). According to Anney (2015:273), the term “trustworthiness” is used when referring to the quality of qualitative studies (Ali & Yusof, 2011:30; Anney, 2015:273; Cypress, 2017:254). The term

“trustworthiness” refers to the quality, authenticity, and truthfulness of the findings in a qualitative study, which in turn has an impact on the degree of trust and confidence readers have in these findings (Cypress, 2017:254). Four measures are most often used to assess the trustworthiness of a qualitative study, namely credibility, dependability, transferability and confirmability (Anney, 2015:276; Quinlan *et al.*, 2015:259; Hays *et al.*, 2016:174; Cypress, 2017:255). Each of these are described below.

Credibility refers to whether the data gathered is accurate and a truthful depiction of participants’ lived experiences (Hays *et al.*, 2016:174). Moreover, Bengtsson (2016:13) describe the credibility of a study as to whether the appropriate data analysis procedures were followed and that no relevant data were excluded. In the current study, methodological triangulation was used to enhance credibility, whereby multiple data collection methods were used to collect the data, including document analysis (desk research) and semi-structured interviews (Ali & Yusof, 2011:63; Anney, 2015:277). Moreover, Likert-type scales were also incorporated into the interview protocol against which the responses of the participants could be compared and confirmed. Member checking was also used to ensure credibility, where the transcriptions and analysed data were sent back to the participants to be evaluated (Cope; 2014:89; Anney, 2015:277).

According to Cope (2014:89), dependability refers to whether the findings of a study will be replicated if a study was to be repeated with similar participants in similar conditions. Moreover, Stenfors, Kajamaa and Bennett (2020:598) explain that dependability is the extent to which the research could be replicated if similar procedural steps are followed. In order to ensure dependability through an audit trail, the researcher provided step-by-step details in Chapter Four of the research design and methodological choices made during the study and justified why these choices were made (Nowell, Norris, White & Moules, 2017:3). The transcribed interviews, as well as the findings and recommendations, are also made available for future reference by academics, researchers, scholars, government officials, and student entrepreneurship stakeholders. Peer examination was also used to ensure dependability, whereby the research process and findings were discussed with the supervisor as well as with peers (Anney, 2015:279).

Transferability refers to the extent to which the findings of a study can be useful to people in other settings, namely people who are not involved with the current study (Connelly, 2016:435). Cope (2014:89) adds that transferability is dependent on the aim of a qualitative study and whether the researcher intends to generalise the findings to a population. To ensure transferability, the researcher provided a rich and thick description of the methodology adopted, as well as the cases selected and the participants interviewed (Anney, 2015:278; Connelly, 2016:436; Nowell *et al.*, 2017:3). Moreover, the participants interviewed were purposefully selected as they were assumed to be the individuals with the most knowledge in terms of the particular entrepreneurship support offered at the respective universities (Ali & Yusof, 2011:62; Anney, 2015:278).

According to Miles, Huberman and Saldana (2014:248), confirmability refers to the neutrality of the findings of a study and whether these findings are consistent and can be repeated over time. Cope (2014:89) describes the findings of a study as confirmable if a researcher has demonstrated that the data gathered and reported excludes research biases and focuses only on the responses of the participants. To ensure the confirmability of the research findings in the current study, the researcher used methodological triangulation to reduce the effect of investigator bias and acknowledged that his beliefs and assumptions could be different from that of the participants (Ali & Yusof, 2011:63). The researcher also wrote an in-depth methodological chapter describing the procedures followed to collect and analyse the data (Ali & Yusof, 2011:63). The researcher also provided an audit trail of the data analysis and methodology followed by providing a research design and methodology chapter (Chapter Four) as well as a detailed presentation of the results (Chapters Five, Six, Seven and Eight) (Ali & Yusof, 2011:62; Connelly, 2016:435). In addition, all the interviews conducted by the researcher were transcribed verbatim to reduce bias, and direct quotations from the participants were utilised to ensure neutrality (Cope, 2014:89).

4.9 ETHICAL CONSIDERATIONS

Ismail (2017:169) asserts that research is a social activity that incorporates processes dealing with human interaction. Quinlan *et al.* (2015:42) add that researchers represent an institution or organisation in the wider community and that the highest ethical standards should be adopted. Saunders and Lewis (2012:74) describe research ethics as the appropriateness of a

researcher's behaviour concerning the rights of those who partake in a study and are affected by it. Research ethics also described the rules of conduct which should be adhered to when a researcher collects data from participants or respondents (Walliman, 2011:171).

Babbie and Mouton (2012:522) note that research conducted should not cause any physical, psychological or any other form of harm, whether being direct or indirect, to any participants. This notion of not causing harm relates to both primary data collection as well as the use of secondary data (Saunders & Lewis, 2012:79). Walliman (2011:48) explains that a researcher should assess the harm that could be caused through the methods used to collect data and the findings that will be presented from the study. Therefore, a researcher should ensure that the methods chosen and the findings presented minimise the risks of potentially harming the reputation, dignity, or privacy of participants (Walliman, 2011:48). Adams *et al.* (2014:23) add that the findings of a study should not be falsified and that exaggerated claims should not be made, which could cause harm to the participants. To ensure that no harm is done to humans, the proposed study was subjected to the research ethics procedures set out by the Nelson Mandela University's Research Ethics Committee for Humans prior to the study commencing. The ethical approval letter is presented as Annexure A, and the number allocated is H20-BES-BMA-011.

To ensure that no harm was done to humans, the researcher in the current study explained to participants that they were welcome to end an interview should they ever feel uncomfortable. The participants were also informed in advance of the benefits and risks associated with participating in this study. No sensitive questions were asked, and the researcher behaved courteously during the data collection period to ensure not to humiliate or ridicule the participants. Specific precautionary measures were put in place to overcome some of the security issues concerning the use of Zoom and to ensure the safety of the participants. A meeting password was used and shared only with the interviewee to ensure that only individuals with the required information could access the meeting. The waiting room feature was enabled, giving the host (interviewer) the ability to choose who could enter the meeting room. Finally, the meeting room was locked once the interviewer and interviewee joined, preventing anyone else from accessing the meeting. The researcher strived to provide high-quality work and give credit where due when undertaking the desk research and literature review through referencing when necessary. The recordings of the interviews were transcribed, and a summary of the transcription was emailed to the participant to ensure that the information

gathered was correct. To further ensure that no harm to humans was done when undertaking the current study, the researcher ensured that the guidelines for ensuring confidentiality, anonymity and voluntary consent were adhered to. The strategies adopted for each are described in the paragraphs that follow.

According to Saunders *et al.* (2016:244), confidentiality in a research study refers to a researcher ensuring that the data collected cannot be traced back to a specific participant in a study. Confidentiality is all about protecting the data provided by participants and that private data, which can identify a participant, is not reported (Babbie & Mouton, 2012:523; Flick, 2018:33). To ensure confidentiality in the current study, the researcher made sure not to report any private information, and raw data was encrypted and stored away. This process was followed to safeguard the raw data from individuals who were not part of the research team unless permission was acquired from participants. The participants were also assured that video recording was not used and that the audio recording was used only to ensure accurate transcription of the interview and was deleted after being transcribed.

Anonymity in a research study refers to a researcher ensuring that the study is conducted in such a way that the participants are not identifiable (Quinlan *et al.*, 2015:46). Walliman (2011:49) asserts that anonymity is vital for guaranteeing that the data reported does not harm those participating in this study. In the current study, pseudonyms were used to protect the identity of the cases investigated, as well as the participants interviewed. Full anonymity could, however, not be guaranteed as the data was gathered through semi-structured face-to-face or Zoom interviews with the participants. When reporting the findings, the researcher did not disclose which data was obtained from which specific participant or which data was associated with which case (university). No personal detail questions were posed in the interview protocol to guarantee confidentiality and the anonymity of participants.

Voluntary consent is obtained when an individual agrees to take part in a study without being coerced (Adams *et al.*, 2014:127). It is important to note that voluntary consent is not sufficient, and the focus should instead be on informed, voluntary consent. Quinlan *et al.* (2015:46) describe informed voluntary consent as an agreement given by a person to participate in a study after being fully informed of the nature of the study as well as the benefits and risks associated with it. In the current study, consent was firstly obtained from each of the cases approached to be investigated, namely the eight South African universities. An introductory letter (See

Annexure C) was sent to the various gatekeepers at each of these universities, and once ethics approval was obtained, consent was sought from key entrepreneurship stakeholders (unit of observations) with whom interviews could be conducted. Each entrepreneurship stakeholder identified received an introductory letter informing them about the research that was being conducted and asking if they were willing to participate. If the participant agreed to participate in the interview, written consent was obtained by having the participant sign the consent form (See Annexure G), which had to be sent back to the researcher prior to the interview taking place. To ensure that the participant was thoroughly informed before the interview was conducted, the following steps took place: the researcher (i) explained the nature of the study and what the interview pertained to; (ii) elaborated on risks and benefits associated with participating in the study; (iii) emphasised that the participation of the participant was entirely voluntary and that the participants were allowed to end the interview at any time should they wish to; and finally (iv) asked whether the participant was still willing to provide consent and willing to continue with the interview. Consent to record the interview was again requested verbally before the researcher started recording the interview, and an assurance was given that the purpose of the audio recording was to ensure accurate transcription only and would be destroyed afterwards.

4.10 SUMMARY

In this chapter, the methodological choices made and how they were applied in the current research was described using Saunders *et al.*'s (2016:124) research framework, or research onion. In this study, an interpretivist philosophical stance was adopted, and the study is positioned in the interpretivist paradigm. This philosophy and paradigm were applicable as the researcher wished to gather in-depth subjective data from participants to gain a greater understanding of university-based student entrepreneurship support activities offered, as well as to identify best practices. Moreover, an abductive approach to theory development was followed as it allowed the research design to evolve. This flexibility in the research design was vital as different stakeholders interviewed had different perspectives and value systems, thus, making it difficult to predict the outcome of interactions. As the purpose of the study was exploratory in nature, a multi-method qualitative methodological choice was made. As such, more than one data collection method was used to collect the data concerning student entrepreneurship support provided by South African universities. These methods included desk

research and document analysis, as well as semi-structured interviews. A case study research strategy was used as it allowed the researcher to gain valuable in-depth information regarding the cases concerned. More specifically, an embedded multiple-case study strategy was used as more than one case was investigated, with each having its own subunits (entrepreneurship stakeholders). The study is cross-sectional in nature as it focuses on events that were currently happening while the study was being conducted.

The multiple-case study procedure suggested by Yin (2014) was adopted, which involved several phases, namely, developing theory, selecting cases, designing the case study protocol, preparing to collect case study evidence, collecting case study evidence, analysing case study evidence, writing the individual case reports, drawing cross-case conclusions, modifying theory, developing policy implications, and writing the cross-case report. How each of these phases was applied in the current study was described. Thereafter, the strategies adopted to ensure the quality and trustworthiness of the research process and the findings were described. The chapter concluded by describing the ethical considerations observed to ensure that no harm was done to humans during the whole research process.

The empirical findings of this study are presented in three chapters. In the next, Chapter Five, the findings relating to the university rankings, as well as the backgrounds, experiences and entrepreneurial endeavours of the participating student entrepreneurs, are presented.

CHAPTER FIVE

EMPIRICAL FINDINGS: CASE RANKINGS AND SAMPLE DESCRIPTIONS

5.1 INTRODUCTION

In the previous chapter, the research design and methodology utilised in this study was described and justified. The empirical findings, obtained through the implementation of this research design and methodology, are presented in Chapters Five to Eight that follow. In this chapter (Chapter Five), the procedure followed to rank the 26 South African public universities is described and their ranking presented. They are ranked from the most active (most entrepreneurship support activities offered) to the least active (least entrepreneurship support activities offered). Based on this ranking the four most active and four least active universities were selected to serve as cases for the remainder of this study. These cases and the participants interviewed for each case are described in the sections that follow.

Given that student entrepreneurs are central to the conceptual model (see Figure 3.1), and the ultimate beneficiaries of entrepreneurship support in the context of the current study, the student entrepreneurs participating in the current study are further described in terms of their backgrounds, experiences, and entrepreneurial endeavours. In addition, their challenges experienced and perceptions of legitimacy, as well as their awareness of entrepreneurship support offered both internal and external to their universities, are also described.

5.2 UNIVERSITY RANKINGS BASED ON CURRENT SUPPORT

As mentioned in Chapter Four, a desk research was undertaken to investigate what each of the 26 South African public universities are offering in terms of student entrepreneurship support. The findings of this desk research addressed the first secondary objective (SO¹), namely to identify the most and least active South African public universities by ranking their current student entrepreneurship support activities. The Google and university website searches for various terms associated with entrepreneurship and the respective universities resulted in several entrepreneurship support activities being identified. These entrepreneurship support activities identified as well as descriptions thereof from the literature are summarised below.

Table 5.1: Student entrepreneurship support initiatives described

Term	Descriptions	Source
Entrepreneurship societies	Informal, non-accredited student-led societies focused on promoting entrepreneurship as a viable career option and developing the entrepreneurial skills of students.	Pittaway <i>et al.</i> (2010); Pittaway <i>et al.</i> (2015)
Student entrepreneurship intervarsity	A competition held by the EDHE to identify the top student entrepreneurs at the South African public universities, recognise and showcase their businesses, and invite investment into this cohort of student businesses.	Entrepreneurship Development in Higher Education (2021)
Student entrepreneurship week	One-week campaign hosted by universities across South Africa where the institution, partnered with businesses, industry, and non-profit organisations, promote entrepreneurship as a career option.	Entrepreneurship Development in Higher Education (2021)
Technology transfer office	A central agent tasked with managing the university's intellectual property, identifying and encouraging the disclosure of inventions with potential to be commercialised, and facilitating the transfer of technology from a research institution to market.	York & Ahn (2012); Weckowska, (2015); Good <i>et al.</i> (2018)
Entrepreneurship competitions	Competitions that provide a stimulus for entrepreneurial activities, such as business plan competitions or pitching competitions, where students stand a chance to win seed money or gain valuable entrepreneurial knowledge and skills.	Russell, Atchison & Brooks (2008); Jones & Jones (2011)
Incubators / Incubation programmes	A business incubator is a programme offered with the sole purpose of providing support to early-stage entrepreneurs who are in the process of establishing a business, which can include services such as fully equipped working space, technical assistance, advice, coaching and mentorship.	Good <i>et al.</i> (2018); Allahar & Sookram (2019b); Covelli <i>et al.</i> (2020)
Entrepreneurship strategic plan	Universities are encouraged to include a strategic objective in their strategic plan focused on developing a conducive entrepreneurial environment to encourage entrepreneurship as a career option and provide an integrated entrepreneurial culture within the university.	Budyldina (2018)
Entrepreneurship workshops	Entrepreneurship workshops are offered to aspiring and existing entrepreneurs to provide them with the opportunities to network with experienced entrepreneurs, receive mentorship, develop entrepreneurial skills, and gain practical entrepreneurial experience.	Pruett (2012); Viviers <i>et al.</i> (2013)
Centre for entrepreneurship	A centre for entrepreneurship acts as the link between the various components of the entrepreneurial ecosystem, increasing the accessibility of facilities and features provided to assist early-stage entrepreneurs in the process of establishing a new venture, or existing entrepreneurs with established businesses.	Nieuwenhuizen, Groenewald, Davids, Janse van Rensburg & Schachtebeck (2016); Pittz & Hertz (2018)

Table 5.1: Student entrepreneurship support initiatives described (cont.)

Term	Descriptions	Source
Practical entrepreneurship programmes	Practical entrepreneurship programmes are provided to students to emphasise practice over theory, allowing the student entrepreneurs to develop their entrepreneurial competence in a practical, yet risk-free environment.	Sanchez, Maldonado, Velasco & Kakash (2015); Ebewo <i>et al.</i> , (2017)
International collaborations	Universities that have collaborated with other universities across the globe to promote, enhance, and encourage entrepreneurship among students in South Africa.	Authors' own description
Entrepreneurship funding (Seed funding)	Entrepreneurship funding, such as seed funding, in the form of either equity or non-equity investments, loans, or small grants provided by the university to early-stage ventures run by students.	Morris <i>et al.</i> (2017); Wright <i>et al.</i> (2017)
International presence	Students from these universities have made an entrepreneurial impact and have either competed in international competitions or been invited to present their entrepreneurship ideas internationally.	Authors' own description.
Entrepreneurship conferences	Staff or students at these universities either presented or attended conferences focused on entrepreneurship, student entrepreneurship, or university-based student entrepreneurship support.	Authors' own description.
Entrepreneurship policy	These universities have an established entrepreneurship policy with the aimed at promoting entrepreneurship among students at the university, as well as providing a supportive environment for student businesses to flourish.	Authors' own description.
Entrepreneurship seminar	Staff or students at these universities either presented or attended seminars focused on entrepreneurship, student entrepreneurship, or university-based student entrepreneurship support.	Authors' own description.
Centre for social entrepreneurship	A centre for social entrepreneurship aims to promote social entrepreneurship among students by utilising innovative strategies to address socio-economic challenges and provide various programme offerings, partnerships and initiatives to encourage social entrepreneurship initiatives.	Durban University of Technology (2020); University of Johannesburg (2020)
Student training for entrepreneurial promotion	Entrepreneurship training for youths, and young adults focused on developing the skills, knowledge, and confidence of young individuals to pursue an entrepreneurial career.	Student Training for Entrepreneurial Promotion (2020)
Science parks	A science park is a business support, and technology transfer property-based organisation or initiative with links to a university or other higher education institution focused on encouraging and supporting the start-up, incubation, and development of innovative and high-growth business ventures.	Albahari, Pérez-Canto, Barge-Gil & Modrego (2017); Lamperti, Mavilia & Castellini (2017); Good <i>et al</i> (2018)

Source: Authors own construction

The various student entrepreneurship support activities (see Table 5.1) that are undertaken or offered by each of the participating universities (Uni-A to Uni-Z) were then analysed using INVIVO coding and are summarised in Annexure N.

The findings of the INVIVO coding analysis were then tabulated (see Table 5.2) or ranked, as such identifying the most active and least active South African public universities in terms of offering student entrepreneurship support (SO¹). These findings were also used to identify the universities that would be subjected to more in-depth investigation in the current study, namely the four most active and the four least active universities. It is the in-depth investigation of these eight universities that allows for describing the university-based student entrepreneurship support offered at South African public universities and achieving SO².

Table 5.2: Student entrepreneurship support provided by the 26 South African public universities

Entrepreneurship Support	Universities																										Total
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
Entrepreneurship Societies	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	26
Student Entrepreneurship Intersarsity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	26
Student Entrepreneurship Week	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓		✓	✓	✓	✓	✓	✓	✓			21
Technology Transfer Office	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓					20
Entrepreneurship Competitions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								✓						15
Incubators	✓	✓	✓	✓	✓		✓			✓	✓		✓	✓	✓			✓			✓						13
Entrepreneurship Strategic Plan	✓	✓	✓	✓		✓		✓	✓		✓				✓				✓						✓		11
Entrepreneurship Workshops	✓	✓	✓	✓			✓	✓	✓		✓						✓	✓		✓							11
Centre for Entrepreneurship	✓	✓	✓	✓	✓	✓	✓					✓	✓			✓											10
Practical Entrepreneurship Programmes	✓	✓	✓		✓	✓	✓	✓				✓							✓	✓							10
International Collaborations	✓	✓				✓	✓			✓		✓		✓	✓												8
Entrepreneurship Funding	✓	✓	✓	✓	✓			✓				✓					✓										8
Entrepreneurship Initiatives	✓	✓		✓	✓	✓				✓	✓																7

Table 5.2: Student entrepreneurship support provided by the 26 South African public universities (cont.)

Entrepreneurship Support	Universities																										Total	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
International Presence	✓		✓		✓	✓		✓								✓												6
Entrepreneurship Conferences				✓		✓	✓		✓				✓											✓				6
Entrepreneurship Policy			✓		✓			✓	✓	✓																		5
Entrepreneurship Seminar	✓	✓			✓			✓																				4
Centre for Social Entrepreneurship		✓		✓		✓																						3
Student Training for Entrepreneurial Promotion (STEP)									✓									✓										2
Science Parks							✓					✓																2
Total Items	15	15	13	13	13	13	12	12	10	9	9	8	8	7	7	6	6	6	6	5	5	4	4	3	3	2		

Source: Authors own construction

From Table 5.2 it can be seen that the entrepreneurship support initiatives being offered by all 26 public universities in South Africa include entrepreneurship societies and the student entrepreneurship intervarsity. Other commonly offered support initiatives include student entrepreneurship week (21 universities), TTOs (20 universities), and entrepreneurship competitions (15 universities). Other less common initiatives include a centre for social entrepreneurship (3 universities), entrepreneurship seminars (4 universities), and an entrepreneurship policy (5 universities). The entrepreneurship support initiatives offered by the least universities include science parks and the STEP programme, both only being offered by two universities.

Table 5.2 also shows the total number of student entrepreneurship support initiatives being offered by each university. This total was calculated by adding up the number of initiatives that each university is providing. Thereafter, the 26 public universities in South Africa were ranked in terms of the total number of student entrepreneurship support initiatives that they are providing. Based on this ranking process the four most active (see Table 5.3) and the four least active universities in terms of student entrepreneurship support (see Table 5.4) were identified. This ranking was also anecdotally confirmed by a senior member of the EDHE. The four most active and the four least active universities, together with the number of initiatives they offer, are tabled below (see Tables 5.3 and 5.4). Although University X was ranked higher than University V, the mission of University X is focused on health sciences, and they were thus excluded as a possible participant. Due to confidentiality and anonymity reasons, pseudonyms were used to name the 26 public universities in South Africa.

Table 5.3: Most active universities in terms of student entrepreneurship support

Most Active Universities	University A	University B	University C	University D
Total number of support/initiatives	15	15	13	13

Source: Authors own construction

Table 5.4: Least active universities in terms of student entrepreneurship support

Least Active Universities	University V	University W	University Y	University Z
Total number of support/initiatives	4	4	3	2

Source: Authors own construction

These cases (8 participating universities) are described in more detail in the section to follow.

5.3 CASE DESCRIPTIONS

In this section, the participating universities, as the case units of analysis under investigation, are described. To ensure anonymity, their descriptions in terms of age, as well as the number of faculties, staff members and students are presented in terms of average numbers.

5.3.1 AGE

In terms of the age of the universities, it was found that the most active universities [Uni-A, Uni-B, Uni-C, Uni-D] had an average age of 107.25 years, while the average age for the least active universities [Uni-V, Uni-W, Uni-Y, Uni-Z] was only 47.25 years. Thus, a difference of 60 years is noted. Two of the most active universities were the oldest in the sample and were established prior to 1900. The two other most active universities were established in the mid-1900s, and in the early 2000s, respectively.

One of the least active universities was also established prior to 1900, and was the third oldest in the sample. The other three least active universities were established in the mid-1900s and early 2000s. The two universities established in the early 2000s are the youngest in the sample.

5.3.2 FACULTIES

Information was also gathered regarding the number of faculties at the participating universities. On average, the most active universities [Uni-A, Uni-B, Uni-C, Uni-D] have 7.25 faculties, while the least active universities [Uni-V, Uni-W, Uni-Y, Uni-Z] have an average of 4.25. The number of faculties range from six to ten faculties at the most active universities and from three to six at the least active universities.

5.3.3 STAFF

Information regarding the number of staff at the participating universities was obtained from their respective university websites, and for anonymity purposes, these number are rounded off to the nearest 100. A clear difference is noted in terms of the average number of staff employed at the most active universities compared to the least active universities. Information on the number of staff could not be obtained for Uni-B and Uni-V, and they were thus excluded when

calculating the average number of staff employed at the least active universities. The average number of staff employed at the most active universities was 3 442.67, ranging from +/-2 400 to +/-5 000. In contrast, at the least active universities, the average number of staff was 737.33, ranging from +/- 100 to +/-1 800. It was found that, on average, the most active universities had 2 705.34 more staff employed than the least active universities.

5.3.4 STUDENTS

Information regarding the number of students registered at the participating universities was also gathered. This information was gathered from the websites of the participating universities or from participants, where it was not available online. Although numbers obtained from participants may not reflect official numbers, and the accuracy thereof questionable, they still provide insights into the numbers of students in general. Based on the numbers gathered, the most active universities have an average of 29 203 students, whereas the least active universities have an average of 15 186. Thus, a difference of 14 017 registered students on average is noted between the most active and least active universities.

Based on the numbers given above the average staff-student ratios were also calculated. The average staff-student ratio at the most active universities is 1:8.48, whereas the average staff-student ratio at the least active universities is 1:20.6.

5.4 SAMPLE (PARTICIPANT) DESCRIPTIONS (UNITS OF OBSERVATION)

In this section, details regarding the units of observation, namely the participants interviewed at each of the participating universities, are provided. The details reported include the positions, gender, and home language of participants. In addition, the date on which the interview was undertaken as well as the duration thereof is summarised in Table 5.5.

Table 5.5: Participants interviewed

University	Position	Gender	Home Language	Date of Interview	Duration of Interview
Uni-A	TM	Male	English	02/02/2021	01:13:20
	SEC/P	Female	English	21/01/2021	01:37:43
	AS	Male	Shona	04/03/2021	00:40:27
	IS	Did not respond			
	TTO	Female	English	09/03/2021	01:46:52
	SE	Female	English	02/02/2021	01:00:11
Uni-B	TM	Female	English	18/10/2020	01:35:49
	SEC/P & TTO	Female	Cholo	01/12/2020 & 24/03/2021	01:07:09 & 00:20:51
	AS	Female	isiXhosa	19/10/2020	00:56:36
	IS	Male	isiXhosa	09/12/2020	02:26:18
	SE	Female	isiXhosa	27/10/2020	
Uni-C	TM	Male	Afrikaans	16/11/2020	01:14:14
	SEC/P	Male	English	27/11/2020 & 11/01/2021	00:46:50 & 00:38:19
	AS	Male	English	01/12/2020	02:42:19
	IS	Male	English	19/11/2020 & 03/12/2020	00:21:45 & 00:55:20
	TTO	Female	English	16/03/2021 & 19/03/2021	00:54:18 & 00:21:29
	SE	Male	English	02/02/2021	00:57:21

Table 5.5: Participants interviewed (cont.)

University	Position	Gender	Home Language	Date of Interview	Duration of Interview
Uni-D	TM	Female	English	28/10/2020	01:10:19
	SEC/P	Female	isiXhosa	16/02/2021	01:39:36
	AS	Male	English	02/03/2021	00:45:50
	IS	Female	isiXhosa	02/12/2020	01:05:45
	TTO	Male	English	29/10/2020 & 05/11/2020	00:52:37 & 00:41:37
	SE	Male	isiZulu	09/03/2021	01:33:55
Uni-V	TM	Did not respond			
	SEC/P	Male	English	08/03/2021	01:34:19
	AS	Female	English	10/02/2021	01:32:10
	IS	Do not have an incubator			
	TTO	Did not respond			
	SE	Male	isiXhosa	12/02/2021	01:04:02
Uni-W	TM	Did not respond			
	SEC/P	Male	isiZulu	04/03/2021	01:52:43
	AS	Male	English	18/02/2021	01:25:01
	IS	Do not have an incubator			
	TTO	Did not respond			
	SE	Male	isiZulu	10/03/2021	00:38:59

Table 5.5: Participants interviewed (cont.)

University	Position	Gender	Home Language	Date of Interview	Duration of Interview
Uni-Y	TM	Male	siSwati	05/02/2021	01:43:35
	SEC/P	Male	English	12/02/2021	01:28:58
	AS	Female	Tsonga	22/03/2021	00:59:32
	IS	Male	isiXhosa	04/02/2021	00:36:41
	TTO	Do not have a TTO			
	SE	Female	siSwati	10/02/2021	01:02:44
Uni-Z	TM	Male	English	14/04/2021	01:50:57
	SEC/P & AS	Male	English	09/03/2021	01:19:45
	IS	Male	isiXhosa	18/03/2021	01:15:38
	TTO	Female	isiXhosa	18/03/2021	01:19:41
	SE	Female	isiXhosa	30/03/2021	01:23:17

Source: Authors own construction

From Table 5.5 it can be seen that 38 interviews were conducted. Thirty were with entrepreneurship support stakeholders occupying various positions at each of the eight participating universities, and eight were with student entrepreneurs. It was not possible to undertake interviews with all stakeholders at each of the eight participating universities for several reasons. Two universities did not have an incubator [Uni-V, Uni-W], and one did not have a TTO [Uni-Y], thus stakeholders occupying positions in these structures could not be interviewed. In addition, five stakeholders invited to participate did not respond. These five participants included one from a most active university [Uni-A-IS] and four from the least active universities [Uni-V-TM, Uni-V-TTO, Uni-W-TM, Uni-W-TTO]. Moreover, two participants responded to interview questions relating to two positions at their respective universities, namely a participant from Uni-B [Uni-B-TTO, Uni-B-SEC/P] and one from Uni-Z [Uni-Z-AS, Uni-Z-SEC/P].

The 38 interviews were conducted between the 18th of October 2020 and the 14th of April 2021, and ranged from 00:36:41 and 02:42:19. Of the 38 participants, 22 were male, and 16 were female. The home language of the participants varied, with the majority (19) speaking English as a home language. Other home languages spoken by the participants include isiXhosa (10), isiZulu (3), siSwati (2), Afrikaans (1), Cholo (1), Shona (1), and Tsonga (1).

As student entrepreneurs are the ultimate beneficiaries of the entrepreneurship support investigated in the current study, further details are provided relating to their backgrounds, experiences, and entrepreneurial endeavours in the sections to follow.

5.5 STUDENT ENTREPRENEURS: BACKGROUNDS, EXPERIENCES AND ENTREPRENEURIAL ENDEAVOURS

In this section, background information on the participating student entrepreneurs and their start-up businesses is provided. In addition, the challenges experienced, perceptions of legitimacy, awareness levels of support offered by universities and external entrepreneurship support are also described.

5.5.1 BIOGRAPHICAL INFORMATION

The biographical information of participating student entrepreneurs, including their personal details and education, as well as their previous work and entrepreneurial experience, is presented in this section.

5.5.1.1 Personal information

Personal information collected from the eight participating student entrepreneurs is summarised in Table 5.6.

Table 5.6: Personal information of student entrepreneurs

	Uni-A-SE	Uni-B-SE	Uni-C-SE	Uni-D-SE	Uni-V-SE	Uni-W-SE	Uni-Y-SE	Uni-Z-SE
Gender	Female	Female	Male	Male	Male	Male	Female	Female
Year of birth	2000	1992	1995	1998	1993	1995	1999	1987
Home language	English	isiXhosa	English	isiZulu	isiXhosa	isiZulu	siSwati	isiXhosa

Source: Interview data

The student entrepreneurs who participated in this study were evenly split in terms of gender at the eight participating universities, namely four males and four females. The most active and the least active universities were also equally represented in terms of gender. Their year of birth ranged from 1987 to 2000, with Uni-Z-SE having the oldest (34 years) and Uni-A-SE having the youngest (21 years) participants. Most (3) of the students spoke isiXhosa as a home language, followed by English (2) and isiZulu (2). One participant [Uni-Y-SE] indicated siSwati as his/her home language.

5.5.1.2 Education

Information regarding the education of participating students is presented below, including the year that they started their current studies, the qualification they are following and in which faculty they are studying. Whether they are full-time or part-time students and at undergraduate or postgraduate level is also presented (see Table 5.7).

The eight participating student entrepreneurs commenced with studying towards their current qualification (certificate/diploma/degree) between the years 2017 and 2021, with most (3) commencing in 2019. As can be seen from the qualifications followed and faculties of study (see Table 5.7), the students are studying in a wide variety of academic disciplines. All eight student entrepreneurs indicated being registered as full-time students at their respective universities, with the majority (6) being at the undergraduate level. Two of the participants were studying Masters degrees at postgraduate level.

Table 5.7: Student entrepreneurs' education

	Uni-A-SE	Uni-B-SE	Uni-C-SE	Uni-D-SE	Uni-V-SE	Uni-W-SE	Uni-Y-SE	Uni-Z-SE
Started studying	2018	2019	2018	2017	2021	2021	2019	2019
Qualifications followed	LLB	National Diploma: Cost and Management Accounting	Bachelor of Medicine and Bachelor of Surgery (MBChB)	Bachelor of Commerce: Law and Politics	Master of Commerce: Economics and Business Management	Master of Commerce: Economics	Bachelor of Science: Geography and Biology	National Diploma: Building
Faculty	Faculty of Law	Faculty of Accounting and Informatics	Faculty of Medicine and Health Sciences	Faculty of Law	Faculty of Management and Commerce	Faculty of Commerce, Administration and Law	Faculty of Agriculture and Natural Sciences	Faculty of Science, Engineering and Technology
Full-time/Part-time	Full-time	Full-time	Full-time	Full-time	Full-time	Full-time	Full-time	Full-time
Undergrad/Postgrad	Undergraduate	Undergraduate	Undergraduate	Undergraduate	Postgraduate (Masters)	Postgraduate (Masters)	Undergraduate	Undergraduate

Source: Interview data

5.5.1.3 Previous work and entrepreneurial experience

Seven of the eight student entrepreneurs indicated having had previous work experience, with participant Uni-Y-SE being the only exception. Of those with previous work experience, five mentioned that it was only part-time, while two explained that their experience was gained from both part-time as well as full-time employment. The work experienced gained by the student participants is evident from the varied responsibilities assigned (see Table 5.8).

Table 5.8: Previous work experience

Participant	Previously Employed (Y/N)	Full-Time / Part-Time	Responsibilities
Uni-A-SE	Y	Part-time	Handling social media, communicating with customers or clients, or just general inquiries that customers might have.
Uni-B-SE	Y	Part-time	Waitering
Uni-C-SE	Y	Part-time	Manage the over-the-counter desk at a pharmacy. I also do a little bit of a side hustle being a ghostwriter.
Uni-D-SE	Y	Part-time	Coached a number of sporting codes such as tennis, hockey and cricket at a college. I also did some waitering and bartending work.
Uni-V-SE	Y	Part-time and Full-time	Was a part-time retail packer. Now a full-time marketing specialist in corporate marketing focusing on relationship management and stakeholder management.
Uni-W-SE	Y	Part-time	Part-time banker responsible for monitoring and compliance of the company in terms of environmental, social and corporate governance.
Uni-Y-SE	N	N/A	N/A
Uni-Z-SE	Y	Part-time and Full-time	Worked at three businesses, a retail shoe store, an income tax company, a web designing company (web-hosting), a mining engineering company (IT), and a civil engineering company (marketing).

Source: Interview data

Only three of the participants [Uni-D-SE, Uni-V-SE, Uni-Z-SE] indicated that they had previously established and operated their own businesses. These businesses were either no longer in existence, or the participants were no longer involved in them.

5.5.2 BACKGROUND INFORMATION ON CURRENT BUSINESS START-UP

In this section, general information on the participating student entrepreneurs' start-up businesses is presented (see Table 5.9). This information includes the year in which the business was established, and the year of studies the participants were in when they established the business. Moreover, information regarding the business offerings, funding sources, monthly revenues and future plans are described.

The eight student start-ups were established between 2016 [Uni-B-SE] and 2020 [Uni-Y-SE], with most (three) being established in 2017. At the time of establishing their student start-ups, four participants were in their first year, while the others were in later years of study. One participant [Uni-Z-SE] indicated not studying at the time of establishing the business. The student start-ups operate in various sectors (see Table 5.9) and are (were) primarily self-funded. Only one student indicated obtaining funding from his/her parents. Other sources of funding include competitions, NYDA, University awards, grants and the Alan Gray Orbis Foundation.

The monthly revenue of the student start-ups ranged from R4 500 per month [Uni-V-SE] to R80 000 per month [Uni-D-SE]. However, the R80 000 per month declared by participant Uni-D-SE is an outlier, as the second-highest monthly revenue is only R30 000 per month [Uni-B-SE]. It was explained that *“the margins are still a little bit very tight”* [Uni-D-SE], with only a third of the R80 000 revenue being profit. Two participants [Uni-A-SE, Uni-C-SE] indicated that they had to date not yet generated revenue from their start-ups. Participant Uni-A-SE explained that *“the business is not up and running yet”*, while participant Uni-C-SE is *“still completing beta testing”*. All eight student entrepreneurs indicated that they had future expansion plans for their businesses and were planning to continue as entrepreneurs.

Table 5.9: Background of student entrepreneurship businesses

	Uni-A-SE	Uni-B-SE	Uni-C-SE	Uni-D-SE	Uni-V-SE	Uni-W-SE	Uni-Y-SE	Uni-Z-SE
Year established	2018	2016	2018	2017	2017	2019	2020	2017
Year of studies when established	First-year	First-year	First-year	First-year	Fourth-year	Third-year	Second-year	N/A
Sector	Information management	Décor and catering	Tech/ healthcare	Travel	Education	Photography and videography	Agriculture	Manufacturing
Where they got funding	• Self-funded	• Self-funded • Competitions • NYDA • University awards	• Competitions	• Self-funded • Competitions • Grants • Alan Gray Orbis Foundation	• Self-funded	• Self-funded	• Self-funded • Parents	• Self-funded
Monthly revenue	N/A	R30 000 p/m	N/A	R80 000 p/m	R4 500 p/m	R8 000 p/m	R12 000 p/m	R180 000 p/a (approx. R15 000 p/m)
Hoping to expand in the future	Y	Y	Y	Y	Y	Y	Y	Y
Plans to continue as an entrepreneur	Y	Y	Y	Y	Y	Y	Y	Y

Source: Interview data

5.5.3 CHALLENGES EXPERIENCED BY STUDENT ENTREPRENEURS

During the interview process, the student entrepreneurs were asked to indicate the various challenges they have and currently still do face in their student entrepreneurial endeavours at the participating universities. A list of challenges commonly experienced by entrepreneurs was presented to them and they were requested to indicate the severity of each challenge experienced on a Likert-type scale ranging from one (not a challenge) to seven (extreme challenge). The findings relating to the challenges experienced are divided into two sections: challenges during establishment (denoted as Est) and current challenges (denoted as Cc) (see Table 5.10) and are discussed under two headings: challenges experienced in most active versus least active universities and challenges experienced during establishment versus currently.

Table 5.10: Severity of challenges experienced

	Uni-A-SE		Uni-B-SE		Uni-C-SE		Uni-D-SE		Uni-V-SE		Uni-W-SE		Uni-Y-SE		Uni-Z-SE	
	Est	Cc	Est	Cc	Est	Cc	Est	Cc	Est	Cc	Est	Cc	Est	Cc	Est	Cc
Lack of entrepreneurial knowledge	7	5	5	4	6	4	4	4	4	2	1	1	6	4	1	1
Lack of finance	5	4	6	4	5	4	3	5	6	6	7	4	6	6	1	4
Problems relating to employees	7	1	5	4	2	2	1	3	2	2	1	3	1	1	2	4
Fear of failure	3	7	4	3	5	4	2	1	1	1	1	1	7	5	1	1
Repaying school/university loans	1	1	7	2	1	1	2	1	1	1	1	1	1	1	4	4
Lack of collateral	5	7	5	4	5	5	5	4	7	5	1	1	3	2	7	7
Lack of contacts/network	6	4	6	3	6	2	6	4	7	3	1	1	7	3	1	1
Irregular income	6	3	7	4	1	1	7	6	5	2	1	1	5	5	3	3
Working long hours	1	6	7	6	2	2	5	7	3	1	7	7	4	4	3	6
Lack of information about how to start a business	7	4	6	2	7	3	2	1	6	2	1	1	5	3	1	1
Lack of information about government support	7	7	7	2	1	1	5	5	3	3	1	1	7	7	1	1
Lack of practical business experience	7	5	5	3	3	3	5	3	5	3	1	1	6	4	1	1
Lack of self-confidence	7	5	7	4	1	1	2	1	1	1	1	1	7	3	1	1
Lack of business ideas	7	6	6	2	2	2	1	1	1	1	1	1	1	1	1	1
Unable to access the market	7	4	6	4	5	2	6	5	1	1	1	1	6	2	2	2
Compliance with statutory requirements	1	1	5	3	2	5	5	3	4	3	1	1	1	1	1	1
Lack of legal aid/counselling	1	1	7	5	6	3	7	6	1	1	1	1	7	7	3	5
Lack of encouragement from people around me	6	2	7	4	1	1	2	2	6	2	7	1	5	3	2	2

Source: Interview data

5.5.3.1 Challenges experienced in most active versus least active universities

From the findings presented in Table 5.10, it can be seen that the type of challenges experienced by the student entrepreneurs at the most active universities differs from those experienced at the least active universities. The challenges that were indicated more by student entrepreneurs at most active universities as extremely challenging (≥ 6 ; shaded orange) during the establishment of their businesses included lack of entrepreneurial knowledge, problems relating to employees, repaying school/university loans, lack of contacts/network, irregular income, lack of information about how to start a business, lack of information about government support, lack of self-confidence, lack of business ideas, unable to access the market, and lack of legal aid/counselling. In contrast, the challenges experienced more by students at the least active universities as extremely challenging (≥ 6 ; shaded orange) included lack of finance, fear of failure, and lack of collateral.

Moreover, differences were also noted in terms of challenges currently being experienced in their student start-ups. Current challenges indicated more by student entrepreneurs at most active universities as extremely challenging (≥ 6 ; shaded green) include fear of failure, lack of collateral, irregular income, working long hours, and lack of business ideas. In contrast, only one current challenge was indicated as extremely challenging (≥ 6 ; shaded green) by more student entrepreneurs at the least active than at the most active universities, namely, a lack of finance.

5.5.3.2 Challenges experienced during establishment versus currently

The findings presented in Table 5.10 were further analysed to provide insights into how many of the participants were experiencing the particular challenges as extreme challenges and how many were not (see Table 5.11). For reporting purposes, a challenge is regarded as an extreme challenge when the majority (four or more) of participants indicated a six or seven on the Likert-type scale, while a two and a one indicated it as being little or no challenge.

Table 5.11: Student entrepreneurship challenges

Key: * = number of participants who indicated higher or lower than given rating; ** = Number of participants who indicated the specific rating																		
	Challenge during establishment									Current challenge								
	7	6	*>5	5	4	3	3>*	2	1	7	6	*>5	5	4	3	3>*	2	1
Lack of entrepreneurial knowledge	1**	2	3	1	2	0	2	0	2	0	0	0	1	4	0	3	1	2
Lack of finance	1	3	4	2	0	1	1	0	1	0	2	2	1	5	0	0	0	0
Problems relating to employees	1	0	1	1	0	0	6	3	3	0	0	0	0	2	2	4	2	2
Fear of failure	1	0	1	1	1	1	4	1	3	1	0	1	1	1	1	4	0	4
Repaying school/university loans	1	0	1	0	1	0	6	1	5	0	0	0	0	1	0	7	1	6
Lack of collateral	2	0	2	4	0	1	1	0	1	2	0	2	2	2	0	2	1	1
Lack of contacts/network	2	4	6	0	0	0	2	0	2	0	0	0	0	2	3	3	1	2
Irregular income	2	1	3	2	0	1	2	0	2	0	1	1	1	1	2	3	1	2
Working long hours	2	0	2	1	1	2	2	1	1	2	3	5	0	1	0	2	1	1
Lack of information about how to start a business	2	2	4	1	0	0	3	1	2	0	0	0	0	1	2	5	2	3
Lack of information about government support	3	0	3	1	0	1	3	0	3	2	0	2	1	0	1	4	1	3
Lack of practical business experience	1	1	2	3	0	1	2	0	2	0	0	0	1	1	4	2	0	2
Lack of self-confidence	3	0	3	0	0	0	5	1	4	0	0	0	1	1	1	5	0	5
Lack of business ideas	1	1	2	0	0	0	6	1	5	0	1	1	0	0	0	7	2	5
Unable to access the market	1	3	4	1	0	0	3	1	2	0	0	0	1	2	0	5	3	2
Compliance with statutory requirements	0	0	0	2	1	0	5	1	4	0	0	0	1	0	3	4	0	4
Lack of legal aid/counselling	3	1	4	0	0	1	3	0	3	1	1	2	2	0	1	3	0	3
Lack of encouragement from people around me	2	2	4	1	0	0	3	2	1	0	0	0	0	1	1	6	4	2

Source: Interview data

As can be seen from Table 5.11, extreme challenges experienced whilst establishing their student start-ups by most (4 or more participants indicated 6 or 7; shaded orange) participating student entrepreneurs included:

- Lack of contacts/network (6);
- Lack of finance (4);
- Lack of information about how to start a business (4);
- Unable to access the market (4);
- Lack of legal aid/counselling (4); and
- Lack of encouragement from people around me (4).

In contrast, the establishment challenges experienced as least challenging (4 or more participants indicated 2 or 1; shaded green) by most of the student entrepreneurs included:

- Problems relating to employees (6);
- Repaying school/loans (6);
- Lack of business ideas (6);
- Lack of self-confidence (5);
- Compliance with statutory requirements (5); and
- Fear of failure (4).

As can be seen from the findings in Table 5.11, only one challenge was currently experienced as extremely challenging (4 or more participants indicated 6 or 7; shaded orange) by most of the student participants, namely that of working long hours. However, ten others were described by most as being of little or no challenge (4 or more participants indicated 2 or 1; shaded green) while currently operating their student businesses, namely:

- Repaying school/university loans (7);
- Lack of business ideas (7);
- Lack of encouragement from people around me (6);
- Lack of information about how to start a business (5);
- Lack of self-confidence (5);
- Unable to access the market (5);

- Problems relating to employees (4);
- Fear of failure (4);
- Lack of information about government support (4); and
- Compliance with statutory requirements (4).

These findings show that three of the challenges that were experienced by most as extreme challenges during the process of establishing their businesses are currently experienced as little or no challenge. These challenges include a lack of information about how to start a business, unable to access the market, and a lack of encouragement from people around them. The inability to access markets was associated with the lack of information by participant Uni-C-SE.

With regard to the lack of information on how to start a business no longer being a challenge, participant Uni-C-SE explained:

“I think it is just like, involving yourself within the realm and speaking to people who have a business. You hear from people how they started a business. How they got the people who are involved in the business now, how they connect with them. How they got funding and all those types of things. It is just like everything, the more hours you put into it, the more comfortable you find yourself in it.” [Uni-C-SE].

Several explanations for the lack of encouragement from people around them during the process of establishing their businesses and why they have become more encouraging were given by participants. Initially, people around them were “*sceptical*” [Uni-A-SE] and “*did not believe in me [student entrepreneurs]*” [Uni-B-SE, Uni-Y-SE]. Participant Uni-W-SE explained how the mind-sets of those around him are not supportive of entrepreneurship:

“Our parents, family and friend do not believe that entrepreneurship is the way. They still believe that someone must complete a degree and go and work. They are thinking in business, they are thinking, you are just asking for failure.” [Uni-W-SE].

Participant Uni-V-SE pointed out that people around him/her only became encouraging when he/she “*started making some money*”, which was described as “*when you need it [encouragement] the least*”. Participant Uni-A-SE claimed not to have waited for those around him/her to become supportive and encouraging, but “*I basically surrounded myself with more supportive people*”. Support and encouragement also followed when they “*saw me doing it practically*” [Uni-B-SE] and “*offering something better to them*” [Uni-Y-SE].

5.5.4 PERCEIVED LEGITIMACY OF STUDENT ENTREPRENEURS

Student participants were also requested to indicate their level of agreement on whether certain groups perceive student entrepreneurs to be legitimate (serious) entrepreneurs. These groups consisted of the university community, the business community, and the community in general (family, friends, consumers and peers). Their extent of agreement was recorded using a Likert-type scale ranging from one (strongly disagree) to seven (strongly agree). These findings are presented in Table 5.12.

Table 5.12: Student entrepreneurship perceived legitimacy

	Uni-A-SE	Uni-B-SE	Uni-C-SE	Uni-D-SE	Uni-V-SE	Uni-W-SE	Uni-Y-SE	Uni-Z-SE
University community	7	5	5	2	2	7	2	4
Business community	6	6	4	4	5	4	2	4
Community in general	5	5	6	4	3	4	5	6

Source: Interview data

The majority (five) of the participants agreed (≥ 4) that their respective universities perceive student entrepreneurs as legitimate. Three of these students were from the most active universities [Uni-A-SE, Uni-B-SE, Uni-C-SE] and two were from the least active universities [Uni-W-SE, Uni-Z-SE]. Participant Uni-A-SE and Uni-B-SE made reference to their Centre for Entrepreneurship to justify that their universities perceived student entrepreneurs as legitimate, while participant Uni-C-SE made reference to the competitions held. Participant Uni-W-SE claimed that “*...there are so many events happening around student entrepreneurship, pushing for it*”. Three of the participants [Uni-D-SE, Uni-V-SE, Uni-Y-SE] disagreed that their respective universities perceived student entrepreneurs as legitimate because “*it is a theoretical thing, but in practice that is not what you see on the ground, there is a lot of red tape*”.

bureaucracy” [Uni-D-SE]. Participant Uni-V-SE explained that at Uni-V “*there is no support for entrepreneurs*”. Student entrepreneurs are also “*not allowed to sell their products on university grounds*” [Uni-Y-SE].

In terms of whether the business community perceive student entrepreneurs as legitimate, seven of the eight participants agreed (≥ 4). These included all four student entrepreneurs from the most active universities and three from the least active universities [Uni-V-SE, Uni-W-SE, Uni-Z-SE]. Participant Uni-B-SE claimed that “*...investors and banks are prone to supporting student entrepreneurs*”. Participant Uni-D-SE also noted that investors, banks and suppliers are supportive, as they “*...got a partnership with an airline, which is not something that happens every day*”. When referring to the business community, the majority of the participants referred to financial institutions such as banks, as explained by participant Uni-V-SE,

“Financial institutions really love to see young entrepreneurs in vibrant, especially in [location]. It is really a surreal experience, the excitement they get when they see a young person who is also a student who is doing something real. You know they always there to support. So, banks are really surprisingly supportive.” [Uni-V-SE]

Participant Uni-Y-SE was the only participant who indicated that the business community did not perceive student entrepreneurs as legitimate. “*They see us as young people, we are not serious about what we are doing, I feel like they fear losing their money*” [Uni-Y-SE].

Seven participants indicated that the community in general perceive student entrepreneurs to be legitimate (≥ 4). These include all four student entrepreneurs from the most active universities and three from the least active universities [Uni-W-SE, Uni-Y-SE, Uni-Z-SE]. Participant Uni-Y-SE explained the following,

“Our friends, family and community, they kind of have hope in us that we will, in doing these businesses, we will make a change. So, they have faith, and they have hope that we will make it at some point.” [Uni-Y-SE]

Participant Uni-V-SE, however, indicated that the community, in general, did not perceive student entrepreneurs as legitimate. This participant mentioned,

“Consumers, I would say yes, but everyone else no. Everyone thinks you are just trying to run away from school.” [Uni-V-SE]

5.5.5 AWARENESS OF UNIVERSITY ENTREPRENEURSHIP SUPPORT

This section presents the findings regarding student awareness of entrepreneurship support activities being offered at the participating universities. The student entrepreneurs were presented with a list of possible entrepreneurship support activities and asked to indicate which are offered by their respective universities (see Table 5.13).

Table 5.13: Entrepreneurship support at the participating universities

	Uni-A-SE	Uni-B-SE	Uni-C-SE	Uni-D-SE	Uni-V-SE	Uni-W-SE	Uni-Y-SE	Uni-Z-SE
Entrepreneurship education	U	Y	Y	Y	Y	Y	Y	Y
Entrepreneurship centre	Y	Y	Y	N	N	N	U	U
A technology transfer office	U	Y	Y	N	N	N	U	Y
An incubator/accelerator (program)	Y	Y	Y	N	N	N	U	U
A university venture fund	U	N	U	U	N	N	U	N
Provision of material support: Office and workspace	Y	Y	N	N	N	N	N	Y
Provision of material support: Meeting facilities	Y	Y	Y	Y	N	Y	Y	Y
Provision of material support: Start-up capital, seed-funding	N	Y	Y	Y	N	Y	N	N
Business plan competition	N	Y	U	N	N	N	Y	N
Pitching competition	Y	Y	Y	Y	N	N	Y	Y
Mentorship	Y	Y	N	U	N	N	U	Y
Networking events	N	Y	U	Y	N	N	N	N
Entrepreneurship bootcamps	N	N	N	U	N	N	U	N
Individual counselling, advice, coaching	Y	Y	N	N	N	N	N	Y
Co-curricular seminars/workshops	Y	Y	Y	N	Y	Y	U	Y
A student entrepreneurship support organisation/society	Y	Y	N	U	N	N	Y	Y
A student entrepreneurship policy	U	Y	N	N	N	N	U	N
A student entrepreneurship week	Y	Y	Y	Y	N	Y	U	U
An entrepreneurship intervarsity competition	Y	N	Y	Y	N	Y	Y	Y

Source: Interview data

According to the findings presented in Table 5.13, participating students from most active universities identified on average 11 (44/4) student entrepreneurship support activities being offered at their universities in comparison to an average of 6 (24/4) at the least active universities. The most “yes” responses were reported by the participant from Uni-B (most active) and the least by the participant from Uni-V (least active).

The entrepreneurship support activities highlighted by the majority of student participants as being offered by their respective universities includes entrepreneurship education, provision of material support: meeting facilities, pitching competitions, co-curricular seminars/workshops, and an entrepreneurship intervarsity competition. These supports were identified as being offered by six or more of the participating universities. The support that was offered by the least number of universities includes a university venture fund, provision of material support: office and workspace, business plan competitions, networking events, entrepreneurship boot camps, individual counselling, advice, and coaching, and a student entrepreneurship policy. For these supports, only three or fewer participating student entrepreneurs indicated a yes.

Several student entrepreneurs (3 from most active, 2 from least active) also indicated being unsure as to whether their universities offered certain support or not. The student entrepreneur who indicated the most ‘unsure’ responses (9 out of 19) was Uni-Y-SE from Uni-Y, a least active university.

5.5.6 EXTERNAL ENTREPRENEURSHIP SUPPORT

Information was also gathered from the participating student entrepreneurs on whether they had received any support external to the university during the process of establishing their current businesses, as well as to whether they were currently receiving any support. These findings are presented in Table 5.14.

Table 5.14: External entrepreneurship support received

	Uni-A-SE	Uni-B-SE	Uni-C-SE	Uni-D-SE	Uni-V-SE	Uni-W-SE	Uni-Y-SE	Uni-Z-SE
External support in establishing the business	N	Y	Y	Y	N	N	N	Y
Currently receiving external support	N	N	N	Y	N	N	N	N

Source: Interview data

Four of the student entrepreneurs mentioned receiving external support during the process of establishing their businesses. Three were from the most active universities [Uni-B-SE, Uni-C-SE, Uni-D-SE] and one from a least active university [Uni-Z-SE]. The support received varied among them and included:

- Monetary support from NYDA [Uni-B-SE];
- Mentoring and networking sessions from EDHE [Uni-C-SE];
- Business plan development support from the French South African Technology Laboratory [Uni-D-SE];
- Co-working spaces at the Alan Grey Orbis Foundation [Uni-D-SE];
- Monetary support from the Alan Grey Orbis Foundation [Uni-D-SE]; and
- Skills development opportunities from OR Tambo Municipality [Uni-Z-SE].

The four participants who did not receive any external support during the process of establishing their businesses indicated that this was primarily due to a lack of awareness and a lack of access to this external support. Participant Uni-Y-SE explained:

“I have been struggling to find assistance with regards to the businesses. So, I do not have the right contacts. I do not know which doors to knock on for assistance and help.” [Uni-Y-SE]

Only one participant [Uni-D-SE] from a most active university indicated that external support was currently being received, while the other seven indicated they were not. However, one participant [Uni-B-SE] was in the process of obtaining funding from SEDA at the time of the interview.

Student participants also provided information on whether they perceived the government and the business community as supportive of student entrepreneurship (see Table 5.15).

Table 5.15: Perceived external student entrepreneurship environment

	Uni-A-SE	Uni-B-SE	Uni-C-SE	Uni-D-SE	Uni-V-SE	Uni-W-SE	Uni-Y-SE	Uni-Z-SE
Does the government support student entrepreneurs	Y	Y	Y	Y	N	N	Y	Y
Does the business community support student entrepreneurs	N	Y	Y	N	Y	N	N	N

Source: Interview data

All four of the participants at the most active universities perceived the government to be supportive of student entrepreneurs, while only two from the least active universities perceived this to be the case [Uni-Y-SE, Uni-Z-SE]. To justify their responses, names of government organisations/initiatives were put forward, including the EDHE [Uni-A-SE, Uni-C-SE], NYDA [Uni-D-SE, Uni-Z-SE], and SEDA [Uni-D-SE, Uni-Z-SE]. Participant Uni-C-SE praised the EDHE by asserting:

“This initiative in my experience was perfect. Like they are amazing people. You can tell that they are very student-focused, which is great because you do not want people there with ulterior motives.” [Uni-C-SE]

Nevertheless, these participants did point out that the initiatives of government were ineffective and in need of improvement. They explained:

“There is a whole lot of challenges when it comes to the governments. There are insufficient funds for certain programmes that are meant for certain things. There is bureaucracy, inefficiencies, challenges, the whole nine yards when it comes to government and our government particularly.” [Uni-D-SE]

“It is a headache. Dealing with them, you have to phone, you know it’s like you have to beg, have to be persistent. It is exhausting.” [Uni-Z-SE]

Participants [Uni-V-SE, Uni-W-SE] who perceived the government as not being supportive claimed that *“there is no continued support, there is no capacity building”* [Uni-V-SE]. Participant Uni-W-SE mentioned that there are many student entrepreneurs, and the government should be *“asking students to put their businesses on a database so that they can use them, but they are not”*.

Only three student participants perceived the business community as being supportive of student entrepreneurs, two were from the most active universities [Uni-B-SE, Uni-C-SE] and one from a least active university [Uni-V-SE]. Participant Uni-B-SE referred to entrepreneurship competitions hosted by the business community, explaining that there are *“competitions, and if you did well then they give you money that you do not have to pay back”*. Participant Uni-C-SE also referred to monetary support; however, further claimed that *“...it was at the cost of investment, and they would want a portion of your business”*. To justify their response these participants made reference to the various types of support offered by the business community to support student entrepreneurs, including competitions, *“money that you do not have to pay back”* [Uni-D-SE], *“monetary support [...] but they would want a portion of your business”* [Uni-C-SE]. Other support from the business community includes *“financial literacy workshops to students, sponsorships and food and lunch packs for events”* [Uni-V-SE].

The other five participants, two from the most active universities [Uni-A-SE, Uni-D-SE] and three from the least active universities [Uni-W-SE, Uni-Y-SE, Uni-Z-SE], did not have the same perception and indicated that the business community was not supportive of student entrepreneurship. Both participants Uni-D-SE and Uni-W-SE explained that there is *“no*

support that is focused primarily on student entrepreneurship coming from the business community". Participant Uni-Y-SE speculated that the reason for not providing support to student entrepreneurs is that the business community "*fear losing their investment on a business that they are unsure of*". Participant Uni-D-SE did, however, assert the following:

"They [the business community] are more focused on you if your business has legs to stand on, is this something they can kind of take a risk on and from a purely financial point of view and not necessarily from who is this person, is he or she a student." [Uni-D-SE]

5.6 SUMMARY

Chapter Five was the first of several chapters in which the empirical findings of this study are presented. Firstly, the finding relating to the ranking of the 26 public universities in South Africa in terms of entrepreneurship support was presented. Thereafter, the eight universities selected to serve as cases for further investigation, as well as the individuals that were interviewed, were briefly introduced and described. Finally, the backgrounds, experiences and entrepreneurial endeavours of the participating student entrepreneurs were elaborated on.

In Chapter Six that follows the findings related to the university environment and culture as well as the co-curricular entrepreneurship support activities being offered by the participating universities is presented.

CHAPTER SIX

EMPIRICAL FINDINGS: UNIVERSITY ENVIRONMENT AND CULTURE AND CO-CURRICULAR SUPPORT ACTIVITIES

6.1 INTRODUCTION

In the previous chapter, the universities serving as cases in the current study and the various participants interviewed were introduced. The conceptual framework proposed for the current study describes a university-based student entrepreneurship support ecosystem in terms of two environments: the internal entrepreneurship environment and the external entrepreneurship environment (see Figure 3.1). The empirical findings pertaining to these two environments are presented in chapters Six to Eight.

In this chapter (Chapter Six), the findings relating to two elements of the internal entrepreneurship environment will be presented, namely the university environment and culture and the various co-curricular entrepreneurship support activities offered. The findings pertaining to these two elements are presented first and together as they provide a broad overview of how entrepreneurship is perceived, and the support offered in the context of this study.

6.2 UNIVERSITY ENVIRONMENT AND CULTURE

In this section, the findings relating to the university environment and culture in terms of supporting student entrepreneurship are presented. The design elements of Good *et al.* (2018), namely purpose, activities, structure and people, are used to structure the presentation. The information for this section was sourced from participants whom the current researcher experienced as most knowledgeable on student entrepreneurship at their respective universities, namely seven student entrepreneurship champions/promoters [Uni-A-SEC/P, Uni-B-SEC/P, Uni-C-SEC/P, Uni-D-SEC/P, Uni-V-SEC/P, Uni-W-SEC/P, Uni-Y-SEC/P] and one incubator staff member [Uni-Z-IS]. Responses from other participants were used to validate responses where necessary.

6.2.1 HISTORY AND PURPOSE

In general, the participants did not know exactly when their respective universities started supporting entrepreneurship among students, but did have some idea as to those involved, namely:

- Faculty members [Uni-A, Uni-W, Uni-Y, Uni-Z];
- University management [Uni-A, Uni-C, Uni-D];
- Regional parties/government: EDHE [Uni-B, Uni-W, Uni-Y]; SEDA [Uni-B, Uni-Z];
- Industry actors [Uni-D];
- Student societies [Uni-V].

Although information about the history of supporting entrepreneurship among students at their universities was limited, the eight participants were most informative in terms of the perceived and actual current situation. Information was gathered from them in terms of whether they perceived entrepreneurship to be embedded in the mission (as reflected in the mission statement) of their respective universities. Four participants did, one from a most active university [Uni-B-SEC/P] and three from least active universities [Uni-V-SEC/P, Uni-Y-SEC/P, Uni-Z-IS]. Moreover, participants from the other four universities did not, three from the most active [Uni-A-SEC/P, Uni-C-SEC/P, Uni-D-SE] and one from a least active university [Uni-W-SEC/P]. Participant Uni-D-SEC/P did, however, explain that “*entrepreneurship is not explicitly embedded in the mission statement, but we do so much in entrepreneurship*”.

To obtain greater clarity on the actual focus of each university’s mission, participants were requested to indicate on a Likert-type scale, ranging from one (strongly disagree) to seven (strongly agree), what they perceived their university’s mission to be focusing on. Their perception was gauged in terms of several statements describing a university’s mission in general (Huyghe & Knockaert, 2015:147). These findings are presented in Table 6.1.

Table 6.1: Focus of university missions

	Uni-A-SEC/P	Uni-B-SEC/P	Uni-C-SEC/P	Uni-D-SEC/P	Most Active Averages	Uni-V-SEC/P	Uni-W-SEC/P	Uni-Y-SEC/P	Uni-Z-IS	Least Active Averages	Total Averages
Generating jobseekers	7	7	3	5	5.5	5	5	4	7	5.25	5.38
Publishing papers with practical implications	-	7	5	7	6.33	6	3	6	6	5.25	5.71
Knowledge transfer (patents, licenses, spin-offs)	5	7	6	7	6.25	5	3	5	2	3.75	5
Contributing to regional and social development	7	7	6	5	6.25	7	4	7	6	6	6.13
Promoting an entrepreneurial culture	3	7	6	5	5.25	5	5	6	6	5.5	5.38
Generating entrepreneurs	3	7	5	5	5	5	4	6	6	5.25	5.13
Publishing scientific, peer-reviewed papers	7	7	6	7	6.75	7	4	6	7	6	6.38
Academic excellence (research and teaching)	6	7	6	7	6.5	7	5	7	7	6.5	6.5
Consulting and contract research with industry	6	7	5	5	5.75	6	3	5	2	4	4.88
Supporting students to become entrepreneurs	5	7	6	5	5.75	6	4	6	6	5.5	5.63

Source: Interview data

Based on the average responses of the eight participants from who this data was sourced (see Table 6.1), the primary focus (mission) of the participating universities is on academic excellence (research and teaching). An average of 6.5 was reported on the 7-point Likert scale. Five of the participants [Uni-B-SEC/P, Uni-D-SEC/P, Uni-V-SEC/P, Uni-Y-SEC/P, Uni-Z-SEC/P] indicated a seven (strongly agree) on the Likert scale, with the lowest (5) indicated by participant Uni-W-SEC/P. Academic excellence (research and teaching) as the primary focus was followed by publishing scientific peer-reviewed papers (average = 6.38) and contributing to regional and social development (average = 6.13), among all eight universities.

The findings also indicate a difference in focus between the most active and least active universities. The primary focus of the most active universities is on publishing scientific peer-reviewed papers (average = 6.75), followed by academic excellence (research and teaching) (average = 6.5), knowledge transfer (patents, licenses, spin-offs) (average = 6.25), and contributing to regional and social development (average = 6). According to the averages provided in Table 6.1, the area least focused on by the four most active universities is generating entrepreneurs (average = 5).

In terms of the least active universities, academic excellence (research and teaching) (average = 6.5) was found to be the primary focus, followed by publishing scientific peer-reviewed papers (average = 6) and contributing to regional and social development (average = 6). This was followed by promoting an entrepreneurial culture and supporting students to become entrepreneurs, which both scored 5.5. Knowledge transfer (patents, licenses, spin-offs) was found to be the least focused on area by the least active universities (average = 3.75).

By indicating on a 7-point Likert-type scale (ranging from not important at all to extremely important), participants were also requested to gauge how important they perceived entrepreneurship to be at their respective universities (see Table 6.2).

Table 6.2: Perceived importance of entrepreneurship

	Uni-A-SEC/P	Uni-B-SEC/P	Uni-C-SEC/P	Uni-D-SEC/P	Uni-V-SEC/P	Uni-W-SEC/P	Uni-Y-SEC/P	Uni-Z-IS
Perceived importance	4	7	5	5	7	3	6	7

Source: Interview data

Only three participants perceived entrepreneurship to be extremely important at their respective universities, one from a most active university [Uni-B-SEC/P] and two from least active universities [Uni-V-SEC/P, Uni-Z-IS]. Participant Uni-B-SEC/P referred to the various entrepreneurship centres and their entrepreneurship desks to justify their ‘extremely important’ response. Participant Uni-B-SEC/P further explained that “[University] regards student entrepreneurship as an important aspect because they could see that it was something that could make them unique; they do not want to be the same as any other university”. Participant Uni-V-SEC/P considered student entrepreneurship as extremely important at their university because:

“They [students] think that they can obtain a degree and after that they are getting employed, but looking at what is happening in the world, [...] realize it is no longer guaranteed that once you have your official qualification, you will be employed. So, it is important for every student to actually get entrepreneurial knowledge and also apply basic entrepreneurial skills.” [Uni-V-SEC/P]

Participant Uni-W-SEC/P did not agree (indicating a 3) that entrepreneurship was important at his/her university (Uni-W; least active). Participant Uni-W-SEC/P explained, “I feel that entrepreneurship is very important because of the high unemployment rate [...], if they graduate with their businesses, the employment creators rather than job seekers, they even create employment for their peers”. However, “management and the policies are still not allowing students to become entrepreneurs and the problems [experienced by] students to become entrepreneurs are not much supported by the university or management” [Uni-W-SE].

Participants were also asked to indicate whether they perceive their universities to support entrepreneurship among students. They indicated their level of agreement on a 7-point Likert-type scale ranging from one (strongly disagree) to seven (strongly agree) (see Table 6.3).

Table 6.3: Perceived university support of student entrepreneurship

	Uni-A-SEC/P	Uni-B-SEC/P	Uni-C-SEC/P	Uni-D-SEC/P	Uni-V-SEC/P	Uni-W-SEC/P	Uni-Y-SEC/P	Uni-Z-IS
Perceived university support	4	7	6	5	5	3	7	5

Source: Interview data

As can be seen from the findings presented in Table 6.3, the majority of participants agree (>4), that their university supports entrepreneurship among students, including the three most active universities [Uni-B, Uni-C, Uni-D] and the three least active universities [Uni-V, Uni-Y, Uni-Z]. The participants from Uni A (most active university) and Uni-W (least active university) did not agree. Participant Uni-A-SEC/P claimed that the lack of support given to student entrepreneurship at Uni-A is due to the lack of top management commitment and a lack of funding, as well as a lack of faculty and student interest. Participant Uni-W-SEC/P also noted the lack of top management support and a lack of funding, as well as a lack of faculty interest, as reasons for his/her response. These two participants highlighted the implications of not supporting entrepreneurship:

“Students who are there [at university] will lack the entrepreneurial mindset. They will graduate without or with very little of that entrepreneurial mindset embedded in them. So, it is the quality of the graduate that leaves the university in relation to the need in the world, it is inadequate.” [Uni-A-SEC/P]

“Students will only become job seekers rather than employment creators. Student entrepreneurs rapidly increase the amount of people contributing to our GDP, so it will negatively impact our GDP. Even the employment sector is losing, because a graduate who is an entrepreneur is far more competitive at work than a graduate who just got a degree and was not part of an entrepreneurial programme. Entrepreneurial programmes are not only helping student to start their businesses, but also allows for skills transfer.” [Uni-W-SEC/P]

Using a 7-point Likert-type scale, ranging from one (not a reason) to seven (main reason), participants were requested to indicate to what extent several reasons posed were why their university supports student entrepreneurship. Their responses are presented in Table 6.4.

Table 6.4: University reasons for supporting student entrepreneurship

	Uni-A-SEC/P	Uni-B-SEC/P	Uni-C-SEC/P	Uni-D-SEC/P	Most Active Averages	Uni-V-SEC/P	Uni-W-SEC/P	Uni-Y-SEC/P	Uni-Z-IS	Least Active Averages	Total Averages
To provide revenues for the university	2	1	4	4	2.75	1	1	2	1	1.25	2
To make the university more attractive to current or prospective students	1	7	5	5	4.5	5	5	5	1	4	4.25
To enhance the local/regional economic development	5	7	5	4	5.25	6	5	5	5	5.25	5.25
To decrease youth unemployment	7	7	5	4	5.75	7	5	6	6	6	5.875
Other:	1	-	-	1	-	-	-	1	-	-	-

Source: Interview data

All the participants indicated (see Table 6.4) that the reasons why their university supports student entrepreneurship are firstly, to decrease youth unemployment, and then to enhance local/regional economic development, and to make their universities more attractive to current or prospective students. The most unlikely reason indicated by all the participants is that of providing revenues for the university. Other reasons highlighted for supporting student entrepreneurship include “to encourage entrepreneurial thinking” [Uni-A-SEC/P], and to encourage “an alternative to graduating and going to a corporate” [Uni-D-SEC/P]. Participant Uni-Y-SEC/P, specifically noted:

“It is the responsibility of the university to ensure that students do not only leave with certificates but can also make a contribution to society.” [Uni-Y-SEC/P]

Despite the majority of participants agreeing (>4) that their respective universities support entrepreneurship among students, only two participants [Uni-B-SEC/P, Uni-Y-SEC/P] agreed that their university dedicates many resources to this support (see Table 6.5).

Table 6.5: Resources supporting student entrepreneurs

	Uni-A	Uni-B	Uni-C	Uni-D	Uni-V	Uni-W	Uni-Y	Uni-Z
University dedicates many resources to support student entrepreneurship	4	7	4	4	3	3	6	2

Source: Interview data

Participants [Uni-V-SEC/P, Uni-W-SEC/P, Uni-Z-IS] who did not agree, elaborated as follows:

“The main challenge is the issue of funding. Funding from the institution itself. It is one thing for academics and other support staff to be willing to support students in these initiatives, but another thing to have a budget to actually fund those activities.” [Uni-V-SEC/P]

“I think within top management, this entrepreneurial drive is still new. I have faith that it is moving forward, but for now, there is only the external funding that is putting more resources.” [Uni-Z-IS]

6.2.2 ACTIVITIES

Various entrepreneurship support activities were found to be offered by the participating universities. A broad description of these activities is presented in the section titled co-curricular entrepreneurship support activities (Chapter 6, Section 6.3) that follows. More details on the activities specifically associated with the other elements in the conceptual model are presented in Chapter Seven.

Participants were asked, with regard to these entrepreneurship support activities, to identify the underlying strategies adopted by their universities. They were able to choose from four options: (i) no strategy; (ii) low selective model; (iii) supportive model; and (iv) incubator model. The four options are described in Table 6.6.

Table 6.6: Entrepreneurship support strategy

Option	Description
No strategy	The university has no strategy in terms of student entrepreneurship.
Low selective model	The university focuses on maximising the number of student start-ups, and the generation of self-employment-oriented student start-ups that rarely grow beyond a critical size of employees.
Supportive model	Generation of a specific type of student start-up(s), who comply with specific selection criteria.
Incubator model	Generation of exit-oriented student start-ups, with potential growth opportunity and potential interest to external investors.

Source: Clarysse, Wright, Lockett, Van de Velde and Vohora (2005:184)

Participants from all four of the most active universities claimed that the incubator model best describes the entrepreneurship support strategy of their respective universities. However, participant Uni-C-SEC/P noted that a low selective model, indicating a combination of the two models, was evident as Uni-C.

One participant [Uni-W-SEC/P] from a least active university indicated that their university did not have a student entrepreneurship strategy, whereas the other three participants from least active universities chose one of each, namely a low selective model [Uni-V-SEC/P], a supportive model [Uni-Y-SEC/P], and an incubator model [Uni-Z-IS].

6.2.3 STRUCTURE

Information was also gathered on how student entrepreneurship support is structured at the participating universities. They were asked to indicate whether this structure is formal with a centralised team/centre or informal and decentralised. All four of the most active and two of the least active universities [Uni-Y, Uni-Z] had a formal structure with a centralised team/centre focusing on student entrepreneurship. These structures were established between 2014 and 2019. The findings show that the formal teams/centres established first were those within most active universities. It should be noted that participant Uni-B-SEC/P was unsure of the structure at Uni-B, but this structure was confirmed by two other participants [Uni-B-TM, Uni-B-IS].

The structure of student entrepreneurship support at both Uni-V and Uni-W was described as informal and decentralised. Explanations for this include:

“Part of the challenge is that there is a lack of a student entrepreneurship policy.” [Uni-V-SEC/P]

“There is no straight budget from the university itself [for student entrepreneurship]. If we want to host events, we need to ask for money from some academic departments.” [Uni-W-SEC/P]

6.2.4 PEOPLE

In this section, information relating to the people concerned with providing student entrepreneurship support at the respective universities, the people at whom the support is targeted, as well as the users thereof, is presented.

6.2.4.1 Providers of student entrepreneurship support

Participants were not able to provide exact numbers of how many people are currently concerned with supporting student entrepreneurship at their respective universities. Two participants explained:

“There are so many faculties and some of them have like little things that they try and do in entrepreneurship. I do not know what number I would put there.” [Uni-D-SEC/P]

“I will not be able to actually provide a number there, because there are different units in the university where we find people who are willing to support student entrepreneurship.” [Uni-V-SEC/P]

However, participants were able to identify the groups concerned with supporting student entrepreneurship and whether they perceived the numbers of people involved as satisfactory or not (see Table 6.7).

Table 6.7: Groups concerned with supporting student entrepreneurship

Participants	Degree of Satisfaction	Number of Groups	Groups	
Uni-A-SEC/P	Too low	5	Individual students	University management
			Student societies	TTO
			(Individual) professors	
Uni-B-SEC/P	Satisfactory	4	(Individual) professors	University management
			Faculty members	TTO
Uni-C-SEC/P	Too low	6	Individual students	(Individual) professors
			Student societies	University management
			Alumni	TTO
Uni-D-SEC/P	Too low	4	Individual students	Faculty members
			Student societies	TTO
Uni-V-SEC/P	Satisfactory	6	Individual students	Faculty members
			Student societies	University management
			(Individual) professors	TTO
Uni-W-SEC/P	Too low	2	Individual students	Student societies
Uni-Y-SEC/P	Too low	2	Faculty members	University management
Uni-Z-IS	Too low	4	Individual students	University management
			Faculty members	TTO

Source: Interview data

Only two participants, one from a most active university [Uni-B-SEC/P] and one from a least active university [Uni-V-SEC/P] perceived the number of people concerned with supporting student entrepreneurship as satisfactory. Participant Uni-B-SEC/P explained that “*even though we have a lot of students who require assistance, we are still able to take good care of them all*”. Although participant Uni-V-SEC/P noted that the number of people concerned was satisfactory at Uni-V, “*it would obviously be better if the number increased*” [Uni-V-SEC/P].

The participants from the other six universities perceived the number of people concerned with supporting student entrepreneurship as too low. Participant Uni-Y-SEC/P claimed that the number would only be considered as satisfactory if “*everyone has the same level of thinking [in terms of entrepreneurship]*”.

The number of groups concerned with supporting student entrepreneurship varied from two [Uni-W, Uni-Y] to six [Uni-C, Uni-V] different groups. The two universities with only two groups are both considered least active universities. Furthermore, the two universities with the most groups include one most active university [Uni-C] and one least active university Uni-V].

The different groups concerned with supporting student entrepreneurship at the participating universities include: individual students (6 universities); university management (6 universities); TTOs (6 universities); student societies (5 universities); faculty members (5 universities); (individual) professors (4 universities); and alumni (1 university).

6.2.4.2 Targets of student entrepreneurship support

Participants were presented with several statements describing the potential targets of student entrepreneurship support at their respective universities. They were requested to indicate their extent of agreement with each description on a 7-point Likert-type scale ranging from one (strongly disagree) to seven (strongly agree). These responses are summarised in Table 6.8.

The findings show that both the most active universities and the least active universities are supporting student entrepreneurs at the earlier stages of the venture creation process. The universities that are the most supportive include Uni-B (most active university) and Uni-Z (least active university) (=7), followed by Uni-D (=6). Although still supportive, the least supportive university of early-stage student entrepreneurs is Uni-W (=4).

The most active universities are more inclined to support students at the later stages of the venture creation process than the least active universities. Uni-B is most supportive of these student entrepreneurs. Two universities [Uni-D, Uni-Z] were found to be more supportive of student entrepreneurs at the earlier stage of the business creation process than the later stages. Participant Uni-D-TTO explained that “...in terms of undergraduates, we do not give that much support to later stage student entrepreneurs, however, we do when it comes to postgraduate students”. Although “...there is no discrimination between early stage and later stage student entrepreneurs” at Uni-Z, the focus is currently more on “changing the mindsets [of students regarding entrepreneurship]” [Uni-Z-IS].

The findings also indicate that, on average, both formal and informal student entrepreneurs are being supported by all eight participating universities. In terms of student entrepreneurs who operate formally, universities Uni-B (=7), Uni-V (=6), Uni-Y (=6), and Uni-Z (=6) were found to be the most supportive, followed by Uni-A (=5), Uni-C (=5), Uni-D (=4), and Uni-W (=3).

Furthermore, six universities were found to be actively supporting informally operating student entrepreneurs, including Uni-B (=7), Uni-Y (6), Uni-Z (=6), Uni-A (=5), Uni-V (=5), Uni-C (=4). One most active university [Uni-D; =2] and one least active university [Uni-W; =3] were found to not be supporting informally operating student entrepreneurs. Participant Uni-D-SEC/P explained that “...there is no track record of what you [student entrepreneurs] are doing, so we cannot really support you [them]”.

Even though the majority of participants indicated that their respective universities supported informally operating student entrepreneurs, they do encourage students to formalise their businesses:

“It is still to a lesser degree, and we would encourage formality” [Uni-A-SEC/P]; *“We encourage the side hustle, but we are trying to do formal business that will eventually employ people”* [Uni-C-SEC/P]

Table 6.8: Targets of student entrepreneurship support

	Uni-A-SEC/P	Uni-B-SEC/P	Uni-C-SEC/P	Uni-D-SEC/P	Most active averages	Uni-V-SEC/P	Uni-W-SEC/P	Uni-Y-SEC/P	Uni-Z-IS	Least active averages	Total averages
Supports students at the earlier stages of the venture creation process	5	7	5	6	5.75	5	4	5	7	5.25	5.5
Supports students at the later stages of the venture creation process	5	7	5	U	5.67	5	4	5	4	4.5	5
Supports students who operate informally	5	7	4	2	4.5	5	3	6	6	5	4.75
Supports students who operate formally	5	7	5	4	5.25	6	3	6	6	5.25	5.25
Supports multidisciplinary collaboration	5	7	5	5	5.5	5	3	6	7	5.25	5.38
Supports as many student entrepreneurs as possible	6	7	6	2	5.25	5	3	5	5	4.5	4.88
Only supports student entrepreneurs that meet certain criteria	1	1	2	7	2.75	2	3	7	4	4	3.38
Only supports student entrepreneurs who have business ideas that meet certain criteria	3	1	2	7	3.25	5	3	7	4	4.75	4

Source: Interview data

Both most active and least active universities support multidisciplinary collaboration, with Uni-B (=7) and Uni-Z (=7) being the most supportive, followed by Uni-Y (=6). According to participant Uni-B-SEC/P at Uni-B “...we want to show that even those students who are studying things like marketing, one can incorporate them to work with student entrepreneurs so that the marketing people can also get experience”. Adding to this participant Uni-Z-IS explained that “...entrepreneurship is broad and multidisciplinary in general, same as the university having various courses and students from the various courses can work together to create businesses”. The least supportive university in terms of multidisciplinary collaboration is Uni-W (=3), a least active university. Participant Uni-W-SEC/P claimed that “...it is not just about multidisciplinary collaboration, the university’s support on entrepreneurship is almost non-existent and very minimal”.

On average, participants at both the most active (average = 5.25) and least active (average = 4.5) universities agree that their institutions support as many entrepreneurs as possible. However, those from least active universities agree more. The participants that agreed the most (>5) include those from Uni-B (=7), Uni-A (=6) and Uni-C (=6), all considered most active universities. Participant Uni-A-SEC/P did, however, explain that “...everyone can come and is welcome, but we do not have enough reach yet”. Participant Uni-D-SEC/P disagreed (=2) that their university (a most active university) supports as many student entrepreneurs as possible. He/she explained “...you see so much happening, but it is not formalised, and it is not formally supported, but there is starting to be a cultural shift” [Uni-D-SEC/P]. Participant Uni-W-SEC/P also disagreed (=3) that Uni-W (least active) supports as many entrepreneurs as possible.

The most active universities (average = 2.75) are less restrictive than the least active universities (average = 4) in terms of student entrepreneurs having to meet certain criteria to qualify for support. However, one participant from a most active university [Uni-D-SEC/P; =7], and one from a least active university [Uni-Y-SEC/P; =7] indicated that some criteria were in place in order for students to receive support. The participants explained:

“I think it's mostly just, having a great idea, of course. Being like a motivated individual because you also want to see that this person will pull this through, or they will execute whatever they are saying that they are going to do. It also helps when that person has a bit of exposure in

the industry that they are trying to have a business in. So, the motivation from the entrepreneur and the quality of the idea.” [Uni-D-SEC/P]

“You need to be able to work hard and think out of the box. As much as they are not specific criteria, you need to have that eager, you need to have that hunger to say that I really want to be self-employed or entrepreneur when I graduate.” [Uni-Y-SEC/P]

The universities that were the least restrictive in terms of student entrepreneurs meeting certain criteria were Uni-A and Uni-B, both considered most active universities. Participant Uni-B-SEC/P noted that “...we give each and every student an opportunity, that is why we have the ideation phase and then we take them through [the process]”.

The participants were also requested to indicate whether their institutions only support student entrepreneurs who have business ideas that meet certain criteria. Participants from less active universities were more in agreement (average = 4.75) with this statement than participants from most active universities (average = 3.25) were. Uni-D (most active university) and Uni-Y (least active university) both have strict requirements that the businesses of the student entrepreneurs must meet to qualify for support. Uni-B has the least strict requirements. To qualify for support, business requirements common among the participating universities include:

- The business idea must be a viable and feasible one [Uni-D, Uni-V];
- The business must not conduct any illegal operations [Uni-A];
- The business must not be promoting or selling any substances [Uni-A]; and
- The business must be generating a certain amount of revenue [Uni-Z].

Participant Uni-C-SEC/P, however, pointed out that “...if we start putting too many criteria in place such as you must have certain turnover before you can come or anything like that, we are just going to stun the ideas and enthusiasm”.

6.2.4.3 Users of student entrepreneurship support

The perceptions that participants have of the students and student start-ups at their participating universities was also sourced. Perceptions sourced related to student interest in entrepreneurship, actual start-ups and the nature of businesses established. These findings are presented in Table 6.9.

Table 6.9: Student and student start-ups – Perceptions of stakeholders

	Uni-A-SEC/P	Uni-B-SEC/P	Uni-C-SEC/P	Uni-D-SEC/P	Most active averages	Uni-V-SEC/P	Uni-W-SEC/P	Uni-Y-SEC/P	Uni-Z-IS	Least active averages	Total averages
Students are interested in entrepreneurship	3	7	6	7	5.75	6	6	4	7	5.75	5.75
Students who are interested in entrepreneurship actually starts a business during their studies	2	7	5	5	4.75	5	7	5	3	5	4.88
Student entrepreneurs typically establish high technology start-ups	2	7	5	6	5	3	4	3	3	3.25	4.13
Student entrepreneurs typically have high growth intentions	2	7	6	3	4.5	5	5	5	5	5	4.75
Student entrepreneurs are seen as legitimate entrepreneurs by the university community	3	7	5	5	5	3	4	6	4	4.25	4.63
Student entrepreneurs are seen as legitimate entrepreneurs by the business community	2	7	5	5	4.75	4	4	3	2	3.25	4
Student entrepreneurs are seen as legitimate entrepreneurs by the community in general	4	7	5	3	4.75	6	6	4	6	5.5	5.13

Source: Interview data

Except for Uni-A (most active university) and Uni-Y (least active university), the students registered at both the other most active and least active universities are perceived as being interested in entrepreneurship. Participant Uni-A-SEC/P explained that “...we have [*X number of*] students and we are only reaching about *Y*, so I would say that it is really miniscule”. Moreover, at Uni-Y, “...students try to do it [*start their own businesses*] with the material that they have but are not able to and then stop” [Uni-Y-SEC/P]. The lack of students’ interest in entrepreneurship is attributed to insufficient exposure, the lack of an entrepreneurial mindset, and insufficient support and resources, as explained by participants:

“I think they [students] come into university, not having been exposed to it before and so they come with that mindset that they are there to study so that they can get a job. So, I think it lacks in their primary and secondary education. It is not instilled there.” [Uni-A-SEC/P]

*“I think they need more encouragement, more support, I am worried to add financial support, but sometimes you find it is needed. They try to do it [*start their own businesses*] with the material that they have but they are not able to and then stop. I could see that they are trying, but if you do not have the finances, sometimes it becomes an obstacle”* [Uni-Y-SEC/P]

It is also perceived that not all students who are interested in entrepreneurship actually start a business during their studies. The findings show that it is perceived that more student entrepreneurs start businesses during their studies at least active universities (average = 5) than at the most active universities (average = 4.75). The participants from Uni-B (most active university) and Uni-W (least active university) indicated that they strongly agreed (=7) that students at their universities start businesses during their studies. The universities where it is perceived that the least number of students start a business during their studies include Uni-A (most active university) and Uni-Z (least active university).

Participant Uni-C-SEC/P, however, noted that “...*this is something that is starting to happen more and more*” where students actually start a business during their studies. Nevertheless, “...*those students who start their businesses during their studies are struggling because they do not have the required capital*” [Uni-Y-SEC/P].

Participants from most active universities agree (average = 5) that student entrepreneurs at their universities typically establish high technology start-ups whereas those from least active universities do not (average = 3.25). The only exception was Uni-A (most active university), where participant Uni-A-SEC/P disagreed with the statement.

The findings show that student entrepreneurs establish businesses in various sectors, including:

- Agriculture [Uni-B, Uni-C, Uni-W];
- Fashion [Uni-A, Uni-B, Uni-Y];
- Manufacturing [Uni-V, Uni-W];
- Consulting [Uni-V, Uni-Z];
- Health and Biotechnology [Uni-B];
- Technology [Uni-D]; and
- Engineering [Uni-B].

The student entrepreneurs at both the most active (average = 4.5) and least active universities (average = 5) are perceived as having high growth intentions for their businesses. Participants from two universities disagreed with these growth intentions, namely Uni-A (=2) and Uni-D (=3), both considered most active universities. Participant Uni-A-SEC/P claimed that student entrepreneurs at Uni-A are more concerned about “*self-employment and income generation*”. In contrast, participant Uni-D-SEC/P explained that “*...we want them to create businesses that can employ people, and not just think small*” at Uni-D, where students typically have high growth intentions for their businesses.

Information was also gathered on how student entrepreneurs are perceived by (i) the university community, (ii) the business community, and (iii) the community in general. On average, participants at both most active and least active universities agree that student entrepreneurs are seen as legitimate by the university community. However, the participants from Uni-A (most active university) and Uni-V (least active university) disagreed. At Uni-A, “*...we support them [student entrepreneurs], and we give them space to trade [at a specific event], which is recognising their products and offerings, but not to the extent where we provide them with permanent space to trade on campus*” [Uni-A-SEC/P]. The participant continued to explain that “*...if we were serious, we would consider them [student entrepreneurs] as part of our procurement process*”. Participant Uni-V-SEC/P also made reference to students not being allowed to operate their business on campus at Uni-V.

With the exception of Uni-A-SEC, participants from most active universities agree that student entrepreneurs are regarded as legitimate by the business community more so than participants from least active universities. Student entrepreneurs are perceived as legitimate by the business community because *“the business community act as investors”* [Uni-B-SEC/P]. However, participant Uni-Y-SEC/P was not aware of any banks who are involved with student entrepreneurs, and Uni-Z-IS claimed that *“...banks need a lot of paperwork, experience and surety that student entrepreneurs do not have”*.

Participants from both most active (average = 4.75) and least active universities (average = 5.5) agree that student entrepreneurs are seen as legitimate entrepreneurs by the community in general (e.g., family, friends, consumers, peers). However, those from least active universities agree more. Only participant Uni-B-SEC/P from Uni-B (most active university), strongly agreed, claiming that *“...we have the [initiative] where family and community can see what the benefit is thereof [student entrepreneurship]”*.

Participants also provided information on whether they perceived the students at their respective universities to be typically necessity or typically opportunity driven (see Table 6.10). To obtain this information, participants indicated their inclination on a Likert-type scale ranging from one (strong inclination to the left statement) to seven (strong inclination to the right statement). Responses in the middle of the continuum (4) were considered a perception that neither descriptions are typical.

Table 6.10: Nature of businesses - Necessity versus opportunity driven

	Left-Statement Necessity Driven (1-3)	Not Typical (4)	Right-Statement Opportunity Driven (5-7)
Most active universities	Uni-A (2)	Uni-B (4) Uni-D (4)	Uni-C (6)
Least active universities	Uni-Y (2)	Uni-V (4) Uni-W (4)	Uni-Z (5)

Source: Interview data

Student entrepreneurs at Uni-A are perceived as typically necessity driven as *“...the students [at Uni-A] come from relatively lower to middle income backgrounds, so they actually just want to earn money and meet their needs”* [Uni-A-SEC/P]. Participants from Uni-B and Uni-

D do not perceive their students as typically necessity or typically opportunity driven. At these two universities,

“You see student comes up with an idea based on, you know having the need to earn extra cash, put food on the table, take care of their family while they are studying. Then you also get students who see an opportunity in an industry, and they come up with an idea that is opportunity-driven, market-driven.” [Uni-D-SEC/P]

The majority of the student entrepreneurs at Uni-C are perceived as typically opportunity driven, as *“they [student entrepreneurs] are not out there needing to start a business to survive, but rather exploiting an opportunity”* [Uni-C-SEC/P].

In terms of the least active universities, participant Uni-Y-SEC/P perceived student entrepreneurs at Uni-Y as typically necessity driven saying that *“the majority of my students are from poor backgrounds and they need the money”* [Uni-Y-SEC/P]. Participants from Uni-V and Uni-W do not perceive their students as typically necessity or typically opportunity driven. As explained:

“Some are actually necessity driven, while others have had the opportunity to.” [Uni-V-SEC/P]; *“We have a little bit of both.”* [Uni-W-SEC/P]

Uni-Z was the only least active university where student entrepreneurs are perceived as typically opportunity driven. Participant Uni-Z-IS explained that *“...most people are driven by the opportunities, and also the current trends.”*

Participants also provided information on whether they perceived the students at their respective universities as typically operating informal or formal businesses (see Table 6.11). As with their perceptions of necessity versus opportunity driven, participants were requested to indicate their inclination on a 7-point Likert-type scale.

Table 6.11: Nature of student businesses – Formal versus informal

	Left-Statement Operate Informally (1-3)	Not Typical (4)	Right-Statement Operate Formally (5-7)
Most active universities	Uni-A (3)	Uni-D (4)	Uni-B (7) Uni-C (5)
Least active universities	Uni-V (3) Uni-Z (3)	Uni-W (4) Uni-Y (4)	

Source: Interview data

The participant from Uni-A (most active) perceived their students as typically operating businesses informally. Participant Uni-A-SEC/P noted that *“they [student entrepreneurs] did not want the shlep [hassle] of registering. It is not sort of high growth businesses, so they are not making that much. They are literally just making a couple of 100 here and there”*. At Uni-D students are not perceived as typical of operating either informal or formal businesses. As explained *“most of the businesses start as informal in the very early stage, but we work with them to register their businesses”* [Uni-D-SEC/P]. Student entrepreneurs at Uni-B and Uni-C are however perceived as typically operating formal businesses. Participant Uni-C-SEC/P mentioned that *“even if they are only side hustle, it is probably still registered”*. In addition, Uni-B-SEC/P comments *“...we try to teach them that they do not want to operate like a fly by night”* [Uni-B-SEC/P].

In terms of the least active universities, student entrepreneurs at Uni-V and Uni-Z were mostly perceived as typically operating informal businesses. Participant Uni-Z-IS asserts that *“...they [student entrepreneurs] are running away from paying, and if you want to formalise, you must give your bank statements and submit for taxes”*. It was, however, noted that those who choose to operate informally *“miss out on an opportunity of getting government grants, because to receive that, you need to be formalised”* [Uni-Z-IS].

At Uni-W and Uni-Y students are not perceived as typical of operating an informal or formal business. It is mentioned that *“...sometimes, student entrepreneurs need to formalise and register their business out of necessity in order to apply for funding”* [Uni-W-SEC/P], however many do not formalise. At Uni-W, *“we really do encourage students to register their businesses”* [Uni-W-SEC/P].

6.3 CO-CURRICULAR ENTREPRENEURSHIP SUPPORT ACTIVITIES

In this section, the findings relating to co-curricular entrepreneurship support activities taking place at the participating universities are presented. The design elements of Good *et al.* (2018), namely purpose, activities, structure, and people, are once again used to structure the presentation of these findings. For the purpose of this study, co-curricular entrepreneurship support activities refer to activities taking place outside the formal curriculum of a university that focus on enterprise development or entrepreneurship, do not provide for academic credits, and participation is optional (Preedy, 2017:2).

The data for this section was collected from participants in student entrepreneurship champion/promotor and/or top management positions, namely eight student entrepreneurship champions/promotors, one from each of the participating universities, and six participants in top management positions, one from six of the participating universities [Uni-A, Uni-B, Uni-C, Uni-D, Uni-Y, Uni-Z]. No responses were received from possible participants in top management positions at Uni-V and Uni-W, both least active universities, when invited to participate in this study.

6.3.1 PURPOSE

From the data analysis, four overarching themes were developed to describe the current purpose (aim) of the co-curricular entrepreneurship support activities taking place at the participating universities. These themes include (i) *to develop entrepreneurs*, (ii) *to promote entrepreneurship as a viable career option*, and (iii) *to establish new businesses that create jobs* (see Table 6.12).

Table 6.12: Purpose (aim) of co-curricular entrepreneurship support activities

Extract	Participant	Code	Categories	Themes
To make job creators.	Uni-Z-SEC/P	Make job creators	Assist students to become entrepreneurs	Develop entrepreneurs
To ensure that our students go out and become [entrepreneurs].	Uni-D-TM	Become entrepreneurs		
Hope that they will become entrepreneurs	Uni-D-TM	Become entrepreneurs		
Constantly producing entrepreneurs	Uni-W-SEC/P	Produce entrepreneurs		
We have the social entrepreneurs, so we are also addressing social ills within our communities.	Uni-W-SEC/P	Produce social entrepreneurs	Develop social entrepreneurs	
To develop student entrepreneurs.	Uni-A-SEC/P	Develop student entrepreneurs	Develop entrepreneurial skills	
We want to empower our students to be able to be entrepreneurial in the real world and to undertake entrepreneurial activity.	Uni-A-TM	Develop student entrepreneurs		
And also, the acquiring of skills, there is a great deal of skills that entrepreneurship offers to students	Uni-W-SEC/P	Acquire entrepreneurial skills		
The main aim is to change paradigm, that we no longer producing just to hold some degrees, but we are producing people who can create and identify opportunities.	Uni-Z-TM	Produce students who can create and identify opportunities		
I think it's creating like an alternative to just working for someone else's interest.	Uni-D-SEC/P	Alternative to working for someone		
To engage students to become entrepreneurial minded	Uni-D-TM	Become entrepreneurial minded	Change mindsets	Promote entrepreneurship as viable career option
Students can actually see that instead of only being job seekers, they can also prepare themselves to be job creators.	Uni-V-SEC/P	Job creators rather than job seekers		
High unemployment rate, we do not want students to become employment seekers, but we also want to see them create employment,	Uni-W-SEC/P	Job creators rather than job seekers		
You should have the entrepreneurial mind so that you would be able to do something on the side.	Uni-Y-TM	Entrepreneurial mindset		

Table 6.12: Purpose (aim) of co-curricular entrepreneurship support activities (cont.)

Extract	Participant	Code	Categories	Themes
Just exposing students to entrepreneurship	Uni-D-SEC/P	Exposing students to entrepreneurship	Promote entrepreneurship	Promote entrepreneurship as viable career option (cont.)
To promote entrepreneurship as a career.	Uni-V-SEC/P	Promote entrepreneurship		
It is to enhance the importance of entrepreneurship all areas or in every field. So, entrepreneurship education has to cut across in my view.	Uni-Y-TM	Emphasise importance across all fields		
We must encourage entrepreneurship to all students.	Uni-Y-TM	Encourage entrepreneurship		
We want students to start businesses.	Uni-A-SEC/P	Establish businesses	Establish businesses	Establish new businesses that create jobs
We have developed world-class leaders and now we want to develop businesses	Uni-C-SEC/P	Develop businesses		
We would like businesses that provide jobs	Uni-A-SEC/P	Establish business that provide employment	Create employment opportunities	
Able to create jobs, enhancing economic growth, and decreasing youth unemployment.	Uni-B-SEC/P	Create jobs		
... [businesses] that employ people.	Uni-B-SEC/P	Establish business that provide employment		
Increase the economy in the country by offering, creating jobs for others as well	Uni-D-TM	Create jobs		

Source: Interview data

As can be seen from Table 6.12, the most prominent theme in terms of the purpose (aim) of co-curricular entrepreneurship support activities is *to develop entrepreneurs* (Theme 1). When the purpose (aim) is *to develop entrepreneurs*, the focus is on *assist[ing] students to become entrepreneurs* (Category 1), *develop[ing] social entrepreneurs* (Category 2), and *develop[ing] entrepreneurial skills* (Category 3). Participant Uni-D-TM noted that the aim of co-curricular entrepreneurship support activities is “*to ensure that our students go out and become entrepreneurs*”. However, participant Uni-W-SEC/P added that the aim of such support at Uni-W is to ensure that “*we have social entrepreneurs, so [that] we are also addressing social ills within our communities*”. When the focus is on *develop[ing] entrepreneurial skills*, the activities aim to “*empower our students to be able to be entrepreneurial in the real world and to undertake entrepreneurial activities*” [Uni-A-TM]. It is also explained by participant Uni-Z-TM that “*we are no longer producing [people who] just hold degrees, but we are producing people who can create and identify opportunities*”.

The second theme that was developed in terms of the purpose (aim) of co-curricular entrepreneurship support activities is *to promote entrepreneurship as a viable career option*. When the purpose is to promote entrepreneurship as a viable career option, the focus is to *change [the] mindsets* (Category 1) of students to “*actually see that instead of only being jobseekers, they can also prepare themselves to be job creators*” [Uni-V-SEC/P]. When the purpose is to *promote entrepreneurship* (Category 2), the focus is on “*encouraging entrepreneurship to all students and enhancing the importance of entrepreneurship in all areas or in every field*” [Uni-Y-TM].

The third theme that was developed, namely, *to establish new businesses that create jobs*, describes the purpose of co-curricular entrepreneurship support activities as being the *establishment of businesses* (Category 1), and as the *creation of employment opportunities* (Category 2). Participant Uni-C-SEC/P explained that “*...we have developed world-class leaders, and now we want to develop businesses*”. Although *establishing businesses* (Category 1) underlies this theme, most of the participants pointed out that these established businesses must contribute to creating jobs for others. Participant Uni-B-SEC/P explains that the businesses established must be “*able to create jobs, enhancing economic growth, and decreasing youth unemployment*”.

6.3.2 ACTIVITIES

In the following sections, the findings relating to the co-curricular entrepreneurship support activities being offered at the participating universities are presented. Thereafter, the co-curricular activities perceived as needed by students as well as enablers to offering these activities, are described.

6.3.2.1 Co-curricular support activities offered

Participants were presented with a list of possible co-curricular entrepreneurship support activities and requested to indicate (tick) which are taking place at or being offered by their respective universities. These findings are presented in Table 6.13.

The findings presented in Table 6.13 shows that there are 11 co-curricular entrepreneurship support activities taking place or being offered at the majority of universities, including entrepreneurship education, mentorship, counselling, provision of advice, and coaching, co-curricular training, workshops, and seminars, networking events, material support: office and workspace, as well as meeting facilities, student entrepreneurship support organisations, participation in the student entrepreneurship week, participation in the entrepreneurship intervarsity competition, and internal university business plan/pitching competitions. The co-curricular entrepreneurship support activities that were not taking place or being offered at most of the universities include an entrepreneurship centre, an incubator/accelerator (program), and an incubator/accelerator (program) that is open to students, a university-linked science park/research park, a university venture fund, the provision of material support: start-up capital and seed-funding, and a student entrepreneurship policy.

Table 6.13: Co-curricular entrepreneurship support activities

	Most Active Universities								Least Active Universities					
	Uni-A		Uni-B		Uni-C		Uni-D		Uni-V	Uni-W	Uni-Y		Uni-Z	
	Uni-A-SEC/P	Uni-A-TM	Uni-B-SEC/P	Uni-B-TM	Uni-C-SEC/P	Uni-C-TM	Uni-D-SEC/P	Uni-D-TM	Uni-V-SEC/P	Uni-W-SEC/P	Uni-Y-SEC/P	Uni-Y-TM	Uni-Z-SEC/P	Uni-Z-TM
Entrepreneurship education	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
An entrepreneurship centre	Y	Y	Y	Y	N	Y	Y	N	N	N	N	N	U	Y
A technology transfer office	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	U	Y
An incubator/accelerator (program)	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	U	N
An incubator/accelerator (program) that is open to students	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	U	N
A university-linked science park/research park	N	N	U	N	N	Y	U	Y	U	Y	N	N	U	N
A university venture fund	N	Y	U	N	Y	Y	Y	U	N	Y	N	Y	U	N
Mentorship	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Counselling, provision of advice, coaching	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Co-curricular training/workshops/seminars	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Organisation of networking events	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Provision of material support: Office and workspace	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	N	Y	Y
Provision of material support: Meeting facilities	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y

Table 6.13: Co-curricular entrepreneurship support activities (cont.)

	Most Active Universities								Least Active Universities					
	Uni-A		Uni-B		Uni-C		Uni-D		Uni-V	Uni-W	Uni-Y		Uni-Z	
	Uni-A-SEC/P	Uni-A-TM	Uni-B-SEC/P	Uni-B-TM	Uni-C-SEC/P	Uni-C-TM	Uni-D-SEC/P	Uni-D-TM	Uni-V-SEC/P	Uni-W-SEC/P	Uni-Y-SEC/P	Uni-Y-TM	Uni-Z-SEC/P	Uni-Z-TM
Provision of material support: Start-up capital, Seed-funding	N	N	Y	Y	N	Y	Y	N	N	N	N	Y	N	N
A student entrepreneurship support organisation	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	U
A student entrepreneurship policy	N	N	Y	N	N	Y	N	N	N	N	U	N	N	N
Does your university participate in the student entrepreneurship week?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Does your university participate in the entrepreneurship intervarsity competition?	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	U
Does your university arrange internal university business plan/pitching competitions?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
Other:	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	Y

Source: Interview data

Moreover, as evident from the finding in Table 6.13, the more advanced and technical co-curricular entrepreneurship support activities are not being offered at the least active universities. These include an entrepreneurship centre, a technology transfer office, an incubator/accelerator (programme), and an incubator/accelerator (programme) that is open to students.

Other co-curricular entrepreneurship support activities being offered at the universities (not listed in Table 6.13) include a market day [Uni-A-SEC/P], an entrepreneurship fellowship programme [Uni-A-TM], the publication of success stories [Uni-Y-TM], and an innovation week [Uni-Z-TM].

As can be seen from Table 6.13, there were several contradictions between participants from the same universities in terms of co-curricular entrepreneurship support activities taking place or being offered at their institutions. For example, one of the participants indicated being uncertain, while the other indicated a “yes” or “no”. The response from the participant who indicated “yes” or “no” was used to indicate whether such activities were taking place or not. Moreover, as indicated with circles around the responses in Table 6.13, some participants from the same university indicated “yes” and the other another “no”. In such cases, it was assumed that such support activities were being provided. The provision of these support activities was also validated by responses from other stakeholders interviewed.

The fact that participants were uncertain whether a co-curricular entrepreneurship support activity was taking place or being offered by their respective university, or not, could indicate a lack of communication and awareness among student entrepreneurship stakeholders. Furthermore, “yes” and “no” responses in terms of a specific type of activity taking place from participants at the same university could indicate that different stakeholders are not aware of what each other are doing in the areas of student entrepreneurship support.

In addition to indicating which co-curricular support activities are taking place at or being offered at their respective universities, participants were requested to provide more information on three co-curricular support activities on the list, namely (i) mentoring, (ii) counselling, provision of advice, and coaching, and (iii) provision of material support: office and workspace, meeting facilities and start-up capital and seed funding.

All eight of the participating universities offered mentorship to their student entrepreneurs, with two different categories of people serving as mentors, namely internal or external mentors (see Table 6.14).

Table 6.14: People who serve as mentors

Internal Mentors	External Mentors
Lecturers [Uni-A-SEC/P, Uni-C-TM, Uni-W-SEC/P, Uni-Y-SEC/P, Uni-Z-SEC/P, Uni-Z-TM]	Existing entrepreneurs [Uni-A-SEC/P, Uni-B-SEC/P, Uni-D-SEC/P, Uni-V-SEC/P]
Centre for Entrepreneurship staff [Uni-B-TM]	Alumni with existing businesses [Uni-C-SEC/P, Uni-C-TM, Uni-D-SEC/P]
Existing student entrepreneurs [Uni-D-SEC/P]	Industry experts [Uni-D-SEC/P, Uni-V-SEC/P]
	Contracts mentors [Uni-A-TM, Uni-D-TM]

Source: Interview data

Information was also gathered on the topics dealt with during counselling, provision of advice and coaching sessions, as well as during co-curricular training/workshops/seminars. It was found that both of these co-curricular entrepreneurship support activities were taking place or being offered at all eight of the participating universities. Participants were presented with a list of possible topics and could add to the list if a topic covered was not listed. These findings are presented in Table 6.15.

Table 6.15: Topics dealt with during activities

Counselling, Provision of Advice and Coaching Sessions			Training Workshops/Seminars		
Topics	Participants	Total	Topics	Participants	Total
Business planning and managing a business	Uni-A-SEC/P Uni-B-TM Uni-C-SEC/P Uni-C-TM Uni-D-SEC/P Uni-C-TM Uni-Y-SEC/P Uni-Z-SEC/P	8	Business planning and managing a business	Uni-A-SEC/P Uni-A-TM Uni-C-SEC/P Uni-C-TM Uni-D-SEC/P Uni-V-SEC/P Uni-W-SEC/P Uni-Y-SEC/P Uni-Y-TM Uni-Z-SEC/P	10
Financial and accounting advice	Uni-A-TM Uni-B-SEC/P Uni-C-TM Uni-Y-TM Uni-Z-SEC/P	5	Innovation, R&D and technology	Uni-A-SEC/P Uni-C-TM Uni-D-SEC/P Uni-D-TM Uni-V-SEC/P Uni-Y-TM	6

Table 6.15: Topics dealt with during activities (cont.)

Counselling, Provision of Advice and Coaching Sessions			Training Workshops/Seminars		
Topics	Participants	Total	Topics	Participants	Total
Marketing advice	Uni-A-SEC/P Uni-C-SEC/P Uni-C-TM Uni-Y-TM Uni-Z-SEC/P	5	Legislation and taxation	Uni-A-SEC/P Uni-A-TM Uni-C-SEC/P Uni-C-TM Uni-D-TM	5
Advice/assistance in gaining finance	Uni-A-SEC/P Uni-B-SEC/P Uni-C-TM Uni-Y-TM	4	Accounting	Uni-A-TM Uni-C-TM Uni-Z-SEC/P	3
Legal and intellectual property advice	Uni-A-TM Uni-C-TM Uni-D-TM	3	Marketing	Uni-C-TM Uni-Z-SEC/P	2
Advice on innovation, R&D and technology	Uni-C-TM Uni-Y-TM	2	Corporate social responsibility, social impact, ethics	-	0
Corporate social responsibility, social impact, ethics	Uni-B-SEC/P Uni-C-TM	2	Gaining finance	-	0
Other:	Uni-B-SEC/P Uni-Y-SEC/P Uni-A-TM Uni-C-SEC/P	4	Other:	Uni-A-SEC/P Uni-B-SEC/P Uni-C-SEC/P	3

Source: Interview data

As can be seen from Table 6.15, the topic most dealt with during these sessions is that of business planning and managing a business. Eight and 10 participants mentioned this as a topic dealt with during counselling, provision of advice and coaching sessions, as well as training workshops/seminars, respectively. The topics dealt with the least (indicated by less than four participants) during counselling, provision of advice and coaching include: legal and intellectual property advice; advice on innovation, R&D and technology; and advice on corporate social responsibility, social impact, and ethics. Furthermore, the topics dealt with the least (indicated by less than four participants) during training workshops/seminars include: accounting and marketing; corporate social responsibility, social impact, and ethics; and gaining finance.

Four participants also mentioned other topics dealt with during the counselling, provision of advice and coaching sessions, including the lean canvas [Uni-B-SEC/P, Uni-Y-SEC/P], design thinking [Uni-A-TM], life coaching [Uni-A-TM], growth wheel [Uni-B-TM], and idea valuation [Uni-C-SEC/P]. Moreover, design thinking [Uni-A-SEC/P] and the lean canvas [Uni-

B-SEC/P] were also added as topics dealt with during training/workshops/seminars, while participant Uni-C-SEC/P mentioned preparing and improving pitching skills.

Participant Uni-C-SEC/P did, however, explained the following:

“The topics dealt with during these sessions normally depends on the need for that particular group or for that particular individual. It's not a one size fits all.” [Uni-C-SEC/P]

At the universities where material support (office and workspace, meeting facilities, and start-up capital and seed-funding) is offered, information was gathered regarding who has access to such support. It was found that the majority of universities offered office and workspace (six out of eight universities) and meeting facilities (seven out of eight universities), while only four offered start-up capital and seed-funding to student entrepreneurs. The findings on who has access to such material support is presented in Table 6.16.

Table 6.16: Access to material support

University	Extract	Students Who Have Access
Uni-A	Students who have a relationship with us, you know, that are involved in our programs	Registered student entrepreneurs
Uni-B	There are the spaces that are mainly there for student entrepreneurs. They need to register, and we then keep a list of the student entrepreneurs.	Registered student entrepreneurs
Uni-C	Anyone can basically book space to go and work there. No, anyone can actually go and rent some space there.	Any student
Uni-D	It is students that would be part of the incubation program because it is limited physically	Registered student entrepreneurs
Uni-V	N/A	N/A
Uni-W	Well, it is all the students in the entrepreneurship club, they need to be members.	Registered student entrepreneurs
Uni-Y	Those students who participate in the projects in those entrepreneurship weeks.	Registered student entrepreneurs
Uni-Z	The entrepreneurs would mainly be students. They must be registered students.	Registered student entrepreneurs

Source: Interview data

As can be seen from the findings presented in Table 6.16, the majority of the universities (six) only allow students who have specifically registered as student entrepreneurs to access the material support offered. This includes three universities considered as most active [Uni-A,

Uni-B, Uni-D], and three universities considered least active [Uni-W, Uni-Y, Uni-Z]. The only university that allows any student access to material support is Uni-C, as participant Uni-C-TM explained “...*anyone can basically book space to go and work there*”. The findings also indicated that Uni-V does not provide any material support to student entrepreneurs.

6.3.2.2 Co-curricular support activities needed

Participants were also asked to indicate what type of co-curricular support activities they thought student entrepreneurs at their respective universities needed most to increase the chances of them establishing successful businesses. Three support categories were identified, including:

- Creative space/Entrepreneurship centre [Uni-A-TM, Uni-C-TM, Uni-D-TM, Uni-W-SEC/P, Uni-V-SEC/P, Uni-Z-TM]
- Access to funding (start-up capital and seed funding) [Uni-B-SEC/P, Uni-C-TM, Uni-W-SEC/P, Uni-Y-SEC/P, Uni-Y-TM]
- Business advisory and developmental support (Business plan development [Uni-A-TM, Uni-Z-SEC/P]; refining of ideas [Uni-A-SEC/P]; legal [Uni-A-TM; technical [Uni-Y-SEC/P]; and business training [Uni-Z-SEC/P]).

A creative space or entrepreneurship centre is considered most needed by six participants. Participants are of the opinion that such a space should be “*a creative space for students to come and take over a space for and just work there while they are busy with their idea*” [Uni-D-TM], or “*a play space around the concept of entrepreneurship and a space where a whole lot of things happen in terms of entrepreneurship*” [Uni-Z-TM]. The need for a creative space/entrepreneurship centre was pointed out by three participants from most active universities [Uni-A-TM, Uni-C-TM, Uni-D-TM] and three from least active universities [Uni-W-SEC/P, Uni-V-SEC/P, Uni-Z-TM]. However, participant Uni-A-TM explained that “...*we are not going to offer space for students to conduct their business on-site because space is a big problem at our university, and everyone is fighting for space*”. This issue of space seems to be a similar problem at Uni-D, as participant Uni-D-TM mentioned that “...*we do not have the space*”.

Access to funding was pointed out as needed by two participants from most active universities [Uni-B-SEC/P, Uni-C-TM] and three from least active universities [Uni-W-SEC/P, Uni-Y-SEC/P, Uni-Y-TM]. Participant Uni-Y-SEC/P explained the following:

“You might find a student who has a good idea but without an ICT background or the required knowledge, it is a challenge. Without finance to pay somebody to implement that idea, the idea falls apart. They end up giving it up.” [Uni-Y-SEC/P]

The third category of support identified by participants as needed most to increase the chances of students establishing successful businesses is business advisory and developmental support. This category of support mostly revolves around business assistance and training for students of which support for the development of business plans [Uni-A-TM, Uni-Z-SEC/P] was highlighted. Participant Uni-A-TM explained that business plan development support should be offered as *“business plans let you consider x, y and z and whether you have done all that is required”*. Business plans are not only considered as having an impact on how you establish your business and the steps you need to follow, but *“writing business plans for funding purposes”* [Uni-Z-SEC/P] can also lead to easier access of funding. Other advisory and development support identified by participants as needed were in the areas of refining ideas [Uni-A-SEC/P], legal [Uni-A-TM], technical [Uni-Y-SEC/P] and business training [Uni-Z-SEC/P].

6.3.2.3 Enablers for co-curricular entrepreneurship support activities to be offered

Participants noted that for the co-curricular support activities most needed to take place or to be offered (enabled) at their respective universities, the following is needed:

- Top management buy-in [Uni-A-SEC/P, Uni-A-TM, Uni-V-SEC/P, Uni-W-SEC/P, Uni-Z-SEC/P];
- Financial support [Uni-A-SEC/P, Uni-Y-TM, Uni-Y-SEC/P];
- Entrepreneurship policy [Uni-A-TM, Uni-V-SEC/P, Uni-Z-TM]; and
- External partnerships [Uni-Z-SEC/P].

Top management buy-in and financial support was identified by participants from both most active and least active universities as most important for co-curricular support activities to take place or to be offered at their universities. As explained by Uni-A-TM, “...we need the buy in from our VC and our other top management. We need it to become more of a university wide mission”. Participant Uni-W-SEC/P further elaborated saying “...once we have that someone [in top management], I feel we would be going somewhere because that person will be echoing what we think should be done, and if it comes from someone in top management, I think it will be possible. I have seen it with other universities”.

Furthermore, as emphasised by Participant Uni-Y- TM,

“If you have money, you can have everything you need. So, I think the limited financial resources do limit the extent to which we would want to support our students.” [Uni-Y-TM]

In terms of the need for an entrepreneurship policy, Uni-Z-TM notes that for the effective and efficient provision of student entrepreneurship support, “...the thinking must come through policy”. However, participant Uni-A-TM cautions against the implementation of a student entrepreneurship policy saying, “...we as a country are not mature enough to deal with this policy because if there is a policy it has a potential for being exploited”.

External partnerships were also identified as enablers for offering co-curricular entrepreneurship support activities, as explained by participant Uni-Z-SEC/P:

Partnerships with either the municipality or with other actors on entrepreneurship, maybe like the banks, to provide the necessary training for writing business plans for funding for small businesses. They could help us set up these activities and we could collaborate with them so that the university could provide various things like space, staff, and funding because the university always has this challenge of a lack of funding. [Uni-Z-SEC/P]

6.3.3 STRUCTURE

Information was also gathered regarding the methods and measures used to track/monitor and evaluate the performance of the various co-curricular support activities taking place at the participating universities. From the data, one overarching theme was developed in terms of methods, namely *feedback* (see Table 6.17) and two themes in terms of measures, namely *participation rate* and *business performance* (see Table 6.18).

As can be seen from Table 6.17, the method used to track/monitor and evaluate the performance of activities is through obtaining *feedback* (Theme 1) namely, *feedback from staff* (Category 1) and *evaluations from students* (Category 2). In terms of feedback from staff (Category 1), “*feedback is given to and by the coach(es) or mentor(s)*” [Uni-D-SEC/P], while participant Uni-V-SEC/P explained that “*students can also provide evaluations at the end of each activity*” (Category 2).

With regard to the measures used to track/monitor and evaluate the performance of activities (see Table 6.18), the most prominent is through measuring the *performances of the businesses* (Theme 1), this was mentioned by four participants. Other indicators of business performance noted were the number of ideas turned into ventures [Uni-A-SEC/P], the number of successful spin-outs [Uni-C-TM], and goal attainment [Uni-Z-SEC/P].

The second measure used to track/monitor and evaluate the performance of activities is the *participation rate* (Theme 2) of students in co-curricular entrepreneurship support activities. Three participants indicated using this as a measure at their universities. When this measure is used the “*number of people that attend*” [Uni-C-SEC/P] the activities are taken into account.

It was found that only one university, Uni-W (considered a least active university), was not tracking/monitoring and evaluating the performance of their co-curricular support activities. Participant Uni-W-SEC/P explained:

“We have not done that yet. We are still waiting for endorsement, so we are not measuring that yet, we need to, but we are still developing.”

[Uni-W-SEC/P]

Table 6.17: Methods to track/monitor and evaluate performance of activities

Extract	Participant	Code	Categories	Themes
That is like feedback every month on how you know, like what service was used the most.	Uni-D-SEC/P	Feedback	Feedback from staff	Feedback
Feedback that is given to and by the coach or mentor, evaluation report from the mentor.	Uni-B- SEC/P	Evaluation report from mentors		
...evaluations at the end of each and every activity.	Uni-V-SEC/P	Evaluations	Evaluations by students	

Source: Interview data

Table 6.18: Measures to track/monitor and evaluate performance of activities

Extract	Participant	Code	Categories	Themes
...and how many ideas actually become ventures.	Uni-A-SEC/P	Number of ideas turned into ventures	Business performance	Business performance
Number of successful companies that are actually spinning out	Uni-C- TM	Number of successful spin-outs		
Performance or the outcome of the students in terms of the projects that they get involved in.	Uni-Y-TM	Performance of student businesses		
Probably checking on using a spreadsheet and they probably have certain goals that they would achieve and a kind of a tick box scenario.	Uni-Z-SEC/P	Goal attainment		
...so the show up rate and the completion rate	Uni-A-SEC/P	Show up rate	Attendance	Participation rate
Number of people that attend. It is, yes, number of entries into the competitions.	Uni-C- SEC/P	Number of people attending		
Number of students attending...	Uni-D- TM	Number of students attending		

Source: Interview data

6.3.4 PEOPLE

The findings show that a specific person or team of people is tasked with organising co-curricular entrepreneurship support activities at all eight participating universities. These individuals or team of people include one or more of the following:

- Academic(s) [Uni-V, Uni-W, Uni-Y, Uni-Z];
- Coordinator for student entrepreneurship [Uni-A, Uni-D];
- Centre for Entrepreneurship staff [Uni-B]; and
- Incubator staff [Uni-C].

At all four universities considered most active, specific individuals or a team of people are tasked with organising these activities. In contrast, at all four least active universities [Uni-V, Uni-W, Uni-Y, Uni-Z], these activities are organised by academic staff members.

Participants were also requested to indicate (tick), from a list of descriptions, which group of students are partaking in the activities on offer at their respective universities. These findings are presented in Table 6.19.

Table 6.19: Students involved in entrepreneurship activities

Group of Students	Participants	Total
All students at the university	[None]	0
Students who are interested in entrepreneurship	Uni-A-SEC/P, Uni-A-TM, Uni-B-SEC/P, Uni-B-TM, Uni-C-TM, Uni-D-SEC/P, Uni-D-TM, Uni-V-SEC/P, Uni-W-SEC/P, Uni-Y-SEC/P, Uni-Y-TM, Uni-Z-TM	12
Students who are interested in starting their own business (aspiring)	Uni-A-SEC/P, Uni-A-TM, Uni-B-SEC/P, Uni-B-TM, Uni-C-TM, Uni-D-SEC/P, Uni-D-TM, Uni-Y-TM	8
Students who are in the process of starting their own business (nascent)	Uni-A-SEC/P, Uni-A-TM, Uni-B-SEC/P, Uni-B-TM, Uni-C-TM, Uni-D-SEC/P, Uni-D-TM, Uni-Y-TM	8
Students who have started their own business (active)	Uni-A-SEC/P, Uni-A-TM, Uni-B-SEC/P, Uni-B-TM, Uni-C-TM, Uni-D-SEC/P, Uni-D-TM, Uni-Y-TM	8
Alumni	Uni-C-SEC/P, Uni-D-SEC/P, Uni-D-TM	3

Source: Interview data

As can be seen from Table 6.19, students who are interested in entrepreneurship are the group that are mostly (ticked by 12 participants) involved in entrepreneurship support activities at the participating universities. Thereafter, the groups of students who are most likely to be involved (ticked by 8 participants each) are those who are interested in starting their own business (aspiring), those who are in the process of starting their own business (nascent), and those who have already started their own business (active). Only three participants (all from most active universities) indicated (ticked) that alumni of their university are involved in co-curricular entrepreneurship support activities. None of the participants indicated that all students at their university are involved in co-curricular entrepreneurship support activities. As pointed out by Uni-D-SEC/P, “*it is definitely not all, not all students*”.

6.4 SUMMARY

In Chapter Six, the findings relating to the university environment and culture as well as the co-curricular entrepreneurship support activities being offered by the participating universities were presented. These findings were presented first as they provide a broad overview of how entrepreneurship is perceived, and the support offered at these universities.

As guided by the conceptual framework of this study, the findings relating to the more specific entrepreneurship support elements are presented in Chapter Seven. These specific entrepreneurship support elements include formal entrepreneurship education, incubator and accelerator programmes, TTOs and university venture funds.

CHAPTER SEVEN

EMPIRICAL FINDINGS: OTHER ELEMENTS IN THE INTERNAL ENTREPRENEURSHIP ENVIRONMENT

7.1 INTRODUCTION

In the previous chapter (Chapter Six), the findings relating to two of the elements in the internal entrepreneurship environment, namely the university environment and culture, and the co-curricular entrepreneurship support activities, were presented. In this chapter (Chapter Seven), the findings relating to the other elements in this internal environment are presented, namely formal entrepreneurship education, incubator and accelerator programmes, TTOs and university venture funds (see Figure 3.1).

7.2 FORMAL ENTREPRENEURSHIP EDUCATION

Using the design elements of Good *et al.* (2018), namely purpose, activities, structure, and people, the findings relating to formal entrepreneurship education at the participating universities are summarised below. For the purpose of this study, formal entrepreneurship education is regarded as accredited modules, certificates, degrees or programmes specifically focusing on entrepreneurship (Mohamad *et al.*, 2015:877; Sherwood, 2018:260). The data was collected from eight entrepreneurship educators, one from each of the participating universities.

7.2.1 HISTORY AND PURPOSE

Participants' knowledge regarding the history of formal entrepreneurship education at their institutions as well as the purpose thereof was sought. The findings suggest that entrepreneurship educators have a vague idea or no knowledge of how long entrepreneurship education (history) has been offered at their institutions. In addition, during the analysis of the data, four categories were developed in terms of the purpose (aim) of formal entrepreneurship education at the participating universities, namely, to (i) *develop entrepreneurial skills*; (ii) *change mindsets*; (iii) *enable self-employment*; and (iv) *teach entrepreneurship theory*. The various codes and several extracts (meaning units) supporting these codes are presented in Table 7.1.

Table 7.1: Purpose (aim) of formal entrepreneurship education

Extract	Participant	Code	Categories	Themes
They think that the more we provide entrepreneurship education, the more we will create entrepreneurs.	Uni-A-AS	Create entrepreneurs	Develop entrepreneurial skills	Education for entrepreneurship
We are focusing on building human capacity from a human resource perspective...	Uni-C-AS	Building human capacity		
The main aim of the project is to teach students how to set up and run their own business.	Uni-D-AS	How to set up and run a business		
To get students to devise and develop a business plan and to be able to present this business plan to funders.	Uni-W-AS	Develop and present a business plan		
It is all about changing the mindset of the students...	Uni-B-AS	Change of mindset	Change mindsets	
It is about addressing and dealing with the mindset. Providing the opportunity for students to see things from the entrepreneurial perspective as well.	Uni-C-AS	Dealing with the mindset		
It is to induct students into them thinking about themselves as business creators and not only as job seekers.	Uni-Y-AS	See themselves as job creators instead of job seekers		
You want them to create their own jobs... So, the reason behind this is to make sure that they have their own businesses.	Uni-B-AS	Create their own jobs	Enable self-employment	
To help with employment after exiting out of the university, having a way of generating an income afterwards.	Uni-V-AS	Generate income after studies		
Well, it is to assist the students if they cannot find a job to be job creators rather than job seekers.	Uni-Z-AS	Assist students in creating jobs		
The main aim of formal entrepreneurship education is to get students to be able to understand entrepreneurship.	Uni-W-AS	Understand entrepreneurship	Teach entrepreneurship theory	Education about entrepreneurship

Source: Interview data

From the four categories, two overarching themes are developed which describe the purpose of formal entrepreneurship education at the participating universities, namely *education for entrepreneurship* and *education about entrepreneurship*. Three categories, namely *develop entrepreneurial skills*, *change mindsets*, and *enable self-employment*, fall under the theme of *education for entrepreneurship*. Moreover, the category *teaching entrepreneurship theory*, falls under the theme *education about entrepreneurship*.

From Table 7.1 it can be seen that *education for entrepreneurship* is the dominant theme, with the category *develop entrepreneurial skills* being the most prominent category. Four participants made reference to developing entrepreneurial skills as the main purpose of formal entrepreneurship education at their institution. Their purpose being to “*create entrepreneurs*” [Uni-A-AS], “*build human capacity*” [Uni-C-AS], “*teach students how to set up and run their own businesses*” [Uni-D-AS], and teach them how to “*devise, develop and present a business plan*” [Uni-W-AS]. Of these four participants, three were from the most active universities [Uni-A-AS, Uni-C-AS, Uni-D-AS], and one was from the least active universities [Uni-W-AS].

The category *develop entrepreneurial skills* was followed by two other categories, namely, *change mindsets* and *enable self-employment*. For the category *change mindsets*, three participants [Uni-B-AS, Uni-C-AS, Uni-Y-AS] indicated that the purpose of formal entrepreneurship education at their universities was to change the mindsets of students to “*thinking about themselves as business creators and not only as job seekers*”. Two of these participants were from the most active universities [Uni-B-AS, Uni-C-AS], and one was from the least active universities [Uni-Y-AS]. Moreover, the category *enable self-employment* describes the purpose of entrepreneurship education as assisting students “*to be job creators rather than job seekers*” [Uni-Z-AS] and “*create their own jobs and have their own business*” [Uni-Uni-B-AS], which will allow students to “*generate an income afterwards [after graduating]*” [Uni-V-AS]. One of these participants was from a most active university [Uni-B-AS], and two were from least active universities [Uni-V-AS, Uni-Z-AS].

The second theme generated to describe the purpose of entrepreneurship education was named *education about entrepreneurship*. Only one participant, who was from one of the least active universities, made reference to the primary purpose of formal entrepreneurship education being “*to get students to be able to understand entrepreneurship*” [Uni-W-AS].

7.2.2 ACTIVITIES AND STRUCTURE

In this section, the findings relating to the content and extent of formal entrepreneurship education at the participating universities as well as the various teaching methods used are presented.

7.2.2.1 Content and extent of activities

The knowledge of participants regarding the extent and content of formal entrepreneurship education at their institutions was sought. It also appears that they have little knowledge of the number of offerings (extent) or content of entrepreneurship modules being offered. A reply from an entrepreneurship educator from Uni-D-AS sums this up:

“I can’t answer that because, you know, we’ve got eight faculties and a Business School, so I couldn’t possibly say what all of them are doing in terms of entrepreneurship”. [Uni-D-AS]

There was some awareness by participants of the extent (such as number of modules) to which formal entrepreneurship education was offered throughout their institutions. In general, it appears that formal entrepreneurship education is not offered broadly throughout all faculties and schools at institutions. The following faculties and schools were found to participate in formal entrepreneurship education at the participating universities:

- Management and Commerce Faculties only [Uni-A-AS; Uni-B-AS; Uni-V-AS; Uni-Z-AS]
- Management and Commerce Faculties as well as various other faculties, schools and departments [Uni-C-AS; Uni-D-AS; Uni-W-AS; Uni-Y-AS], including Medical [Uni-C-AS], Science [Uni-C-AS; Uni-W-AS; Uni-Y-AS], Engineering [Uni-C-AS; Uni-D-AS], Humanities [Uni-D-AS], and Tourism [Uni-W-AS].

Of the four participating entrepreneurship educators who mentioned that formal entrepreneurship education was only being provided in the Management and Commerce Faculty, two were from the most active universities [Uni-A-AS; Uni-B-AS], and two were from

the least active universities [Uni-V-AS; Uni-Z-AS]. Moreover, of the four participating entrepreneurship educators who indicated that entrepreneurship education was being provided in the Management and Commerce Faculty, as well as other faculties, schools and departments, two were from the most active universities [Uni-C-AS; Uni-D-AS], and two were from the least active universities [Uni-W-AS; Uni-Y-AS]. The most prominent faculties in terms of providing formal entrepreneurship education, besides the traditional Management and Commerce Faculty, were the Science [Uni-C-AS; Uni-W-AS; Uni-Y-AS] and Engineering Faculty [Uni-C-AS; Uni-D-AS]. Medical, Humanities and Tourism were mentioned the least, each only indicated by one participant [Uni-C-AS; Uni-D-AS; Uni-W-AS], respectively.

In addition to formal entrepreneurship education not being offered by all faculties and schools, it was also noted that, in general, formal entrepreneurship education was not provided or made available to all students for registration. As pointed out by participant Uni-B-AS, “...*not in all schools, but we are working on it*”. Similarly, participant Uni-V-AS says the following, “*They are core modules in certain BCom’s. Even so, not even all BCom’s ... it’s a third-year module and an honours module, it’s not offered broadly. So normally by the third year you have specialised.*”

For students that could register for formal entrepreneurship education, entrepreneurship modules were either core modules (compulsory) or electives, depending on the curriculum, faculty, and department:

“It depends on the faculty. They decide. I cannot say in a specific faculty, they do this or that. I can only speak in my department. For instance, in my department, students do not have a choice to do a specific subject.” [Uni-B-AS]

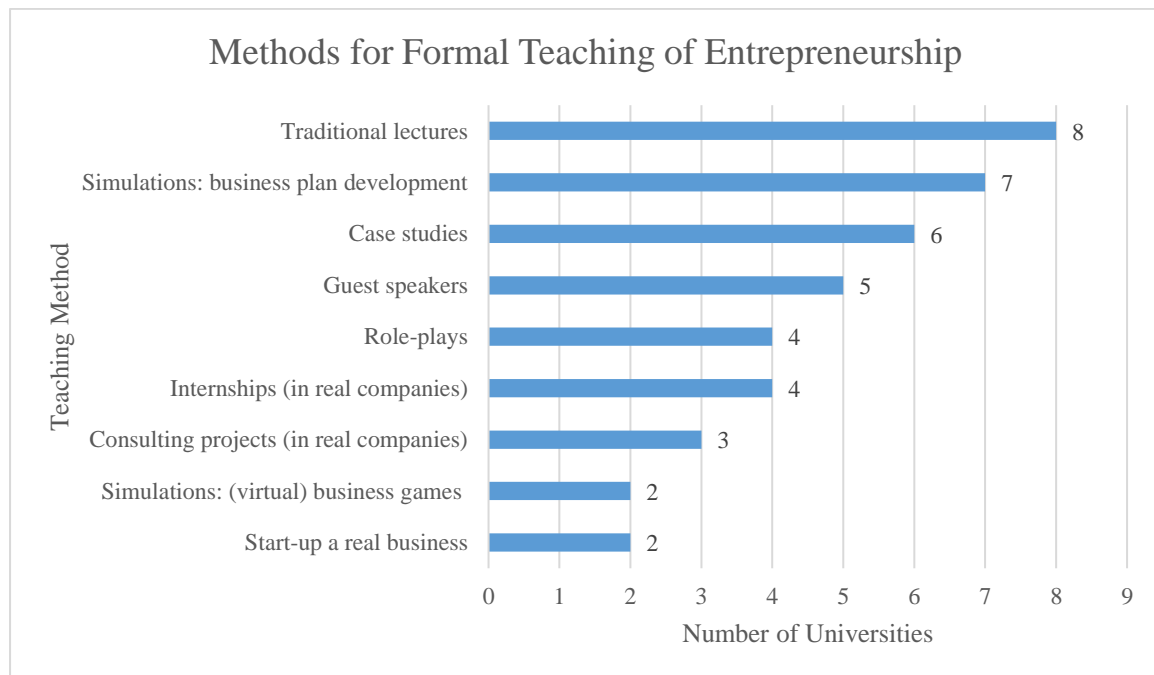
Worth noting is the formal entrepreneurship education program offered by Uni-D-AS. Their programme is similar to a postgraduate degree and is open to all faculties and schools:

“It is a postgraduate [programme], so you have to have an undergraduate degree, and you can have any undergraduate degree. So, science, art, perform and media, theatre, advertising, commerce, humanities, we take anybody who meets the criteria.” [Uni-D-AS]

7.2.2.2 Teaching methods

Information regarding the methods adopted to teach formal entrepreneurship education at the participating universities was also gathered. Participants were required to indicate (tick) the methods they use from a list of options. The findings show that a variety of teaching methods are adopted to teach entrepreneurship at the participating universities. These methods are presented in Figure 7.1.

Figure 7.1: Methods for formal teaching of entrepreneurship



Source: Interview data

From Figure 7.1 it can be seen that traditional lectures are still the most common method used for teaching entrepreneurship at the participating universities, with all eight entrepreneurship educators interviewed indicating (ticking) this option. Traditional lectures as a teaching method were followed by business plan development, case studies, guest speakers, internships (in real companies), and role-plays, respectively. These methods were used by at least half of the participating universities (> four). The methods used least often are consulting projects (in real companies), start-up of a real business and simulations: (virtual) business games, with less than half (< four) of the participating universities using these methods.

Table 7.2 provides more details on the methods of teaching entrepreneurship adopted by the two categories of participating universities, namely the most active and the least active in terms of providing student entrepreneurship support.

Table 7.2: Methods for formal teaching of entrepreneurship

Key: Y = Method adopted; N = Method not adopted; U = Unsure whether method adopted or not										
	Most Active					Least Active				
Participant:	Uni-A-AS	Uni-B-AS	Uni-C-AS	Uni-D-AS	Total (out of 4)	Uni-V-AS	Uni-W-AS	Uni-Y-AS	Uni-Z-AS	Total (out of 4)
Traditional lectures	Y	Y	Y	Y	4	Y	Y	Y	Y	4
Simulations: business plan development	Y	Y	Y	Y	4	U	Y	Y	Y	3
Case studies	N	Y	Y	N	2	Y	Y	Y	Y	4
Guest speakers	N	Y	Y	Y	3	N	U	Y	Y	2
Role-plays	N	N	Y	Y	2	Y	N	Y	N	2
Internships (in real companies)	N	Y	Y	Y	3	N	N	Y	N	1
Consulting projects (in real companies)	N	N	Y	Y	2	N	N	Y	N	1
Simulations: (virtual) business games	N	N	Y	N	1	N	N	Y	N	1
Start-up a real business	N	Y	N	Y	2	N	N	N	N	0
Other:	N	N	Y	N	1	N	Y	Y	Y	4
Total (out of 10)	2	6	9	7		3	4	9	5	
Average number of methods employed	6					5.25				

Source: Interview data

From a total of ten teaching methods that the participants could select, the most active universities adopt between two and nine different methods. In contrast, the least active universities adopt between three and nine different methods. The outliers are Uni-A (most active) and Uni-Y (least active), who use two and nine different methods, respectively. Out of the eight participating universities, Uni-A, which was categorised as a most active university, adopts the least variety of methods, whereas Uni-Y, categorised as a least active university, together with Uni-C (categorised as most active), adopts the greatest variety of methods.

From Table 7.2 it can also be seen that universities categorised as most active make use of 6 different methods on average, whereas universities categorised as least active make use of 5.25 different methods on average. As such, active universities are using a wider variety of teaching methods to teach entrepreneurship than least active universities are.

It is also evident from the findings presented in Table 7.2 that universities categorised as active are more inclined to use practical methods described as education *for* entrepreneurship and education *through* entrepreneurship. Practical methods include internships (in real companies), consulting projects (in real companies), simulations: (virtual) business games, and start-up of a real business. These practical methods were selected eight times by entrepreneurship educators at universities categorised as active, but only three times by those at universities categorised as least active. The method, starting up a real business, is the method least employed by the eight participating universities, with only Uni-B and Uni-D, both categorised as active universities, making use of this method.

Three educator participants indicated making use of teaching methods not an option on the list provided. These other methods included “*live cases*”, “*entering formal competitions*”, “*farm visits*”, and “*community training*”. The quotes below provide more insights into these methods.

“I prefer that people must go out there and talk to entrepreneurs and assess their strengths and weaknesses and stuff of that nature. It is a business case. I normally refer to it as a live case.” [Uni-C-AS]

“Students in their practical implementation of the business plan use those ideas in formal competitions, like, for example, the seed funding competition that we have or education competition. We tried to make it practical in the sense that they actually do compete. You know when they do present their business plans.” [Uni-W-AS]

“Farm visits, that is demonstrations.” [Uni-Y-AS]; *“On-going training in the community.”* [Uni-Z-AS]

7.2.3 PEOPLE

In the following section, information collected relating to the people involved in formal entrepreneurship education at the participating universities is presented, namely the academics that teach and the students who are registered for these modules.

7.2.3.1 Staff (academics and lecturers)

The participating entrepreneurship educators were uncertain as to the number of people involved in teaching formal entrepreneurship modules at their institutions. Educators did, however, have opinions as to whether the numbers were satisfactory or not. Four claimed that the numbers were satisfactory [Uni-B-AS; Uni-C-AS; Uni-V-AS; Uni-Y-AS], and four claimed that they were not [Uni-A-AS; Uni-D-AS; Uni-W-AS; Uni-Z-AS]. However, the satisfactory responses by the least active universities were based on their current offerings and lecturer/student ratios.

“I mean, it’s satisfactory in terms of the number of modules we have, so I don’t know if it’s the staff that is the problem; it’s the number of modules in entrepreneurship that’s the problem.” [Uni-V-AS]

“The question of satisfaction depends on the lecturer/student ratio. I would say that the ratio is okay, but with the increasing numbers, we would need a higher number of lecturers.” [Uni-Y-AS]

The entrepreneurship educators interviewed made numerous suggestions on how to increase the interest among lecturers to teach formal entrepreneurship modules. Three themes were developed, including increasing opportunities to teach entrepreneurship modules, employing the correct staff, and providing incentives (see Table 7.3).

Table 7.3: Methods to increase an interest in entrepreneurship among educators

Extract	Participant	Code	Categories	Themes
If I'm employed as a lecturer, my boss tells me you are teaching A, B or C, that is it. ... The university does not force them or does not create avenues for them to teach entrepreneurship.	Uni-A-AS	Create avenues to teach entrepreneurship	Create avenues to teach entrepreneurship	Increasing opportunities to teach entrepreneurship modules
It's not about increasing the interest of lecturers to teach formal entrepreneurship modules but increasing the number of modules.	Uni-V-AS	Increasing entrepreneurship modules	Expand on entrepreneurship modules	
... make it part of their module, not to make it stand alone ...	Uni-Y-AS	Integrating entrepreneurship in existing modules		
There is this view that if you do not have a business, you have no business teaching entrepreneurship. Because you do not know anything about being an entrepreneur.	Uni-W-AS	Having a business	Staff requirements	Employing the correct staff
You have to have certain qualities and skills to teach entrepreneurship, and it is not so widespread. You need to have certain skills and academic qualifications, of course. That is why even though we would desire it, it is very difficult to find people like that.	Uni-W-AS	Possessing certain qualities and skills		
That would be extrinsic motivation, such as an additional payment.	Uni-Z-AS	Additional payments	Extrinsic motivation	Providing incentives

Source: Interview data

The theme *increasing opportunities to teach entrepreneurship modules* consists of two categories: *create avenues to teach entrepreneurship* and *expand on entrepreneurship modules*. In terms of opportunities to teach entrepreneurship, participant Uni-A-AS contends that lecturers do not have a choice in what they are required to teach, asserting that “...my boss tells me you are teaching A, B or C, and that is it”. The participant further elaborated that “...universities should create avenues for lecturers to teach entrepreneurship modules if they would like to”. Regarding the category *expand on entrepreneurship modules*, participant Uni-V-AS asserts that “...it’s not about increasing the interest of lecturers to teach formal entrepreneurship modules, but increasing the modules”. In contrast, an argument was also made to increase opportunities to teach entrepreneurship by including it in existing modules as “most lecturers are highly specialised. This way, it doesn’t feel like they are totally leaving their area of expertise [Uni-Y-AS].

The themes, *employing the correct staff* and *providing incentives*, each consisted of one category which were named *staff requirements* and *extrinsic motivation*, respectively. Participant Uni-W-AS explained that lecturers interested in teaching entrepreneurship are expected to have “*certain qualities and skills*” and have their own business. It is viewed that “...if you do not have a business, you have no business teaching entrepreneurship” [Uni-W-AS]. Moreover, participant Uni-Z-AS mentioned that extrinsic motivation, such as monetary compensation, could be used to increase lecturers’ interest in teaching formal entrepreneurship education.

The extent to which research in the field of entrepreneurship is being undertaken at the participating universities is also unclear among the entrepreneurship educators interviewed. The findings suggest that they have a vague idea of research being done in their immediate environments but no knowledge of what research is being done or by who in the institutions as a whole. The replies of educators from Uni-Y-AS and Uni-Z-AS sum this up:

“*I can only speak for the agricultural school...*” [Uni-Y-AS]; “*I’m going to guess now because it might just be our campus...*” [Uni-Z-AS]

7.2.3.2 Students

Knowledge of the number of students registered for entrepreneurship modules at the participating universities varied (see Table 7.4). Three educator participants [Uni-A-AS, Uni-C-AS, Uni-W-AS] provided the numbers for all students registered for entrepreneurship modules, whereas another three [Uni-V-AS, Uni-Y-AS, Uni-W] were able to provide numbers for students registered for a specific module. One participant could only provide numbers specific to their entrepreneurship programme, and one participant [Uni-B-AS] had no knowledge of the number of students registered for entrepreneurship modules at his/her university.

Table 7.4: Students registered for entrepreneurship modules

Context	Participant	Number of Students
Number of students registered within all entrepreneurship modules at the respective university	Uni-A-AS	400-500
	Uni-C-AS	350
	Uni-W-AS	300
Number of students registered for specific entrepreneurship modules	Uni-V-AS	110
	Uni-Y-AS	13
	Uni-W-AS	26-30
Number of students registered for specific entrepreneurship programmes	Uni-D-AS	50

Source: Interview data

Worth noting is that the entrepreneurship programme offered by Uni-D attracts more than 400 applications per annum, but only 50 are selected and allowed to register. To find the most suitable candidates, an extensive selection process is followed. Uni-D-AS explains:

“There are three levels of selection; they have to get into the university, then they must get into the faculty and then they have to get into the programme. We recruit based on two core competencies, namely leadership and entrepreneurship. As I said, the background is eclectic, so it could be any background - science, media, commerce, humanities, and academics are not that important. If we had to choose an academically brilliant candidate and somebody’s entrepreneurial or leadership capability, we would choose the latter.” [Uni-D-AS]

Three of the entrepreneurship educators interviewed [Uni-B-AS, Uni-Y-AS, Uni-Z-AS] indicated that they are satisfied with the number of students registered for entrepreneurship modules, whereas four [Uni-A-AS, Uni-C-AS, Uni-V-AS, Uni-W-AS] regard registrations as being too low. One interviewee [Uni-D-AS] could not comment. However, the resources available should be considered when assessing the level of satisfaction with student numbers registered for entrepreneurship modules. As noted by participant Uni-W-AS:

“I would say depending on the resources that we have and the stuff we have, it’s satisfactory.” [Uni-W-AS]

Methods suggested to increase students’ interest in registering for entrepreneurship modules include *“delivering a kind of value that students appreciate”* [Uni-C-AS], *“introducing entrepreneurship modules earlier in the curriculum and making it compulsory”* [Uni-Y-AS], and *“having an entrepreneurship BCom programme”* [Uni-Z-AS].

7.3 INCUBATOR AND ACCELERATOR PROGRAMMES

In the following sections, the findings regarding incubators and accelerator programmes are presented using the design elements of Good *et al.* (2018), namely purpose, activities, structure and people. For this study incubators are regarded as hubs consisting of small work units which focus on providing a wide variety of business development support within an environment conducive to business start-ups (Covelli *et al.*, 2020:118). In contrast, accelerator programmes are seen as extensions of incubators focusing more on the education and mentoring aspects of business support (Wright *et al.*, 2017:917).

During the data collection process, it was found that of the four most active universities [Uni-A; Uni-B; Uni-C; Uni-D], three hosted incubators [Uni-A, Uni-B, Uni-C], and one [Uni-D] hosted an accelerator programme. In contrast to the most active universities, only two of the least active universities [Uni-Y; Uni-Z] hosted incubators at their institutions. Although one of most active universities [Uni-A] had an incubator, no response was received from incubator staff members when invited to participate in the current study. Thus, the data collected for this section was from five participating universities [Uni-B; Uni-C; Uni-D; Uni-Y; Uni-Z] only.

7.3.1 HISTORY AND PURPOSE

Participants' knowledge regarding the history and initial motivation for establishing the incubators and accelerator programmes at their institutions, as well as the purpose thereof was sought. These findings are presented in the section to follow.

7.3.1.1 History and initial motivation

It was found that these incubators and accelerator programmes were established during the years 2013 and 2019, with the most active universities establishing theirs earlier, 2013 [Uni-C], 2014 [Uni-B, Uni-D], and the least active universities only establishing theirs in 2019 [Uni-Y, Uni-Z].

The actors involved in establishing these incubators and accelerator programmes were identified as:

- University management [Uni-C, Uni-D, Uni-Y, Uni-Z];
- Faculty members [Uni-C]; and
- Regional parties/government – Small Enterprise Development Agency (SEDA) [Uni-B, Uni-Y, Uni-Z], Small Enterprise Finance Agency (SEFA) [Uni-B], Department of Trade, Industry and Competition (DTI) [Uni-B], Department of Small Business Development (DSBD) [Uni-B]

As indicated by participants, the initial motivation for establishing these incubators and accelerator programmes varied between institutions. The various motivations were condensed into two overarching themes: *encouraging and supporting business start-up*, and *economic development* (see Table 7.5)

Table 7.5: Initial motivations for establishing incubators and accelerator programmes

Extract	Participant	Code	Categories	Themes
We had students and community members who came to ask for advice regarding registering their businesses, applying for finance, and just general business. Thus, we decided to be the person to assist as many students as we can and not turn away any students or community members that would want to work.	Uni-B-IS	Assistance in starting businesses	Increase entrepreneurial activities	Encourage and support business start-ups
There was a desire for more entrepreneurial activities with students back in 2011.	Uni-C-IS	More entrepreneurial activities		
I think it is basically getting more entrepreneurs...	Uni-D-IS	Getting more entrepreneurs		
...encourage people to stop looking at white-collar jobs and know that they can create their own businesses	Uni-Y-IS	Know that they can create their own businesses	Change mindset	
To encourage students to create businesses...	Uni-Z-IS	Encourage students to create businesses		
We can also contribute further to the gross domestic product (GDP) of the province	Uni-Y-IS	Contribute to GDP	Improve the standard of living	
...reduce poverty...	Uni-Y-IS	Reduce poverty		
...solve issues that are facing the community...	Uni-Z-IS	Solve community issues		
To increase the technology advancement...	Uni-Z-IS	Increase technology advancement		
...it will reduce unemployment...	Uni-Y-IS	Reduce unemployment	Decrease the unemployment rate	
As I indicated to reduce unemployment...	Uni-Z-IS	Reduce unemployment		

Source: Interview data

Where the initial motivation to establish an incubator was to *encourage and support business start-ups* (Theme 1), institutions were motivated by the need to increase entrepreneurial activities and change the mindsets of students. Three participating incubator staff members provided meaning units that contributed to the development of the category *increase entrepreneurial activities*. These participants mentioned that their respective incubators were established because they “*had students and community members who came to ask for advice regarding registering their businesses, applying for finance, and just general business*” [Uni-B-IS], “*...there was a desire for more entrepreneurial activities*” [Uni-C-IS], and “*...[we] basically [wanted] more entrepreneurs*” [Uni-D-IS]. The second category within this theme is *change mindsets*, where two participants indicated that the incubators were established so that students “*know that they can create their own businesses*” [Uni-Y-IS] and “*to encourage students to create businesses*” [Uni-Z-IS].

Only two of the participants [Uni-Y-IS, Uni-Z-IS] indicated that their initial motivation to establish an incubator was to *contribute to economic development* (Theme 2) through improving the standard of living and decreasing the unemployment rate. Both are considered least active universities in the current study.

7.3.1.2 Purpose

Through an analysis of the data, two themes were developed describing the current purpose (aim) of the incubators at the five universities, namely, to *provide support which focuses on the entrepreneur as individual* and *support which focuses on successfully establishing businesses* (see Table 7.6).

Table 7.6: Purpose of incubators and accelerator programmes

Extract	Participant	Code	Categories	Themes
The main aim is to develop an ethical, socially responsible entrepreneur.	Uni-B-IS	Develop ethical and socially responsible entrepreneurs	Develop entrepreneurial skills	Support focussing on entrepreneur
It is to upskill our student entrepreneurs, alumni and SME's in the province.	Uni-Y-IS	Up-skill entrepreneurs		
So, we should try to train them to develop impactful businesses that are relevant within the community and South Africa as a whole.	Uni-Z-IS	Train entrepreneurs		
So that's the main goal why the incubator exists, to change the mindset of students instead of being job seekers, to be job creators.	Uni-Z-IS	Change mindset from job seeker to job creators	Change mindsets	
It is to create high impact start-ups.	Uni-D-IS	Establish high impact start-ups	Establish successful start-ups	Support focussing on business start-ups
So that's the essence of why the incubator exists, as we know that businesses fail within their first three years. So, we're trying to minimise such failure rate.	Uni-Z-IS	Minimise start-up failure rate		
To help them perfect their business ideas, access the market, access funding, as well as access technical expertise.	Uni-Y-IS	Start-up assistance		
Primarily to build successful spin-off companies from technology transfer.	Uni-C-IS	Spin-off companies		

Source: Interview data

These overarching themes each consist of two categories. When the purpose of an incubator is to provide support that focusses on the individual entrepreneur (Theme 1), developing entrepreneurial skills and changing mindsets is important. *Developing entrepreneurial skills* (Category 1) was however most prominent with three participating incubator staff members mentioning that the purpose of their incubator was to “*develop an ethical, socially responsible entrepreneur*” [Uni-B-IS], to “*up-skill our student entrepreneurs*” [Uni-Y-IS], and to “*train them to develop impactful businesses*” [Uni-Z-IS]. The second category developed within this overarching theme was *change mindsets*, which was mentioned by one participant [Uni-Z-IS] who pointed out that the purpose of their incubator is “*to change the mindset of students instead of being job seekers, to be job creators*”.

When the purpose of an incubator is to provide support that focusses on business start-ups (Theme 2), then establishing successful start-ups and spin-off companies is their primary aim. The category within this overarching theme with the most meaning units to support such a focus was *establishing successful start-ups*. As pointed out by participants, their purpose is to establish successful start-ups, or more specifically to “*create high impact start-ups*” [Uni-D-IS], “*minimise start-up failure rate*” [Uni-Z-IS], and “*help [incubatees to] perfect their business ideas, access the market, access funding, as well as access technical expertise*” [Uni-Y-IS]. The second category that makes up the theme *support focussing on business start-ups* relates to *establishing spin-off companies*. Only one participant highlighted that their focus is “*to build success for spin-off companies from technology transfer*” [Uni-C-IS].

It was found that, in general, the support provided by the incubators of the participating universities was available not only to existing registered students, but also to other individuals outside the university. These individuals are specifically targeted by the incubators and have access to the support they provide. Individuals who have access to the support provided by incubators include:

- Registered students [Uni-B-IS; Uni-C-IS; Uni-D-IS; Uni-Y-IS; Uni-Z-IS];
- Alumni [Uni-B-IS; Uni-C-IS; Uni-D-IS; Uni-Y-IS; Uni-Z-IS];
- Community [Uni-B-IS; Uni-C-IS; Uni-Z-IS];
- Existing entrepreneurs with established businesses [Uni-C-IS; Uni-Y-IS].

As can be seen from the findings of this study all five incubators target and provide support to registered students at their respective universities, as well as other groups of individuals, including their alumni, the community, and established entrepreneurs.

7.3.2 ACTIVITIES

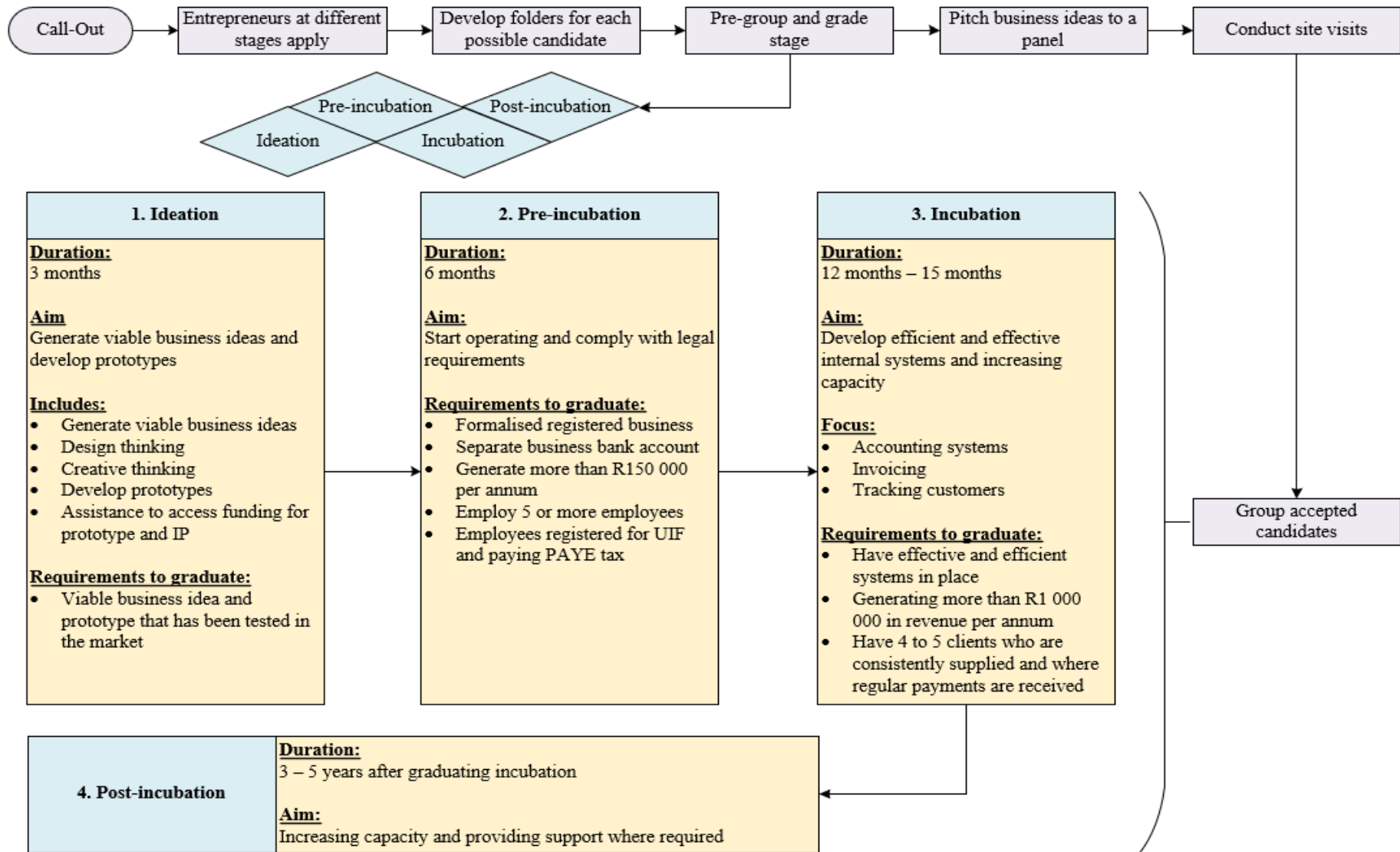
In this section, the findings relating to selection processes and content of incubators and accelerator programmes at the participating universities are presented and described.

7.3.2.1 Selection process and content

During the data collection process, information was gathered regarding the incubator selection process followed as well as the content of support offered. Only two of the participating incubator staff members [Uni-B-IS, Uni-Z-IS] provided details on their selection process, while all five provided information on the phases and content of their support.

In terms of their selection process, Uni-B-IS (see Figure 7.2) indicated that they start with a call-out for interested individuals to apply for a position to be part of the incubation programme. Participant Uni-B-IS elaborated that “*entrepreneurs at different stages in the business life cycle can apply*”. After potential participants have applied, Uni-B-IS explained that they then “*formulate a mini folder for each and every entrepreneur*” and “*group them and grade them*”. Thereafter, possible candidates need to pitch their business ideas to a panel and site visits are conducted. Those accepted into the incubation programme are then grouped according to the four phases of the programme, namely ideation, pre-incubation, incubation, and post-incubation. As explained by participant Uni-B-IS, this recruitment and selection process is conducted yearly, “*...we do our recruitment and selection process right in the first two months of the year*”.

Figure 7.2: Incubation selection process and content of programmes at Uni-B



Source: Authors own construction based on interview data

The first phase, ideation, is aimed at generating viable business ideas and developing prototypes. The duration of the ideation phase is three months. It focuses on “*design-thinking, which is across the board, regardless whether you are already established as you need to apply using design thinking every day*” [Uni-B-IS]. These design thinking and creative workshops are run every month as “*things are dynamic*” [Uni-B-IS]. After a viable business idea has been generated, the candidates are taken to a “*make-a-space*” to “*develop their products and make prototypes*”, which can then be tested in the market. In order to graduate from the ideation phase to the pre-incubation phase, the participants must “*have a service or product that has been tested in the market that can sell*” [Uni-B-IS].

The second phase, pre-incubation, is concerned with assisting the candidates to initiate the operations of their business and to ensure that they comply with all legal requirements. The duration of the pre-incubation phase is six months. In order to graduate from the pre-incubation phase to the incubation phase, specific requirements need to be met (see Figure 7.2).

The third phase, incubation, focuses on “*making sure that you have systems in place*”, ensuring that they are set up as efficiently and effectively as possible, and “*increasing your [the business’s] capacity*”. The duration of this phase is 12 months but can be extended to 15 months “*depending on the progress*” [Uni-B-IS]. Participant Uni-B-IS mentioned accounting systems, invoicing, and customer tracking as examples of systems focused on during this phase. In order to graduate from the incubation phase to the post-incubation phase, the business must meet certain criteria (see Figure 7.2). Participant Uni-B-IS noted that “*...as a rapid incubator, the idea is to establish a business in 18 months that can grow, run on its own, be sustainable, and graduate and go*”.

The final phase, post-incubation, provides support, guidance and advice to participants who have graduated from the incubation programme and are sustainable on their own. This post-incubation support can be received for three to five years after graduating from the incubation programme.

Instead of following the traditional incubation phases (ideation, pre-incubation, incubation, and post-incubation), Uni-C offers three different programmes from their incubator (see Figure 7.3). These programmes are denoted as Programme A, Programme B and Programme C for anonymity purposes.

Figure 7.3: Content of incubation programmes at Uni-C

Programme A	Programme B
<p><u>Duration:</u> 10-week programme</p> <p><u>Aim:</u> Assist individuals to get a validated business idea and product that people actually care about and want to pay money for</p> <p><u>Characteristics:</u></p> <ul style="list-style-type: none"> • Apply design thinking • Selection process is softer • Online content and videos with paired mentorship • Open to students 	<p><u>Duration:</u> 22-week programme</p> <p><u>Aim:</u> Assist in developing the products and focus on the basic building blocks of a business</p> <p><u>Characteristics:</u></p> <ul style="list-style-type: none"> • Develop the actual product • Focus on business acumen, such as finance, operations, marketing, increasing customers and sales, governance, etc. • Online content and videos with paired mentorship • Open to students
<p>Programme C</p>	
<p><u>Duration:</u> 44-week programme</p> <p><u>Aim:</u> Scale outside of the country</p> <p><u>Characteristics:</u></p> <ul style="list-style-type: none"> • More bespoke (tailored support) • Not particularly targeted at students • Target existing established ventures specifically those in agriculture, climate, and health. 	

Source: Authors own construction based on interview data

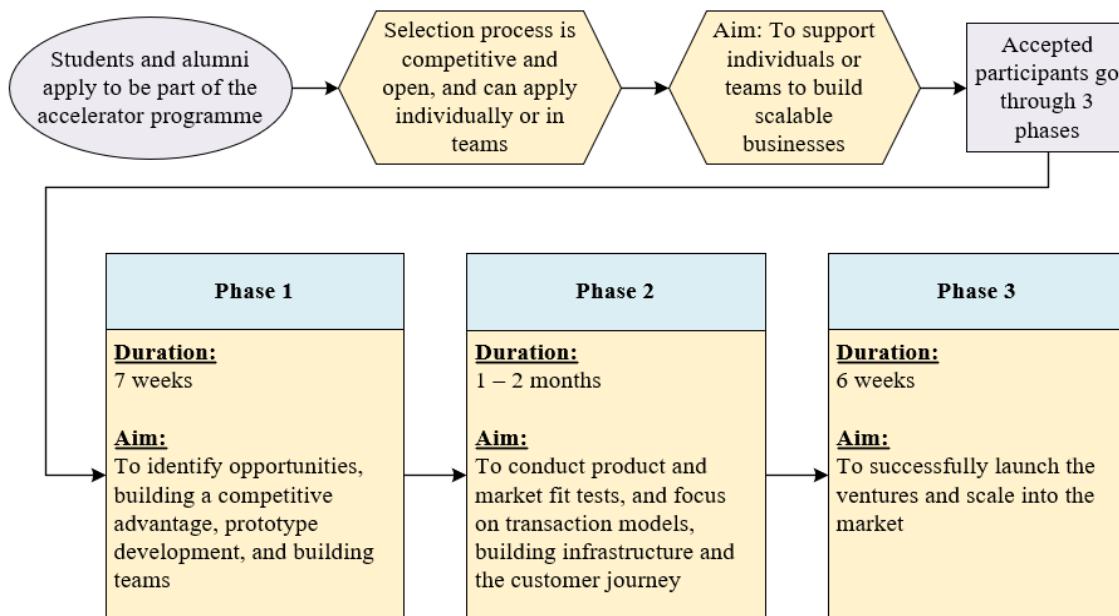
As described by Uni-C-IS, Programme A is the most accessible with the “*selection being softer*” than the other programmes. Programme A aims to assist participants in getting “*validated products that people actually care about and want to pay money for*” [Uni-C-IS]. To do this, “*the incubatees need to apply design thinking throughout this programme*” [Uni-C-IS]. The duration of this programme is ten weeks, is open to students, and consists primarily of “*online content and videos with paired mentorship*” [Uni-C-IS].

Programme B is a more extended programme with a duration of 22 weeks “*focusing on the basic building blocks of a business*” and aimed at “*developing the products*” [Uni-C-IS]. This programme is open to students but is “*a bit more selective*” than Programme A as one needs to already have a validated product. The basic building blocks focused on during this programme includes, but are not limited to, finance, operations, marketing, sales, governance, and increasing customers.

Programme C is the “*most selective*” in terms of candidates entering the programme. It is a 44-week programme which provides more “*bespoke*” (tailored) support to entrepreneurs. In contrast to programmes A and B, the target of this programme is “*established ventures, specifically those in agriculture climate, and health*” who are “*able to scale outside of the country*” [Uni-C-IS].

It was found that Uni-D offers an accelerator programme that is only open to registered students and alumni. Participant Uni-D-IS provided a short description of how the selection process of the accelerator programme works, as well as the various phases (see Figure 7.4). For anonymity purposes, the three phases are denoted as Phase 1, Phase 2 and Phase 3.

Figure 7.4: Acceleration selection process and content of programmes at Uni-D



Source: Authors own construction based on interview data

According to participant Uni-D-IS, students and alumni must apply to be part of the accelerator programme. The selection process is “*open and competitive, and [interested] individuals can either apply individually or in teams*” [Uni-D-IS]. The accelerator programme aims to “*support teams to build scalable businesses*” [Uni-D-IS] and those who are accepted go through three phases.

The first phase aims to assist the participants in “*identifying business opportunities, establishing teams, building a competitive advantage, and developing prototypes*”, which is all done in the space of seven weeks. The next phase focuses on “*product and market fit*”. The duration of the second phase is one to two months, and consists of conducting product and market fit tests, and focuses on “*transaction models, building infrastructure and the customer journey*” [Uni-D-IS]. The final phase takes six weeks and is aimed at successfully “*launching the ventures and scaling into the market*” [Uni-D-IS].

Participant Uni-Y-IS explained that the incubation programme at Uni-Y consists of two phases, a pre-incubation and an incubation phase (see Figure 7.5).

Figure 7.5: Incubation programmes at Uni-Y

Phases of incubation programme at Uni-Y	
Pre-incubation	Incubation
<p><u>Duration:</u> 6 months</p> <p><u>Aim:</u> To develop a viable business idea and provide operations training</p> <p><u>Training focuses on:</u></p> <ul style="list-style-type: none"> • Developing a business plan • Day-to-day activities such as human resource management, basic bookkeeping, and marketing • Legal requirements 	<p><u>Duration:</u> 2 years</p> <p><u>Aim:</u> To establish the start-up business and move into the market</p>

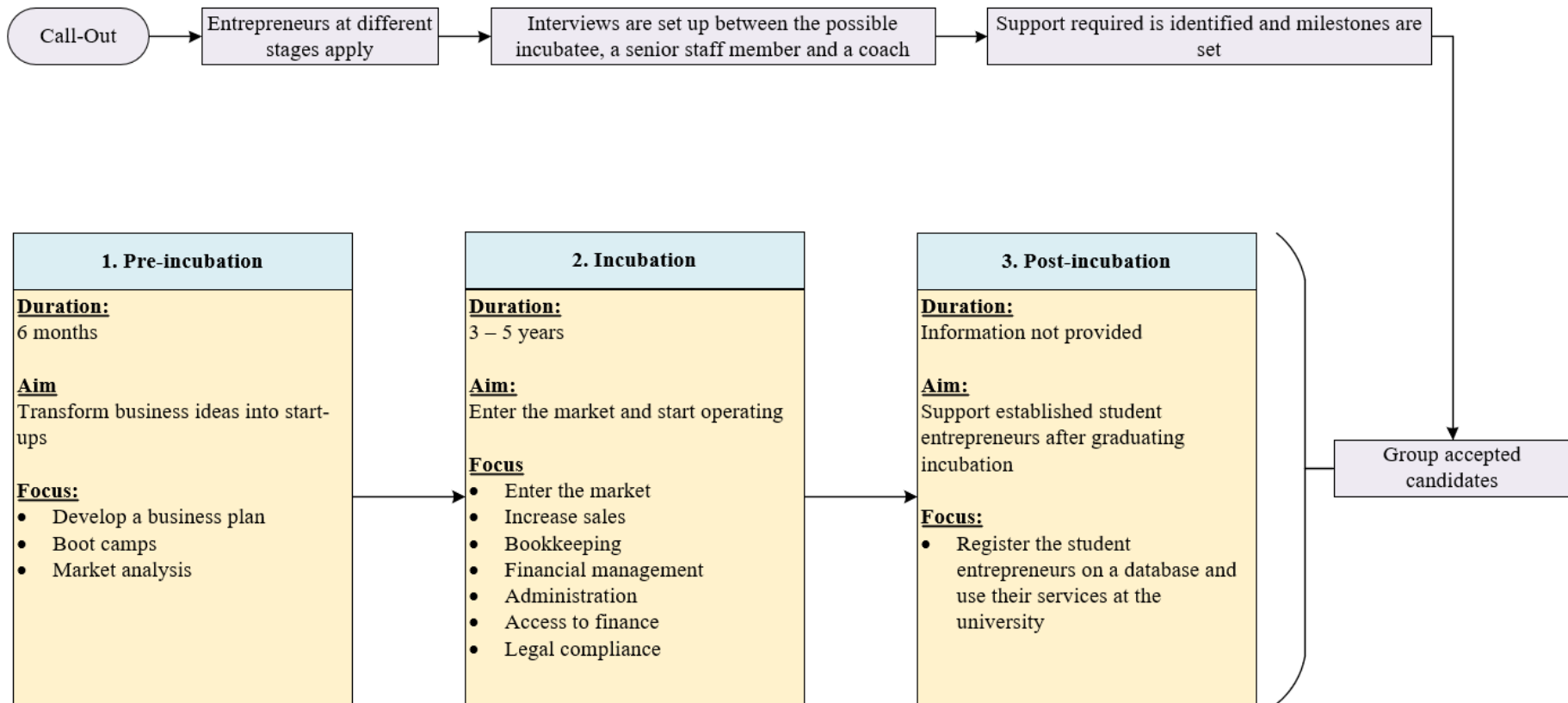
Source: Authors own construction based on interview data

The first phase, pre-incubation, is open to everyone interested, and aims to develop a viable business idea and provide operations training. Operations training includes “*developing a business plan, day-to-day activities, and legal requirements*” [Uni-Y-IS]. Day-to-day activities makes reference to training in the areas of human resource management, basic bookkeeping, and marketing. This pre-incubation phase lasts for six months whereafter participants graduate to the incubation phase. The duration of the incubation phase is two years and aims to assist in “*establishing their start-ups and moving into the market*” [Uni-Y-IS].

Participant Uni-Z-IS provided in-depth information regarding the selection process of their incubator, as well as the content and duration of the three phases that constitutes the incubation programme (see Figure 7.6). It is, however, essential to note that during the data collection process, the incubator at Uni-Z was not yet operational, as explained by participant Uni-Z-IS, “*we are only starting operationally this year [2021]*”.

In terms of the selection process, participant Uni-Z-IS indicated that they start with a call-out for interested individuals to apply for a position to be part of their incubation programme. Thereafter, an interview is set up between the interested individuals, a senior staff member at the university and one coach. It is during this interview that more information is gathered to “*better understand what he or she wants and needs*”, as well as to “*set milestones*” [Uni-Z-IS]. Once individuals are accepted onto the programme, they are grouped according to pre-incubation, incubation, and post-incubation phases.

Figure 7.6: Incubation selection process and content of programmes at Uni-Z



Source: Authors own construction based on interview data

The pre-incubation phase is aimed at “*transforming business ideas into start-up businesses*”, which is done over six months. During this time, the participants conduct market analyses, develop viable business plans and partake in boot camps. After these six months, candidates are expected to have a viable business idea and graduate to the next phase of the programme, namely incubation.

The incubation phase aims to assist in the establishing of businesses, entering the market and starting operations. The duration of this phase is usually three years; however, “*SEDA extended it now to five years depending on the need, because one entrepreneur to another cannot be the same*” [Uni-Z-IS]. Various support topics are focused on during this incubation phase, including entering the market, increasing sales, bookkeeping, financial management, access to finance, administration, and legal compliance. After three to five years and operating businesses have been established, they graduate to the next and final phase, post-incubation.

The final phase of the programme is post-incubation which aims to support those who have graduated from the incubation phase. Although no clear indication of how long the duration of this support would continue after graduation could be established, it was said that “*...we are planning to use these students within the university, registering them in a database to provide some services that the university needs*”, and that “*...they should be given first preference compared to the outside community*” [Uni-Z-IS].

7.3.3 STRUCTURE

Information regarding the structure of the various incubators was also gathered from the participating incubator staff members. Structure deals with the ownership and governance arrangements of the incubator as well as the location thereof. Participants were requested to identify a structure that best describes the ownership and governance arrangements of their incubators and this together with their locations is summarised in Table 7.7.

Table 7.7: Structure of incubators

University	Ownership Structure	Governance Structure	Location
Uni-B	Range of actors (university and DSBD)	Range of actors (university, community and DSBD)	On-campus
Uni-C	Fully owned by the university	Range of actors (university and independent directors)	On-campus
Uni-D	Range of actors (university and MTN)	Range of actors (university and MTN)	On-campus and off-campus
Uni-Y	Fully owned by the university	Fully governed by the university	On-campus
Uni-Z	Fully owned by the university	Range of actors (university and SEDA)	On-campus

Source: Interview data

As can be seen from Table 7.7, three incubators are fully owned by the university itself, namely Uni-C (most active), Uni-Y (least active) and Uni-Z (least active). The other two universities [Uni-B, Uni-D] are owned by a range of actors, amongst others the university, DSBD and MTN. Even though the majority (three of five) of the incubators are fully owned by their respective universities, four are governed by a range of actors, including the university, community and BSBD [Uni-B], the university and independent directors [Uni-C], the university and MTN [Uni-D], and the university and SEDA [Uni-Z]. The only incubator that is fully governed by the university is at Uni-Y (least active). All five participants indicated that their respective incubators are located on campus, while participant Uni-D-IS mentioned that they had a second incubator which is located off-campus.

7.3.4 PEOPLE

During the data collection process information regarding the people providing and using incubation services was gathered. Details concerning incubator employees and users are summarised in Table 7.8 and Table 7.9, respectively. Participants were also requested to indicate their degree of satisfaction with the number of incubator employees.

Table 7.8: Incubator and accelerator employees

Participant	Number of Employees	Position	Degree of Satisfaction	Full-Time or Part-Time Employees
Uni-B-IS	7	Director of the incubator	Too low	Full-time employees
		Incubator manager		
		Business development officer		
		Marketing officer		
		Administrative officer		
		Finance officer		
		Admin assistant		
Uni-C-IS	5	Admin officer	Satisfactory	Full-time employees
		Incubator manager		
		Marketing manager		
		Programme manager		
		Programme manager		
Uni-D-IS	3	Accelerator manager	Too low	Full-time employees
		Programme manager		
		Community liaison		
Uni-Y-IS	1	Incubator manager	Too low	Part-time employees
Uni-Z-IS	2	Incubator manager	Too low	Full-time employees
		Business development officer		

Source: Interview data

As can be seen from Table 7.8, the number of employees working in each incubator ranged from one to seven. The universities considered most active, Uni-B, Uni-C and Uni-D had the most employees working in their incubators, seven, five, and three, respectively. The least active universities, Uni-Y and Uni-Z, only had one and two employees, respectively. At the participating incubators employees were found to hold several positions, namely:

- Incubator manager [Uni-B-IS, Uni-C-IS, Uni-Y-IS, Uni-W-IS];
- Business development officer [Uni-B-IS, Uni-Z-IS];
- Marketing officer [Uni-B-IS, Uni-C-IS];
- Administrative officer and assistant [Uni-B-IS, Uni-C-IS];
- Programme manager [Uni-C-IS, Uni-D-IS];
- Incubator director [Uni-B-IS];
- Finance officer [Uni-B-IS];
- Accelerator manager [Uni-D-IS]; and
- Community liaison [Uni-D-IS].

As shown in Table 7.8, only one participant [Uni-C-IS] indicated being satisfied with the number of employees working in their incubator (five employees) at Uni-C (most active). Participant Uni-C-IS explained that “...*ideally five is the right number and then they can have four consultants and contractors outside of the five, which would be ideal*”.

The other four participants [Uni-B-IS, Uni-D-IS, Uni-Y-IS, Uni-Z-IS] indicated stated that the number of employees was too low, and that more employees were required to increase effectiveness and efficiency of their incubators. Participant Uni-B-IS cited their staff/participant ratio of 7 to 200 as an indication of why the numbers of employees was regarded as being too low. The other participants made reference to “*three employees that resigned in the past two years*” [Uni-D-IS], “*lack of resources*” [Uni-Y-IS], and the fact that “*the incubator is still new*” [Uni-Z-IS] as reasons why the number of employees at their incubator is too low.

Details regarding incubator users were also gathered which are summarised in Table 7.9 In comparison to the other participating university incubators, the incubator at Uni-B annually supported the highest number of total (200) and student participants (80). The incubator at Uni-

C supported the second most candidates (40 individuals including 10 students). Participant Uni-C-IS explained that although they receive many applications (500 to 600 per annum), “40 is actually more than we can work with at a time”. Uni-D had the third most accelerator participants (30) of which all are students.

Table 7.9: Users of incubator/accelerator programmes

	Uni-B-IS	Uni-C-IS	Uni-D-IS	Uni-Y-IS	Uni-Z-IS
Number of people in incubator/accelerator programme yearly (All users)	200	40	30	N/A	N/A
Number of students in incubator/accelerator programme yearly	80	10	30	N/A	N/A

Source: Interview data

In comparison to the most active universities (Uni-B; Uni-C, Uni-D) mentioned above, the least active universities were either unable to provide details on the number of candidates [Uni-Y-IS] or indicated that no candidates had been accepted into the incubator to date [Uni-Z-IS]. Participant Uni-Y-IS indicated that “*I will not be able to give you the final figure now because of the Covid issues for us to actually know how many people we are working with and who are committed to our programme*” [Uni-Y-IS]. Moreover, participant Uni-Z-IS indicated that their incubator was not yet operational and explained that “*we are only starting operationally this year [2021]*” [Uni-Z-IS].

7.4 TECHNOLOGY TRANSFER OFFICES

In the sections to follow, the findings regarding the technology transfer offices (TTOs) at the participating universities are presented using the design elements of Good *et al.* (2018), namely purpose, activities, structure and people. For the current study, a TTO is considered a unit within a university that manages the “third mission” activities of the university (Croce *et al.*, 2014:690; Aragonés-Beltrán *et al.*, 2017:19; Bolzani *et al.*, 2020:338).

All four of the participating most active universities [Uni-A, Uni-B, Uni-C, Uni-D] have established TTOs. Possible TTO staff members from only two of the least active universities [Uni-Y, Uni-Z] responded to the invite to participate in this study and Uni-Y was identified as not having a TTO. No response was received from the other two least active universities [Uni-V, Uni-W]. Thus, the data presented for these sections are based on that obtained from TTO staff members at five of the participating universities [Uni-A, Uni-B, Uni-C, Uni-D, Uni-Z].

7.4.1 HISTORY AND PURPOSE

In this section, the findings relating to the history and purpose of the TTOs at the participating universities is presented.

7.4.1.1 History

During the data collection process, information was gathered regarding when, by whom and why the TTOs were established. It was found that the participating TTOs were established between the years 1997 and 2016 (see Table 7.10). One participant (Uni-B-TTO) explained that he/she had little to no knowledge of the history of the TTO at Uni-B as he/she “*only recently joined the university in November 2020*”, thus excluding himself/herself from this section.

Table 7.10: Year TTO established

	Uni-A	Uni-B	Uni-C	Uni-D	Uni-Z
Year	2012	Unsure	1997	2001	2016

Source: Interview data

From Table 7.10 it can be seen that the TTOs at the most active universities are the oldest, with the TTO of Uni-C being established as far back as 1997 and that of Uni-D, 2001. The TTO at the least active university [Uni-Z] was established more recently (2016). Various actors were involved in establishing the TTOs, including:

- Deputy Vice-Chancellor (university management) [Uni-A, Uni-C, Uni-D, Uni-Z];
- Regional parties/government [Uni-A, Uni-C, Uni-Z];
- External director [Uni-A]; and
- Post-doctoral student [Uni-A].

Deputy Vice-Chancellors (DVC) were identified by most as key actors in the establishing of the TTOs with three of the participants highlighting the role of regional parties/government. They explained that “*with the passing of the IPR Act [Intellectual Property Rights Act], all universities had to have technology transfer offices...*” [Uni-C-TTO]. This IPR Act was also mentioned as the main reason why the TTOs were established at the respective universities. Moreover, participant Uni-A-TTO mentioned two additional actors involved in establishing their TTO, namely an external director and a postdoc student.

7.4.1.2 Purpose

From the data analysis, three overarching themes were developed describing the purpose (aim) of the participating TTOs. These themes include (i) *to facilitate matters regarding intellectual property*, (ii) *to create spin-out/start-up companies*, and (iii) *to achieve university’s strategic goals* (see Table 7.11).

As can be seen from Table 7.11, the first and most prominent theme developed in terms of the purpose of TTOs is to “*facilitate matters regarding intellectual property*”. When the purpose of a TTO is to facilitate matters regarding intellectual property (Theme 1), the focus is on “*identifying, protecting and managing intellectual property*” (Category 1), “*facilitating commercialisation*” (Category 2), and “*licensing intellectual property to industry partners*” (Category 3). The first category, “*identifying, protecting and managing intellectual property*”, consists of the most meaning units, being responses from four participants (see Table 7.11).

Table 7.11: Purpose of TTOs

Extract	Participant	Code	Categories	Themes
It is the protection of the IP.	Uni-A-TTO	Protect intellectual property	Identify, protect and manage intellectual property	Facilitate matters regarding intellectual property
The main aim of TTO is to promote IP	Uni-B-TTO	Promote intellectual property		
We are actively managing the intellectual property portfolio.	Uni-D-TTO	Managing intellectual property		
Identification of intellectual property from the intellectual property that stems out of the university research	Uni-Z-TTO	Identification of intellectual property		
Assist in terms of protecting that IP	Uni-Z-TTO	Protecting intellectual property		
...also to try and facilitate the commercialisation of it.	Uni-A-TTO	Facilitate commercialisation	Facilitate commercialisation	
To license the technology to make sure that technology is going to be commercialised...	Uni-B-TTO	Commercialise technology		
Well, for us, it is the commercialisation of intellectual property...	Uni-C-TTO	Commercialise intellectual property		
...manage or commercialise IP.	Uni-Z-TTO	Commercialise intellectual property		
...through a licensing model to an industry partner	Uni-A-TTO	License intellectual property to industry partners	License intellectual property to industry partners	
... to promote intellectual property by licensing the technology to the people who want to license or to the companies, let me put it in that way.	Uni-B-TTO	License intellectual property		
...licensing...	Uni-C-TTO	Licensing		

Table 7.11: Purpose of TTOs (cont.)

Extract	Participant	Code	Categories	Themes
...the creation of start-ups.	Uni-A-TTO	Create start-ups	Assist in start-up creation	Create spin-off/start-up companies
...formation of start-up companies...	Uni-C-TTO	Formation of start-up companies		
Creating spin-out companies.	Uni-C-TTO	Spin-off creation	Create spin-off companies	
We incubate businesses and spin-out companies from the university.	Uni-D-TTO	Spin-off creation		
One of the strategies at [Uni-B] for 2030 is to make sure that our people are creative, innovative, entrepreneurial and adaptive to changing the world. [...] Our state of the art infrastructure and system will enhance an ecosystem created to achieve this vision.	Uni-B-TTO	Achieve university strategic vision	Strategy	Achieve university's strategic goals
...establishing a spin-off policy...	Uni-B-TTO	Establish spin-off policy	Policy	

Source: Interview data

The second category, namely “*facilitate commercialisation*”, was described by four participants [Uni-A-TTO, Uni-B-TTO, Uni-C-TTO, Uni-Z-TTO] as the purpose of their TTO. This category revolves around “*facilitating the commercialisation of intellectual property*” [Uni-A-TTO] and “*licensing the technology to make sure that technology is going to be commercialised*” [Uni-D-TTO]. The third category, “*license intellectual property to industry partners*” was referred to by three participants [Uni-A-TTO, Uni-B-TTO, Uni-C-TTO] and concerns their “*licensing model*” [Uni-A-TTO], and “*licensing the technology to other people or companies*” [Uni-B-TTO].

The second theme, “*create spin-out/start-up companies*”, revolves around “*assisting in start-up creation*” (Category 1) and “*creating spin-off companies*” (Category 2). Participants [Uni-A-TTO, Uni-C-TTO] explained that they “*create start-up companies*” to commercialise their intellectual property. Moreover, participant Uni-C-TTO and Uni-D-TTO referred to “*creating spin-off companies*” to achieve the goal of commercialising their intellectual property.

The third theme, *achieve university strategic goals*, consists of two categories: *achieve university strategic vision* and *establish spin-off policy*. Both categories were developed based on the responses from one participant (Uni-B-TTO). The category, *achieve university strategic vision*, revolves around the TTO being a “*state of the art infrastructure and system that will enhance an ecosystem created to achieve the vision [of the university]*” [Uni-B-TTO]. The strategy referred to by participant Uni-B-TTO is “*to make sure that our people are creative, innovative, entrepreneurial and adaptive to changes [experienced] in the world*”. The second category, *establish spin-off policy*, focuses on developing a spin-off policy that will guide the protection and commercialisation of intellectual property.

To gather more details concerning the purpose of the participating TTO’s and for triangulation purposes, participants were presented with a Likert-type scale to measure the extent to which their university TTOs subscribed to several possible objectives. The Likert-type scale had a response continuum ranging from one (not an objective) to seven (main objective). The findings are summarised in Table 7.12.

Table 7.12: Objectives of TTO

Key: 1 = Not an objective; 7 = Main objective					
Participant:	Most Active				Least Active
	Uni-A-TTO	Uni-B-TTO	Uni-C-TTO	Uni-D-TTO	Uni-Z-TTO
Act as a bridge between the university and the market environment.	7	7	7	7	7
Protect university proprietary rights to generate returns.	7	7	7	7	7
Support pre-commercialisation of inventions.	7	7	6	7	7
Support students in commercialising ideas and engaging in entrepreneurship.	6	7	7	7	7
Support local or regional economic development.	7	7	6	6	7

Source: Interview data

As can be seen in Table 7.12, the objectives listed were indicated (rated either 6 or 7) as objectives by all the TTO participants. The objectives *to act as a bridge between the university and the market environment* and *protect university proprietary rights to generate returns* were rated a 7 (main objective) by all TTO participants. The objectives *supporting pre-commercialisation of inventions* and *supporting students in commercialising ideas and engaging in entrepreneurship* was rated a 6 by Uni-C-TTO and Uni-A-TTO, respectively. Furthermore, the objective to *support local or regional economic development*, was rated a six by TTO staff members at both Uni-C-TTO and Uni-D-TTO. Although a rating of six implies an objective as not being a ‘main objective’, they are still considered an important objective by the respective TTO participants.

Participants were also requested to identify the model that best describes their TTOs. They were presented with the three models, namely a low selective model, supportive model and incubator model, as described by of Clarysse *et al.* (2005:184) (see Table 7.13).

Table 7.13: TTO models

Model	Description
Low selective model	<ul style="list-style-type: none"> - The mission is oriented towards maximising the number of entrepreneurial ventures. - Generation of self-employment-oriented start-ups that only rarely grow beyond a critical size of employees.
Supportive model	<ul style="list-style-type: none"> - The mission is oriented towards creating spin-outs as an alternative to licensing out intellectual property. - Generation of profit-oriented spin-offs with the potential to grow.
Incubator model	<ul style="list-style-type: none"> - The trade-off is made between the use of a body of research to generate contract research versus spinning off this research in a separate company. - Generation of exit-oriented spin-offs.

Source: Clarysse *et al.* (2005:184)

Three of the participants from the most active universities [Uni-B-TTO, Uni-C-TTO, Uni-D-TTO] and one from a least active university [Uni-Z-TTO] described their TTO as having a supportive model. This finding suggests that all four of these TTOs focus on creating spin-out companies rather than on licensing out their intellectual property. The participant from the fifth university, Uni-A, explained that they adopt an incubator model, focusing on the generation of exit-orientated spin-offs [Uni-A-TTO].

Despite most of the participants describing their TTOs as adopting a supportive model which aims to generate profit-orientated spin-off companies, the number of spin-offs to date was either not known or none had been generated (see Table 7.14).

Table 7.14: Student spin-offs at TTOs

	Uni-A	Uni-B	Uni-C	Uni-D	Uni-Z
Number of student spin-offs	0	0	Unsure	Unsure	0

Source: Interview data

Most of the TTOs [Uni-A, Uni-B, Uni-Z] had to date generated zero student spin-off companies. Reasons for this include:

“No, because I am only starting now with it. Remember, you won't do this without the policy that is guiding you.” [Uni-B-TTO]

“Not yet. We are still at the pre-commercialisation stage.” [Uni-Z-TTO]

Participants Uni-C-TTO and Uni-D-TTO, both from most active universities, indicated that their respective TTOs have over the years generated several student spin-off companies. However, they were not certain of the specific number, explaining that *“...there have been many that have started, but I have only worked with one. I would be incorrect if I give you the exact number”* [Uni-C-TTO] and *“I can't say off the top of my head”* [Uni-D-TTO].

7.4.2 ACTIVITIES

In this section, the various activities in which the TTOs are involved are presented and described.

The TTO participants were presented with a list of activities that TTOs generally engage in (Good *et al.*, 2018:6). They were requested to indicate whether their TTO engaged in these activities or not. The findings are presented in Table 7.15.

Table 7.15: TTO Activities

Key: Y = Activity engaged with; N = Activity not engaged with; U = Unsure whether activity engaged with or not					
	Most Active				Least Active
Participant:	Uni-A-TTO	Uni-B-TTO	Uni-C-TTO	Uni-D-TTO	Uni-Z-TTO
Encouraging the participation of researchers in technology commercialisation	Y	Y	Y	Y	Y
Identifying high potential technologies	Y	Y	Y	Y	Y
Securing funding or other resources where more research is required	Y	Y	Y	Y	Y
Determining an intellectual property rights strategy and securing intellectual property rights for university-based inventions	Y	Y	Y	Y	Y
Assessing the commercialisation potential of technologies	Y	Y	Y	Y	Y
Determining the ideal commercialisation strategy relating to licensing, spin-offs and research contracts	Y	Y	Y	Y	Y
Developing a licensing strategy	Y	Y	Y	Y	Y
Engaging in spin-off creations	Y	Y	Y	Y	Y
Engaging in both internal and external network building: connecting with industry actors, business support organisations, government representatives, and researchers	Y	Y	Y	Y	Y
Engaging in student entrepreneurship	Y	Y	Y	Y	Y
Other:	Y	N	N	Y	N

Source: Interview data

As can be seen from Table 7.15, all the activities were selected by all the participants. Two of the participants from the most active universities added “other” activities to the list which included contract management [Uni-A-TTO] and management of the university venture capital investment fund [Uni-D-TTO]. Participant Uni-A-TTO describes their contract management activities as follows:

“We do a lot of contract management as well, so not only research contracts, we look at collaboration contracts, material transfer agreements and non-disclosures and then we have to look at the IP clauses in any other agreement that the university is involved in.” [Uni-A-TTO]

All participants indicated that they support student entrepreneurs through their TTOs. They were asked to elaborate on how they do this and explained as follows:

“So, every time we start a company, and there is a student entrepreneur involved, they are incubated in the [incubator] for a year, having all that support that start-up would need.” [Uni-C-TTO]

“We assist the student by enrolling them in the incubation centre and then providing the necessary support to get the resources needed for the company to be established.” [Uni-Z-TTO]

In addition to the activities listed in Table 7.15, participant Uni-A-TTO described several other ways that their TTO supports student entrepreneurs which includes “*having awareness campaigns*”, “*commercialisation and intellectual property talks*”, “*entrepreneurship and commercialisation booklets*”, and “*provision of advice*” [Uni-A-TTO].

7.4.3 STRUCTURE

The structure of the TTOs at the participating universities is described in terms of their ownership-, governance-, and organisational arrangements. Participants were presented with various descriptions of these arrangements and were requested to indicate (tick) which best describes the structure of their TTO. These descriptions were sourced from Markman, Gianiodis, Phan and Balkin (2005).

Table 7.16: TTO structures

University	Ownership	Governance	Organisational
Uni-A	Internally integrated into the university administration	For-profit private extension	Centralised in one central office
Uni-B	Internally integrated into the university administration	Combination between traditional university structure and for-profit private extension	Centralised in one central office
Uni-C	Internally integrated into the university administration	For-profit private extension	Centralised in one central office
Uni-D	Internally integrated into the university administration	Traditional university structure	Centralised in one central office
Uni-Z	Internally integrated into the university administration	Traditional university structure	Centralised in one central office

Source: Interview data

Participants could describe the ownership arrangement of their TTO as one of the following: (i) internally integrated into the university administration, (ii) an external organisation, (partly) owned by non-university actors such as public or private actors, (iii) an external organisation owned by multiple universities, and (iv) other. As can be seen from Table 7.16, all five participants described their TTOs as being internally integrated into the university administration.

The participants could describe the governance structure of their TTOs as having (i) a traditional university structure, (ii) a non-profit research foundation, (iii) a for-profit private extension, and (iv) or other. These structures are described in Table 7.17.

Table 7.17: Descriptions of TTO governance structures

Governance Structure	Description
Traditional university structure	- The TTO is a department within the university structure. - It is run primarily by an assistant/vice president/director of the university and generally is funded by the research office.
Non-profit research foundation	- The TTO is a separate entity or part of a separate 'research' entity outside of the university structure. - Research foundation is set by the university/state government specifically to grant greater autonomy to conduct research.
For-profit private extension	- The TTO is either part of a university structure or a research foundation, with a private venture extension. - The private venture extension is generally focused on economic development and creating start-up companies.

Source: Markman *et al.* (2005:1067)

The findings indicate that the TTOs at Uni-D (most active) and Uni-Z (least active) adopt a traditional university structure, while Uni-A (most active) and Uni-C (most active) adopt a for-profit private extension structure. Participant Uni-B-TTO explained that at the time of the data collection process, their TTO was “*changing the model of how it used to look like*”, transitioning from adopting a traditional university structure to a for-profit private extension. Thus, a combination of the two options was noted.

In terms of the organisational structure of their TTOs, participants could choose from three descriptions, namely being (i) centralised in one central office, (ii) decentralised, with technology transfer officers being placed within faculties or specific research centres, or (iii) a combination of the two. All five of the TTO participants described the organisational structures of their respective TTOs as centralised in one central office.

7.4.4 PEOPLE

Information was also gathered regarding the people employed at the participating TTOs. These findings are summarised in Table 7.18.

Table 7.18: Employees at TTOs

Participant	Number of Employees	Positions		Degree of Satisfaction
Uni-A-TTO	6	TTO director	IP and contract specialist	Satisfactory
		Technology transfer manager	IP administrator	
		Technology transfer commercialisation specialist	General administrator	
Uni-B-TTO	3	N/A		Too low
Uni-C-TTO	7	TTO director	Administrative staff	Too low
		Technology transfer manager	Administrative staff	
		Technology transfer manager	Administrative staff	
		Technology transfer officer		
Uni-D-TTO	23	TTO director	Research contract team	Satisfactory
		Personal assistant	Contract manager	
		Innovation team	Contract manager	
		Marketing specialist	Contract manager	
		Senior manager innovation	Contract manager	
		IP manager	Contract manager	
		Principal IP officer	Contract manager	
		Senior IP officer	Contract officer	
		Database officer	Administrative support team	

Table 7.18: Employees at TTOs (cont.)

Participant	Number of Employees	Positions		Too Low, Satisfactory, Too High
Uni-D-TTO (cont.)	23 (cont.)	Innovation commercialisation manager	Senior finance officer	Satisfactory (cont.)
		New venture support manager	Database administrator	
		Innovation commercialisation manager	Administrator	
		Innovation project coordinator		
		Innovation funds manager		
Uni-Z-TTO	4	Technology transfer manager	Marketing specialist	Too low
		Technology transfer officer	Marketing specialist	

Source: Interview data

The number of individuals employed within the participating TTOs ranged from three to 23, with Uni-B (most active) having the least number of employees and Uni-D (most active) having the most employees. The other three university TTOs had four [Uni-Z], six [Uni-A], and seven [Uni-C] employees, respectively. Worth noting is that the TTO at Uni-Z (least active) has more employees than the TTO at Uni-B (most active). The various positions held within these participating TTO's are listed in Table 7.19. Participant Uni-B-TTO did not provide information regarding the positions held by their three TTO employees.

Table 7.19: TTO positions held

Position	University	Position	University
TTO director	Uni-A, Uni-C, Uni-D	Technology transfer manager	Uni-A, Uni-C, Uni-Z
General administrator	Uni-A, Uni-C, Uni-D	Technology transfer officer	Uni-C, Uni-Z
Marketing specialist	Uni-D, Uni-Z	TTO director assistant	Uni-D
Technology transfer commercialisation specialist	Uni-A	IP and contract specialist	Uni-A
IP administrator	Uni-A	IP manager	Uni-D
Principal IP officer	Uni-D	Senior IP officer	Uni-D
Database officer	Uni-D	Innovation commercialisation manager	Uni-D
New venture support manager	Uni-D	Innovation project coordinator	Uni-D
Innovation funds manager	Uni-D	Contract manager	Uni-D
Contract officer	Uni-D	Senior finance officer	Uni-D
Database administrator	Uni-D	Senior manager innovation	Uni-D

Source: Interview data

Only two participants indicated that the number of employees in their respective TTOs was satisfactory, namely Uni-A-TTO (most active) and Uni-D-TTO (most active). According to these participants “*we have a small portfolio, but as it increases then we probably would need more people on board*” [Uni-A-TTO] and “*during Covid, we went through a massive recruitment exercise to the research innovation team*” [Uni-D-TTO]. Although satisfied with the number of people employed at their TTO, participant Uni-A-TTO mentioned that “*everything is still quite new, and we do not have a lot of experience in spin-offs. Someone who has more of that kind of experience or that kind of skills would be quite valuable*”. Participant

Uni-A-TTO also mentioned that an individual who is able to evaluate IP would be beneficial. According to participant Uni-D-TTO, “*after the recruitment round, we should have all our bases covered*”.

The other three participants, two from most active universities [Uni-B-TTO, Uni-C-TTO] and one from a least active university [Uni-Z-TTO], indicated that the number of people employed in their TTOs was too low. However, participant Uni-B-TTO noted that he/she has “*submitted a motivation for employing three more people, including a commercialisation manager, IP manager, and administrator*”. Moreover, participant Uni-C-TTO indicated that “*they are currently advertising and marketing the recruitment of two [TTO] staff members*”.

The number of employees at the participating TTOs being described as too low was attributed to a lack of funding and a lack of skills. The extracts below provide evidence supporting this claim:

“It is also the fact that technology transfer offices are generally not well funded...” [Uni-C-TTO]; *“We have limited financial resources.”* [Uni-Z-TTO]

“... there are not enough people skilled in technology transfer in South Africa.” [Uni-C-TTO]

The skills identified as lacking at the participating TTOs included commercialisation experience [Uni-B-TTO, Uni-Z-TTO], patent experience [Uni-B-TTO], and legal knowledge [Uni-B-TTO, Uni-C-TTO].

Information was also gathered regarding the number of student entrepreneurs assisted through the participating TTOs; however, the majority of participants were not able to give an exact number. The participants explained, “*I cannot give you that figure, sorry*” [Uni-C-TTO], and “*...we have helped many, but I cannot say off the top of my head*” [Uni-D-TTO]. Participant Uni-A-TTO indicated that they did not keep track of student entrepreneurs supported or assisted because “*it [support and assistance] is informal, and it's not part of our reporting requirements*”.

7.5 UNIVERSITY VENTURE FUND

In the following section, the findings relating to the university venture funds at the participating universities are presented using the design elements of Good *et al.* (2018), namely purpose, activities, structure and people. In this study, university venture funds refer to funds that collaborate with universities to provide seed and early-stage funds to enhance and support technology transfer, commercialisation and university start-ups (Munari *et al.*, 2015, Good *et al.*, 2018:3).

Information relating to the university venture funds at the participating universities was obtained from participants in several different positions. These participants, their positions and whether a university venture fund exists or not, is summarised in Table 7.20.

Table 7.20: University venture fund

	Uni-A-TM	Uni-B-TM	Uni-C-TM	Uni-C-TTO	Uni-D-TTO	Uni-V-SEC/P	Uni-W-SEC/P	Uni-Y-TM	Uni-Z-TTO
University venture fund	Yes	Yes	Yes	Yes	Yes	No	No	No	No

Source: Interview data

The findings show that all four of the most active universities [Uni-A, Uni-B, Uni-C, Uni-D] have a university venture fund. Information regarding the university venture funds at these four universities was gathered from participants in top management positions [Uni-A, Uni-B, Uni-C] and TTO staff members [Uni-C, Uni-D].

Although they have a university venture fund, it is important to note that at Uni-A this fund “*is not for students*” [Uni-A-TM]. When asked why not, Uni-A-TM explained, “*I think there is an awkward relationship between the students and the university. The student has to perform student academic work, and if they were connected from a business perspective, I think there is somewhat of a conflict. So, I think that tension will exist, and therefore we do not go into that space*”. Uni-A-TM also indicated that they had no future plans to open the university venture fund to student entrepreneurs. Similarly, participant Uni-D-TTO indicated that at Uni-D their university venture fund is predominantly focused on supporting student research spin-offs and not specifically undergraduate start-ups (student entrepreneurs).

7.5.1 UNIVERSITIES WITH VENTURE FUNDS

In this section, the findings regarding the university venture funds at the five participating universities that have one are presented.

7.5.1.1 History and purpose

Information was gathered regarding the history of the university venture funds and the purpose (why) for which they were established. From the data analyses, two main reasons for establishing university venture funds were identified at Uni-A, Uni-B, Uni-C, and Uni-D: to support early-stage start-ups financially and to generate a return on investment. Participant Uni-C-TTO explained that *“they are investing in high-risk technologies because they are very early-stage companies. Without this investment, we would not be able to bridge that gap between early-stage technologies and starting up”*. Moreover, *“there was a need for late-stage investment in spin-offs and start-ups”* [Uni-D-TTO], and *“academic staff who have viable business prospects needed to be encouraged, and this venture fund is there to support them”* [Uni-A-TM]. Uni-A-TM and Uni-C-TM also noted that the university venture funds at their respective universities were established to invest in start-ups to gain a return on investment. Participant Uni-C-TM explained that they realised the importance of investing in start-up companies because *“some of these young companies do better in terms of return on investment than some of the big established companies”*.

7.5.1.2 Activities

Information was also gathered regarding activities associated with the university venture fund, namely the size of these funds and how funds are allocated. The size of the university venture funds at the participating universities who knew the amount varied between R3 million and R60 million (see Table 7.21), with Uni-A having the smallest fund and Uni-D having the largest.

Table 7.21: Size and allocation of university venture funds

	Uni-A	Uni-B	Uni-C	Uni-D
Size of fund	R10 million	R3 million	Did not know	R60 million
Amount invested in ventures related to university	N/A	R3 million	Did not know	Confidential
Amount invested in student ventures	N/A	R3 million	Did not know	Confidential

Source: Interview data

Information regarding the allocation of funding was also gathered. More specifically, the amount invested in university related ventures and student ventures was sought. Participant Uni-A-TM indicated that none of their R10 million venture fund had to date been used “because we have not made use of it yet”. The funds had not yet been used because of a perceived conflict of interest. Participant Uni-A-TM explained:

“I think it is very awkward. The main reason is similar to that of students. If you are going to do business with your own staff members, you know that is the conflict. So, you are paying your staff member a salary, and you are going into business with a staff member to generate revenues that you will jointly seek a return on and what about the salary that we are paying you for the service delivery for that purpose. So, that is a conflict, and I don't know how we are really going to get over that. The same applies for students, and yes, it is awkward.” [Uni-A-TM]

Participant Uni-B-TM noted that their R3 million fund was invested in university related ventures, with all of the funds dedicated to supporting student ventures. Participants Uni-C-TTO had no knowledge of how their venture funds were allocated and participant Uni-D-TTO explained that how their funds were allocated is confidential. Participant Uni-D-TTO did however point out that “the majority of them are companies where it is not a student per se. Maybe a graduate, yes, but not an existing registered student”.

7.5.1.3 Structure

Information was also gathered from participants on how their university venture funds were structured in terms of ownership and governance. These findings are presented in Table 7.22.

Table 7.22: University venture fund structure

	Uni-A	Uni-B	Uni-C	Uni-D
Ownership structure	Wholly owned by the university	Owned by a range of actors	Wholly owned by the university	Wholly owned by the university
Actors (if applicable)	-	University and SEDA	-	-
Governance structure	Internal to the university	Internal to the university	Internal to the university	Internal to the university

Source: Interview data

As can be seen from Table 7.22, three of the four university venture funds [Uni-A, Uni-C, Uni-D] are wholly owned by the university and one [Uni-B] is owned by a range of actors. The other actor in the case of Uni-B is SEDA. The governance of all four university venture funds occurs internally to the university, meaning that these funds are managed by units within the university, such as the TTO (Munari *et al.*, 2015:956).

Governance of the venture funds includes ensuring accountability by monitoring the performance of these funds. Participants were requested to indicate (i) how they track, monitor and evaluate the performance of their university venture fund, (ii) the perceived effectiveness thereof, and (iii) how the university venture fund can be improved.

The venture funds of the two participating universities [Uni-C, Uni-D] are tracked and monitored. Participant Uni-C-TTO explained:

“We have governance structures in place where we monitor the projects, the start-ups, the investments, the development of the companies, and the development of where the funding has taken us. So, we track everything regularly, even the finances and the investments.”

[Uni-C-TTO]

Participant Uni-D-TTO indicated that they also look at the number of jobs created through the companies supported by the university venture fund, suggesting that *“both financial and non-financial indicators can be used”*. The performance of these funds are evaluated primarily in terms of return on investment [Uni-C-TM, Uni-C-TTO, Uni-D-TTO]. As pointed out by Uni-D-TTO, venture funds are evaluated *“by the portfolio return of companies invested in”*. Participant Uni-A-TM explained that the tracking, monitoring and evaluation of the performance of their university venture fund is not applicable, as they have not yet used their fund.

The venture funds of Uni-C and Uni-D are perceived as effective. According to participant Uni-C-TTO, “...*the fund managers and investors are very reasonable and they are quite accommodating to the fact that the university has its own policies and procedures as well*”. In addition, Uni-C-TM says, “...*if you look at the number of successful companies we have supported*” [Uni-C-TM]. Participant Uni-C-TTO also explained that “*the fund managers and investors are very reasonable and they are quite accommodating to the fact that the university has its own policies and procedures as well*”. However, Uni-C-TM and Uni-C-TTO point out that their funds are still new, commenting that “*it is still early days*” [Uni-C-TM] and “*this is something new for us*” [Uni-C-TTO]. Participant Uni-D-TTO perceived their venture fund as effective because they were “*good at weeding out opportunities and structuring deals, as well as risk mitigation*”.

Several recommendations were put forward by participants to improve existing university venture funds. According to participant Uni-C-TM “...*a certain percentage [of return on investment] should be taken from successful businesses and ploughed back into new start-ups, which is one way to grow the fund*”. Another recommendation was to increase the capital of the university venture fund by “*having fundraisers*” [Uni-D-TTO].

The university venture fund at Uni-A is perceived as ineffective and “*awkward*” with a “*conflict of interest*” existing [Uni-A-TM]. Participant Uni-A-TM explained that “*you are paying your staff member a salary and you are going into business with a staff member to generate revenues that you will jointly seek a return on and what about the salary that we are paying you for the service delivery for that purpose. So, that is a conflict, and I don't know how we are going to get over that*”. Uni-A-TM continued by saying, “...*it is best externally managed where you have venture capital and facilitate the process to bring others in to assist with some form of capital injection for the projects*”. Participant Uni-B-TM perceives their funding mechanism as ineffective, “*If you are just giving students money, there is no guarantee that they are going to use that money for the intended purpose. The money goes to their accounts*” [Uni-B-TM]. Uni-B-TM recommends that the businesses are “*actually tracked to see how the business is performing*” and “*the money should be directed to specific areas*”.

7.5.2 UNIVERSITIES WITHOUT VENTURE FUNDS

The findings show that none of the least active universities [Uni-V, Uni-W, Uni-Y, Uni-Z] have university venture funds (see Table 7.22). Although the existence of a “*university venture fund is a good thing, and I do not know why we do not have one, or if there are any plans to get one*” [Uni-V-SEC/P]. Furthermore, historical challenges have given rise to a lack of priority and the subsequent lack of resources given to initiatives such as a university venture fund. As participant Uni-Z-TTO explains:

“Lack of resources, we have requested for it, but then it has not been approved. We are also a historically disadvantaged institution, so most of the funds are still kind of focusing on some of the, I will say maybe major priority areas of the university, such as improving the infrastructure and getting their relevant personnel in the relevant sections that need the support.”; “There are no plans to get a university venture fund [at Uni-Z] yet. We need the funding first”. [Uni-Z-TTO];

In contrast, participant Uni-Y-TM explained that they are already providing funding informally to “*support the development of entrepreneurial projects for students*”. The participant elaborated saying “*there will definitely be a fund where we will involve the private sector and other potential investors. [This will be done] after we have established the entrepreneurship centre*” [Uni-Y-TM].

7.6 SUMMARY

In this chapter the findings relating to the various internal entrepreneurship support elements were presented and described. These support elements include formal entrepreneurship education, incubator and accelerator programmes, TTOs, and university venture funds. The findings specifically related to the history and purpose, activities, structure and people associated with these various elements.

As indicated by the underlying conceptual framework, internal collaborations between these elements in the internal entrepreneurship environment exist. Moreover, on the left-hand side of the conceptual framework, the external entrepreneurship environment is included as an element therein, and the collaborations between the internal and external elements influence the functioning of the U-BEE as a whole. The findings relating to these internal collaborations, as well as the collaboration between the internal and external elements in the conceptual framework, are presented in Chapter Eight that follows.

CHAPTER EIGHT

EMPIRICAL FINDINGS: COLLABORATIONS AND EXTERNAL ENTREPRENEURSHIP ENVIRONMENT

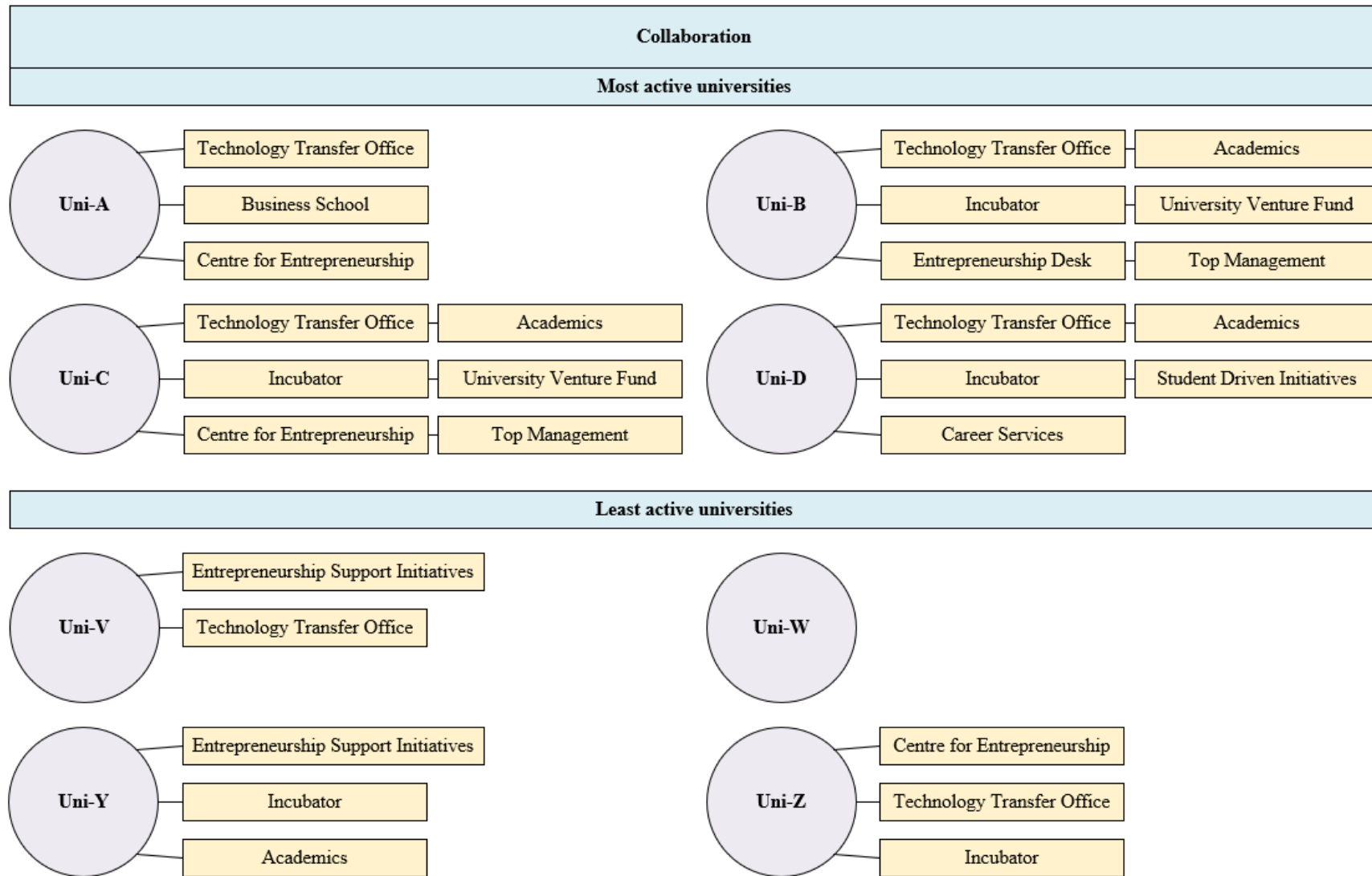
8.1 INTRODUCTION

In the previous chapter (Chapter Seven), the findings relating to specific elements within the internal entrepreneurship environment were presented. The conceptual framework (see Figure 3.1) also highlighted the formal and informal collaborations between the elements in the internal entrepreneurship environment as well as the collaborations between these elements and those in the external entrepreneurship environment. In this chapter (Chapter Eight), the findings relating to these collaborations are presented. Furthermore, the findings relating to the left-hand side of the conceptual framework, namely the external entrepreneurship environment, are also presented. It is this external environment that is key to creating supportive external collaborations.

8.2 INTERNAL COLLABORATIONS SUPPORTING STUDENT ENTREPRENEURSHIP

In this section, the findings related to the collaborations among the various elements within each of the participating universities are presented. This information was collected from all participants who were interviewed during the data collection process, except for participants Uni-A-AS and Uni-A-TM who were unable to complete their interviews due to time constraints. The data shows that in general, collaborations exist between internal stakeholders at seven of the eight participating universities (see Figure 8.1), namely four of the most active [Uni-A, Uni-B, Uni-C, Uni-D] and three of the least active [Uni-V, Uni-Y, Uni-Z] universities.

Figure 8.1: Overview of internal collaborations at participating universities



Source: Authors own construction based on interview data

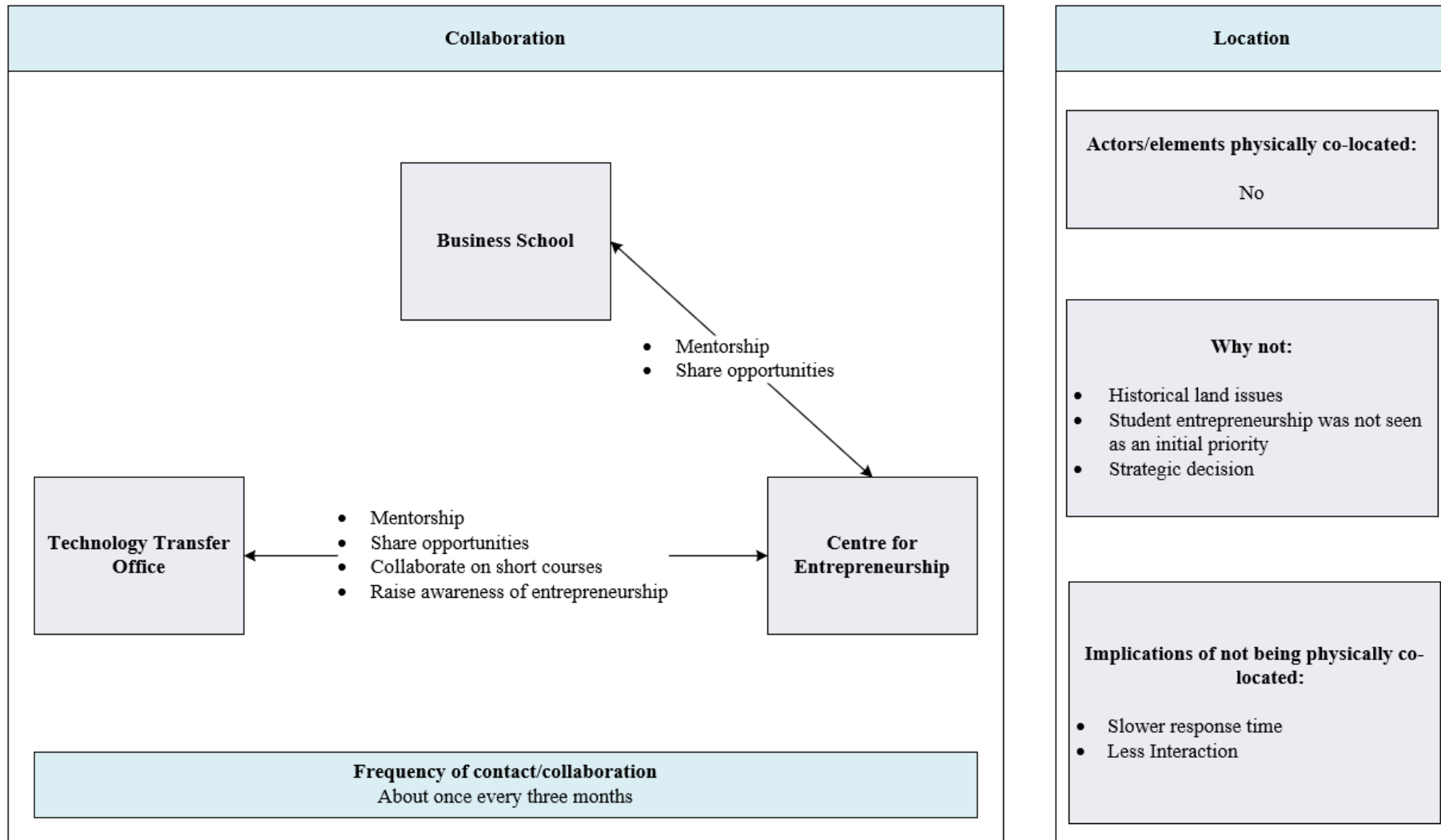
No internal collaborations were found to exist between internal stakeholders at Uni W. Participant Uni-W-AS explained that, “...until we set up the Centre for Entrepreneurship, which we are busy setting up, there is no collaboration because we haven't set up a formal structure in which this thing should happen”. What can be noted from Figure 8.1 is that internal collaborations between stakeholders at the most active universities is more extensive than at the least active universities.

In the sections to follow, the collaborations and interactions between the various elements of each participating university are presented. Moreover, the findings related to the location of the various support elements are also noted, specifically focusing on whether the various support elements are physically co-located or not.

8.2.1 COLLABORATIONS AND LOCATIONS OF ENTREPRENEURSHIP SUPPORT AT UNI-A

Collaborations exist between three internal stakeholders at Uni-A, these being the Business School, Centre for Entrepreneurship and the TTO (see Figure 8.2).

Figure 8.2: Collaborations and locations at Uni-A



Source: Authors own construction based on interview data

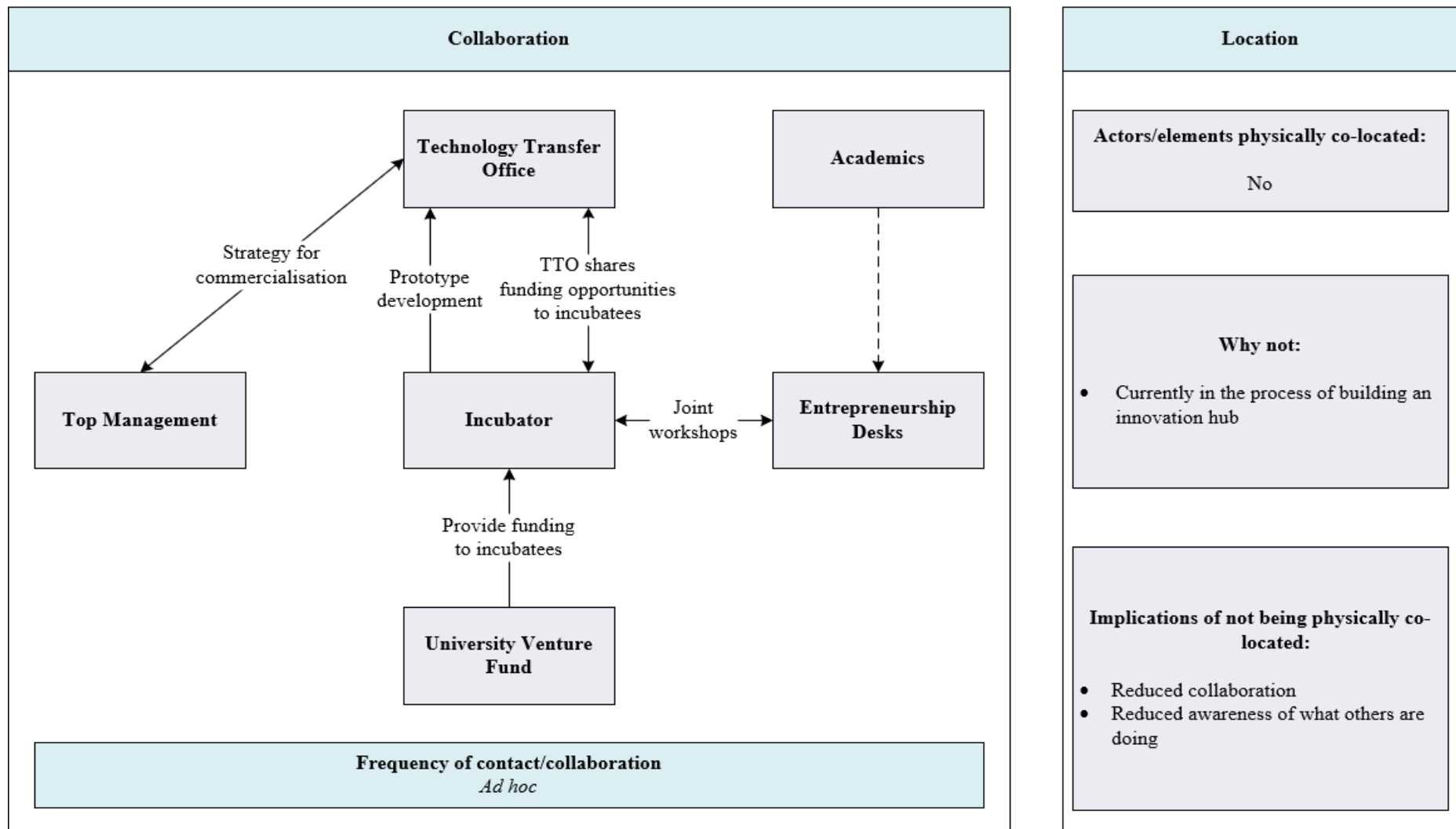
As can be seen from Figure 8.2, collaborations exist between the Centre for Entrepreneurship and the Business School, as well as between the Centre for Entrepreneurship and the TTO. Uni-A-SEC/P explains that “...we [Centre for Entrepreneurship and Business School] share opportunities with one another as it comes through our emails [...], but nothing formalised”. Uni-A-SEC/P also mentioned that “...we are busy having conversations with the Business School to start providing mentorship [to student entrepreneurs]”. Furthermore, participant Uni-A-SEC/P explained that “...if there are opportunities that the TTO hears of that they think is relevant to us [Centre for Entrepreneurship], they'll let us know”. Collaborations were elaborated on by participant Uni-A-TTO, who explained that “...we [Centre for Entrepreneurship and TTO] offer courses together and we've also given some talks within some of their courses on IP”. It was also found that they interact with one another to raise awareness of entrepreneurship at their respective universities but collaborations “used to be a lot more frequent when we were in the same building and had died down a bit due to Covid” [Uni-A-TTO].

The elements at Uni-A are not physically co-located due to “historical land issues and student entrepreneurship not being an initial priority” [Uni-A-SEC/P]. Participant Uni-A-TTO also explained that the entrepreneurship support activities are not co-located as “the TTO collaborates with both the support units of the research hub, as well as the Centre for Entrepreneurship”, thus a “strategic decision resulted in us [TTO] being located in a different building”. Participant Uni-A-TTO noted that not being co-located has led to a “slower response to various things and also less interaction”. In contrast, participant Uni-A-SEC/P explained that not being co-located does not have an impact on effectiveness and efficiency as “we are living in a digital age, and it does not matter that we are not physically in the same space”.

8.2.2 COLLABORATIONS AND LOCATIONS OF ENTREPRENEURSHIP SUPPORT AT UNI-B

Through the data analysis, it was found that collaborations exist between six different entrepreneurship support elements at Uni-B. These elements include the incubator, TTO, university venture fund, entrepreneurship desks, top management and academics (see Figure 8.3).

Figure 8.3: Collaborations and locations at Uni-B



Source: Authors own construction based on interview data

As can be seen in Figure 8.3, the incubator at Uni-B collaborates with several elements that support student entrepreneurship, including the TTO, the university venture fund, and entrepreneurship desks. Participant Uni-B-TM explained that “...we [incubator] have a relationship with them [TTO], although not very strong, we do work with them”. Their collaboration involves the sharing of opportunities, as indicated by participant Uni-B-TM, “...if they have opportunities for funding and they are looking for students then we actually recommend students”, and prototype development, “...we send our students to the TTO if they need prototypes that cannot be done at our Make-A-Space” [Uni-B-IS]. It was also found that Uni-B has multiple TTOs, all focusing on different areas, allowing them to cater for the needs of student entrepreneurs:

“We have four different TTO’s, two in engineering, one in biotechnology, and one in renewable energy, which means we are able to assist anyone who comes with ideas in those areas.” [Uni-B-IS]

Participant Uni-B-IS explained that participants also have access to funds through the university venture fund, “...as long as you are a student and you pitch [your business idea], you can get funding”. Furthermore, it was found that “during the whole lockdown situation, we [incubator and entrepreneurship desks] are running joint workshops, as well as webinars to educate the student community as one board” [Uni-B-IS].

Collaborations between the TTO and top management, as well as between academics and entrepreneurship desks were also noted. The TTO and top management were collaborating to develop a “strategy for commercialisation” [Uni-B-TTO]. Interactions between academics and the entrepreneurship desks were noted, but details were not provided.

It was found that the frequency of collaborations in general between the various entrepreneurship support elements at Uni-B takes place on an *ad hoc* basis, as summarised below:

“It is really on an ad hoc basis. Where there is a need.” [Uni-B-TM];
“In terms of specific collaboration, it is mostly when the need arises.”
[Uni-B-IS]

Participant Uni-B-IS, however, pointed out that in recent times collaborations and interactions between stakeholders had increased, saying that *“the contact is quite frequent, especially now during the whole lockdown situation”*.

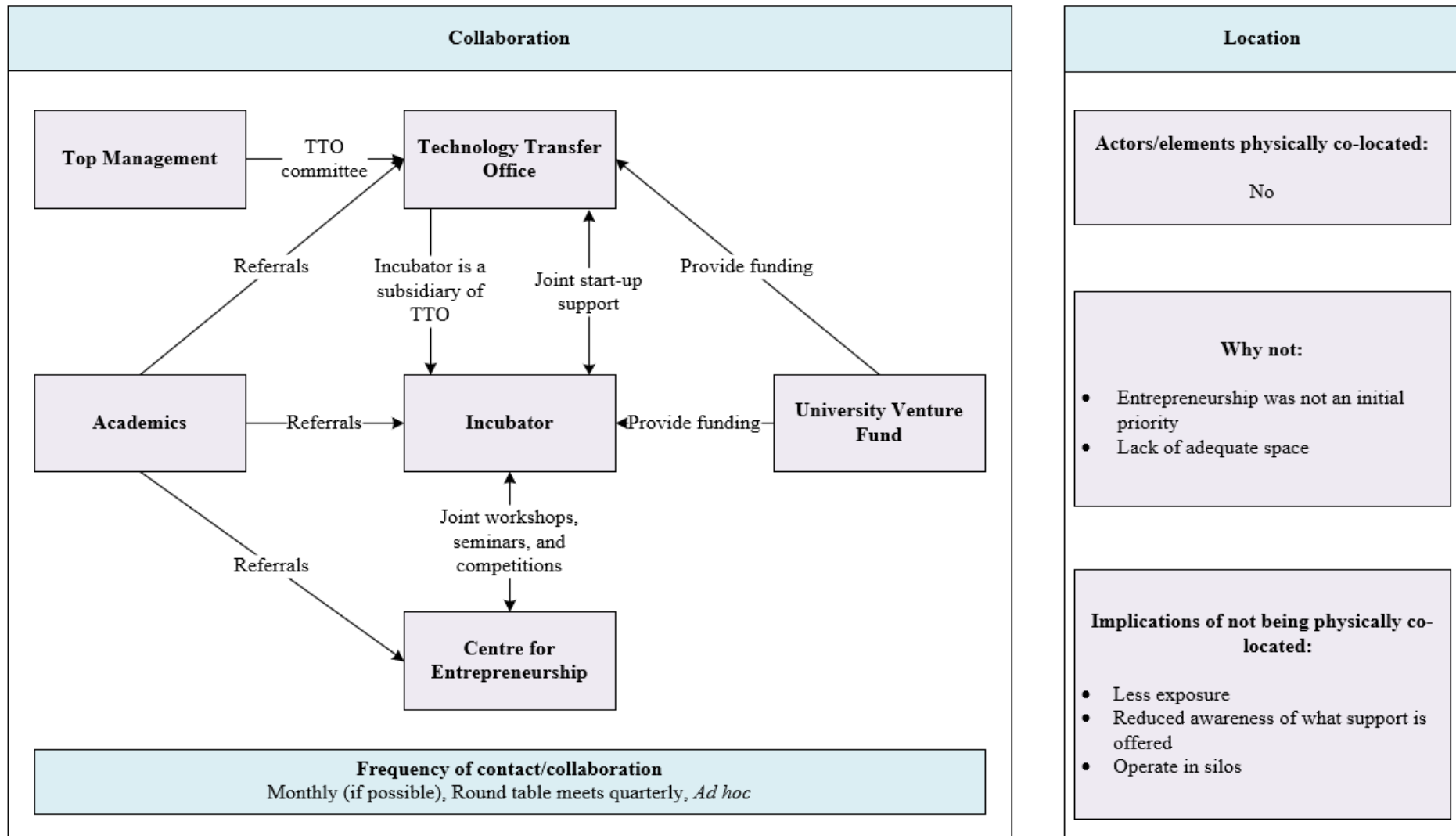
The various entrepreneurship support elements at Uni-B are not physically co-located and are *“spaced out in various sections of the university”* [Uni-B-TTO]. However, *“...there is a plan for that [being co-located], which will happen by the end of maybe next year, called an innovation hub”* [Uni-B-TM]. Not being physically co-located has led to a lack of collaboration between stakeholders and has reduced awareness of what each is doing in terms of student entrepreneurship support.

“The problem is that this is where collaboration is struggling because nobody can see what the others are doing, but if we are in the same building with the entrepreneurs and other elements, they are able to learn from each other, get to know one another, and collaborate.” [Uni-B-TTO]

8.2.3 COLLABORATIONS AND LOCATIONS OF ENTREPRENEURSHIP SUPPORT AT UNI-C

It was found that collaborations exist between six different entrepreneurship support elements at Uni-C. These elements include the incubator, TTO, university venture fund, Centre for Entrepreneurship, academics, and top management (see Figure 8.4).

Figure 8.4: Collaborations and locations at Uni-C



Source: Authors own construction based on interview data

As can be seen from Figure 8.4, the majority of these collaborations stem from the incubator at Uni-C. Two types of collaborations exist between the incubator and the TTO, being a one-way interaction, and a two-way interaction. The one-way interaction occurs where “*the incubator is a subsidiary of the technology transfer office*” [Uni-C-AS], while the two-way interaction occurs through providing start-up assistance, as explained by participant Uni-C-IS, “*...the technology transfer [office] does the legal [work] and protects the actual intellectual property and then the incubator brings the rest of the business [building] blocks around it to a standard...*”. These two elements “*help get those projects ready to go to the venture fund and apply for funding*” [Uni-C-IS], indicating a one-way interaction between the university venture fund and the incubator and TTO. Another two-way interaction exists between the incubator and the Centre for Entrepreneurship as “*workshops, seminars, competitions, and platforms where they [entrepreneurs] can interact is put together in the incubator*” [Uni-C-TM]. Although not physically collaborating with the various support elements, academics are a source of “*referrals*” to them. As explained by participant Uni-C-AS, when students have an idea, academics are able to refer them to the best possible elements who could assist them, indicating a one-way interaction between academics, and the TTO, incubator and Centre for Entrepreneurship. Furthermore, Uni-C “*...has an entrepreneurial table in which we pull all the different faculties in together and talk about how we can support the university, the students and drive entrepreneurship*” [Uni-C-SEC/P]. There are also members of top management on the board of the TTO, indicating that “*the top management is very much involved in how we run entrepreneurship at Uni-C*” [Uni-C-TM].

Regarding the frequency of collaborations and interactions, the participants indicated that it varied between monthly (if possible) [Uni-C-IS], quarterly for the entrepreneurial round table [Uni-C-SEC/P] and occurred on an *ad hoc* basis [Uni-C-SEC/P] when collaborations and interactions were required.

The various entrepreneurship support elements at Uni-C are not physically co-located. Participant Uni-C-TTO explained:

“The way the university is structured, the technology transfer office is in a house outside the university. The incubator is on the other side of the university, and the student entrepreneurship centres are in the

centre of the main university. Yeah, and the research office is also in the centre of the main university.” [Uni-C-TTO]

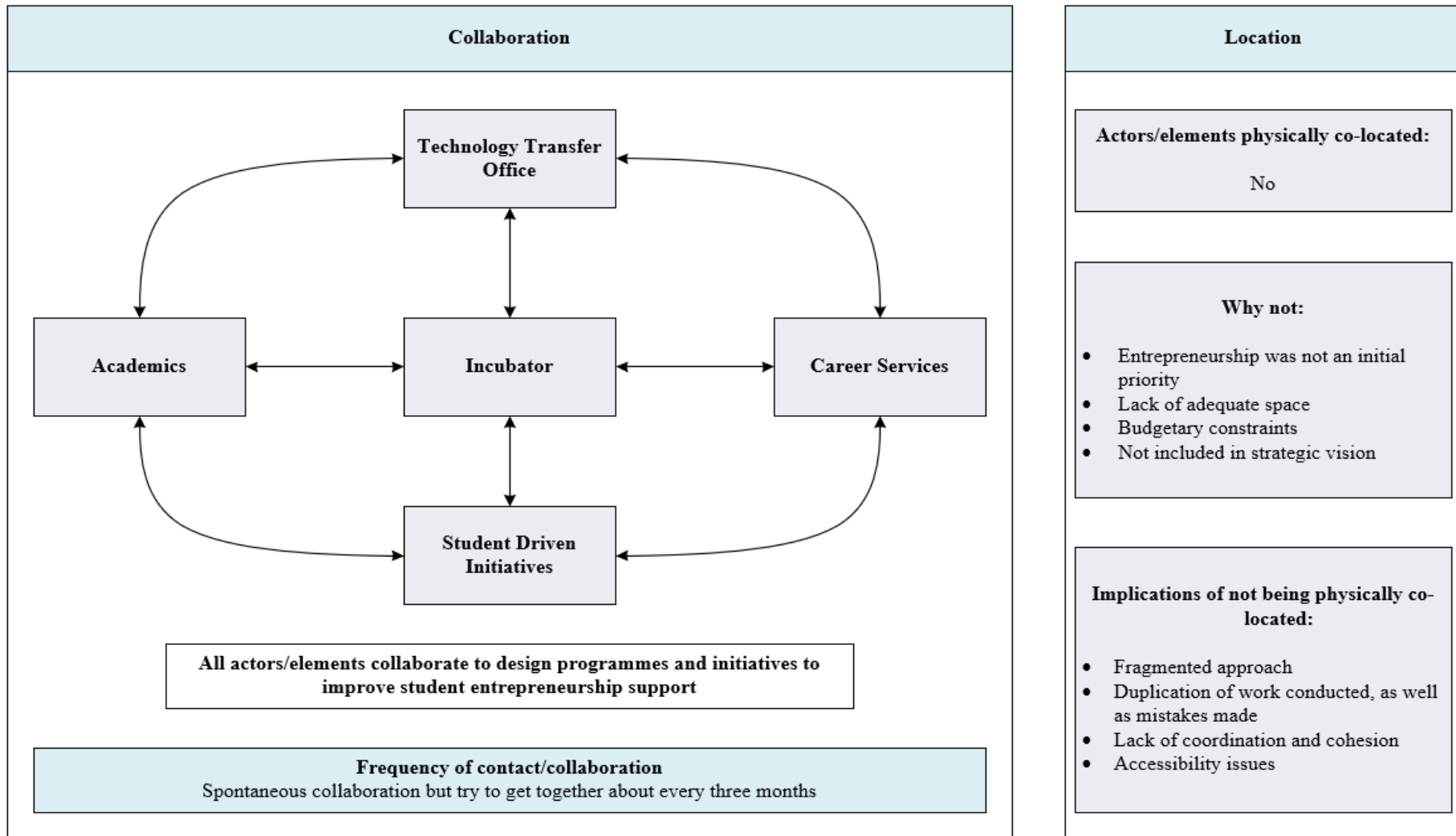
According to participant Uni-C-AS, “*entrepreneurship came in late*”, therefore co-location was not an option and “*now we do not have space, so we just decided to put them over there because that is a space over there*” [Uni-C-AS]. The implications of not being co-located were noted as less exposure and awareness of support being offered [Uni-C-AS], as well as various stakeholders operating in silos [Uni-C-IS]. However, participant Uni-C-IS explained that:

“It is impossible to do it effectively, because if you have a Bio-tech company, they need labs. If you have an Agri-tech company, they need a farm or they need vines or an orchid or something to go and dig in. Everyone needs computers, but they need much more than just a computer.” [Uni-C-IS]

8.2.4 COLLABORATIONS AND LOCATIONS OF ENTREPRENEURSHIP SUPPORT AT UNI-D

At Uni-D, collaborations exist between five different entrepreneurship support elements, namely the incubator, TTO, student driven initiatives, and academics (see Figure 8.5).

Figure 8.5: Collaborations and locations at Uni-D



Source: Authors own construction based on interview data

Collaborations between these five entrepreneurship elements at Uni-D are informal and occur on an *ad hoc* basis, with a focus on “*how to further advance entrepreneurship, what support there is and how we can help students out*” [Uni-D-TM]. The only formal collaboration noted was the “[*joint*] *designing of programmes and initiatives*” [Uni-D-SEC/P]. These, however, were perceived as “*not consistent*” [Uni-D-SEC/P]. In addition, participant Uni-D-TTO explained that, “*...we have got a working group between the career services, the business school, the TTO and the school for design thinking and some of the entrepreneurship lecturers*”.

It was noted that a “*lack of buy in from top management*” [Uni-D-AS, Uni-D-IS] was affecting collaborations between various stakeholders at Uni-D. Participant Uni-D-IS also mentioned that “*when you are dealing with professors, and also head of departments, they only concentrate on the academic side*”.

In terms of the frequency of collaborations between the various elements, it was found that “*an effort is made to get together at least once every three months*” [Uni-D-TM], but is mostly conducted “*spontaneously*” [Uni-D-SEC/P].

The locations of the various entrepreneurship support elements were described as dispersed, with participant Uni-D-TM indicating that “*we are all in different areas*”. These elements are not physically co-located because “*entrepreneurship was not formally part of the university’s agenda*” [Uni-D-SEC/P] and “*there is no strategic vision for entrepreneurship*” [Uni-D-AS]. “*There is also not enough budget allocated*” [Uni-D-AS] to effectively and efficiently provide entrepreneurship support. Participant Uni-D-AS also noted a lack of space being an issue, explaining that “*when you build a campus [place] space is always going to be an issue*”.

Implications of not being physically co-located include a “*fragmented approach, where there is a lot of duplication in what people are doing and the mistakes being made*” [Uni-D-SEC/P] and “*a lack of coordination and cohesion*” [Uni-D-AS]. Participant Uni-D-IS also noted that “*students would lack access to the various support being offered*”. However, participant Uni-D-TTO pointed out that “*co-location is not a requirement to be effective*”.

8.2.5 COLLABORATIONS AND LOCATIONS OF ENTREPRENEURSHIP SUPPORT AT UNI-V

Collaborations were only found to exist between two different entrepreneurship support elements at Uni-V, namely co-curricular entrepreneurship support activities and TTO (see Figure 8.6).

As indicated by participant Uni-V-SEC/P, *“sometimes the technology transfer office organises their own [entrepreneurship] events, which we also support and send students to”*. Moreover, *“during the Student Entrepreneurship Week, we actually engage them, we invite them to come, they provide knowledge of what they do, as well as knowledge related to IP generation and so forth”* [Uni-V-SEC/P]. These collaborations take place on an *ad hoc* basis. In contrast, participant Uni-V-AS perceived that no collaborations were taking place between stakeholders at Uni-V, claiming that *“there is no ecosystem”*. Participant Uni-V-AS noted that they have tried to establish such collaborations but *“it never got beyond a discussion and a good idea”*.

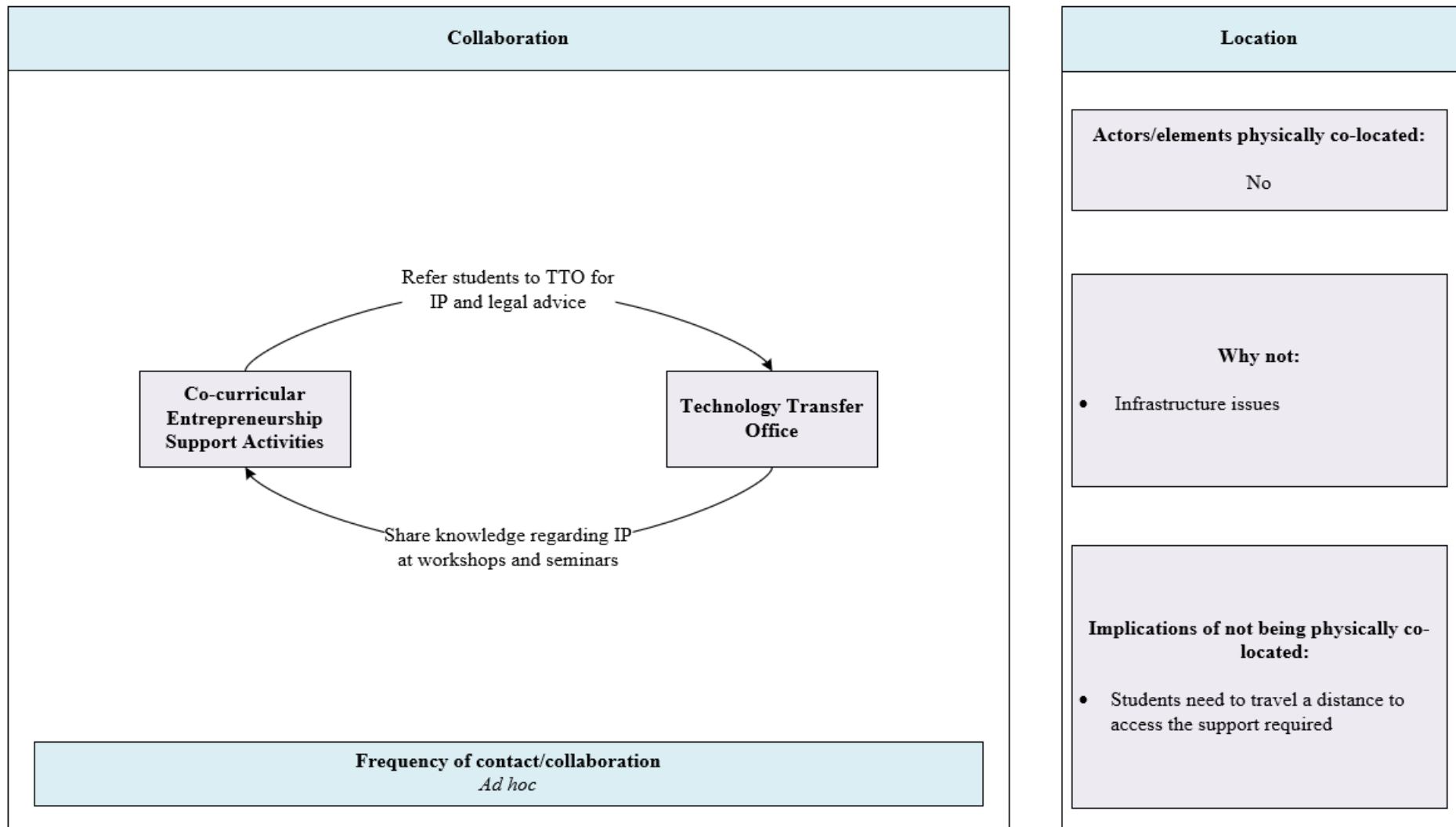
The various entrepreneurship support elements at Uni-V, are not physically co-located because of a lack of infrastructure [Uni-V-SEC/P]. Participant Uni-V-SEC/P explained:

“Those may be related to infrastructure problems or something else, because even in terms of departments, you rarely find all staff of a particular department in one building.” [Uni-V-SEC/P]

Not being co-located raises several challenges for students. Participant Uni-V-SEC/P explains:

“If they [students] are to be told that for this one [assistance or guidance], you have to go and see so-and-so in a building or a place that may obviously be a challenge. In our case, sometimes it is not only an issue of buildings, but also an issue of campuses.” [Uni-V-SEC/P]

Figure 8.6: Collaborations and locations at Uni-V



Source: Authors own construction based on interview data

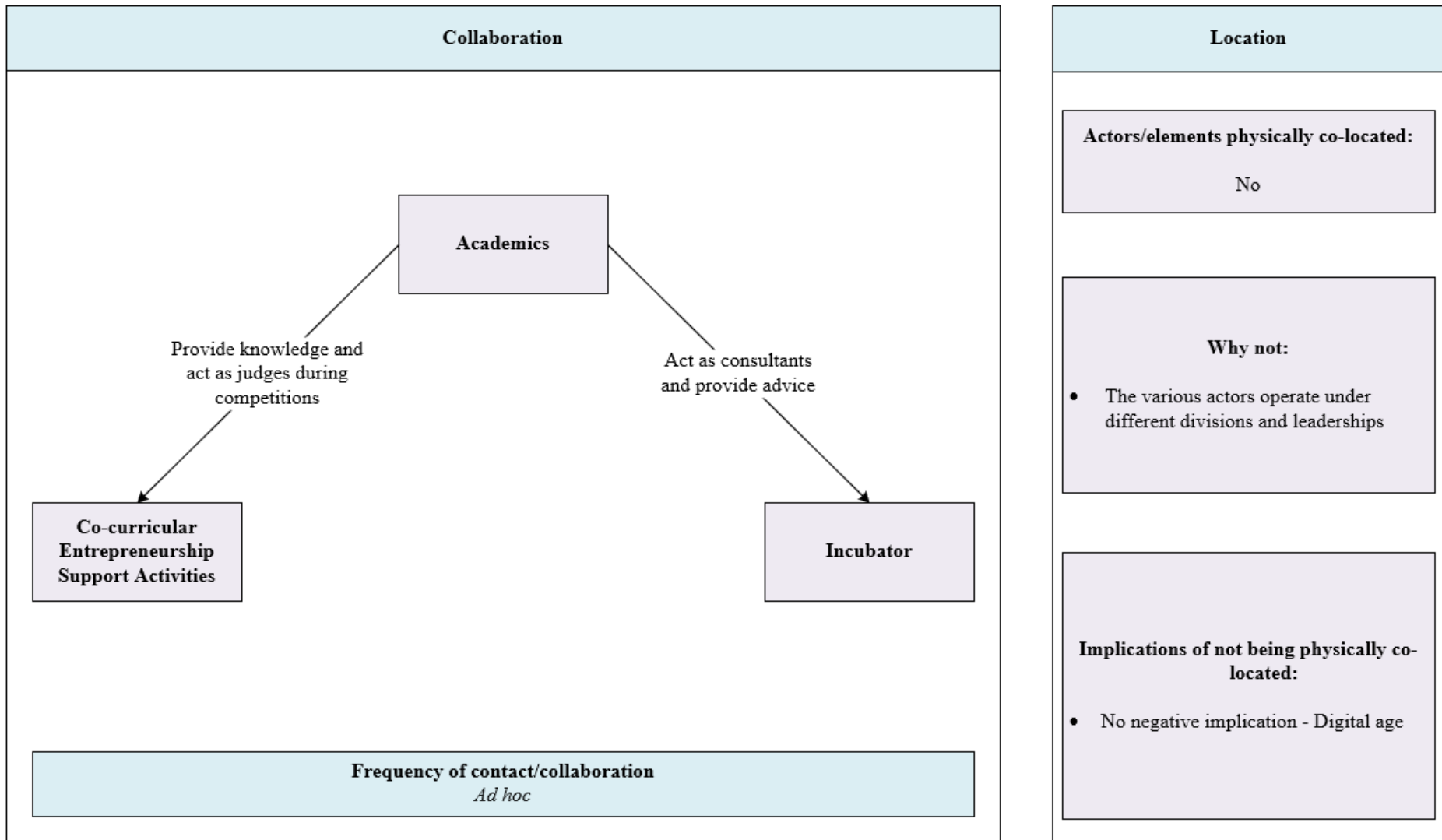
8.2.6 COLLABORATIONS AND LOCATIONS OF ENTREPRENEURSHIP SUPPORT AT UNI-Y

Collaborations exist between three different entrepreneurship support elements at Uni-Y, namely co-curricular entrepreneurship support activities, the incubator, and academics (see Figure 8.7).

Academics at Uni-Y interact with both co-curricular entrepreneurship support activities and the incubator. Academics *“bring in their expertise to support this entrepreneurship development projects in terms of when we have those entrepreneurship weeks and competitions and so forth, to act as judges”* [Uni-Y-TM] and provide *“technical assistance, as well as advice”* [Uni-Y-IS] to participants. Collaborations occur on an *ad hoc* basis, and when the need arises.

The various entrepreneurship support elements at Uni-Y are not physically co-located as *“they are not in the same building”* [Uni-Y-IS] and *“all operate under different divisions and leaderships”* [Uni-Y-TM]. Despite not being physically co-located, participant Uni-Y-IS mentioned, *“I do not see this as a challenge – we communicate via Zoom, emails, telephone, one call away”*. However, participant Uni-Y-TM disagreed, suggesting that a centralised approach should be adopted as a *“one-stop service point would assist operationally”*.

Figure 8.7: Collaborations and locations at Uni-Y



Source: Authors own construction based on interview data

8.2.7 COLLABORATIONS AND LOCATIONS OF ENTREPRENEURSHIP SUPPORT AT UNI-Z

Collaborations exist between two different entrepreneurship support elements at Uni-Z, namely the Centre for Entrepreneurship and Rapid Incubation and TTO (see Figure 8.8).

Regarding these collaborations, participant Uni-Z-IS explained that *“the incubator and the TTO share resources, we [incubator] seek assistance and guidance from the TTO and we even planned the student entrepreneurship week last year together”*. Moreover, participant Uni-Z-TTO noted that *“...when student entrepreneurs come to us or those that we are in contact with, when they need any support that we may not necessary be able to provide - we then channel them to the center of entrepreneurship and rapid incubation”*. These collaborations are on an *ad hoc* basis, *“depending on the opportunities or the training or the competition that comes for the students”* [Uni-Z-IS].

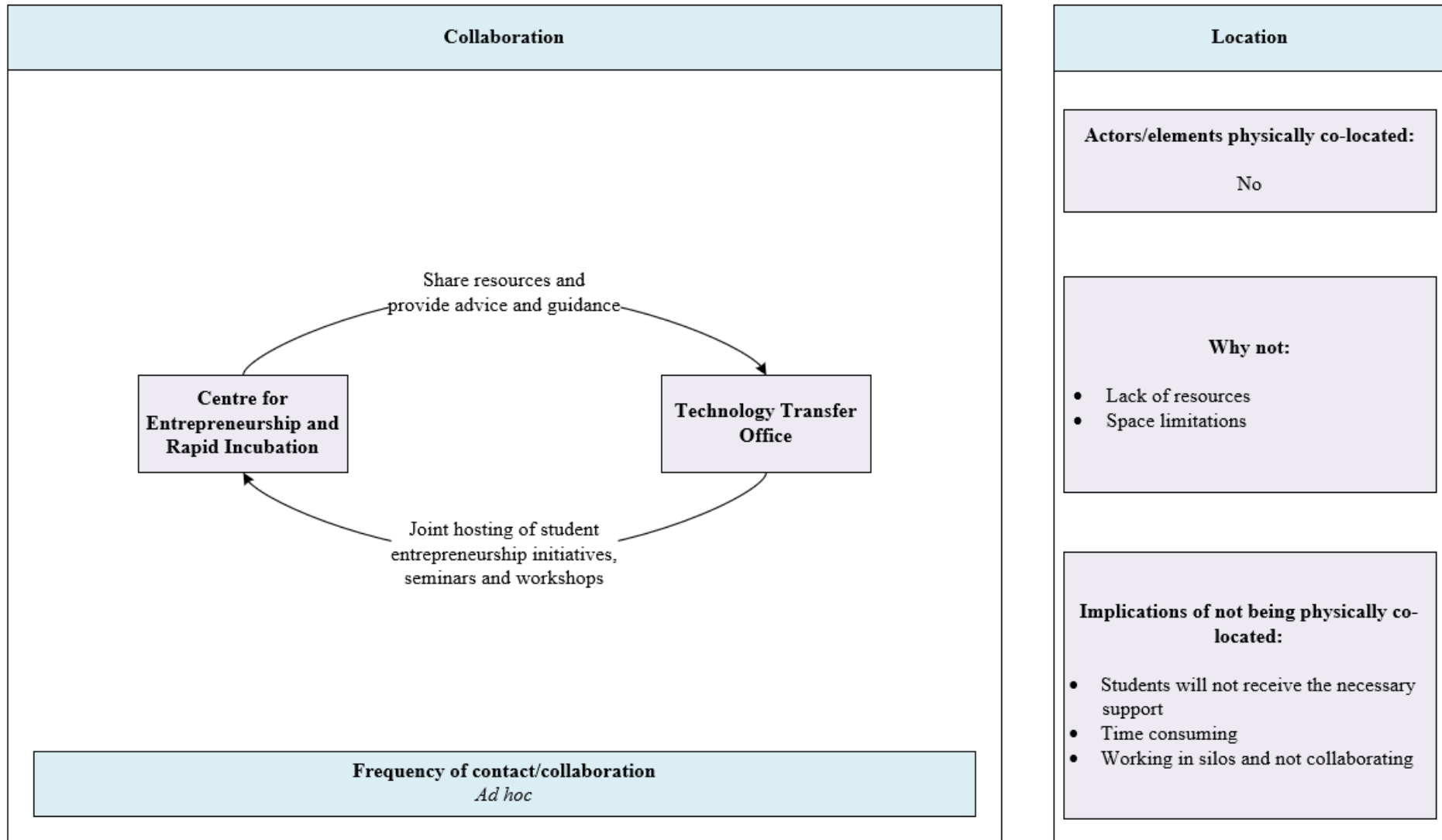
The entrepreneurship support elements at Uni-Z are not physically co-located. Reasons for this include:

“I think it is most likely due to a lack of resources” [Uni-Z-AS]

“I’ll say it’s the space issue because the main campus, I will say that there was no space to kind of have the center also located in our office, whereas at the other campus there was a building that was suitable and that was not utilised.” [Uni-Z-TTO]

Participant Uni-Z-AS noted that by not being physically co-located, *“students might not be provided and have access to the necessary support”*, and it is very *“time consuming in terms of running from this department to another, to the person you might not even find there”* [Uni-Z-IS]. The risk of *“working in silos and not necessarily collaborating”* [Uni-Z-IS] also exists due to stakeholders being dispersed on campus grounds.

Figure 8.8: Collaborations and locations at Uni-Z



Source: Authors own construction based on interview data

8.3 EXTERNAL COLLABORATIONS SUPPORTING STUDENT ENTREPRENEURSHIP

In this section, the findings relating to collaborations between the participating universities and various external student entrepreneurship support actors are presented, including local or regional actors and other universities. This information was collected from all participants who were interviewed during the data collection process, with the exceptions of Uni-A-AS and Uni-A-TM who had to finish their interviews before completing this particular section. Findings relating to participant awareness of these local or regional actors and whether their respective universities are in contact with them, are presented in Table 8.1.

Table 8.1: Awareness of and collaborations with local or regional actors

	Uni-A	Uni-B	Uni-C	Uni-D	Uni-V	Uni-W	Uni-Y	Uni-Z
Are you aware of any local or regional actors that support student entrepreneurship?	Y	Y	Y	Y	Y	Y	Y	Y
Is your university in touch with local or regional actors that support student entrepreneurship?	Y	Y	Y	Y	Y	Y	Y	Y

Source: Interview data

As can be seen from Table 8.1, the majority of participants are aware of local or regional actors that support entrepreneurship and noted that their respective universities are in touch with these actors. The participants provided a list of local or regional actors with whom their respective universities collaborate with (see Table 8.2)

Table 8.2: Local or regional actors involved with universities in supporting student entrepreneurs

University	Actors		
Uni-A	Mashauri	Enactus	Ingenious faces
	Launch Lab at [Name] University		
Uni-B	Municipality	Innovate [City name]	Financial institutions such as banks
	Innovation Hubs	TIA	[Province] Economic Development
	[City name] Make-a-Space		
Uni-C	Capitec Bank	PSG	DHET
	Small Business Ministry	AfricArena	Distell
	Industrial Development Corporation (IDC)	Technology stations	Local businesses
Uni-D	D-School	Solution space	The Southern African Venture Capital and Private Equity Association (SAVCA)
	Angel investors	Directors of Industry	Alan Gray Orbis Foundation
	Banks		
Uni-V	SEDA	EDHE	
Uni-W	Shanduka Incubator	Ithala Bank	ABSA Bank
	[City name] Industrial Development Zone	Chamber of Commerce	NYDA
Uni-Y	Enactus	Department of Social Development	MTN
	SEDA	NYDA	SEFA
Uni-Z	Technology Innovation Agency (TIA)	National Innovation Intellectual Property Management Organization (NIIPMO)	Department of Science and Innovation (DSI)
	Science Academy	SEDA	DHET
	Universities South Africa (USAF)	EDHE	[Province] Regional Innovation Network

Source: Interview data

As can be seen from Table 8.2, a wide variety of collaborations exist between the participating universities and external actors providing student entrepreneurship support. On average, the most active universities have 6.75 collaborations with local or regional actors. These include collaborations with financial institutions, municipalities, government institutions, and local businesses.

As participant Uni-B-IS noted, “...*there is a diverse range of support that is being offered, depending on the needs of the client*”. Participant Uni-D-AS, however, points out that their collaborations revolve “*mainly around funding*” [Uni-D-AS].

Participant Uni-B-TM pointed out that,

“I do not think businesses and industry is actually supporting entrepreneurship development as much. It is mostly government” [Uni-B-TM]

According to participant Uni-C-TM, financial institutions not only provide funding, but “*even more importantly mentorship and coaching*”.

According to participant Uni-C-TM, individuals who work for those external actors also “*sit on the governing boards of [our TTO and incubator], and they are alumni that advise faculties on their advising boards*”. These networks and collaborations are regarded by Uni-C-TM as “*extremely important to be successful*”.

On average, the least active universities have 5.75 collaborations with local or regional actors. These include collaborations with financial institutions, municipalities, and government institutions. The collaborations mainly revolve around “*joint entrepreneurship events*” [Uni-W-AS, Uni-W-SEC/P, Uni-Z-IS], “*provision of funding*” [Uni-W-AS, Uni-Y-TM, Uni-Z-IS], “*provision of advice*” [Uni-W-AS], and “*provision of workshops*” [Uni-W-SEC/P, Uni-Y-IS, Uni-Z-TTO].

Participant Uni-V-SEC/P explained that:

“Currently, it is still at the early stages, because it was something that we would start in 2020, but unfortunately, because of Covid, thing did not go the way we expected” [Uni-V-SEC/P]

The findings also show that six of the eight participating universities are collaborating or interacting with other national and/or international universities in terms of student entrepreneurship support (see Table 8.3). Participants from Uni-V and Uni-Y indicated that no such collaborations were taking place.

From Table 8.3 it can be seen that participant Uni-A-SEC/P only provided a general answer, mentioning that *“...we would work with the Western Cape Universities, mainly”*. However, the other three most active universities have on average 7.33 national collaborations.

National collaborations are generally based on the opportunities presented through the *“EDHE advisory board”* which is usually *“regional or national competitions and the student entrepreneurship week”* [Uni-A-SEC/P]. Participant Uni-B-TM explained that the collaboration at a national level is *“more informal than formal”*, and mainly involves *“sharing of best practices”* [Uni-B-SEC/P], *“joint conferences”* [Uni-B-AS], and *“student entrepreneurship exchange students”* [Uni-B-IS].

International collaborations were found to take place with universities from 12 different countries. These collaborations include *“joint workshops”* [Uni-C-SEC/P], *“student exchange programmes”* [Uni-C-SEC/P, Uni-C-AS, Uni-C-IS], *“virtual international modules”* [Uni-C-SEC/P], *“sharing of resources and facilities”* [Uni-C-IS], and *“research collaborations”* [Uni-C-TTO]. Participant Uni-C-AS noted that:

“It is not the focus of our activities, but we do participate wherever we can and when we have got the capacity to do so.” [Uni-C-AS]

At Uni-D international collaborations involve *“joint pitching competitions”* [Uni-D-SEC/P], *“visiting guest lecturers”* [Uni-D-SEC/P], *“joint research projects”* [Uni-D-AS], *“student entrepreneurship exchange students”* [Uni-D-AS], *“knowledge sharing”* [Uni-D-TTO], and *“sharing of business opportunities”* [Uni-D-TTO].

Table 8.3: Collaborations with other universities

Participating University	National Universities		International Universities
Uni-A	Universities in the Western Cape		
Uni-B	Mangosuthu University of Technology	University of Pretoria	Cork Institute of Technology (Ireland)
	University of Kwazulu-Natal	University of Johannesburg	Universities in China
	University of Zululand	University of Cape Town	Universities in Thailand
	Regent University	Rhodes University	
	Tswane University	Walter Sisulu University	
Uni-C	University of Cape Town	Nelson Mandela University	Esade Business School (Barcelona)
	Stellenbosch University	Rhodes University	Saint Hose University (Silicon Valley, California)
	University of the Western Cape	University of the Free State	Lorea University (Canada)
	University of Witwatersrand	Cape Peninsula University of Technology	Universities in the Netherlands
	University of Johannesburg	University of Pretoria	Universities in Germany
			Universities in France
Uni-D	University of Limpopo	University of Pretoria	Universities in Belgium
			Universities in India
			Universities in the United States of America
Uni-W	Durban University of Technology	University of Fort Hare	Jacksons State University
			Moses Cortana Institute
Uni-Z	Durban University of Technology	Nelson Mandela University	
	Rhodes University	University of Fort Hare	

Source: Interview data

On average, the two least active universities have three national and one international collaboration. Participant Uni-W-SEC/P noted that their collaborations with other universities “do not include funding”, but rather focus on “joint research projects” and “staff and student exchanges”. Participant Uni-W-AS also added that some of the universities provide guidance and assistance in terms of establishing and providing student entrepreneurship support. As explained by participant Uni-Z-SEC/P, “there is ongoing training and workshops to where various universities are invited focusing on student entrepreneurship”. Other activities on which Uni-Z collaborates with other national universities include “sharing of tools, experience, and equipment” [Uni-Z-IS], “organising events together” [Uni-Z-TTO], and “visiting guest speakers at events” [Uni-Z-TTO].

8.4 EXTERNAL ENTREPRENEURSHIP ENVIRONMENT

As mentioned above it is the external environment that is key to creating supportive external collaborations. In this section opinions were sourced concerning this external environment. More specifically, information was gathered on participants’ opinion of (i) national government’s policy stance towards student entrepreneurship, (ii) environmental/contextual factors that influence student entrepreneurship in South Africa, and (iii) environmental/contextual factors that influence student entrepreneurship at their respective universities. This information was collected from all participants who were interviewed during the data collection process, with the exceptions of Uni-A-AS, Uni-A-TM, Uni-C-SEC/P, Uni-D-AS, and Uni-Y-IS, who were unable to complete this particular section.

Participants’ opinions on the national policy stance towards student entrepreneurship are presented in Table 8.4.

Table 8.4: National government’s policy stance towards student entrepreneurship

	Extract	Participant	Extract	Participant
Positive responses towards the national policy in terms of student entrepreneurship	The national development plan does prioritise it. It dedicates a section to entrepreneurship and its importance in relation to youth unemployment.	Uni-A-SEC/P	I have no doubt that the government supports student entrepreneurship because EDHE is sort of a government initiative under the DHET.	Uni-V-SEC/P
	We are in the process of developing the national policy now. So, we are just waiting for the baseline research to be completed which is done to inform us about areas in the policy for development.	Uni-B-TM	Well, for instance, having the EDHE is a great policy stance and is very effective, even though it is still less than 3 years old, if I am not mistaken.	Uni-W-SEC/P
	I am quite happy about the policies because the university can follow that because they are also supporting it.	Uni-B-TTO	If you look at USAf, they probably represent government stance on student entrepreneurship and they have dedicated a lot of money. So they are promoting it in a big, big way.	Uni-W-AS
	The national government policy stance, through the DHET, have formulated EDHE. I would say that it came at the right time and that a lot has been done.	Uni-B-IS	So, one could say the government has a wish to promote entrepreneurship.	Uni-Y-TM
	Very keen. Government policy absolutely supportive of student entrepreneurship.	Uni-C-TM	EDHE is financed by the DHET. To me, it is still new. I would say we are on the right path to have such programmes such as the EDHE.	Uni-Y-SEC/P
	I feel it is quite supportive. I feel even though there is a lot of money made available to students, even though not directly to all universities, but there is money made available for entrepreneurship.	Uni-D-TM	There is a lot of promising support. The rollout is still to be seen. There are a few projects but it can be improved.	Uni-Y-AS
	Yeah, I think that they are trying and as a specific example, is USAf where it is government based. I feel like they have laid the foundation, but so much still needs to be done.	Uni-D-SEC/P	Yes, I think they are now focusing on student entrepreneurship.	Uni-Z-AS
	I think is evolving. I think they are developing their policies. You know the whole EDHE initiative that is underway is good. You know it is in the right direction.	Uni-D-TTO	I am not sure if the Higher Education Act is explicit in terms of entrepreneurship, but I will assume that the support that is provided through DHET is informed by the Higher Education Act.	Uni-Z-TTO

Table 8.4: National governments policy stance towards student entrepreneurship (cont.)

	Extract	Participant	Extract	Participant
Negative responses towards the national policy in terms of student entrepreneurship	My findings have been that the stuff is not needs-driven, it is program driven and unfortunately life does not work like that, but it is our government's work. Little interaction. Maybe they must get entrepreneurs to write the policy and then we can just check and edit the language and stuff like that. Some of them, they know exactly what they want.	Uni-C-AS	Policy, they have not done much, nothing in terms of policy. To my knowledge, they have not done much.	Uni-Z-IS
Unaware or less knowledgeable responses towards the national policy in terms of student entrepreneurship	I have not really heard of any initiatives from governments in promoting student entrepreneurship at universities. Either I'm just not aware of it or there is nothing happening. There probably is something happening I'm not aware of it.	Uni-A-TTO	I do not know anything about that.	Uni-D-IS
	I understand that the government is assisting entrepreneurs, but I am not sure in terms of student entrepreneurs.	Uni-B-AS	Look, I have not looked at that for a long time that I would be able to give a really informed viewpoint.	Uni-V-AS
	I have no idea.	Uni-C-IS	I do not even know at this stage whether government does have a policy in that regard.	Uni-Z-TM
	I do not know the national policy on student entrepreneurship.	Uni-C-TTO		

Source: Interview data

The responses of participants with regards to the national policy stance towards student entrepreneurship were categorised into three areas, namely positive responses, negative responses, and unaware or less knowledgeable responses. These categories were developed considering the answers of 25 participants who responded to this question. The majority of participants (16) indicated positive responses in terms of the national policy, of which eight were from universities considered as most active and eight from universities considered as least active. In general, these participants described the national policy stance towards student entrepreneurship as being “*quite supportive*” [Uni-D-TM] and “*effective*” [Uni-V-SEC/P]. Although participant Uni-D-SEC/P and Uni-Y-AS noted a positive response, they continued to explain that “*so much still needs to be done*” and that “*there are a few projects but it can be improved*”. The national governments policy stance towards student entrepreneurship is most evident through the EDHE initiative, which falls under the DHET. This initiative was mentioned by five participants [Uni-B-IS, Uni-D-TTO, Uni-V-SEC/P, Uni-W-SEC/P, Uni-Y-SEC/P].

Only two participants [Uni-C-AS, Uni-Z-IS] gave negative responses in terms of the national policy stance towards student entrepreneurship, one from a university considered as most active, and the other from one considered as least active. Participant Uni-C-AS explained:

“My findings have been that the stuff is not needs-driven, it is program driven and unfortunately life does not work like that, but it is our government's work. Little interaction.” [Uni-C-AS]

Of the 25 participants who gave their opinions on the national policy stance towards student entrepreneurship, seven indicated that they were unaware or had little knowledge of the policy. As explained by participant Uni-A-TTO,

“I have not really heard of any initiatives from government in promoting student entrepreneurship at universities. Either I'm just not aware of it or there is nothing happening. There probably is something happening I'm not aware of it.” [Uni-A-TTO]

Participants were also requested to give their opinions on environmental/contextual factors influencing student entrepreneurship in South Africa (see Table 8.5). As can be seen from Table 8.5, three overarching themes were developed, namely *socio-economic factors*, *lack of entrepreneurial mindsets*, and *lack of entrepreneurially supportive culture*.

Table 8.5: Environmental/contextual factors influencing student entrepreneurship in South Africa

Extract	Participant	Code	Categories	Themes
Unemployment is key. It is very difficult for students after they graduate to find employment within industry. So they would definitely come up with their own ideas.	Uni-A-TTO	Difficult to find employment	Unemployment Rate	Socio-economic factors
Lack of jobs is one of the things that actually influences student entrepreneurship in South Africa.	Uni-B-TTO	Lack of jobs		
Unemployment is getting very high so therefore the student needs to start thinking about entrepreneurship.	Uni-Y-SEC/P	Unemployment		
I think if we continue having unemployment, I think it will become a focus area where dedicated resources will be made available.	Uni-Z-SEC/P	Unemployment		
I think with poverty they might not have the resources to become entrepreneurs or to start up their own companies.	Uni-A-TTO	Lack of access due to poverty	Poverty	
Poverty is important because what happens is students eventually see the businesses they started at university as something that can help their families.	Uni-W-AS	Poverty		
Some previously disadvantaged students, it is a little bit more difficult for them. They do not have that exposure. They do not know where to start.	Uni-C-TTO	Previously disadvantaged students	Previously disadvantaged individual and provinces	
There are people who are privileged and then there are people who are underprivileged, and I think that is an external social-economic factor that is real and it is significant.	Uni-D-TTO	Gap between privileged and underprivileged		
I will think that being in provinces like Eastern Cape, which is underdeveloped, resources are limited and it also contributes in terms of how students are influenced.	Uni-Z-TTO	Underdeveloped provinces		

Table 8.5: Environmental/contextual factors influencing student entrepreneurship in South Africa (cont.)

Extract	Participant	Code	Categories	Themes
The main limitation is the mindset of people.	Uni-C-TM	Lack of entrepreneurial mindset	Change of mindsets	Lack of entrepreneurial mindset
There is a need for a mind shift from where we are expecting handouts. People need to start looking at what resources we have and how to make the best of the resources we have, even the natural resources.	Uni-B-TM	Expecting handouts		
We do not believe in suffering first. And also, we do not believe in working hard.	Uni-W-SEC/P	Lack of work ethic		
The sense of entitlement, entrepreneurship is hard, you need to work a lot before you receive anything substantial.	Uni-Y-AS	Sense of entitlement		
I think we need to develop a stronger culture towards this development of entrepreneurial orientation and the mindset.	Uni-C-AS	Develop a stronger entrepreneurial culture	Entrepreneurially supportive culture	Lack of entrepreneurially supportive culture
I also just think the culture of entrepreneurship in South Africa, the ecosystem is not that much as other ecosystems around the world.	Uni-D-SEC/P	Culture of entrepreneurship		
We do not have that drive or that culture of saying I want to start my own business.	Uni-W-SEC/P	Culture of entrepreneurship		
The country or the society as a whole still need to be competitive in that area of entrepreneurship, because we're not yet there.	Uni-Y-SEC/P	Culture of entrepreneurship		

Source: Interview data

Socio-economic factors (Theme 1) were mentioned the most as influencing student entrepreneurship in South Africa. Participants particularly made mention of the *unemployment rate* (Category 1), *poverty* (Category 2), and *previously disadvantaged individuals and provinces* (Categories 3) as environmental/contextual factors that influence student entrepreneurship in South Africa. In terms of the unemployment rate, participant Uni-Y-SEC/P explained that “*unemployment is getting very high so therefore the students need to start thinking about entrepreneurship*”. Moreover, it was indicated that as unemployment continues to rise, “*it will become a focus where dedicated resources will be made available*” [Uni-Z-SEC/P] to encourage and support student entrepreneurs. It was found that *poverty* (Category 2) has both a negative and positive influence on student entrepreneurship in South Africa. Although poverty might lead to students “*not having access to resources to become entrepreneurs or start their own businesses*” [Uni-A-TTO], participant Uni-W-AS claims that due to poverty “*students eventually see the businesses they started at university as something that can help their families*”. Responses from three participants led to the development of the third category, *previously disadvantaged individuals and provinces*. It was found that Uni-C-TTO and Uni-D-TTO (both from universities considered as most active) experienced that previously disadvantaged students and people who are underprivileged “*find it a bit more difficult to become entrepreneurs*”. Moreover, a participant from a university considered as least active [Uni-Z-TTO], explained that “*in provinces that are underdeveloped, resources are limited, and it also contributes in terms of how students are influenced*”.

The second theme, *lack of entrepreneurial mindset*, was developed based on responses from four participants. Participant Uni-Y-AS asserted that “*there is a sense of entitlement*”, which corresponds with participant Uni-B-TM explaining that “*...there needs to be a mind shift from where we are expecting handouts*”. This notion is supported by Uni-W-SEC/P who claims that “*we do not believe in suffering first; we do not believe in working hard*”.

The third theme, *lack of entrepreneurially supportive culture*, was developed based on responses from four participants who claimed that “*we need to develop a stronger culture towards this development of entrepreneurial orientation and the mindsets*” [Uni-C-AS]. Participant Uni-Y-SEC/P explained that “*the country or society as a whole still needs to be competitive in that area of entrepreneurship, because we are not there yet*”.

Participants also provided their views on environmental/contextual factors that influence student entrepreneurship at their respective universities. These findings were grouped into two themes, namely *university-related environmental/contextual factors*, and *student-related environmental/contextual factors* (see Table 8.6).

As can be seen from Table 8.6, the majority of the environmental/contextual factors highlighted by participants as influencing student entrepreneurship at their respective universities are university-related (Theme 1). Three categories of factors were identified, namely a *lack of entrepreneurial culture* (Category 1), a *lack of integration* (Category 2), and a *lack of required resources* (Category 3). In terms of a *lack of entrepreneurial culture*, participant Uni-C-TM pointed out that “...academics are pretty risk adverse, instilling a culture of work hard, get a degree, go work for a company or government and work your way up the ladder”. It can be assumed that due to the lack of an entrepreneurial culture, “*entrepreneurship is not formally integrated (category 2), in the curriculum and activities*” [Uni-D-SEC/P]. The third category, *lack of required resources*, was developed based on responses received from participants at Uni-B (most active university) and Uni-Z (least active university). Their responses highlighted the lack of financial and infrastructure resources. Participant Uni-B-IS explained that “...*there is a lot that needs to be done to breach the gap and to expose underprivileged environments*”.

The second theme, *student-related environmental/contextual factors*, consists of two categories, namely a *lack of awareness* (Category 1) and a *lack of start-up capital* (Category 2). The first category, *lack of awareness*, was developed based on the response from participant Uni-W-AS who claimed that “*entrepreneurship is something that they do not even think about until they find out about it at university*”. Furthermore, participants also noted that “*students come from lower to middle income households*” [Uni-A-TTO], “*so they do not have the start-up capital*” [Uni-A-SEC/P] required. The extracts led to the development of the second category, *lack of start-up capital*.

Table 8.6: Environmental/contextual factors influencing student entrepreneurship at universities

Extract	Participant	Code	Categories	Themes
Change the mindset and create a culture of entrepreneurship.	Uni-C-TM	Lack of entrepreneurial culture	Lack of entrepreneurial culture	University-related environmental/contextual factors
The culture, I think, our country has all kinds of diversities and cultures.	Uni-C-AS	Lack of entrepreneurial culture		
I think once again it is that culture thing. I feel like it is a budding culture of entrepreneurship.	Uni-D-SEC/P	Lack of entrepreneurial culture		
Academics are pretty risk adverse, instilling a culture of work hard, get a degree, go work for a company or government and work your way up the ladder.	Uni-C-TM	Lack of entrepreneurial culture		
It is not formally integrated into the core curriculum and activities. It is still an extra thing that they do.	Uni-D-SEC/P	Not formally integrated	Lack of integration	
Students might have been through a programme of regimental sort of teaching or education. There seems to be a focus on the content, instead of raising the quality of the student.	Uni-C-AS	Lack of practical integration		
The amenities in the rural based universities focus on supporting student entrepreneurs, surely, there is a lot that needs to be done to breach the gap and to expose underprivileged environments, because the environment plays a big role.	Uni-B-IS	Lack of resources	Lack of required resources	
The funding at the university is constrained by the budgetary categories and if it is changed for business and entrepreneurship, and if the university can receive higher funding, then the universities will bring in more courses in entrepreneurship.	Uni-Z-SEC/P	Lack of financial support		
Infrastructure is terrible here.	Uni-Z-IS	Lack of infrastructure		
I would say lack of resources.	Uni-Z-IS	Lack of resources		

Table 8.6: Environmental/contextual factors influencing student entrepreneurship at universities (cont.)

Extract	Participant	Code	Categories	Themes
I would say rural-based students, entrepreneurship is something that they do not even think about until they find out about it at university.	Uni-W-AS	Lack of awareness	Lack of awareness	Student-related environmental/contextual factors
Many students come from lower middle-income families so they do not have the start-up capital.	Uni-A-SEC/P	Lack of start-up capital	Lack of start-up capital	
So our university is a previously disadvantaged institution, so a lot of the students are from the lower to middle income households.	Uni-A-TTO	Lack of start-up capital		

Source: Interview data

8.5 SUMMARY

In this chapter (Chapter Eight), the findings relating to the collaborations between the internal entrepreneurship support elements were presented. Thereafter, the various external elements supporting student entrepreneurship at the participating universities were identified, and the collaboration between the internal and external elements described. Finally, the findings relating to the external entrepreneurship environment was presented, specifically focusing on the national governments policy stance towards student entrepreneurship, environmental/contextual factors that influence student entrepreneurship in South Africa, and environmental/contextual factors that influence student entrepreneurship at the respective universities.

Chapter Nine will commence by presenting an overview of the whole study. Thereafter, the empirical findings will be discussed and compared to existing literature, and recommendation will be made. The chapter will conclude with the contributions of the study as well as limitations, and avenues for future research.

CHAPTER NINE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

9.1 INTRODUCTION

In Chapter Nine, the final chapter, a brief overview of the study is provided by highlighting the contents of each of the previous eight chapters. After this brief overview, the findings of the study are discussed and compared to the extant literature. The design elements of Good *et al.* (2018), namely purpose, activities, structure and people, are used to structure this discussion. In addition, recommendations on best practices for supporting student entrepreneurs in a university context are provided and the contribution of the study are highlighted. The limitations of the study are pointed out and suggestions for future research made. The chapter and study conclude with some closing remarks.

9.2 OVERVIEW OF THE STUDY

In Chapter One, the introduction and background to the study were presented. The underlying problem statement was described, and a lack of research on student entrepreneurship support identified. Entrepreneurship is regarded as the solution to increasing unemployment and as such research attention focussed on stimulating entrepreneurial activities and education has increased (Shambare, 2013:449; Amadi-Echendu *et al.*, 2016:21; Yusoff *et al.*, 2017:892). Despite universities being ideal environments for promoting entrepreneurship among students and graduates (Department of Higher Education and Training, 2017:8), and the significant contributions of student entrepreneurs, support provided to these students by universities has been the subject of very little research (Breznitz & Zhang, 2019:855). Bergmann *et al.* (2016:54) note that far less research has been conducted on student start-ups than academic start-ups, even though student start-ups occur more frequently. Given the importance of student entrepreneurship support and the lack of research thereon, the main research question for this study was: How are South African public universities supporting student entrepreneurship?

To answer this research question, the primary objective of this study was to assess the state of university-based student entrepreneurship support at South African public universities. In order to achieve the primary objective, three secondary objectives (SO) were formulated:

- SO¹: To rank the 26 South African public universities in terms of student entrepreneurship support;
- SO²: To describe university-based student entrepreneurship support offered by South African public universities;
- SO³: To identify start-up (establishment) and current operational challenges facing student entrepreneurs at South African public universities.

To achieve the primary and secondary research objectives, six methodological objectives (MO) were formulated:

- MO¹: To undertake a theoretical investigation into the nature and importance of student entrepreneurship and the challenges faced;
- MO²: To undertake a theoretical investigation into student entrepreneurship support at universities and the various U-BEE models and frameworks;
- MO³: To propose a conceptual framework for investigating student entrepreneurship support at South African public universities;
- MO⁴: To determine the most appropriate research methodology for addressing the identified research problem and research objectives;
- MO⁵: To undertake an empirical investigation and gather the necessary data;
- MO⁶: To provide conclusions and to make recommendations on best practices regarding student entrepreneurship support to South African public universities.

In Chapter One, a brief overview of the research design and methodology adopted was provided and the study's scope was demarcated. Thereafter, the significance of the study was highlighted and the chapter concluded by clarifying key concepts and outlining the structure of the chapters to follow.

Chapter Two presented a literature review and commenced with an overview of student entrepreneurship, focusing on the nature and importance thereof. Moreover, the challenges experienced by students in starting their own businesses were also explored. Thereafter, previous research conducted on student entrepreneurship support in general, as well as in South Africa, was discussed. The chapter concluded by presenting the theories underpinning the current study as well as the various university-based student entrepreneurship ecosystem models and frameworks identified in the literature.

In Chapter Three, the conceptual framework for the current study was presented. The framework consists of two environments: the internal entrepreneurship environment and the external entrepreneurship environment. The various elements in these environments were described and their inclusion in the framework justified. The conceptual framework also highlighted the formal and informal collaborations between the elements within the internal entrepreneurship environment as well as the collaborations between the elements within the internal entrepreneurship environment and the external entrepreneurship environment. These relationships were also described and justified.

In Chapter Four, the research design and methodology adopted in this study was presented. The chapter commenced by describing the research philosophy and paradigm in which the study is situated, namely an interpretivist philosophical stance and an interpretive research paradigm. Thereafter, the approach to theory development was described. An abductive approach to theory development was used as it allowed the research design to adapt as the investigation unfolded. The methodological choices made were then described. Given that the purpose of the study was exploratory, a multi-method qualitative research method was chosen. In Chapter Four the research strategy utilised and the time horizon of the study were also described. A multiple-case study research strategy was used and the study was described as cross-sectional in nature. Thereafter, the techniques and procedures adopted to gather, analyse and present the data were described. The chapter concluded by explaining how the trustworthiness of the processes followed and data gathered were ensured and by describing the ethical considerations taken.

Chapter Five was the first of four chapters presenting the empirical findings. In Chapter Five the procedure followed to rank the 26 South African public universities was described, and their rankings presented. They were ranked from the most active (most entrepreneurship support activities offered) to the least active (least entrepreneurship support activities offered). Based on this ranking, the four most active and four least active universities were selected to serve as cases for the remainder of this study. After the rankings were presented, the eight universities selected as cases were described. Thereafter, the participants interviewed were described and their biographical information presented. Given that student entrepreneurs were central to the conceptual model, the student entrepreneurs interviewed were further described in terms of their backgrounds, experiences, and entrepreneurial endeavours. In addition, their challenges experienced and perceptions of legitimacy, as well as their awareness of entrepreneurship support offered, both internal and external to their universities, were described.

Chapter Six was the second empirical findings chapter, where the findings relating to two elements within the internal entrepreneurship environment, namely, university environment and culture, as well as the co-curricular entrepreneurship support activities, were presented. The findings relating to these two elements were presented first and together as they provide a broad overview of how entrepreneurship is perceived and the support offered in the context of this study. In the third empirical findings chapter, Chapter Seven, the findings relating to specific elements of support within the internal entrepreneurship environment were presented. These specific elements included formal entrepreneurship education, incubators and accelerator programmes, TTOs and university venture funds. The findings pertaining to all the elements in the internal entrepreneurship environment were presented using the organisational design elements of Good *et al.* (2018), namely purpose, activities, structure and people.

Chapter Eight was the fourth and final empirical findings chapter. The chapter commenced by presenting the findings pertaining to collaborations between the elements in the internal entrepreneurship environment. Thereafter, the findings relating to collaborations between the internal elements and the external entrepreneurship environment were provided and discussed. The chapter concluded by presenting the findings relating to the external entrepreneurship environment, more specifically those relating to the perceived national policy stance towards student

entrepreneurship and the environmental and contextual factors influencing student entrepreneurship in South Africa and at the participating universities.

Based on the overview of the previous chapters, it is evident that the primary, secondary, and methodological objectives (MO¹ to MO⁵) have been achieved. The final methodological objective (MO⁶) is addressed in Section 9.3.2 of this chapter. Table 9.1 summarises in which chapter each of the study's objectives have been achieved.

Table 9.1: Study objectives achieved and relevant chapters

Objectives		Relevant Chapters
Primary objective		
To assess the state of university-based student entrepreneurship support at South African public universities.		All Chapters
Secondary objectives		
SO ¹ :	To rank the 26 South African public universities in terms of student entrepreneurship support;	Chapter 5
SO ² :	To describe university-based student entrepreneurship support offered by South African public universities;	Chapters 6, 7 & 8
SO ³ :	To identify start-up (establishment) and current operational challenges facing student entrepreneurs at South African public universities.	Chapter 5
Methodological objectives		
MO ¹ :	To undertake a theoretical investigation into the nature and importance of student entrepreneurship and the challenges faced;	Chapter 2
MO ² :	To undertake a theoretical investigation into student entrepreneurship support at universities and the various U-BEEs models and frameworks;	Chapter 2
MO ³ :	To propose a conceptual framework for investigating student entrepreneurship support at South African public universities;	Chapter 3
MO ⁴ :	To determine the most appropriate research methodology for addressing the identified research problem and research objectives;	Chapter 4
MO ⁵ :	To undertake an empirical investigation and gather the necessary data;	Chapters 5, 6, 7 & 8
MO ⁶ :	To provide conclusions and to make recommendations on best practices regarding student entrepreneurship support to South African public universities.	Chapter 9

Source: Authors own construction

In the following section, a discussion on the key empirical findings emanating from this study is provided.

9.3 DISCUSSION OF FINDINGS

In this section, the key empirical findings from this study are presented and discussed. These sections are structured in a manner that shows how the secondary objectives of the study have been addressed. In achieving these secondary objectives, the primary objective of the study is also achieved.

9.3.1 RANKING OF SOUTH AFRICAN PUBLIC UNIVERSITIES

This section addresses the first secondary objective (SO¹), namely, to rank the 26 South African public universities in terms of student entrepreneurship support. The findings show that the entrepreneurship support activities being offered by all 26 public universities in South Africa include entrepreneurship societies and hosting a student entrepreneurship intervarsity. Other commonly offered support activities include hosting a student entrepreneurship week, having a TTO, and running entrepreneurship competitions. Less common support activities include having a centre for social entrepreneurship, hosting entrepreneurship seminars, and having an entrepreneurship policy. Having a science park is the least common entrepreneurship support activity offered.

The total number of student entrepreneurship support activities (as per the list identified) offered by each university was calculated and the 26 public universities in South Africa were then ranked accordingly. This ranking was presented in Chapter 5 (Table 5.2), thus achieving SO¹. Unfortunately, pseudonyms were used to name the 26 public universities to ensure confidentiality and anonymity and actual rankings could thus not be given.

According to Wright *et al.* (2017:912), the historical trajectory and culture of a university has an impact on the nature and extent of support being offered to student entrepreneurs. The ranking done in this study shows that the universities most active in terms of student entrepreneurship support (i.e. those ranked at the top) are much older than those considered as least active (ranked at the

bottom). Moreover, most active universities are also larger in terms of faculty, staff and student numbers, than least active universities are. Considering these findings, one can suggest that universities ranked at the top in terms of providing student entrepreneurship support have been doing so for much longer than those ranked at the bottom, effectively giving them more time to establish such a support structure. Moreover, larger staff numbers at most active universities possibly allows for a greater variety of entrepreneurship support activities being offered. With more human resources come a wider range of skills and knowledge. It was also found that some of the least active universities are historically disadvantaged institutions, which could also influence the nature and extent of support being offered to student entrepreneurs.

9.3.2 UNIVERSITY-BASED STUDENT ENTREPRENEURSHIP SUPPORT AND BEST PRACTICES IDENTIFIED

This section addresses the second secondary objective (SO²), namely to describe the university-based student entrepreneurship support offered at South African public universities. The findings relating to the various elements within the conceptualised U-BEE adopted in this study are discussed in the sections to follow. These elements discussed include the university environment and culture, co-curricular entrepreneurship support activities, formal entrepreneurship education, incubators and accelerator programmes, TTOs, university venture funds, and external entrepreneurship environment. Thereafter, the findings relating to the internal collaborations and locations, as well as external collaborations, are discussed.

In addition to describing each of the elements, best practices associated with each are also identified, and in doing so MO⁶ is achieved. By describing the university-based student entrepreneurship support offered at South African public universities, the study's research question, namely, "How are South African public universities supporting student entrepreneurship?", is addressed. Furthermore, by identifying best practices associated with this support, the study not only answers the "how are" question but also makes suggestions on how it could and should be done.

According to Blake, Glaser, Bertolini and Brommelstroet (2021:1253), no one definition of “best practices” exists, but in general are described as “the solutions, policies, interventions, actions, or procedures that are deemed successful and may assist other entities grappling with similar challenges”. Moreover, Druery, McCormack and Murphy (2013:111) describe best practices as those that have shown to produce superior performance and are then consequently adopted by organisations to enhance the performance of processes, products and services. However, best practices have often been criticised as not being universally applicable, as what is best practice for one case might not be best for another (Marsden, 2011:44; Blake *et al.*, 2021:1255). Best practices are not considered universally applicable as contextual differences exist between places and organisations, differences arising from culture, language, resources and structure (Blake *et al.*, 2021:1255). According to Osburn, Caruso and Wolfensberger (2011:11), four noticeable patterns of usage are evident when using the term “best practices”. These patterns are summarised in Table 9.2.

Table 9.2: Patterns of usage for the term “best practices”

Pattern	Description	Pitfall
Best practices tied to evidence-based practices.	Called a best practice if a solid body of evidence (not just one single study) demonstrates that the practice ranks at or near the top of effective measures.	Not a popular approach anymore.
Best practices tied to ideological beliefs.	A best practice has nothing to do with evidence but is based solely on the ideological beliefs adopted.	Can lead to deception as evidence can be misinterpreted or denied, or contrary evidence omitted.
Best practices tied to what has been done for the longest time.	A best practice is that which has been adopted for the longest time-period.	That which has been adopted for the longest time period is not necessarily a best practice.
Best practices tied to what is being done by the majority.	A best practice is that which is adopted by the majority and what is most popular.	Such practices might not always be best practices and may only be common practices.

Source: Authors own construction based on Osburn *et al.* (2011:12-13)

In the current study best practices are identified based on evidence tied to existing literature and based on what is done by the majority. Evidence tied to best practices was found in the existing literature on U-BEEs and evidence tied to what is being done by the majority is supported by the findings of this study.

9.3.2.1 University environment and culture

In this section, the findings relating to the university environment and culture are discussed and best practices are presented.

a) Purpose

Novela *et al.* (2021:180) contend that the vision, mission and leadership of a university are vital in encouraging innovation and entrepreneurial agendas throughout all university levels. A study undertaken at a residential university in South Africa supports this finding, suggesting that entrepreneurship should take a prominent place in a university's institutional strategy (UCT Entrepreneurship Ecosystem Study, 2020:5). Amadi-Echendu *et al.* (2016:23) emphasise the importance of having entrepreneurial learning included in the strategic vision, plan and policies of a university, as this allows for the development of entrepreneurial graduates through teaching, learning, research, and engagement (Yusoff *et al.*, 2017:894). The findings of this study, however, show mixed responses as to whether entrepreneurship is included at the highest level. Half of the participants perceived entrepreneurship to be embedded in the mission (as reflected in the mission statement) of their respective universities, including one from a most active and three from least active universities. Participants from the other half did not perceive this to be the case, of which three were from most active universities and one from a least active university.

Further investigation revealed that the primary focus (mission) of the participating universities is on academic excellence (research and teaching), followed by a focus on publishing scientific peer-reviewed papers and contributing to regional and social development. Although the primary focus is on academic excellence, as it should be, that entrepreneurship is neglected is however not necessarily the case. As suggested by Sherwood (2018:260), the most visible strategy adopted at universities to support student entrepreneurship is through formal education programmes. All of the participating universities offer formal entrepreneurship education programmes, the results of which are discussed in detail in Section 9.3.2.3 of this chapter. It is through these formal education programmes that entrepreneurship is introduced into their universities.

The findings also indicate a difference in focus between the most active and the least active universities. The most active universities place greater focus on publishing scientific peer-reviewed papers, whereas the least active place greater focus on academic excellence (research and teaching). The primary focus of the most active universities was also on knowledge transfer (patents, licenses, spin-offs), whereas their area of least focus was that of generating entrepreneurs. Not surprising, only one of the participants from a most active university perceived entrepreneurship to be extremely important at their university.

The primary focus of the least active universities also included promoting an entrepreneurial culture and supporting students to become entrepreneurs, whereas an area of least focus was that of knowledge transfer (patents, licenses, spin-offs). Despite a focus on promoting entrepreneurship, only two of the participants from least active universities perceived entrepreneurship to be extremely important at their university. The findings suggest that in general, entrepreneurship is not perceived as important among either the most active universities or the least active universities.

The majority of participants do, however, agree that their university supports entrepreneurship among students. Only two did not agree fully, one from a most and one from a least active university. Their not agreeing fully that their university supports student entrepreneurship is attributed to a lack of top management commitment, a lack of funding, and a lack of faculty and student interest. The aforementioned does not bode well for student entrepreneurship support activities at those universities as it is well supported in the literature that top management commitment, funding and interest are essential building blocks (requirements) for effectively and efficiently supporting student entrepreneurs (Graham, 2014:43; Human Resource Development Council of South Africa, 2014:98; Morris *et al.*, 2014:61; Elia *et al.*, 2017:40).

The findings of this study suggest that the reasons why the participating universities support student entrepreneurship concur with the literature, most importantly to decrease youth unemployment (Nicolaidis, 2011:1044; Shambare, 2013:449; Fatoki, 2014b:216; Dhaliwal, 2016:4266), and secondly, to enhance local/regional economic development (Nicolaidis, 2011:1044; Ndedi, 2014:463; Hamilton & Mostert, 2019:157). A third reason brought to light was that of making their universities more attractive to current and prospective students. Other reasons highlighted for

supporting student entrepreneurship include to encourage entrepreneurial thinking and to encourage an alternative to being jobseekers and corporate employment. The most unlikely reason for supporting student entrepreneurship is that of providing revenues for the university. Despite the majority of participants agreeing that their respective universities support entrepreneurship among students, only two participants agreed that much support is dedicated to this cause. Lack of top-management support and funding were once again highlighted as stumbling blocks.

b) Activities

Various entrepreneurship support activities were found to be offered by the participating universities. These are discussed in Section 9.3.2.2. However, when describing the underlying strategies adopted by their universities, the incubator model was indicated by most participants. When such a model is adopted, entrepreneurship support activities revolve around the generation of exit-oriented student start-ups that have the potential for growth and to be of potential interest to external investors (Clarysse *et al.*, 2005:184).

c) Structure

In terms of how student entrepreneurship support is structured at the participating universities, the findings show that the majority, all four of the most active and half of the least active universities, have a formal structure consisting of a centralised team/centre that focuses on student entrepreneurship. These structures have only been established in recent years with the most active universities being the first to do so. According to Morris *et al.* (2014:61), a formal centralised team/centre is the most appropriate structure for supporting student entrepreneurship, as the ultimate success of entrepreneurship at universities depends on well-coordinated teams, as well as respected champions leading those teams (Morris *et al.*, 2014:61).

The structure of student entrepreneurship support at the other two universities (both least active) was described as informal and decentralised. Reasons cited for this type of structure were a lack of a student entrepreneurship policy and a lack of budget for student entrepreneurship.

d) People

The findings relating to the people concerned with providing student entrepreneurship support at the participating universities, those at whom the support is targeted at, as well as the users thereof, are discussed in this section.

Providers of student entrepreneurship support

Although participants were not able to provide exact numbers of how many people are currently concerned with supporting student entrepreneurship at their respective universities, they were able to identify the groups concerned with providing this support and whether they perceived the numbers of people involved as satisfactory or not. The majority of which perceived these numbers as being too low.

The groups identified as being concerned with supporting student entrepreneurship include: individual students themselves, university management, TTOs, student societies, faculty members, (individual) professors, and alumni. The aforementioned groups are also all identified in the literature (Rice *et al.*, 2014; Miller & Acs, 2017; Wright *et al.*, 2017; Sherwood, 2018; Novela *et al.*, 2021), as those who are concerned with supporting student entrepreneurship within U-BEES.

Targets of student entrepreneurship support

The findings show that both the most active and the least active universities are supporting student entrepreneurs at the earlier stages of the venture creation process. The most active universities are more inclined to also support students at the later stages of the venture creation process than the least active universities are.

Although the findings indicate that both formal and informal student entrepreneurs are supported at the participating universities, the majority actively support those operating informally. Even though the majority indicated that their universities support informal student entrepreneurs, they do encourage students to formalise their businesses.

On average, participants at both the most active and least active universities agree that their institutions support as many entrepreneurs as possible. However, those from least active universities agree more. The most active universities are less restrictive than the least active universities in terms of student entrepreneurs having to meet certain criteria to qualify for support. Criteria identified included having a great idea, being a motivated and dedicated individual, having some exposure to the industry entering, and being able to think outside of the box. The universities that were the least restrictive in terms of criteria were both most active universities, and their view was that every student should be given an opportunity.

The findings also indicate that participants from less active universities were more in agreement in terms of their institutions only supporting student entrepreneurs who have business ideas that meet certain criteria than those from most active universities were. Business requirements common among the participating universities to qualify for the student entrepreneurship support include that the business idea is viable and feasible and must generate a certain amount of revenue, and that the business must not conduct any illegal operations or sell illegal substances. It was, however, suggested that if more criteria and requirements to receive support are put in place, entrepreneurial ideas and enthusiasm would diminish.

Users of student entrepreneurship support

Students at most of the participating universities are perceived as being interested in entrepreneurship. However, a participant from one most active university and one least active university did not perceive this to be the case. They attributed this lack of interest to insufficient exposure, the lack of an entrepreneurial mindset, and insufficient support and resources. These reasons for a lack of interest in entrepreneurship among students are commonly cited in the literature (Fatoki, 2010:92; Viviers *et al.*, 2013:14; Iwu *et al.*, 2016:174; Ebewo *et al.*, 2017:176; Ramchander, 2019:3).

It is also perceived that not all students who are interested in entrepreneurship actually start a business during their studies. However, this is more likely to be the case at the least active universities than at the most active universities.

The findings show that student entrepreneurs establish businesses in a variety of sectors, including agriculture, fashion, manufacturing, consulting, health and biotechnology, technology, and engineering. The majority of participants from most active universities, however, agree that student entrepreneurs at their universities typically establish high technology start-ups, whereas those from least active universities do not. High technology start-ups are associated with growth entrepreneurs who pursue high growth and innovative opportunities, which are usually high technology-intensive and aim to provide income for the owners as well as employment for others (Kuratko, 2016:551; Bosch *et al.*, 2018:72; Alam; 2019:2). Although student entrepreneurs from most active universities are more typical of establishing high technology start-ups, most student entrepreneurs from both the most active and least active universities are perceived as having high growth intentions for their businesses.

In general, participants at both most active and least active universities agree that student entrepreneurs are seen as legitimate by the university community, whereas those from active universities agree that student entrepreneurs are regarded as legitimate by the business community more so than those from least active universities do. This finding is in line with the responses provided by the participating student entrepreneurs, as the majority also indicated that their respective universities, as well as business communities, perceive student entrepreneurs as legitimate. Moreover, participants from both most active and least active universities agree that student entrepreneurs are seen as legitimate entrepreneurs by the community in general (e.g., family, friends, consumers, peers). However, those from least active universities agree more. Responses from the participating student entrepreneurs support this perception.

Mixed results were reported in terms of whether students are perceived as typically necessity or typically opportunity driven. Being typically necessity driven was more evident among students from relatively lower to middle income backgrounds, whereas being typically opportunity driven was more evident among students from the more affluent universities. Mixed results were also reported on whether students at the participating universities typically operate informal or formal businesses. Student entrepreneurs operating formally was more evident at the most active universities while those at least active universities were operating more informally.

e) Best practices for university environment and culture

In this section, several best practices are proposed. These best practices are deduced from the existing literature, the findings of the study, as well as recommendations made by participants (see Table 9.3).

Table 9.3: Best practices for university environment and culture

	Best Practice	Supporting Evidence
Purpose	Entrepreneurial learning is included in the strategic vision, mission and policies of the university.	Empirical support: Evident at Uni-B, Uni-V, Uni-Y & Uni-Z. Literature support: Salem (2014); Amadi-Echendu <i>et al.</i> (2016); Yusoff <i>et al.</i> (2017); UCT Entrepreneurship Ecosystem Study (2020); Novela <i>et al.</i> (2021)
	Entrepreneurship receives the same focus (priority) as academic excellence, publishing scientific reviewed papers, and contributing to regional and social development.	Empirical support: Evident at the least active universities. Literature support: Rice <i>et al.</i> (2014); Suryanto (2019); Novela <i>et al.</i> (2021)
	A university culture exists that promotes and embraces entrepreneurship at all levels and provides the necessary support to students to assist them on their entrepreneurial journeys.	Literature support: Ndedi (2013); Amadi-Echendu <i>et al.</i> (2016); Hamilton & Mostert (2019)
Activities	An incubator model exists where entrepreneurship support activities revolve around the generation of exit-oriented student start-ups, with potential growth opportunity and potential interest to external investors.	Empirical support: Evident at the four most active universities and at one least active university.
Structure	A formal centralised team/centre is coordinated by well-respected champions.	Empirical support: Evident at the four most active universities and at two least active universities. Literature support: Graham (2014); Human Resource Development Council of South Africa (2014); Morris <i>et al.</i> (2016)

Table 9.3: Best practices for university environment and culture (cont.)

	Best Practice	Supporting Evidence
People	A diverse group of people are concerned with providing student entrepreneurship support ensuring that a variety of support is offered. This group includes individual students themselves, university management, TTOs, student societies, faculty members, (individual) professors, and alumni.	Empirical support: Evident at the four most active universities and at two least active universities. Literature support: Graham (2014); Rice <i>et al.</i> (2014); Elia <i>et al.</i> (2017); Sherwood (2018)
	Student entrepreneurs at both the early-stage and later-stage of the business life cycle are supported.	Empirical support: Evident at the majority of participating universities.
	Both informal and formal student entrepreneurs are supported. Informal entrepreneurs are encouraged to formalise their businesses and assisted in doing so.	Empirical support: Evident at the majority of participating universities.
	The criteria to receive entrepreneurship support varies according to the support offered but is realistic and fair, so as not to diminish interest in entrepreneurship.	Empirical support: Based on recommendations made by participants at Uni-C.
	Student entrepreneurs are included as suppliers in university procurement activities.	Empirical support: Based on recommendations made by participants at Uni-A. Literature support: UCT Entrepreneurship Ecosystem Study (2020)

Source: Authors own construction

9.3.2.2 Co-curricular entrepreneurship support activities

In this section, the findings relating to university-based student entrepreneurship support in terms of the element co-curricular entrepreneurship support activities at the participating universities are discussed.

a) Purpose

The findings show that the purpose of co-curricular entrepreneurship support activities offered at the participating universities is threefold, namely to develop entrepreneurs, to promote entrepreneurship as a viable career option, and to establish new businesses that create jobs. This finding concurs with Hofer and Potter (2010:11), who note that the objectives of universities in

terms of providing entrepreneurship support include generating entrepreneurial attitudes, behaviour, and skills among students as well as promoting student start-ups, among others. Other objectives highlighted by Hofer and Potter (2010:11) include promoting technology-intensive start-ups, and generating revenue for universities. Although these objectives of Hofer and Potter's (2010) were not identified specifically by the participants with regard to co-curricular entrepreneurship support activities, they were identified as a purpose of the participating TTOs.

The most prominent purpose found is to develop entrepreneurs and with such a purpose the focus of co-curricular entrepreneurship support activities is on assisting students to become entrepreneurs and social entrepreneurs, and to develop their entrepreneurial skills. The purpose of such activities within a university context being to develop entrepreneurs among students is well supported in literature (Morris *et al.*, 2017:69; Tiemann *et al.*, 2018:104). According to Preedy (2017:1), co-curricular entrepreneurship support activities in a university context provide both theoretical and practical learning, as well as valuable experiential and social learning opportunities.

When the purpose of co-curricular entrepreneurship support activities is to promote entrepreneurship as a viable career option, the focus is to change the mindsets of students from being jobseekers to wanting to become job creators. Similarly, Arranz *et al.* (2017:1986) point out that entrepreneurship support activities aim to encourage entrepreneurship among all students and enhance the importance of entrepreneurship in all areas or in every field.

The aim of co-curricular entrepreneurship support is also to establish new businesses that create jobs. Morris *et al.* (2017:69) explain that co-curricular entrepreneurship support activities aim to provide students with support throughout the entrepreneurial process, which stimulates the number of successful student start-ups. However, the findings of the current study show that the purpose of co-curricular entrepreneurship support activities is not only to encourage and assist student entrepreneurs to establish their own businesses, but also to encourage and assist them to establish businesses that lead to job creation and the employment of others.

b) Activities

In this section, the findings relating to the activities within co-curricular entrepreneurship support are discussed, specifically focusing on the activities offered, the activities needed the most by student entrepreneurs, and the enablers for these support activities to be offered.

Co-curricular support activities offered

The literature highlights numerous types of co-curricular entrepreneurship support activities that can be offered by universities. The findings of this study show that 11 of these types of activities are commonly taking place or being offered at the participating universities, including:

- Entrepreneurship education (Rice *et al.*, 2014; Elia *et al.*, 2017; Tiemann *et al.*, 2018);
- Mentorship (Pittaway *et al.*, 2010; Viviers *et al.*, 2013; Morris *et al.* 2017);
- Counselling, provision of advice, and coaching (Morris *et al.*, 2017; Sherwood, 2018; Novela *et al.*, 2021);
- Co-curricular training, workshops and seminars (Pittaway *et al.*, 2010; Pruett, 2012; Arranz *et al.*, 2017);
- Networking events (Viviers *et al.*, 2013; Preedy, 2017);
- Material support: office and workspace (Arranz *et al.*, 2017; UCT Entrepreneurship Ecosystem Study, 2020);
- Material support: meeting facilities (Arranz *et al.*, 2017);
- Student entrepreneurship support organisations/societies (Pittaway *et al.*, 2010; Pittaway *et al.*, 2015; Morris *et al.*, 2017);
- Participation in student entrepreneurship week;
- Participation in entrepreneurship intervarsity competition; and
- Internal university business plan/pitching competitions (Pittaway *et al.*, 2010; Viviers *et al.*, 2013; Morris *et al.*, 2017; Preedy, 2017; Matt & Schaeffer, 2018).

This finding is in line with that of the EDHE baseline study (2019:19), where 92% of the 26 participating public universities in South Africa were found to offer various co-curricular entrepreneurship support activities. The most common activities reported in the EDHE Baseline Study (2019:19) were participating in student entrepreneurship week as well as hosting entrepreneurship competitions, conferences, and societies. These activities are also commonly taking place at the universities participating in this study. Co-curricular entrepreneurship support activities not commonly taking place or being offered at the participating universities include an entrepreneurship centre, an incubator and accelerator programme, a science park, a university venture fund, the provision of material support: start-up capital and seed-funding, and a student entrepreneurship policy. It was specifically noted that support activities such as a technology transfer office, an incubator and accelerator programme and an entrepreneurship centre are not being offered at the least active universities.

Although included as a co-curricular entrepreneurship support activity, in the current study, formal entrepreneurship education is considered a distinct element in the conceptual framework and is discussed in more detail in Section 9.3.2.3. That formal entrepreneurship education is considered a separate element is well supported in existing U-BEEs models (Rice *et al.*, 2014; Miller & Acs, 2017; Wright *et al.*, 2017; Sherwood, 2018; Tiemann *et al.*, 2018; Shil *et al.*, 2020; Novela *et al.*, 2021).

Numerous studies advocate for the establishment of an entrepreneurship centre at universities to enhance the student entrepreneurship support offered (Rice *et al.*, 2014:487; Wright *et al.*, 2017:916; Sambo, 2018:198; Tiemann *et al.*, 2018:92; Suryanto, 2019:4). These centres focus on a variety of support activities, including building networks, hosting competitions and speakers, facilitating access to advice and funding, as well as raising the visibility and credibility of entrepreneurship and the other elements in the U-BEE (Rice *et al.*, 2014:487). Despite the important role that such a centre can play in providing support to student entrepreneurs, the findings of this study show that only five of the eight participating universities have a centre for entrepreneurship, including the four most active universities and one of the least active universities. Similarly, the EDHE Baseline Study (2019:19) reports that only 18 of the 26 public universities in South Africa have entrepreneurship centres.

Despite the important role that incubators play in driving and promoting entrepreneurship (Guerrero *et al.*, 2020:757), as well as in the success of student start-ups (Wright *et al.*, 2017:917), the findings suggest that the number of university-led business incubators has not increased as substantially as they have in other countries (Matt & Schaeffer, 2018:11). In South Africa, only 61% of the 26 public universities were found to have incubators (EDHE Baseline Study, 2019:19), while only four of the eight universities participating in this study had incubators, which were all most active universities.

Various authors have emphasised the importance of science parks within a university context (Rice *et al.*, 2014:487; Elia *et al.*, 2017:40; Wright *et al.*, 2017:917). These parks provide similar services and support as incubators do, but tend to focus more on mature companies and usually assist students who have graduated from their incubators (Rice *et al.*, 2014:487). They also often provide both temporary and permanent employment for students and graduates of entrepreneurship programmes (Rice *et al.*, 2014:487). Although considered important, only three of the participating universities were found to have university-linked science parks, two of the most active universities and one of the least active universities. This finding is consistent with the findings of the EDHE Baseline Study (2019:19) which reports that only a few (23%) of the 26 public universities in South Africa were found to have university-linked science parks.

As indicated by numerous authors, a lack of funding is one of the greatest challenges experienced by student entrepreneurs (Fatoki, 2010:1; Sandhu *et al.*, 2011:441; Viviers *et al.*, 2013:14; Iwu *et al.*, 2016:174). Moreover, the findings of this study also show that access to funding is a challenge experienced by the participating student entrepreneurs, especially during the start-up stages of their businesses. To assist students in overcoming these financial challenges, several authors contend that universities should provide start-up capital and seed-funding (Miller & Acs, 2017:81; Wright *et al.*, 2017:914; Sherwood, 2018:244), through the establishment of a venture fund. Despite these financing challenges only four of the eight participating universities offered such support, including three universities considered as most active and one considered as least active.

According to Amadi-Echendu *et al.* (2016:23), it is crucial for universities to include entrepreneurship and entrepreneurial learning in their strategic plans and policies. However, only

two of the participating universities have a student entrepreneurship policy in place, both being most active universities. Similarly, the EDHE Baseline Study (2019:26) reports that only one of the 26 public universities in South Africa have a policy in place that is specifically aimed at student entrepreneurship. The aim of this one policy identified is to “facilitate the creation of an enabling and practical environment whereby students present business proposals, receive structured mentorship, establish start-up companies and learn and apply basic entrepreneurial skills to facilitate enterprise development across all disciplines, including humanities, law and management, the sciences and engineering-related enterprises” (EDHE Baseline Study, 2019:26).

The findings show that counselling, provision of advice and coaching sessions, as well as co-curricular training/workshops/seminars are taking place or being offered at all eight of the participating universities. The topic most dealt with during these sessions and in the training is that of business planning and managing a business. The topics dealt with the least during the sessions include: legal and intellectual property advice; advice on innovation, R&D and technology; and advice on corporate social responsibility, social impact and ethics. Additional session topics identified include the lean canvas, design thinking, life coaching and the growth wheel. It was noted that topics dealt with during counselling, advice and coaching sessions are not a one size fits all and should be tailored based on the needs of the individual or group. Furthermore, the topics dealt with the least during training include: accounting and marketing; corporate social responsibility, social impact, and ethics; and accessing finance. Other training topics pointed out by participants include design thinking, the lean canvas and pitching skills.

The findings show that the majority of participating universities offer material support in the form of space (e.g., office and workspace, meeting facilities) to their student entrepreneurs, whereas only half offer start-up capital and seed-funding. It is recommended that universities offer such spaces where entrepreneurial teams can meet with each other, other entrepreneurial teams, mentors and other companies (EDHE Baseline Study, 2019:40; UCT Entrepreneurship Ecosystem Study, 2020). Such space could be offered through maker spaces and creative labs, which was only found to be offered by 50% of the 26 public universities in South Africa (EDHE Baseline Study, 2019:19). In most cases, only students who are specifically registered as student entrepreneurs can access the material support offered by the participating universities.

Co-curricular support activities needed

Types of co-curricular support identified in this study as needed most by student entrepreneurs to increase the chances of them establishing successful businesses, include a creative space/entrepreneurship centre, funding (start-up capital and seed funding), and business advisory and developmental support.

According to Alves *et al.* (2019:98), universities in general are not providing a safe environment where student entrepreneurs can experiment with new ideas and follow their passions. Such a creative space or entrepreneurship centre is crucial as students often lack the necessary entrepreneurship support while attending university (Shambare, 2013:451). The need for a creative space or entrepreneurship centre is specifically highlighted in this study and refers to a space where student entrepreneurs are able to work on their ideas, get the necessary support and guidance, and surround themselves with like-minded individuals. Such a space should serve as a focal point and a coordinating body for all entrepreneurship activities within a university. As previously mentioned, such a space for student entrepreneurs is also recommended by the EDHE Baseline Study (2019:40).

That access to funding is most needed by student entrepreneurs to ensure success is well supported in the literature and was pointed out by several of the participants interviewed in this study. Numerous studies have found that accessing finance is the most significant challenge facing student entrepreneurs in South Africa (Fatoki, 2010:92; Viviers *et al.*, 2013:14; Iwu *et al.*, 2016:174). Student entrepreneurs specifically struggle to obtain funding from formal institutions, such as banks, because most do not have collateral (Sandhu *et al.*, 2011:441; Thamahane *et al.*, 2017:3).

Business advice and developmental support was also identified as support needed most by student entrepreneurs to increase their chances of successfully establishing businesses. Business assistance and training for students, as well as support for the development of business plans, was specifically highlighted by participants. Other advisory and development support identified as needed were in the areas of refining ideas, legal, technical, and general business management. Such support is needed because, as suggested by Fatoki (2010:92) and Shambare (2013:450), students tend to lack

the necessary skills to establish and operate businesses due to universities following a traditional theory approach to teaching entrepreneurship.

Enablers for co-curricular entrepreneurship support activities to be offered

Several enablers were identified for needed co-curricular support activities to be available or offered at the participating universities. These enablers include top management buy-in, financial support, an entrepreneurship policy, and external partnerships.

Top management buy-in and financial support were identified as most important for co-curricular support activities to take place or to be offered at the participating universities. Through the support of top management, entrepreneurship should be part of the vision and mission of the university, and woven into all curricular, operating and other activities. As suggested by both Rice *et al.* (2014:489) and Suryanto (2019:4), when top management encourages the support of student entrepreneurship and makes it a priority, the resources (funding) needed to provide more effective and efficient support are made available. According to Ndedi (2013:130), it is the lack of funding available to cover the high costs involved in establishing such support, that leads to the lack of or inefficiency thereof.

An entrepreneurship policy was also identified as an enabler for providing effective and efficient student entrepreneurship support. An entrepreneurship policy is crucial as it influences the nature and extent of the student entrepreneurship support offered at universities (Amadi-Echendu *et al.*, 2016:23; Rice *et al.*, 2014:489).

As suggested by several authors (Graham, 2014:43, Elia *et al.*, 2017:43), it is beneficial for universities to have a strong relationship built on mutual trust and benefit with several external stakeholders (actors) who support entrepreneurs. Suggestions for external partnerships made by participants in this study include partnerships with local government and commercial banks. Miller and Acs (2017:82) do, however, contend that students usually prefer to access resources available to them within the university setting as this allows for more liberty and openness.

c) Structure

In order to effectively provide university-based entrepreneurship support, a dedicated well-resourced and coordinated team focusing on entrepreneurial activities, led by a respected champion, is essential (Morris *et al.*, 2014:61; EDHE Baseline Study, 2019:40). The UCT Entrepreneurship Ecosystem Study (2020:5) also recommends that a more centralised, coordinated and transparent approach to entrepreneurship be adopted. The findings of this study show that a specific person or a team of people are tasked with organising co-curricular entrepreneurship support activities at all the participating universities.

The findings also show that co-curricular support activities are governed through monitoring and evaluating the performance of such activities. Feedback from staff, such as coaches and mentors who are responsible for offering the support, as well as from students, who are the receivers of the support, is obtained and used to track/monitor and evaluate the performance of activities.

Measures commonly used to track/monitor and evaluate the performance of activities include measuring the performances of the student's businesses and participation rates of students in support activities. Indicators of business performance identified include the number of ideas turned into ventures, the number of successful spin-outs, and goal attainment.

d) People

As mentioned above, a specific person or a team of people are tasked with organising co-curricular entrepreneurship support activities at all the participating universities. These individuals or teams of people include one or more of the following: academic(s), coordinator for student entrepreneurship, centre for entrepreneurship staff; and incubator staff. At all four universities considered most active, specific individuals or a team of people are tasked with organising these activities, whereas at all four least active universities, these activities are organised by academic staff members.

The findings also show that people both internal and external to the participating universities provide entrepreneurship support to students in an advisory capacity (e.g. mentoring). These advisors include lecturers, centre for entrepreneurship staff, and existing student entrepreneurs, while external advisors include existing entrepreneurs, alumni with existing businesses, industry experts, and contract mentors.

It was also found that students mostly partaking in the activities on offer at their respective universities are those who are interested in entrepreneurship, followed by students who are interested in starting their own business (aspiring), those who are in the process of starting their own business (nascent), and those who have already started their own business (active). Alumni were only involved in co-curricular entrepreneurship support activities at two of the most active universities.

e) Best practices for co-curricular entrepreneurship support activities

In this section, best practices in terms of co-curricular entrepreneurship support activities are provided (see Table 9.4). These best practices are deduced from the existing literature, the findings of this study, and recommendations made by participants.

Table 9.4: Best practices for co-curricular entrepreneurship support activities

	Best Practice	Supporting Evidence
Purpose	To develop entrepreneurs and entrepreneurial skills.	<p>Empirical support: Evident at Uni-A, Uni-D, Uni-W & Uni-Z.</p> <p>Literature support: Hofer & Potter (2010); Morris <i>et al.</i> (2017); Tiemann <i>et al.</i> (2018); Preedy (2017)</p>
	To promote entrepreneurship as a viable career option.	<p>Empirical support: Evident at Uni-D, Uni-V, Uni-W & Uni-Y.</p> <p>Literature support: Arranz <i>et al.</i> (2017)</p>
	To establish new businesses that create jobs.	<p>Empirical support: Evident at Uni-A, Uni-B, Uni-C & Uni-D.</p> <p>Literature support: Morris <i>et al.</i> (2017)</p>

Table 9.4: Best practices for co-curricular entrepreneurship support activities (cont.)

	Best Practice	Supporting Evidence
Activities	Top management buy-in exists and student entrepreneurship is a strategic priority.	<p>Empirical support: Based on recommendations from participants at Uni-A, Uni-V, Uni-W & Uni-Z.</p> <p>Literature support: Rice <i>et al.</i> (2014); Suryanto (2019)</p>
	An entrepreneurship policy exists which guides matters relating to university-based student entrepreneurship.	<p>Empirical support: Based on recommendations from participants at Uni-A, Uni-V & Uni-Z.</p>
	Funding is available to provide more effective and efficient student entrepreneurship support.	<p>Empirical support: Based on recommendation from participants at the majority of participating universities.</p> <p>Literature support: Ndedi (2013)</p>
	Partnerships exist between internal and external entrepreneurship stakeholders to provide effective and efficient support activities.	<p>Empirical support: Based on recommendations from participants at Uni-Z.</p> <p>Literature support: Graham (2014); Elia <i>et al.</i> (2017); Miller & Acs (2017)</p>
	Depending on the needs of the university community, more advanced and technical co-curricular entrepreneurship support activities are offered including an entrepreneurship centre, a technology transfer office, and an incubator/accelerator (programme).	<p>Empirical support: More advanced and technical co-curricular entrepreneurship support activities are not being offered at the least active universities.</p>
	Only students who have specifically registered with the university as student entrepreneurs have access to the support offered.	<p>Empirical support: Evident at the majority of participating universities.</p>
	Financial support (start-up capital and seed funding) is available to student entrepreneurs.	<p>Literature support: Miller & Acs (2017); Wright <i>et al.</i> (2017)</p>

Table 9.4: Best practices for co-curricular entrepreneurship support activities (cont.)

	Best Practice	Supporting Evidence
Activities (cont.)	Business advisory and developmental support exists that is tailored to the specific needs of individuals or groups. These support activities focus on business plan development, refining ideas, legal, technical, and business training.	<p>Empirical support: Evident at Uni-C and based on recommendations from participants at Uni-A, Uni-Y & Uni-Z.</p> <p>Literature support: Fatoki (2010); Shambare (2013); Graham (2014); Human Resource Development Council of South Africa (2014); Morris <i>et al.</i> (2014)</p>
	A creative space or entrepreneurship centre is available where material support is offered such as office and workspace, as well as meeting facilities.	<p>Empirical support: Evident at the majority of participating universities and based on recommendations from participants at the majority of participating universities.</p> <p>Literature support: Shambare (2013); Viviers <i>et al.</i> (2013); Arranz <i>et al.</i> (2017); Alves <i>et al.</i> (2019); UCT Entrepreneurship Ecosystem Study (2020)</p>
Structure	A specific person (champion) with a supporting team is tasked with organising university wide co-curricular entrepreneurship support activities. Coordinating and facilitating entrepreneurship support activities is the primary purpose and task of this person.	<p>Empirical support: Evident at Uni-A & Uni-D.</p> <p>Literature support: Graham (2014); Human Resource Development Council of South Africa (2014); Morris <i>et al.</i> (2014); UCT Entrepreneurship Ecosystem Study (2020)</p>
	Feedback from staff and students on the effectiveness of support activities is obtained and analysed.	<p>Empirical support: Evident at Uni-B, Uni-D & Uni-V.</p>
	The effectiveness of support activities is monitored and tracked using indicators such as the number of ideas turned into ventures, the number of successful spin-outs, and goal attainment.	<p>Empirical support: Evident at Uni-A, Uni-C, Uni-Y & Uni-Z.</p>
	The effectiveness of support activities is monitored and tracked using participation rates of students participating in the co-curricular support activities as indicator.	<p>Empirical support: Evident at Uni-A, Uni-C & Uni-D.</p>

Table 9.4: Best practices for co-curricular entrepreneurship support activities (cont.)

	Best Practice	Supporting Evidence
People	Communication and collaborations exist among various elements (actors) involved in supporting student entrepreneurs.	<p>Empirical support: Entrepreneurship stakeholders at the same universities do not know what the other entrepreneurship stakeholders are doing. Evident at all the participating universities.</p> <p>Literature support: Human Resource Development Council of South Africa (2014); Morris <i>et al.</i> (2014)</p>
	A team consisting of both academic and non-academic staff members to support the student entrepreneurship coordinator exists.	<p>Empirical support: Evident at all the participating universities.</p> <p>Literature support: Morris <i>et al.</i> (2014); Wright <i>et al.</i> (2017); Novela <i>et al.</i> (2021)</p>
	Both internal and external mentors are available to support student entrepreneurs.	<p>Empirical support: Evident at all the participating universities.</p>
	Internal mentors include lecturers, centre for entrepreneurship staff, and existing student entrepreneurs, while external mentors include existing entrepreneurs, alumni with existing businesses, industry experts, and contract mentors.	
	Those who partake in student entrepreneurship support activities include those who are interested in entrepreneurship, and those in various stages of the business life cycle (aspiring, nascent, active).	<p>Empirical support: Evident at the majority of participating universities.</p>

Source: Authors own construction

9.3.2.3 Formal entrepreneurship education

In this section, the findings relating to university-based student entrepreneurship support in terms of formal entrepreneurship education at the participating universities are discussed, and best practices presented.

a) Purpose

The findings show that the purpose of formal entrepreneurship education at the participating South African public universities is twofold, namely education *for* entrepreneurship and education *about* entrepreneurship. The aforementioned purposes are well supported in the literature (Balan & Metcalfe, 2011:369; Sirelkhatim & Gangi, 2015:5; Hoppe *et al.*, 2017:754; Kakouris & Liargovas, 2020:8) as describing the nature of entrepreneurship education.

The most dominant purpose of formal entrepreneurship education at the participating South African public universities is, however, to provide education *for* entrepreneurship. These universities aim to change the mindsets of students to consider entrepreneurship as a viable career opportunity and to encourage self-employment. Moreover, to change mindsets and encourage self-employment, they strive to develop the entrepreneurial skills of students. This finding is well supported in the literature where numerous authors contend that the purpose of entrepreneurship education should be to equip students with the necessary skills and knowledge for them to start their own businesses (Davies, 2001:33; Radipere, 2012:11016; Ghina *et al.*, 2014:1; Shah *et al.*, 2020:2), as well as to change the mindsets of students with regard to how they see entrepreneurship and their choice of future career (Davies, 2001:33; Radipere, 2012:11016; Ghina *et al.*, 2014:1; Shah *et al.*, 2020:2) - a career where they start their own businesses in order to create employment for themselves and provide employment for others (Choi *et al.*, 2017:4)

Only one of the eight participating entrepreneurship educators mentioned that the primary purpose (aim) of formal entrepreneurship education at their university is to teach about entrepreneurship, namely to teach about the theoretical perspectives and concepts related to entrepreneurship (Kakouris & Liargovas, 2020:4). As such it appears that there has been a shift towards focusing more on education *for* entrepreneurship rather than on education *about* entrepreneurship at South African universities, a shift that is recommended by Elia *et al.* (2017:37).

b) Activities and structure

The findings show that each of the participating universities have numerous faculties and it is unknown what each is doing in terms of entrepreneurship education (extent and content). A lack of coordination and communication between these faculties providing entrepreneurship education is evident.

Various methods are adopted to teach formal entrepreneurship education at the participating universities. It was found that the most active universities make use of 6 different methods on average, whereas the least active universities make use of 5.25 different methods on average. As such, active universities are using a slightly wider variety of methods to teach entrepreneurship than the least active universities are. Using a wider variety of methods allows for the teaching of entrepreneurship to better serve the needs of potential student entrepreneurs.

The three most used teaching methods among the participating universities are traditional lectures, simulations: business plan development, and case studies. As is the case in the current study, Galvao *et al.*'s (2017:20) point out that traditional lectures, case studies and business plan development are the most popular teaching methods utilised in entrepreneurship education. In contrast, the method, starting up a real business, is the method least employed by the participating universities.

Most active universities were found to be more inclined to use practical methods associated with education *for* entrepreneurship and education *through* entrepreneurship, than theoretical methods. Practical methods include internships (in real businesses), consulting projects (in real businesses), simulations: (virtual) business games, and start-up of a real business. However, theoretical methods are also still used by these universities (education *about* entrepreneurship), indicating that education *for*, *about* and *through* entrepreneurship (Sirelkhatim & Gangi, 2015:6) is common among the most active universities.

The findings show that the least active universities employ mostly theoretical methods rather than practical methods to teach entrepreneurship, including traditional lectures, simulations (business plan development), case studies, guest speakers and role-plays. These methods are associated with education *about* and education *for* entrepreneurship in the literature (Sirelkhatim & Gangi, 2015:6). However, Galvao *et al.* (2017:20) note that traditional lectures are seen as less effective for teaching entrepreneurship to students, and more practical approaches should be adopted.

The findings also show that the methods used to teach entrepreneurship at the participating universities support the purpose of formal entrepreneurship education at these universities. Both most active and least active universities employ teaching methods that support education *about* and education *for* entrepreneurship. In addition, four universities, adopt practical methods commonly associated with education *through* entrepreneurship.

c) People

Uncertainty was found to exist among participants regarding the people involved in teaching formal entrepreneurship modules at their institutions, and a lack of consensus on whether the numbers involved are sufficient or not, exists.

Several suggestions were put forward by participants to increase the interest among lecturers to teach formal entrepreneurship modules. These suggestions included increasing the opportunities for academics to teach entrepreneurship, employing the appropriately qualified academics and providing incentives for academics to teach entrepreneurship. The findings show that in some cases academics are not given a choice with regard to the modules they teach, and/or modules for teaching entrepreneurship are not available.

The suggestion to employ the appropriately qualified academics with the experience and skills needed for teaching entrepreneurship is well supported in the literature where it is noted that entrepreneurship educators are often lacking expertise in entrepreneurship (Gedeon, 2014:235). Moreover, it was the view of some educator participants that academics who teach entrepreneurship modules are expected to have their own businesses, as it provides them with practical

entrepreneurial knowledge that they can transfer to their students. As suggested by Otache (2019:932) entrepreneurship lecturers are able to make a more significant impact on students if they are perceived as being entrepreneurially inclined. However, Otache (2019:932) highlights that although it is beneficial for entrepreneurship lecturers to have their own businesses, it is not a necessity, as guest lecturers who have started their own businesses can be approached to share their knowledge, skills and experiences with students.

Providing incentives for academics was a suggestion put forward to increase the interest in teaching entrepreneurship among academics. Incentives, specifically extrinsic motivation such as monetary compensation, was mentioned. This suggestion is not considered a viable option given the lack of funding experienced by most universities and that teaching entrepreneurship should fall within their existing job descriptions for which salaries are earned. However, were academics to take on additional lecturing loads to teach entrepreneurship modules and take on the responsibility of coordinating entrepreneurship projects, then such incentives would be justified.

The numbers of students registered for entrepreneurship modules at the participating universities varied, with most educator participants being of the opinion that the number is too low. Furthermore, it was found that formal entrepreneurship education is not available to all registered students and only some can choose to register for such education. Several recommendations were made by them to increase students' interest in registering for entrepreneurship modules, including delivering value that is appreciated by students, introducing entrepreneurship earlier in the curriculum, making entrepreneurship modules compulsory, and having a specifically designed entrepreneurship programme. These recommendations coincide with those of the Human Resource Development Council of South Africa (2014:99), as well as Rice *et al.* (2014:487), who argue that entrepreneurship education should be of high quality and provide value to students, as well as being tailored to meet the needs of the students. Both Price (2018:42) and Suryanto (2019:9) contend that it is beneficial to make entrepreneurship courses compulsory for students, as many are unaware of the importance and benefits of entrepreneurship until entrepreneurship modules are attended.

d) Best practices for formal entrepreneurship education

Several best practices have been identified with regards to formal entrepreneurship education at university level (see Table 9.5). These practices have been identified as best practices because they are supported by both the empirical findings of this study and other studies reported in the literature, as well as the recommendations of participants.

Table 9.5: Best practices for formal entrepreneurship education

	Best Practice	Supporting Evidence
Purpose	To provide education <i>for</i> entrepreneurship that focusses on building entrepreneurial skills and encouraging self-employment.	Empirical support: Evident at the majority of participating universities. Literature support: Davies (2001); Radipere (2012); Ghina <i>et al.</i> (2014); Elia <i>et al.</i> (2017); Shah <i>et al.</i> (2020)
Activities and structure	Coordination and regular communication exist between faculties offering entrepreneurship education.	Empirical support: Highlighted as not taking place at the majority of participating universities.
	A wide variety of methods are used to teach entrepreneurship, including theoretical and practical methods.	Empirical support: Evident at the most active universities.
	Practical methods that prepare students for entrepreneurship and through entrepreneurship are emphasised.	Empirical support: Evident at Uni-B & Uni-D. Literature support: Galvao <i>et al.</i> (2017)
	The methods used to teach entrepreneurship are aligned with the purpose of entrepreneurship education.	Empirical support: Evident at Uni-B, Uni-C, Uni-D & Uni-Y.
People	Increased opportunities for academics to teach entrepreneurship exist	Empirical support: Recommended by participants at Uni-A, Uni-V & Uni-Y.
	Entrepreneurship education is available to all registered students.	Empirical support: Recommended by the majority of participants.
	Academics with the appropriate entrepreneurial skills, who have practical entrepreneurial experience and who are entrepreneurially inclined, are employed.	Empirical support: Recommend by participants at Uni-W. Literature support: Gedeon (2014); Otache (2019)
	Incentives are provided for those who teach entrepreneurship and undertake entrepreneurship projects outside the scope of their existing job descriptions.	Empirical support: Recommend by participants at Uni-Z.

Table 9.5: Best practices for formal entrepreneurship education (cont.)

	Best Practice	Supporting Evidence
People (cont.)	Entrepreneurship education content is delivered that students find valuable, i.e. content that is tailored to the needs and wants of students.	<p>Empirical support: Recommend by participants at Uni-C.</p> <p>Literature support: Human Resource Development Council of South Africa (2014); Rice <i>et al.</i> (2014)</p>
	Entrepreneurship is introduced earlier in the curriculum, specifically at first year.	<p>Empirical support: Recommended by participants at Uni-Y.</p>
	An entrepreneurship module is evident in most, if not all, degrees in the undergraduate curriculum.	<p>Empirical support: Recommend by participants at Uni-Y.</p> <p>Literature support: Suryanto (2019); UCT Entrepreneurship Ecosystem Study (2020)</p>
	A specifically designed entrepreneurship programme is available to all registered students.	<p>Empirical support: Evident at Uni-B and recommended by participants at Uni-Z.</p> <p>Literature support: Human Resource Development Council of South Africa (2014); Rice <i>et al.</i> (2014)</p>

Source: Authors own construction

9.3.2.4 Incubator and accelerator programmes

In this section, the findings relating to the element incubator and accelerator programmes within the conceptual framework adopted in this study are discussed. In addition, best practices are presented. The findings relate to four incubators and one accelerator programme.

a) Purpose

From the findings of this study, it can be seen that the purpose (aim) of the incubators and accelerator programmes at the participating universities (those who had them), was twofold, namely to provide support for entrepreneurs as individuals and to provide support for their business start-ups. Aiming to provide this kind of support is common among incubators and accelerator programmes in general (Ndedi, 2014:468; McAdam *et al.*, 2015:2; Drori & Wright, 2018:2; Allahar & Sookram, 2019b:251).

In terms of providing support for the entrepreneurs themselves, incubators and accelerator programmes aim to change the mindsets of students from that of being job seekers to that of being job creators. In order to do this, they strive to develop the entrepreneurial skills of students, through providing educational programmes as well as mentoring and networking opportunities (Drori & Wright, 2018:2).

When the purpose is to provide support for business start-ups, incubators and accelerator programmes aim to establish successful start-ups and spin-off companies. As suggested in the literature (Cohen, 2013:21; Lange & Johnston, 2020:1564; Pellegrini & Sheehan, 2021:186), the participating incubators and accelerator programmes strive to provide a safe space where nascent entrepreneurs can perfect their business ideas, as well as access markets, funding and technical support. Moreover, as highlighted by Sherwood (2018:265), they strive to assist entrepreneurs in creating high impact start-ups and minimising start-up failure rates (Sherwood, 2018:265).

b) Activities

The findings show several common elements among the activities of the participating incubators and accelerator programmes. In general, only registered students and alumni can apply to participate. Commonalities were found in their application and selection processes, which were only provided by participants from three of the five participating incubators and accelerator programmes. All three have application and selection stages which are open and competitive. During the application stage, call-outs are sent out to entrepreneurs that are interested in partaking in the incubators or accelerator programmes. Those interested have the opportunity to apply and can be at any stage in the business life cycle. During the selection stage, interested student entrepreneurs pitch their business ideas to panels consisting of incubator or accelerator staff members, and certain criteria must be met for them to be selected. In general, once accepted, successful applicants are grouped into specific phases depending on the stage of their entrepreneurial journey. Their stage of the journey and the phase to which they have been allocated, determines the support that they will receive.

The majority of participating incubators and accelerator programmes group the support they offer into three phases or programmes, which differ in terms of aim and duration. These phases are traditionally known as pre-incubation, incubation, and post-incubation. The general aim of the pre-incubation phase is on transforming business ideas into start-ups and complying with legal requirements. The duration of this phase varies between seven weeks and six months, with six months being the most common. The focus of activities in this phase is on applying design thinking, developing a viable business idea and business plan, identifying a competitive advantage through market analysis, prototype development, and building teams.

The incubation phase is aimed at establishing and developing the start-ups through emphasising the basic building blocks of a business. The duration of this phase varies between two months and five years (60 months). The phase indicated as lasting only two months was specifically part of an accelerator programme, and not that of an incubator. During this phase, the focus of activities is on developing the actual products and establishing the business. Moreover, attention is given to the operational aspects of the business such as accounting systems, invoicing, tracking of customers, finance, marketing, sales, governance, amongst others.

The post-incubation phase is aimed at assisting and supporting those individuals who have successfully graduated from the incubators and accelerator programmes. The duration of the support received varies between three and five years. An example of such support would be to make use of the services or buy products from those student start-ups that have been developed and assisted through the incubators and accelerator programmes or assisted through other co-curricular activities (UCT Entrepreneurship Ecosystem Study, 2020:5).

c) Structure

In terms of ownership structure, the majority of incubators and accelerator programmes at the participating universities were found to be fully owned by the university itself. This finding contradicts that of Good *et al.* (2018:8) who found that incubators and accelerators programmes are generally owned by a range of actors. However, as suggested by Good *et al.* (2018:8), the majority are governed by a range of actors. These actors include directors, both internal and external to the university.

It was also found that all of the participating incubators and accelerator programmes are situated on-campus, with one university having a second incubator situated off-campus. This finding concurs with the literature, which points out that incubators and accelerator programmes are generally located near associated research departments (Good *et al.*, 2018:8). However, authors have also indicated that incubators are sometimes located within a university's affiliated science park (Good *et al.*, 2018:8) or within a TTO (McAdam *et al.*, 2015:7), which could be outside the campus of the university.

d) People

The number of employees working in the participating incubators or accelerator programmes ranged from one to seven. As is the case in the current study, Good *et al.* (2018:8) contends that this difference in number of employees varies according to the support provided and how often external service providers are relied upon. The universities considered most active had the most employees working in their incubators and accelerator programmes. These employees held several positions which are similar to those identified by Murray (2019:4), namely director and/or manager (various levels); business development officer and/or marketing officer; finance officer; administrative officer and assistant; and programme manager at operational level.

Only one participant from a most active university indicated being satisfied with the number of employees working in their incubator. The other four participants indicated that the number of employees was too low, and that more employees were required to increase the effectiveness and efficiency of their incubators.

The support and assistance offered by the incubators participating is not restricted to registered students only, but is also available to alumni, the community, and existing entrepreneurs with established businesses. Only the most active universities were able to provide details in terms of the number of users of their incubators and accelerator programmes. These users ranged from 30 to 200, with only a certain percentage being students.

e) Best practices for incubators and accelerator programmes

In this section, best practices in terms of incubators and accelerator programmes are presented (see Table 9.6). These practices have been identified as best practices because they are supported by the empirical findings of this study, existing literature, and recommendations made by participants.

Table 9.6: Best practices for incubators and accelerator programmes

	Best Practice	Supporting Evidence
Purpose	To provide support for changing mindsets and developing entrepreneurial skills.	Empirical support: Evident at Uni-B, Uni-Y & Uni-Z. Literature support: Drori & Wright (2018)
	To provide support for establishing successful start-ups and spin-off companies.	Empirical support: Evident at Uni-D, Uni-C, Uni-Y & Uni-Z. Literature support: Cohen (2013); Lange & Johnston (2020); Pellegrini & Sheehan (2021); Sherwood (2018)
Activities	Entrepreneurs from any stage of the business life cycle can apply to be part of the incubator or accelerator programme.	Empirical support: Evident at all five participating incubators and accelerator programmes.
	Interested entrepreneurs pitch their businesses (ideas) to a panel of judges who select those to be accepted.	Empirical support: Evident at the majority of the participating incubators and accelerator programmes.
	Support offered is tailored according to the business life cycle stage in which the entrepreneur is.	Empirical support: Evident at all five participating incubators and accelerator programmes.
	Various services/support are provided, namely: <ul style="list-style-type: none"> • Access to training • Business advice and services • Access to potential clients and supplier database • Networking opportunities with seasoned entrepreneurs, mentors, and venture capitalists • Mentorship • Capital/Funding • Office- and workspace • Services related to intellectual property • Assistance with market analysis • Prototype development 	Empirical support: Evident at the majority of participating incubators and accelerator programmes. Literature support: Cohen (2013); Culkin (2013); Ndedi (2014); Jamil <i>et al.</i> (2015); Covelli <i>et al.</i> (2020); Pellegrini & Sheehan (2021)

Table 9.6: Best practices for incubators and accelerator programmes

	Best Practice	Supporting Evidence
Activities (cont.)	Activities provided are designed to accelerate the growth and success of entrepreneurial start-ups.	Empirical support: Evident at all five participating incubators and accelerator programmes. Literature support: Cohen (2013); Pellegrini & Sheehan (2021)
	Duration of incubation and accelerator programme is between one and five years.	Empirical support: Evident at all participating incubators, with exception being the accelerator programme at Uni-D Literature support: Cohen (2013); Covelli <i>et al.</i> (2020)
	Activities allow those who are accepted to apply their theoretical knowledge obtained through formal entrepreneurship education to practice.	Empirical support: Evident at all five participating incubators and accelerator programmes. Literature support: Radipere (2012); Gwija <i>et al.</i> (2014)
Structure	Incubators and accelerator programmes are owned by a range of stakeholders (actors).	Empirical support: Evident at Uni-B & Uni-D. Literature support: Typically evident according to Good <i>et al.</i> (2018).
	Incubators and accelerator programmes are governed by a range of actors, both internal and external to the university.	Empirical support: Evident at all five participating incubators and accelerator programmes. Literature support: Gozali <i>et al.</i> (2015); Good <i>et al.</i> (2018)
	Incubators and accelerator programmes are situated on campus, either within the TTO or within close proximity of associated research departments.	Empirical support: Evident at all five participating incubators and accelerator programmes. Literature support: McAdam <i>et al.</i> (2015); Good <i>et al.</i> (2018)
People	Employees with the appropriate skills and knowledge are employed. Employee positions include those in senior management, as well as in marketing, finance, administration and operations.	Empirical support: Evident at majority of participating incubators and accelerator programmes. Literature support: Good <i>et al.</i> (2018); Murray (2019)

Source: Authors own construction

9.3.2.5 Technology Transfer Office

In the following section, the findings relating to technology transfer offices as an element within the conceptual framework developed for this study are discussed, and best practices are presented.

a) Purpose

The findings show that the purpose of the participating TTOs is threefold, namely (i) to facilitate matters regarding intellectual property, (ii) to create spin-out/start-up companies, and (iii) to achieve university's strategic goals. This being the purpose is common among TTOs in general (Good *et al.*, 2018:5; Baglieri *et al.*, 2018:51; Bolzani *et al.*, 2020:336).

Having the purpose of facilitating matters regarding intellectual property requires that the TTOs focus their support given on identifying, protecting and managing intellectual property, facilitating commercialisation, and licensing intellectual property to industry partners. Similarly, Good *et al.*, (2018:5) asserts that TTOs aim to protect a university's proprietary rights to generate returns and support the pre-commercialisation of inventions.

With their purpose being to create spin-out/start-up companies, the participating TTOs focus on assisting start-up creation (spin-outs and spin-offs) and to commercialise their intellectual property. As is the case in the current study, Bolzani *et al.* (2020:336) contend that TTOs support the creation of start-up companies through spin-outs and spin-offs, licensing, and contracts with industry (Bolzani *et al.*, 2020:336). As suggested by Fitzgerald and Cunningham (2016:1238) the purpose of the participating TTOs is to facilitate the transfer of discoveries made by university staff and students to the market environment, and to facilitate spin-out companies.

The participating TTOs also aim at achieving their university's strategic vision and goals. Strategies employed to align the purpose of the TTOs with their universities strategic goals include establishing a spin-off policy and providing a supportive system (infrastructure). Developing a spin-off policy is important to guide the protection and commercialisation of intellectual property (Boh *et al.*, 2016; Aragonés-Beltrán *et al.*, 2017; Jefferson *et al.*, 2017). In addition, a supportive

system (infrastructure) is one that allows and encourages people (staff and students) to be creative, innovative, entrepreneurial and adaptive (Croce *et al.*, 2014:690; Aragoes-Beltran *et al.*, 2017:19; Bolzani *et al.*, 2020:338).

The following were all identified as objectives of the participating TTOs, namely to act as a bridge between the university and the market environment, to protect university proprietary rights to generate returns, to support pre-commercialisation of inventions, to support students in commercialising ideas and engaging in entrepreneurship, and to support local or regional economic development. These objectives of the participating TTOs are consistent with those presented by Good *et al.* (2018:6) and Wright *et al.* (2017:916).

The majority of participating TTOs adopt a supportive TTO model, which focusses on creating spin-out companies rather than on licensing out intellectual property (Clarysse *et al.*, 2005:184). Despite this being the model adopted most, feedback on success rates (spin-outs) was vague.

b) Activities

The findings show that the participating TTOs are all engaging in the following activities:

- Encouraging the participation of researchers in technology commercialisation;
- Identifying high potential technologies;
- Securing funding or other resources where more research is required;
- Determining an intellectual property rights strategy and securing intellectual property rights for university-based inventions;
- Assessing the commercialisation potential of technologies;
- Determining the ideal commercialisation strategy relating to licensing, spin-offs and research contracts;
- Developing a licensing strategy;
- Engaging in spin-off creations;
- Engaging in both internal and external network building, i.e. connecting with industry actors, business support organisations, government representatives, and researchers; and
- Engaging in student entrepreneurship.

Performing these activities is common among TTO's and is well supported in the literature (Good *et al.*, 2018:6; Croce *et al.*, 2014; Huyghe *et al.*, 2014; Lundqvist, 2014; Berbegal-Mirabent *et al.*, 2015; Boh *et al.*, 2016; Gubitta *et al.*, 2016; Schaeffer & Matt, 2016; Aragonés-Beltrán *et al.*, 2017; Jefferson *et al.*, 2017)

Specific activities highlighted as being undertaken by the participating TTOs included re-directing student entrepreneurs to where support is available, having awareness campaigns, hosting commercialisation and intellectual property seminars, developing and distributing entrepreneurship and commercialisation booklets, and providing advice in general.

c) Structure

The findings show that the ownership structure common among the participating TTOs is one of being internally integrated into the administration of the university. All five of the TTO participants described the organisational structures of their respective TTOs as being centralised in one office. Adopting such a structure is, however, not supported in the literature. According to Bolzani *et al.* (2020:340), a traditional centralised structure is often subject to a robust administrative oversight, limiting the autonomy of staff in terms of decision making, the scope of activities, commercialisation strategies and incentive systems. Alessandrini *et al.* (2013:209) notes that a centralised structure can negatively impact the relationships between TTO staff, researchers and students, and can severely impact the success of a TTO (Alessandrini *et al.*, 2013:209).

Although an integrated ownership structure and a centralised organisational structure are common among the participating TTOs, the governance structure adopted varies. Two universities adopt a traditional university governance structure where the TTO is a department within the university structure, is primarily run by a director at senior level and is generally funded by the research office. Another two adopt a for-profit private extension structure which can either be part of the university structure or a research foundation, with a private venture extension, and is generally focused on economic development and the creation of start-up companies. The fifth university is in the process of transitioning from adopting a traditional university structure to a for-profit private extension.

As suggested by Alessandrini *et al.* (2013:209) and Bolzani *et al.* (2020:340), the ownership and organisational structures adopted by the participating TTOs are not optimal. In addition, the governance structures adopted vary. As suggested by Schoen *et al.* (2014:437), the ownership, governance and organisational structures adopted by the participating TTO are possibly influenced by the history, goals and characteristics of their universities, as well as the external environment in which they operate.

d) People

The findings of the study indicate that the number of employees at the participating TTOs ranged from three to 23. Most cited a lack of resources (funding and skills) as a reason for being dissatisfied with employee numbers. The ideal number is, however, described as befitting of the size of the portfolio and the structure adopted.

Based on the positions held by employees in the participating TTOs, the following skills and expertise are evident:

- Management and administration (assistants);
- Marketing;
- Finance;
- Technology transfer;
- Commercialisation;
- Intellectual property;
- Legal; and
- Project management.

Expertise specifically identified as lacking among employees at the participating TTOs included commercialisation and patent experience, as well as legal and technology transfer knowledge. These skills are identified as vital for TTO employees in the literature (Gubitta *et al.*, 2016:391; Jefferson *et al.*, 2017:1311; Good *et al.*, 2018:9)

e) Best practices for TTOs

In the following section, best practices in terms of TTOs are presented (see Table 9.7). These practices have been identified as best practices because they are supported by the empirical findings of this study, existing literature, and recommendations made by participants.

Table 9.7: Best practices for TTOs

	Best Practice	Supporting Evidence
Purpose	To facilitate matters regarding intellectual property, specifically identifying, protecting and managing intellectual property, facilitating commercialisation, and licensing intellectual property.	<p>Empirical support: Evident at all five of the participating TTOs.</p> <p>Literature support: Fitzgerald & Cunningham (2016); Weckowska (2015); Baglieri <i>et al.</i> (2018); Good <i>et al.</i> (2018)</p>
	To create spin-off and start-up companies.	<p>Empirical support: Evident at Uni-A, Uni-C & Uni-D.</p> <p>Literature support: Fitzgerald & Cunningham (2016); Weckowska (2015)</p>
	To achieve the strategic goals (“third mission”) of the university.	<p>Empirical support: Evident at Uni-B.</p> <p>Literature support: Croce <i>et al.</i> (2014); Aragoes-Beltran <i>et al.</i> (2017); Bolzani <i>et al.</i> (2020)</p>

Table 9.7: Best practices for TTOs (cont.)

	Best Practice	Supporting Evidence
Activities	<p>Engaging in the following activities:</p> <ul style="list-style-type: none"> • Encouraging the participation of researchers in technology commercialisation; • Identifying high potential technologies; • Securing funding or other resources where more research is required; • Determining an intellectual property rights strategy and securing intellectual property rights for university-based inventions; • Assessing the commercialisation potential of technologies; • Determining the ideal commercialisation strategy relating to licensing, spin-offs and research contracts; • Developing a licensing strategy; • Engaging in spin-off creations; • Engaging in both internal and external network building; • Engaging in student entrepreneurship; • Promoting services and technology transfer in general through awareness campaigns; • Hosting seminars; and • Developing and distributing entrepreneurship and commercialisation booklets. 	<p>Empirical support: Evident at the majority of the participating TTOs.</p> <p>Literature support: Croce <i>et al.</i> (2014); Gubitta <i>et al.</i> (2016); Aragonés-Beltrán <i>et al.</i> (2017); Good <i>et al.</i> (2018)</p>
Structure	The ownership, governance and organisational structures adopted are tailored to the history, goals and characteristics of the university, as well as the external environment in which it operates.	Literature support: Schoen <i>et al.</i> (2014)
People	Number of employees are appropriate for the size of the portfolio and the structure adopted.	Literature support: Good <i>et al.</i> (2018)
	<p>Expertise available includes:</p> <ul style="list-style-type: none"> • Commercialisation and patent experience; • Legal and technology transfer knowledge; • Business and marketing skills; • Prior entrepreneurial experience; • An understanding of the academic environment; and • The ability to develop beneficial relationships with industry actors. 	<p>Empirical support: Evident at Uni-B, Uni-C & Uni-Z.</p> <p>Literature support: Gubitta <i>et al.</i> (2016); Jefferson <i>et al.</i> (2017); Good <i>et al.</i> (2018)</p>

Source: Authors own construction

9.3.2.6 University venture fund

The findings of this study show that all four of the most active universities participating in this study have a university venture fund, while none of the least active universities do. Historical challenges were highlighted as to why these universities did not have such a fund. Historical challenges are associated with a lack of priority given to student entrepreneurship and the subsequent lack of resources given to initiatives such as a university venture fund.

a) Purpose

The findings indicate two main reasons (purposes) for establishing a university venture fund at the participating universities that had one, namely to support early-stage start-ups financially and to generate a return on investment. In supporting early-stage start-ups financially, the participating university venture funds aim to invest in high-risk early-stage technology companies. These funds aim to bridge the gap between early-stage technologies and starting up. Moreover, academic staff who have viable business prospects are encouraged, and the purpose of these funds is to support them. Furthermore, these university venture funds aim to support their universities by generating a return on investment. It is through investing in new and more risky ventures that higher returns for their universities are possible. The purpose of the participating venture funds is similar to the assertion of Croce *et al.* (2014:691), who point out that the purpose of a university venture fund is to invest equity capital into companies whose technologies are close to the scientific fields in which the faculties specialise; and utilising the revenue generated through these investments to enhance the commercialisation of technology developed by university staff or students.

b) Activities

The known sizes of the venture funds at the participating universities who had one, varied between R3 million and R60 million. The allocation of these funds was either vague or considered confidential. As suggested by Munari *et al.* (2015:969), the size of a university's venture fund varies, but what is important is not so much the amount but having access to more funds.

Only half of the participating university venture funds were perceived as effective. Those funds that are perceived as effective are considered so because fund managers and investors are reasonable and accommodating to the procedures and policies set out by the university itself. The other funds are perceived as ineffective because a conflict of interest exists between the receivers of the funding (staff and students) and the university venture fund. Moreover, no guarantee exists that the student entrepreneurs receiving the funding are spending it on the intended purpose.

Several recommendations were put forward by participants to improve existing university venture funds. These recommendations include using a percentage of the return from invested companies to grow the fund and to support new start-ups, having fundraisers to increase capital, and establishing tracking mechanisms to ensure that funds invested in start-ups are spent on intended purposes. A recommendation made to overcome the conflict-of-interest issue is for the university venture fund to be externally managed.

c) Structure

Three of the four university venture funds are wholly owned by their respective universities, while one is owned by a range of actors. However, the governance of all four university venture funds occurs internal to the university, meaning that these funds are managed by units within the university, such as the TTO (Munari *et al.*, 2015:956).

The findings show that various indicators are tracked to measure the performance of the university venture funds. These indicators are of both a monetary and non-monetary nature. The performance of these funds is measured primarily in terms of return on investment (monetary), while the number of start-ups and jobs created through these companies supported by the university venture fund (non-monetary), are also used as indicators.

d) Best practices for university venture funds

In this section, several best practices are identified for university venture funds (see Table 9.8). These best practices are identified based on support found in the existing literature as well as practices adopted by the majority of university venture funds in this study, and recommendations made by participants.

Table 9.8: Best practices for university venture funds

	Best Practice	Supporting Evidence
Purpose	To financially support early-stage technology start-ups through investments.	Empirical support: Evident at Uni-A, Uni-B, Uni-C & Uni-D. Literature support: Croce <i>et al.</i> (2014)
	To generate a return on invest from the start-ups supported.	Empirical support: Evident at Uni-A & Uni-C. Literature support: Croce <i>et al.</i> (2014)
	To encourage staff and students to commercialise viable business ideas.	Empirical support: Evident at Uni-A. Literature support: Croce <i>et al.</i> (2014); Good <i>et al.</i> (2018)
Activities	A large pool of funds is available to invest in start-up companies.	Empirical support: Based on recommendations by participants at Uni-A. Literature support: Croce <i>et al.</i> (2014); Good <i>et al.</i> (2018)
	Fundraising events are hosted to increase the size of the fund so that more funding is available to start-up businesses.	Empirical support: Based on recommendations by participants at Uni-D.
	A percentage of the return on investment is used to grow the fund and to invest in additional start-up businesses.	Empirical support: Based on recommendations by participants at Uni-A.
	Tracking mechanisms are in place to ensure that funds invested in start-ups are spent on intended purposes.	Empirical support: Based on recommendations by participants at Uni-B.

Table 9.8: Best practices for university venture funds (cont.)

	Best Practice	Supporting Evidence
Structure	The fund is wholly owned by the university.	Empirical support: Evident at the majority of the participating university venture funds.
	The fund is internally governed by units within the university.	Empirical support: Evident at the majority of the participating university venture funds.
	Both monetary (return on investment) and non-monetary (number of start-ups and jobs created) indicators are used to measure the performance of the university venture fund.	Empirical support: Based on recommendations by participants at Uni-A.

Source: Authors own construction

9.3.2.7 External entrepreneurship environment

The external environment is key to creating supportive external collaborations. Concerning this external environment, opinions relating to the national governments policy stance towards student entrepreneurship, as well as environmental/contextual factors that influence student entrepreneurship in South Africa in general, and at their respective universities in particular, were sourced. Best practices are also suggested.

a) Perceived external entrepreneurship environment

The majority of participants have positive perceptions of the national policy stance towards student entrepreneurship and describe this stance as supportive and effective. According to Wright *et al.* (2017:912) and Theodoraki *et al.* (2018:158), a supportive national policy positively influences U-BEEs, the objectives of universities, as well as the flexibility that universities can enjoy in terms of providing student entrepreneurship support. Although some participants were unaware of any national support, others were of the opinion that there is room for improvement in terms of supporting student entrepreneurship at a national level. However, the activities undertaken by the EDHE initiative, which falls under the DHET, were specifically commended. A recommendation made in the EDHE Baseline Study (2019:3) was that EDHE work together with universities to develop a policy for creating opportunities for students to engage in entrepreneurship on campus. The baseline study further noted that no one-size-fits-all policy should be created as universities differ in ethos, as well as in the availability and allocation of resources (EDHE Baseline Study, 2019:42).

Three types of environment/contextual factors influencing student entrepreneurship in South Africa were identified, namely socio-economic factors, the lack of entrepreneurial mindsets, and the lack of an entrepreneurially supportive culture. Socio-economic factors were found to be most influential and included unemployment, poverty and being previously disadvantaged. Participants are of the opinion that students are often forced into entrepreneurship through lack of employment opportunities but due to the high level of poverty experienced are unable to access the resources needed to establish their own businesses, this is especially evident among previously disadvantaged communities. This finding concurs with several authors, who claim that poverty and specifically youth unemployment influences entrepreneurship (Nicolaidis, 2011:1044; Dzisi, 2014:5; Atiase *et al.*, 2018:644; Alam, 2019:1; Toerien, 2021:1). Poverty is however also seen as having a positive influence on entrepreneurship because having an own business offers an alternative. That entrepreneurship offers a solution to poverty is well supported in the literature (Shambare, 2013:449; Fatoki, 2014b:216; Dhaliwal, 2016:4266).

The lack of entrepreneurial mindsets was also identified as an environmental/contextual factor influencing student entrepreneurship in South Africa. This finding concurs with the views of Fatoki (2010:1) and Ebewo *et al.* (2017:176), who contend that students in South Africa are more focused on being job seekers and being employed after graduating than on becoming entrepreneurs and establishing their own businesses. Viviers *et al.* (2013:1) also noted the lack of an entrepreneurial mindset and entrepreneurial intention among students in South Africa. In the current study students were also described as having a mind-set associated with expecting handouts, lacking in work ethic, and a sense of entitlement. However, Fatoki (2010:1) and Ebewo *et al.* (2017:176) suggest that in addition to mind-set, it is the lack of capital, skills and support that is influencing student entrepreneurship negatively.

Furthermore, participants are also of the opinion that in comparison to many other countries, South Africa as a whole lacks an entrepreneurially supportive culture. According to Bergmann *et al.* (2016:54), an entrepreneurial culture influences students' entrepreneurial intentions, and the success of their entrepreneurial ventures.

In this study both university-related and student-related environmental/contextual factors were identified as influencing student entrepreneurship at the participating universities. University-related factors include the lack of an entrepreneurship culture, a lack of integration and a lack of

required resources at universities. The lack of an entrepreneurship culture is not uncommon among universities where the focus of many is on developing job seekers rather than job creators (Sirelkhatim & Gangi, 2015:5; Shah *et al.*, 2020:2). The findings suggest that a lack of formal integration exists in that entrepreneurship is not integrated into the core curriculum, and a lack of resources are available to offer student entrepreneurship support in an effective and efficient manner.

Student-related environmental/contextual factors identified as influencing student entrepreneurship at the participating universities relate to the lack of awareness of students in terms of the entrepreneurship support being offered, as well as the lack of start-up capital to establish their own businesses. These factors are more influential among students based in rural areas and those that come from lower to middle income households. In her study, Viviers *et al.* (2013:6) also found that many students were unaware of the university-based student entrepreneurship support available. According to Novela *et al.* (2021:180), top management support has the greatest influence on increasing the awareness of student entrepreneurship support among both staff and students.

b) Best practices for the external entrepreneurship environment

Based on previous literature, the findings of this study, as well as recommendations made by participants, best practices were identified and are presented in Table 9.9.

Table 9.9: Best practices for a conducive external entrepreneurship environment

	Best Practice	Supporting Evidence
National government policy stance towards student entrepreneurship	Government initiatives are needs-driven, not programme driven.	Empirical support: Based on recommendation from participants at Uni-C.
	Government initiatives are effectively shared and communicated to entrepreneurship stakeholders.	Empirical support: Seven of 25 participants were unaware or not knowledgeable about the national government's policy stance towards student entrepreneurship.
Environment/contextual factors influencing student entrepreneurship in South Africa	Access to resources exists regardless of socio-economic status or location (rural/urban areas).	Empirical support: Based on recommendation from participants at Uni-C, Uni-D & Uni-Z.
	Students have an entrepreneurial mindset and strive to be job creators rather than job seekers.	Empirical support: Based on recommendation from participants at Uni-B, Uni-C, Uni-W & Uni-Y.
	A general entrepreneurially supportive culture exists.	Empirical support: Based on recommendation from participants at Uni-C, Uni-D, Uni-W & Uni-Y. Literature support: Hamilton & Mostert (2019)
Environment/contextual factors influencing student entrepreneurship at the participating universities	Top management actively supports student entrepreneurship by encouraging involvement and raising awareness.	Literature support: Viviers <i>et al.</i> (2013); Rice <i>et al.</i> (2014); Novela <i>et al.</i> (2021)
	An entrepreneurial culture exists within universities and students are encouraged and supported through their entrepreneurial journey.	Empirical support: Based on recommendation from participants at Uni-C & Uni-D. Literature support: Ndedi (2013); Hamilton & Mostert (2019)
	Entrepreneurship is embedded into the curricula at university.	Empirical support: Based on recommendation from participants at Uni-C & Uni-D. Literature support: Human Resource Development Council of South Africa (2014)
	The required resources are available to offer student entrepreneurship support and to assist student entrepreneurs in establishing their businesses.	Empirical support: Based on recommendation from participants at Uni-B & Uni-Z. Literature support: Human Resource Development Council of South Africa (2014); Morris <i>et al.</i> (2014); Rice <i>et al.</i> , (2014); Sherwood (2018)

Source: Authors own construction

9.3.2.8 Internal collaborations and locations

In this section, the findings relating to the internal collaborations between and the locations of the various elements (stakeholders) within each of the participating universities are discussed. In addition, best practices are presented.

a) Existing internal collaborations and locations

According to Morris *et al.* (2014:62), universities must ensure that cross-campus initiatives take place and have the common purpose of encouraging entrepreneurship stakeholders from different departments and disciplines to collaborate on supporting prospective and existing student entrepreneurs. The findings of this study indicate that at the majority of participating universities, collaborations do, in general, take place between the various internal stakeholders that exist at these universities, and that multidisciplinary collaboration is supported and encouraged. However, the internal collaborations between stakeholders at the most active universities are more extensive than at the least active universities. This is to be expected given that they have more stakeholders with which collaborations can take place.

In general, the TTOs were found to be a focal point for internal collaborations within universities. Most collaborations originate or occur through them, including those with centres for entrepreneurship, top management, academics, co-curricular entrepreneurship support activities, incubators, and university venture funds. TTOs and centres for entrepreneurship generally collaborate in terms of providing mentorship, sharing opportunities, offering short courses and jointly raising awareness of entrepreneurship. Top management collaborations occur through serving on TTO committees and assisting with the development of commercialisation strategies. Academics and those who offer co-curricular entrepreneurship support activities collaborate with TTOs by making student referrals to them. A collaboration not mentioned by the participants in this study is that of TTOs and academics working together to find market applications for university research and technology (Morris *et al.*, 2014:52). In this study the TTOs collaborate with those who offer co-curricular entrepreneurship support activities by participating in their workshops and seminars (Bischoff *et al.*, 2018:33). The findings show that most collaborations take place between

TTOs and incubators, and these collaborations relate to prototype development assistance, sharing of funding opportunities, jointly providing start-up support, co-hosting workshops and seminars, sharing of resources, and providing each other with advice and guidance. TTOs were also found to collaborate with university venture funds who provide the necessary financial resources needed by students.

Incubators were found to collaborate with entrepreneurship desks, academics, TTOs (previously discussed), and university venture funds. As suggested in the literature the incubators and entrepreneurship desks were found to jointly host entrepreneurship workshops, seminars and competitions (Bischoff *et al.*, 2018:33), while academics serve as consultants and provide advice to incubator employees and the participants involved in programmes. Just as with TTOs, the incubators and university venture funds work together to supply start-ups with needed capital or investments.

In addition to collaborating with TTOs and incubators, academics were found to also collaborate with the centres for entrepreneurship, entrepreneurship desks, and with those providing co-curricular entrepreneurship support activities. Academics were found to be a source of referrals to internal stakeholders supporting student entrepreneurs. Moreover, the academics are a source of knowledge and assistance to those providing co-curricular entrepreneurship support activities and often act as judges during competitions (Bischoff *et al.*, 2018:33).

Although not mentioned by most, collaboration was also found to exist between business schools and the centres for entrepreneurship, with their collaboration focusing on providing joint mentorship and sharing entrepreneurial opportunities and support. Two other internal stakeholders identified were student driven initiatives and career services, however, their collaborations were not elaborated on. In this study student driven initiatives, as internal stakeholders involved in collaborations, was mentioned the least, despite several authors highlighting the importance of having existing student entrepreneurs' input and involvement in university-based student entrepreneurship support (Wright *et al.*, 2017:917; Bischoff *et al.*, 2018:32; Sherwood, 2018:259). Existing student entrepreneurs can provide general and continuous support throughout the activity continuum to those who are just starting on their entrepreneurial journey (Wright *et al.*, 2017:917),

they can act as mentors and coaches to prospective and nascent entrepreneurs in establishing their own businesses, they can create start-ups on campuses and invite others to become part of an entrepreneurial network, and they can act as instructors or guest speakers at workshops (Bischoff *et al.*, 2018:32; Sherwood, 2018:259).

The internal stakeholders involved in entrepreneurship collaborations at the majority of participating universities include the TTOs, incubators and academics, while the least involved are entrepreneurship desks, career services and student driven initiatives. The most common way of collaborating between internal stakeholders at the participating universities is that of jointly hosting workshops, seminars and competitions, followed by the provision of mentorship and advice between them. The least common ways of collaborating are that of jointly hosting short-courses, jointly raising awareness of entrepreneurship, assisting in prototype development, and jointly supporting start-ups. In general, the collaborations were found to take place on an *ad hoc* basis and when the need arises. Only two of the participating universities indicated collaborations taking place in an organised and structured manner.

The findings show that the majority of internal stakeholders at the respective universities are not physically co-located. The most common reasons for not being co-located are the lack of adequate space (mostly due to entrepreneurship not being an initial priority), as well as budgetary constraints and the lack of resources. Also mentioned was that entrepreneurship was not included in the strategic vision of the university.

The implications of the various internal stakeholders not being co-located were identified as slower response times in being able to assist student entrepreneurs, less collaborations between those involved in supporting student entrepreneurs (various internal stakeholders), reduced awareness of entrepreneurship activities taking place and the support offered, duplication of work being conducted and not learning from previous mistakes made in terms of offering support and hosting activities, lack of coordination and cohesion, accessibility issues, and greater travel distance between support. The fact that internal entrepreneurship stakeholders are not physically co-located could also be the reason why participants were uncertain whether certain co-curricular entrepreneurship support activities are taking place or being offered by their respective university, or not. As such a lack of awareness and or a lack of communication is evident.

b) Best practices for internal collaborations and locations

In this section, best practices in terms of internal collaborations between and locations of various internal entrepreneurship support stakeholders (elements) are presented. These best practices are deduced from the existing literature, the findings of this study and recommendations made by participants (see Table 9.10).

Table 9.10: Best practices for internal collaborations and locations

	Best Practice	Supporting Evidence
Internal collaboration	Cross-campus initiatives take place and have the common purpose of encouraging entrepreneurship stakeholders from different departments and disciplines to collaborate on supporting prospective and existing student entrepreneurs.	Empirical support: Evident at the majority of participating universities. Literature support: Morris <i>et al.</i> (2014)
	Existing student entrepreneurs collaborate with other elements in a U-BEE to enhance access by those in need of support	Literature support: Wright <i>et al.</i> (2017); Bischoff <i>et al.</i> (2018); Sherwood (2018)
	Formal structures support cross-disciplinary collaborations, where various key stakeholders discuss ideas and coordinate actions.	Empirical support: Evident at Uni-C and based on recommendations made by majority of participants. Literature support: Ferreira <i>et al.</i> (2018)
	Internal stakeholders get together on a quarterly basis to discuss progress, ideas and future plans.	Empirical support: Evident at Uni-A & Uni-D.
	Collaborations occur on an <i>ad hoc</i> basis when the need arises.	Empirical support: Evident at the majority of participating universities.
Location	A central entrepreneurship hub exists which serves as the focal point for all related entrepreneurship activities.	Empirical support: Based on negative implications of not being physically co-located mentioned by participants.

Source: Authors own construction

9.3.2.9 External collaborations

In this section, the findings relating to external collaborations are discussed and best practices are presented.

a) Existing external collaborations

In general, participants from all the participating universities are aware of local or regional actors that support student entrepreneurship, and as far as they know their universities are in touch with these actors. On average, the most active universities have 6.75 collaborations with local or regional actors. These include collaborations with financial institutions, local government, national government institutions, and local businesses. In contrast, the least active universities have an average of 5.75 collaborations with local or regional actors. These include collaborations with financial institutions, municipalities, and government institutions. Government institutions mentioned more than once by participants from least active universities included SEDA, NYDA and EDHE. According to several authors (Belitski & Heron, 2017:173; Beyhan & Findik, 2018:1352; Ferreira *et al.*, 2018:3), collaborations between universities, the government and industry, or the “Triple Helix” (Allahar & Sookram, 2019b:248), should exist. As suggested by Amadi-Echendu *et al.* (2016:28), the most common collaborations identified between the participating universities and external actors revolved around the provision of funding, mentorship, coaching, and advice. Other collaborations related to the hosting of joint entrepreneurship events and workshops.

The findings also show that the majority of participating universities are collaborating or interacting with other national and/or international universities in terms of student entrepreneurship support. Only two of the least active universities indicated that no such collaborations are taking place. Although the number of universities with which collaborations take place was not always known, it is estimated that the most active universities have on average 7.33 national collaborations and have international collaborations with various universities from 12 different countries. On average, the least active universities have three national collaborations and one international collaboration. From this finding, it is evident that the most active universities collaborate with more national and international universities on activities relating to student entrepreneurship than least active universities do. National collaborations identified between the participating universities and other national universities revolve around the sharing of best practices, joint conferences, and student entrepreneurship exchange programmes. International collaborations identified revolve around joint workshops and pitching competitions, student exchange programmes, online

international modules, research collaborations, visiting guest lecturers, as well as the sharing of business opportunities, knowledge, resources, and facilities.

b) Best practices for external collaborations

In this section, best practices in terms of external collaborations are presented. These best practices are deduced from the existing literature, the findings of this study and recommendation made by participants (see Table 9.11).

Table 9.11: Best practices for external collaborations

	Best Practice	Supporting Evidence
External collaboration	Collaborations exist between universities, local government, government institutions and industry (local businesses) to enhance the student entrepreneurship support offered.	<p>Empirical support: Evident at the majority of participating universities.</p> <p>Literature support: Graham (2014); Belitski & Heron (2017); Elia <i>et al.</i>, (2017); Beyhan & Findik (2018); Ferreira <i>et al.</i> (2018); Tiemann <i>et al.</i> (2018)</p>
	Universities are the link between students and external stakeholders supporting entrepreneurs.	<p>Empirical support: Evident at the majority of participating universities.</p> <p>Literature support: Sherwood (2018)</p>
	Collaborations revolve around the provision of funding, mentorship, coaching, and advice, as well as hosting joint entrepreneurship events and workshops.	<p>Empirical support: Evident at the majority of participating universities.</p> <p>Literature support: Amadi-Echendu <i>et al.</i> (2016)</p>
	National collaborations between universities exist in terms of student entrepreneurship, and revolve around sharing of best practices, joint conferences, and student entrepreneurship exchange programmes.	<p>Empirical support: Generally evident at the participating universities.</p>

Table 9.11: Best practices for external collaborations (cont.)

	Best Practice	Supporting Evidence
External collaboration (cont.)	International collaborations between universities exist in terms of student entrepreneurship, and revolve around joint workshops and pitching competitions, student exchange programmes, online international modules, research collaborations, visiting guest lecturers, and the sharing of business opportunities, knowledge, resources, and facilities.	Empirical support: Generally evident at the participating universities.
	Universities remain self-sustainable and do not become dependent on external stakeholders.	Literature support: Allahar & Sookram (2019a)
	A formal structure exists to support cross-disciplinary collaboration, where several key stakeholders discuss ideas and coordinate action.	Literature support: Ferreira <i>et al.</i> (2018)

Source: Authors own construction

9.3.3 CHALLENGES FACED BY STUDENT ENTREPRENEURS

This section addresses the third secondary objective (SO³), namely to identify start-up (establishment) and current operational challenges facing student entrepreneurs at South African public universities. These findings are discussed under two headings: challenges experienced at the most active versus the least active universities, and challenges experienced during the time of establishment of the student start-ups and those they are currently experiencing.

9.3.3.1 Challenges experienced at most active versus least active universities

The type of challenges experienced by student entrepreneurs at the most active universities differ from those experienced by students at the least active universities. Establishment challenges (extremely challenging) experienced more by student entrepreneurs at most active universities include a lack of entrepreneurial knowledge, problems relating to employees, repaying study loans, lack of contacts/network, irregular income, lack of information on how to start a business and government support, lack of self-confidence, lack of business ideas, an inability to access the market, and a lack of legal aid/counselling. In contrast, establishment challenges experienced more by students at least active universities included a lack of finance and collateral, and a fear of failure.

Moreover, differences were also noted in the types of challenges currently being experienced in their student start-ups. Current challenges (extremely challenging) indicated more by student entrepreneurs at most active universities included fear of failure, lack of collateral, irregular income, working long hours, and lack of business ideas. In contrast, only one current challenge was indicated as extremely challenging more by student entrepreneurs at the least active universities, namely a lack of finance.

9.3.3.2 Challenges experienced during establishment versus currently

Differences were also found in terms of the challenges experienced during the establishment of student start-ups and the challenges currently being experienced. The challenges experienced as extremely challenging during the process of establishing their student start-ups included:

- Lack of contacts/network;
- Lack of finance;
- Lack of information about how to start a business;
- Unable to access the market;
- Lack of legal aid/counselling; and
- Lack of encouragement from people around.

The participating student entrepreneurs described six challenges (see list above) experienced during establishment as extremely challenging. Working long hours is the only challenge currently experienced as extremely challenging, followed by a lack of collateral and a lack of legal aid and counselling.

Various studies have shown that access to finance is the most significant challenge facing student entrepreneurs in South Africa (Fatoki, 2010:92; Viviers *et al.*, 2013:14; Iwu *et al.*, 2016:174; Morris *et al.*, 2017:70). However, in this study the challenge experienced the most by student entrepreneurs during the establishment of their businesses was the lack of contacts (network) and the long working hours that were required. Although not the most pressing, the lack of finance was

still considered a challenge and more so during the establishment than the operational stage of their business, because once operating, revenue generated provided finance for operations.

Fatoki (2010:92) also found that students lack the necessary skills to establish and operate businesses. The findings of this study concur in that the participating student entrepreneurs also reported experiencing a lack of information on how to start a business during the establishment phase. Shambare (2013:450) suggests that the lack of information and business skills among students is due to universities following a traditional theory approach to teaching entrepreneurship, leaving them without the required practical knowledge to establish and operate a business. However, the lack of information about starting a business does appear to prove less challenging as the participating student entrepreneurs advanced through the entrepreneurial process because it was not identified as a challenge currently experienced by them. Experiencing the lack of information as less challenging could be attributed to the experience and knowledge gained during the establishment process, as well as the support received from their respective universities.

A challenge experienced by the participating student entrepreneurs during the establishment of their businesses was a lack of encouragement from people around them. This finding is similar to that of Fatoki and Oni (2014:589) who report that student entrepreneurs are often not encouraged by lecturers and other university staff.

Furthermore, it was found that three of the challenges that were experienced by most as extreme challenges during the process of establishing their businesses are currently experienced as little or no challenge. These challenges include a lack of information about how to start a business, the inability to access the market, and a lack of encouragement from people around them.

9.3.3.3 Factors contributing to challenges experienced

The findings suggest that perceptions of legitimacy and the support available to student entrepreneurs, both internally (offered by universities) and externally (government and businesses), could contribute to the challenges they experience when establishing and operating their businesses. The majority of participating student entrepreneurs were of the opinion that the

university and business community, as well as the community in general (family, friends, consumers and peers) perceive them as legitimate (serious) entrepreneurs. The findings show that students who are of the opinion that their communities did not perceive them as legitimate entrepreneurs, were mostly from least active universities.

The student entrepreneurs from the most active universities were aware of more support activities available to them than those from least active universities were. Support activities highlighted by the majority of student participants as being offered by their respective universities includes entrepreneurship education, provision of material support: meeting facilities, pitching competitions, co-curricular seminars/workshops, and an entrepreneurship intervarsity competition. The support offered by the least number of universities includes a university venture fund, provision of material support: office and workspace, business plan competitions, networking events, entrepreneurship boot camps, individuals counselling, advice, and coaching, and a student entrepreneurship policy. It was also found that several student entrepreneurs were unsure of whether their respective universities offered certain entrepreneurship support or not.

Moreover, when comparing the co-curricular entrepreneurship support activities indicated by the participating student entrepreneurs to those indicated by the participating staff members, discrepancies are noted. The provision of material support (office and workspace), business plan competitions, networking events, and individual counselling, advice, and coaching were indicated by the least number of student entrepreneurs as being offered by their respective universities. However, based on responses from participating entrepreneurship stakeholders who are staff, these are considered as offered by the majority of participating universities. Considering that the perceptions of participating student entrepreneurs differ from those of participating staff, the possibility of a lack of awareness existing among student entrepreneurs is highlighted. This lack of awareness could be attributed to a lack of communication in general on entrepreneurship support offered at the respective universities.

Several student entrepreneurs reported having received external support during the establishment of their businesses, with the majority of these students being from the most active universities. Examples of the support received from several external organisations included financing,

mentoring and networking sessions, business plan development, working spaces, and skills development opportunities. Only one student entrepreneur reporting currently receiving external support. A lack of awareness and a lack of access was highlighted as the reason why some had not obtained support during establishment or were not currently making use of external support.

The majority of participating student entrepreneurs also considered various initiatives of the government as supportive of student entrepreneurship. Government initiatives noted included the EDHE, NYDA, and SEDA. However, the participants in general did not perceive the business community as supportive of student entrepreneurship, as they were unaware of any such initiatives offered by them.

9.4 CONTRIBUTIONS OF THE STUDY

Against the background of high graduate youth unemployment, the effectiveness of university-based student entrepreneurship support has been questioned as the numbers of start-up ventures by students remain stagnant (Morris *et al.*, 2017:66). Despite the significance of student entrepreneurship and student entrepreneurship support provided by universities, student entrepreneurship has been the subject of little research (Breznitz & Zhang, 2019:855). The current study aimed to address this research gap by assessing the state of university-based student entrepreneurship support at South African public universities. By doing so, this study made both theoretical and practical contributions.

9.4.1 THEORETICAL CONTRIBUTIONS

This study makes theoretical contributions to both the literature on university-based entrepreneurship ecosystems as well as organisational design theory. These theoretical contributions are further elaborated on in the sections to follow.

9.4.1.1 University-based entrepreneurship ecosystem

Numerous studies have developed and presented university-based entrepreneurship ecosystems, frameworks or models (Rice *et al.*, 2014; Miller & Acs, 2017; Wright *et al.*, 2017; Sherwood, 2018; Tiemann *et al.*, 2018; Novela *et al.*, 2021). Each of these U-BEEs consist of various elements, and while Rice *et al.*'s (2014) model considers the internal environment only, the majority consider both the internal and external environment, as well as interactions between the two (Miller & Acs, 2017; Wright *et al.*, 2017; Sherwood, 2018; Tiemann *et al.*, 2018; Novela *et al.*, 2021). Despite the various U-BEE models proposed, two important issues are worth noting, namely (i) the elements within a U-BEE and the relationships between them vary depending on regional and local conditions (Malecki, 2017:5; Xie & Zhang, 2019:15); and (ii) the elements contained in existing U-BEE models are not always appropriate for all regions (Allahar & Sookram, 2019b). With this in mind, the current study has made a contribution in that it has responded to several calls to conduct research on U-BEEs in developing country contexts (Lahikainen *et al.*, 2019; Xie & Zhang, 2019; de Araujo Ruiz *et al.*, 2020), on universities within the broader entrepreneurial ecosystem to establish a more conducive environment for student entrepreneurs (Morris *et al.*, 2017; Wright *et al.*, 2017:910; Sherwood, 2018:240), and on the interaction and relationships between the elements within the U-BEE (Malecki, 2017).

In responding to calls to conduct research on U-BEEs in developing countries (Lahikainen *et al.*, 2019; Xie & Zhang, 2019; de Araujo Ruiz *et al.*, 2020), a U-BEE framework was conceptualised in this study and used to investigate student entrepreneurship support at South African (developing country) public universities. In addition to providing a summary of pertinent elements common to existing U-BEEs, the framework conceptualised ensured that the theoretical underpinning of the study is appropriate for the South African context.

This study also responded to several research calls to investigate universities within the broader entrepreneurial ecosystem (Morris *et al.*, 2017; Wright *et al.*, 2017:910; Sherwood; 2018:240). The U-BEE framework conceptualised for the current study highlighted the influence of both the internal and external entrepreneurship environment on providing entrepreneurship support to university students. It is through investigating the collaborations between these environments that

insights into the role of the university in the broader ecosystem are forthcoming. How this internal entrepreneurship environment of the university serves as a link between the external environment and the focal point of most U-BEEs, namely student entrepreneurs, is specifically highlighted. It is through partnerships with external stakeholders such as local and regional actors supporting student entrepreneurship, local and international universities supporting student entrepreneurship, and government's support towards student entrepreneurship, that universities are better able to service the entrepreneurs within their internal environment. In turn, upon graduating, these entrepreneurs enter and contribute to the broader entrepreneurial ecosystem.

This study also investigated the formal and informal collaborations between the elements in the internal entrepreneurship environment, as well as the collaboration between the elements in the internal entrepreneurship environment and those in external entrepreneurship. In doing so this study responded to the research call of Malecki (2017) to investigate the interaction and relationships between the elements within a U-BEE.

9.4.1.2 Organisational design theory

In order to achieve the objectives of the current study, organisational theory was drawn on to provide greater insights into the structure and design of U-BEEs. From the literature it is however evident that different theorists use different terminology for the elements within the context of organisation design theory (Ireland *et al.*, 2009; Bolman & Deal, 2017; Burton & Obel, 2018; Good *et al.*, 2018). For the purpose of the current study, the elements of Good *et al.* (2018) were adopted as the theoretical underpinnings, namely purpose, activities, structure and people. According to Good *et al.* (2018:2), although authors use different terminology for the various organisational design elements, considerable overlap exists between them and the elements proposed by them are the most common.

Although the purpose in the current study is not to modify theory or to expand on Good *et al.* (2018:2) elements, worth noting is the importance of context in organisational design. For example, several authors contend that best practices are not universally applicable, as what is best practice for one might not be best for another (Marsden, 2011:44; Blake *et al.*, 2021:1255). Best practices

are not universally applicable because contexts differ. According to Schoen *et al.* (2014:437), U-BEES are influenced by the history, goals and characteristics of their universities, as well as the external environment in which they operate. The contexts of universities differ because of culture, language, resources and structure (Blake *et al.*, 2021:1255). Similarly, the EDHE Baseline Study (2019:42) notes that no one-size-fits-all policy can be developed as universities in South Africa differ in ethos, as well as in the availability and allocation of resources.

The findings of this study show that the participating universities differ in terms of historical backgrounds, strategic priorities, availability of resources, and geographical location. It is therefore suggested that the role of context, in addition to Good *et al.*'s (2018) organisational design elements (purpose, activities, structure, and people), be considered when seeking to provide greater insights into the structure and design of U-BEES in a developing country context.

9.4.2 PRACTICAL CONTRIBUTIONS

This study also makes several practical contributions. These practical contributions may be of value to several stakeholders, namely academic researchers, university top management, internal entrepreneurship stakeholders and external entrepreneurship stakeholders.

For academic researchers, this study presents several avenues for future research. These are elaborated on in Section 9.5. In addition, detailed interview protocols have been developed to investigate the various elements in a U-BEE, which could be adapted and used by other researchers in future studies.

According to Novela *et al.* (2021:180), the top management of a university has the most driving power in increasing awareness and encouraging entrepreneurship among staff and students. The findings of this study also highlight the important role of top management in entrenching a culture of entrepreneurship throughout all levels of a university. They specifically provide top management with better insights into the general challenges experienced by entrepreneurship stakeholders within a university context in providing student entrepreneurship support. These general challenges can provide guidance to top management in terms of strategic priorities and resource allocation.

Moreover, the best practices identified, notably those relating to the university environment and culture, can also guide top management in creating a university environment conducive to student entrepreneurship.

The findings of this study also make a practical contribution in that best practices in terms of purpose, activities, structure and people for each of the elements in the internal university entrepreneurship environment are given. These best practices can serve as guidelines for effectively and efficiently designing student entrepreneurship support. The challenges identified as being experienced by student entrepreneurs in a university context also provide internal entrepreneurship stakeholders with insights into the support student entrepreneurs actually require, and subsequently guides them in tailoring the support they offer.

External entrepreneurship stakeholders, such as local and regional actors as well as local and international universities, can also benefit from the findings presented in this study. The challenges identified as being experienced by internal entrepreneurship stakeholders, including student entrepreneurs, provide them with a general idea as well as specific insights into how they as external entrepreneurship stakeholders can assist or collaborate with internal university stakeholders to enhance the effectiveness and efficiency of the entrepreneurship support that they provide. Furthermore, by identifying the assistance required by universities and the challenges student entrepreneurs face, the support offered by external entrepreneurship stakeholders can be better tailored to meet those needs and address those challenges, which in turn, enhances the collaborations that exist between them. Better collaborations strengthen the role of the university in the broader entrepreneurial ecosystem.

In addition, this study also makes a contribution to the development of a national student entrepreneurship policy. EDHE suggests that universities work together with them to develop an entrepreneurship policy (EDHE Baseline Study, 2019:3). The makers of such a policy can consider the findings of this study and the best practices presented to guide them in developing such a policy, a policy that allows universities to more effectively and efficiently offer student entrepreneurship support at all universities across the country.

9.5 LIMITATIONS OF THE STUDY AND AVENUES FOR FUTURE RESEARCH

In this section, the theoretical and methodological limitations are presented, and avenues for future research are highlighted.

9.5.1 THEORETICAL LIMITATIONS

In this study, a conceptual U-BEE framework was developed based on the most common and appropriate elements evident in existing U-BEEs found in the literature. As such, the empirical investigation was limited to these elements included in the conceptual framework and possibly excluded various other aspects that could also influence the student entrepreneurship support offered at the participating public universities. Future studies could make use of the U-BEE framework conceptualised in this study, but adapt it accordingly so as to capture the influence of the various contextual factors that influence the student entrepreneurship support offered at public universities in South Africa.

The focus of the current study was on the entrepreneurial support offered by universities to student entrepreneurs only. However, it is noted that entrepreneurial universities are important actors in actively promoting and supporting entrepreneurship among staff, students, alumni and other stakeholders (Jansen *et al.*, 2015:173; Kozhakhmetov *et al.*, 2016:16). The entrepreneurial activity and performance of all these stakeholders is influenced by the entrepreneurship ecosystem within these universities (Hunday, 2019:17). In addition, universities play a vital role in the development of local and regional entrepreneurship and are recognised as an important source of new ventures (Meyer *et al.*, 2020:260). Future studies should investigate the role of universities within the broader entrepreneurial ecosystem (Morris *et al.*, 2017; Wright *et al.*, 2017:910), and consider the nature and needs of both internal and external stakeholders.

Furthermore, the various elements in the U-BEE were investigated from the perspective of how they support student entrepreneurs. However, elements such as TTOs, incubators and venture funds have been researched extensively in their own right and future research could delve into more detail to produce in-depth insights into their role within the university as a whole and in a developing country context.

The underlying theory used in this study was that of organisational design theory, and more specifically, Good *et al.*'s (2018) four organisational design elements, namely purpose, activities, structure and people. However, numerous other studies have identified other organisational design elements to describe the structure and design of organisations. Future studies could make use of these other elements or add them to those of Good *et al.*'s (2018), to further investigate the structure and design of student entrepreneurship support at public universities in South Africa.

9.5.2 METHODOLOGICAL LIMITATION

In this study, several methodological limitations are also highlighted. These relate to the sampling process and the sample selected, the self-reporting nature of the data collection process as well as the collection process itself.

With regards to the sampling process and the sample selected, two concerns are noted. Firstly, a desk research was done to rank the universities in terms of most active to least active in terms of providing student entrepreneurship support. This research was done by searching google and the various university's websites. As such the ranking of universities was done based on information that was available on the internet only and may not be an accurate reflection of all student entrepreneur support taking place at these universities. From this ranking, the four most active and the four least active universities were selected to participate in this study. One of the least active universities identified (Uni-X) was, however, excluded because of the discipline focus of their mission. Despite the shortcoming that could be present in the ranking of the universities, those selected were corroborated anecdotally by a senior member of EDHE. Future studies could, however, base their selection of participating universities on different criterion, such as entrepreneurial outputs (number of start-ups and jobs created, ideas turned into ventures, and successful spin-outs) or geographical location (urban universities versus rural universities).

Moreover, the participants invited to participate in this study consisted of one from several positions, including top management, student entrepreneurship champion/promotor, academic staff, incubator staff, technology transfer officer, and registered student entrepreneur. As only a small number of participants were included from each university, the findings are a reflection of their perceptions, and cannot be generalised or accepted as to how things actually are. Albeit that small sample sizes are appropriate for qualitative research, future studies could include previously registered student entrepreneurs (alumni) as well as other staff members not specifically involved with student entrepreneurship related activities. Including them in the sample could provide a more general and broader understanding of the perceptions relating to the student entrepreneurship support offered at their universities. Furthermore, future studies could focus on specific types of student entrepreneurship support offered at universities (such as the support offered by TTOs), and only include participants involved in such support.

The self-reporting nature of the data collection process must also be noted as the data collected is subjective in nature and potential biases in terms of responses provided by participants may have arisen. Subjective responses and potential bias are however inherent in qualitative studies (Merriam & Tisdell, 2016:16). The participants involved in this study may for example not always have been honest in terms of the effectiveness of the support offered because of their loyalty to their universities and self-pride. Moreover, participants could also have provided responses based on what they thought were expected from the researcher, rather than what was actually occurring or perceived to be occurring. To overcome this limitation, future studies could include a greater number and variety of participants to validate findings. Moreover, to overcome potential bias, future studies could also include a variety of internal stakeholders who are not involved with student entrepreneurship support activities, which could provide a more accurate perspective of the student entrepreneurship support being offered.

The original plan for data collection was for the researcher to undertake site visits to observe how the student entrepreneurship support is being offered and to undertake personal face-to-face interviews at the physical locations of the participating universities. However, due to the global Covid-19 pandemic, travel was restricted and site visits and face-to-face interviews were not possible. The researcher was thus not able to physically observe the entrepreneurship support in

action or interact with the supporting environment itself. In addition, interviews were conducted electronically by means of Zoom which made observations in terms of participants' body language difficult. Future studies could obtain richer data by undertaking site visits to physically experience and observe the student entrepreneurship support offered by the universities, as well as by interacting personally with interviewees.

9.6 CONCLUDING REMARKS

In general, the findings of this study highlight the need for entrepreneurship to be a strategic priority at South African public universities, accompanied by top management buy-in to increase awareness and encourage entrepreneurship among staff, students, and other stakeholders. Moreover, the findings call attention to the importance of having a team led by a student entrepreneurship champion whose primary role is to facilitate and coordinate activities related to student entrepreneurship. It is assumed that if entrepreneurship is prioritised by universities, top management buy-in occurs, and a student entrepreneurship champion is appointed, that the required resources, support and infrastructure will follow, most notably an entrepreneurship policy, financial support, and an entrepreneurship centre (a central hub for entrepreneurship related activities). As these support structures are established and resources made available, more frequent collaborations among internal entrepreneurship stakeholders themselves could be experienced, as well those with external partnerships. Increased collaborations will in turn lead to improved communication, greater coordination and increased awareness among all existing entrepreneurship stakeholders as well as future student entrepreneurs.

It is hoped that the findings of this study and the best practices presented will contribute to an entrepreneurially supportive culture within universities where student entrepreneurship stakeholders and student entrepreneurs in particular, are supported, encouraged, and recognised as legitimate. Such a conducive environment could lead to an increase in the number of student start-ups, ultimately having a positive effect on employment (job) creation, economic growth, and the adoption of new technologies and innovation capabilities.

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ANNEXURE A: NELSON MANDELA UNIVERSITY ETHICS CLEARANCE



PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa mandela.ac.za

Chairperson: Research Ethics Committee (Human)
Tel: +27 (0)41 504 2347
sharlene.govender@mandela.ac.za

NHREC registration nr: REC-042508-025

Ref: [H20-BES-BMA-011] / Approval]

21 May 2020

Prof S Farrington
Faculty: BES

Dear Prof Farrington

IMPROVING STUDENT ENTREPRENEURSHIP SUPPORT AT SOUTH AFRICAN UNIVERSITIES IN ORDER TO MITIGATE YOUTH UNEMPLOYMENT

PRP: Prof S Farrington
PI: Mr R Ismail

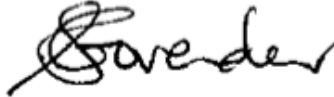
Your above-entitled application served at the Research Ethics Committee (Human) (meeting of 25 March 2020) for approval. The study is classified as a high risk study. The ethics clearance reference number is H20-BES-BMA-011 and approval is subject to the following conditions:

1. The immediate completion and return of the attached acknowledgement to Imtiaz.Khan@mandela.ac.za, the date of receipt of such returned acknowledgement determining the final date of approval for the study where after data collection may commence.
2. Approval for data collection is for 1 calendar year from date of receipt of above mentioned acknowledgement.
3. The submission of an annual progress report by the PRP on the data collection activities of the study (form RECH-004 available on Research Ethics Committee (Human) portal) by 15 November this year for studies approved/extended in the period October of the previous year up to and including September of this year, or 15 November next year for studies approved/extended after September this year.
4. In the event of a requirement to extend the period of data collection (i.e. for a period in excess of 1 calendar year from date of approval), completion of an extension request is required (form RECH-005 available on Research Ethics Committee (Human) portal)
5. In the event of any changes made to the study (excluding extension of the study), completion of an amendments form is required (form RECH-006 available on Research Ethics Committee (Human) portal).
6. Immediate submission (and possible discontinuation of the study in the case of serious events) of the relevant report to RECH (form RECH-007 available on Research Ethics Committee (Human) portal) in the event of any unanticipated problems, serious incidents or adverse events observed during the course of the study.
7. Immediate submission of a Study Termination Report to RECH (form RECH-008 available on Research Ethics Committee (Human) portal) upon expected or unexpected closure/termination of study.
8. Immediate submission of a Study Exception Report of RECH (form RECH-009 available on Research Ethics Committee (Human) portal) in the event of any study deviations, violations and/or exceptions.
9. Acknowledgement that the study could be subjected to passive and/or active monitoring without prior notice at the discretion of Research Ethics Committee (Human).

Please quote the ethics clearance reference number in all correspondence and enquiries related to the study. For speedy processing of email queries (to be directed to Imtiaz.Khan@mandela.ac.za), it is recommended that the ethics clearance reference number together with an indication of the query appear in the subject line of the email.

We wish you well with the study.

Yours sincerely



Dr S Govender
Chairperson: Research Ethics Committee (Human)

Cc: Department of Research Development
Faculty Administrator: BES

Appendix 1

ACKNOWLEDGEMENT OF CONDITIONS FOR ETHICS APPROVAL

I, **PROF S FARRINGTON** (PRP) of the study entitled **[H20-BES-BMA-011] IMPROVING STUDENT ENTREPRENEURSHIP SUPPORT AT SOUTH AFRICAN UNIVERSITIES IN ORDER TO MITIGATE YOUTH UNEMPLOYMENT**, do hereby agree to the following approval conditions:

1. The submission of an annual progress report by myself on the data collection activities of the study by 15 November this year for studies approved in the period October of the previous year up to and including September of this year, or 15 November next year for studies approved after September this year. It is noted that there will be no call for the submission thereof. The onus for submission of the annual report by the stipulated date rests on myself. I am aware of the guidelines (available on Research Ethics Committee (Human) portal) pertinent to the submission of the annual report.
2. Submission of the relevant request to RECH in the event of any amendments to the study for approval by RECH prior to any partial or full implementation thereof. I am aware of the guidelines (available on Research Ethics Committee (Human) portal) pertinent to the requesting for any amendments to the study.
3. Submission of the relevant request to RECH in the event of any extension to the study for approval by RECH prior to the implementation thereof.
4. Immediate submission of the relevant report to RECH in the event of any unanticipated problems, serious incidents or adverse events. I am aware of the guidelines (available on Research Ethics Committee (Human) portal) pertinent to the reporting of any unanticipated problems, serious incidents or adverse events.
5. Immediate discontinuation of the study in the event of any serious unanticipated problems, serious incidents or serious adverse events.
6. Immediate submission of the relevant report to RECH in the event of the unexpected closure/discontinuation of the study (for example, de-registration of the PI).
7. Immediate submission of the relevant report to RECH in the event of study deviations, violations and/or exceptions. I am aware of the guidelines (available on Research Ethics Committee (Human) portal) pertinent to the reporting of any study deviations, violations and/or exceptions.
8. Acknowledgement that the study could be subjected to passive and/or active monitoring without prior notice at the discretion of RECH. I am aware of the guidelines (available on Research Ethics Committee (Human) portal) pertinent to the active monitoring of a study.

Signed:



Date:

22/05/2020

ANNEXURE B: EMAIL REQUESTING GATEKEEPERS PERMISSION

Dear [Name]

I hope this email finds you well.

My name is Riyaad Ismail, and I am the principal investigator for an international collaborative project between Nelson Mandela University, the University of Pretoria and Ghent University in Belgium. I am also a Master of Commerce student at Nelson Mandela University. Given the high levels of graduate youth unemployment in South Africa (Statistics South Africa 2019), the focus of both this international project and my masters study is student entrepreneurship support provided by South African public universities. More specifically, the project is titled “Improving Student Entrepreneurship Support at South African Universities in order to Mitigate Youth Unemployment” and is funded by VLIR-OUS (Flemish Interuniversity Council funded by the Belgium government). The project aims to identify and disseminate best practices in university-based student entrepreneurship support in South Africa and create a development tool to support student entrepreneurship at South African universities.

In January this year, the DHET’s Entrepreneurship Development in Higher Education (EDHE) initiative released a report focusing on the status of student entrepreneurship support at South African public universities (https://edhe.co.za/wp-content/uploads/National-University-Entrepreneurship-Ecosystem-Baseline-study__Interactive-Report-Feb-2020.pdf). The results of this report highlight the need for and importance of our project.

Based on desk research, we have identified [University Name] as one of the possible universities to participate in the study. The data will be collected through semi-structured interviews, which will either be conducted face-to-face or electronically using Zoom, depending on the Covid-19 and lockdown situation at the time. We are hoping to interview the following individuals:

- A member of top management who is knowledgeable about, involved in or tasked with student entrepreneurship issues
- A staff member who has been tasked to promote student entrepreneurship
- A staff member at the incubator who deals with student entrepreneurs
- A staff member at the Technology Transfer Office
- An academic involved in entrepreneurship education
- Student entrepreneurs

Could you please advise us on the process of getting permission to conduct the research among [University Name] staff and students and whom the best persons to contact in this regard is (the gatekeeper of [University Name]).

We would appreciate your assistance regarding this matter.

Regards,
Riyaad Ismail

ANNEXURE C: INTRODUCTORY LETTER TO GATEKEEPERS



FACULTY OF BUSINESS AND ECONOMIC SCIENCES
SUMMERSTRAND SOUTH CAMPUS
DEPARTMENT OF BUSINESS MANAGEMENT

[Date]

To whom it may concern

Research Project: Improving Student Entrepreneurship Support at South African Universities in order to Mitigate Youth Unemployment

I am the principal investigator for the abovementioned research project and I am a masters student at the Nelson Mandela University. The aim of the project is to identify and disseminate best practices in university-based student entrepreneurship support and to create a student entrepreneurship development tool. The project is funded by VLIR-OUS, a Flemish Inter-university Council funded by the Belgium government, and is being undertaken in collaboration with the University of Pretoria and Ghent University (Belgium). My masters degree is being undertaken within the ambit of this project.

In January this year, the DHET's Entrepreneurship Development in Higher Education (EDHE) initiative released a report focusing on the status of student entrepreneurship support at South African public universities (https://edhe.co.za/wp-content/uploads/National-University-Entrepreneurship-Ecosystem-Baseline-study__Interactive-Report-Feb-2020.pdf). The results of this report highlight the need for and importance of our project.

I kindly request your permission to conduct semi-structured interviews with key stakeholders involved in student entrepreneurship at your university. These stakeholders potentially include:

- a) A member of top management who is knowledgeable about, involved in or tasked with student entrepreneurship issues
- b) A staff member who has been tasked to promote student entrepreneurship
- c) A staff member at the incubator who deals with student entrepreneurs
- d) A staff member at the Technology Transfer Office
- e) An academic involved in entrepreneurship education
- f) Student entrepreneurs.

Please be assured that the responses given by the key stakeholders from your university will be treated with the **strictest confidentiality**. Names of individuals and your university will not appear in the research project. Participation in this research project is **voluntary**, and participants may **withdraw** their participation at any time. Should you be interested in the results of this research, a copy of the findings will be made available to you. If this is the case, please contact the principal investigator at the email address provided below.

Your willingness to contribute to the success of this important research project is appreciated.



Change the World

PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa

NELSON MANDELA
UNIVERSITY

Yours faithfully



Mr R Ismail
Principal Investigator
Email: s216094577@mandela.ac.za
Tel: 073 981 9876



Prof SM Farrington
Primary Responsible Person
Email: Shelley.farrington@mandela.ac.za
Tel: 041 504 2203



Change the World

PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa

ANNEXURE D: EMAIL REQUEST TO IDENTIFY POSSIBLE PARTICIPANTS

Dear [Name]

I hope that you are doing well.

My name is Riyaad Ismail, and I am the principal investigator for an international collaborative project between Nelson Mandela University, the University of Pretoria and Ghent University in Belgium. I am also a Master of Commerce student at Nelson Mandela University. Given the high levels of graduate youth unemployment in South Africa (Statistics South Africa 2019), the focus of both this international project and my masters study is student entrepreneurship support provided by South African public universities. More specifically, the project is titled “Improving Student Entrepreneurship Support at South African Universities in order to Mitigate Youth Unemployment” and is funded by VLIR-OUS (Flemish Interuniversity Council funded by the Belgium government). The project aims to identify and disseminate best practices in university-based student entrepreneurship support in South Africa and create a development tool to support student entrepreneurship at South African universities.

In January this year, the DHET’s Entrepreneurship Development in Higher Education (EDHE) initiative released a report focusing on the status of student entrepreneurship support at South African public universities (https://edhe.co.za/wp-content/uploads/National-University-Entrepreneurship-Ecosystem-Baseline-study__Interactive-Report-Feb-2020.pdf). The results of this report highlight the need for and importance of our project.

Based on desk research, we have identified [University Name] as one of the possible universities to participate in this study. We have received ethical clearance to conduct research at [University Name] (see attached) and would like to request your guidance regarding possible participants. The data will be collected through semi-structured interviews, which will either be conducted face-to-face or electronically using Zoom, depending on the Covid-19 and lockdown situation at the time. We are hoping to interview individuals in the following positions:

- A member of top management who is knowledgeable about, involved in or tasked with student entrepreneurship issues
- A staff member who has been tasked to promote student entrepreneurship
- A staff member at the incubator who deals with student entrepreneurs
- A staff member at the Technology Transfer Office
- An academic involved in entrepreneurship education
- Student entrepreneurs.

We kindly request your recommendations on individuals that we could approach in the abovementioned positions and their contact details. Your assistance regarding this matter would be appreciated.

Regards,
Riyaad Ismail

ANNEXURE E: EMAIL REQUESTING PARTICIPATION

Dear [Name],

I hope this email finds you well and that you are in good health.

I am contacting you as an entrepreneurship stakeholder at [University Name]. We are currently conducting a research project which aims to investigate the university-based student entrepreneurship support provided by various South African Public Universities (see introductory letter attached). We have obtained permission to undertake the research at your university (see ethics approval attached).

I would hereby like to invite you to participate in this study, which will involve an interview via Zoom.

We plan to undertake the interviews with [University Name] entrepreneurship stakeholders via Zoom between the [Dates]. If you are willing to participate but cannot do so during this time period, please send me a date and time that will suit you best.

I look forward to hearing a positive response from you, and once an interview time slot has been secured, more details concerning the interview will be forwarded. The necessary consent forms (see attached) can then also be finalised.

Enjoy the rest of your day, and hoping to hear a positive response from you soon.

Kind regards,
Riyaad Ismail

ANNEXURE F: INTRODUCTORY LETTER TO PARTICIPANTS



FACULTY OF BUSINESS AND ECONOMIC SCIENCES
SUMMERSTRAND SOUTH CAMPUS
DEPARTMENT OF BUSINESS MANAGEMENT

[Date]

Dear potential interviewee (participant)

Research Project: Improving Student Entrepreneurship Support at South African Universities in order to Mitigate Youth Unemployment

In your capacity as a staff member or student at the [University Name] who is involved with student entrepreneurship, you are hereby invited to participate in the abovementioned research project. The aim of this study is to identify and disseminate best practices in university-based student entrepreneurship support and to create a student entrepreneurship development tool. To achieve the aim of the study, data will be collected through semi-structured interviews lasting approximately **one and a half hours**.

Please rest assured that the responses given by you will be treated with the **strictest confidentiality**. Your participation is **anonymous** – the names of individuals and your institution will not appear in the research project. Participation in this research project is **voluntary**, and you may withdraw at any time. **With your consent**, the semi-structured interview will be **audio-recorded** for data capture and verification purposes. The audio-recording will be destroyed after it has been transcribed. The transcribed data will be stored for **future research purposes only**. Should you be interested in the results of this research, a copy of the findings will be made available to you. If this is the case, please contact the principal investigator at the email address provided below. This study has been subjected to the research ethics procedures at the Nelson Mandela University. The ethics clearance number of this study is: H20-BES-BMA-011.

Your willingness to contribute to the success of this important research project is appreciated.

Yours faithfully

A handwritten signature in black ink, appearing to read "R Ismail".

Mr R Ismail
Principal Investigator
Email: s216094577@mandela.ac.za
Tel: 073 981 9876

A handwritten signature in black ink, appearing to read "SM Farrington".

Prof SM Farrington
Primary Responsible Person
Email: Shelley.Farrington@mandela.ac.za
Tel: 041 504 2203



Change the World

PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa

ANNEXURE G: CONSENT FORM



INFORMED CONSENT FOR PARTICIPATION IN THE RESEARCH PROJECT

I,, declare that I consent to participate in the study entitled **'Improving Student Entrepreneurship Support at South African Universities in order to Mitigate Youth Unemployment'**. I understand the nature of this study, and the research process has been explained to me.

This study is voluntary and anonymous - personal, identifiable information of participants will be kept confidential. I am aware that while my responses will be kept confidential, they will be audiotaped to ensure accurate transcription of the interview, and the audio-recording will be destroyed after being transcribed. I am also aware that my responses can be re-used by the researchers for research purposes only. I also understand that I have the right to refuse to participate in this research project and that I have the right to withdraw my participation at any point in time. I have the right to contact the researcher (provided below) to request a copy of the findings from this research project, should I wish to do so.

Signature of participant:

Date:

.....

.....

Signature of Principal Investigator:

Date:

.....

.....

FOR OFFICE ONLY:

Higher Education Institution:

Participant type (please indicate where applicable):

- a) Student entrepreneurship promotor/champion
- b) Staff member working at student entrepreneurship incubators/centres
- c) Technology transfer officer
- d) Academic involved in entrepreneurship education
- e) Student entrepreneur
- f) Member of senior/top management

CONTACT DETAILS OF Principal Investigator:

Name: Riyaad Ismail
Phone number: +27 73 981 9876
Email: s216094577@mandela.ac.za



Change the World

PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa

ANNEXURE H: INTERVIEW PROTOCOL – TOP MANAGEMENT

GENERAL INFORMATION – ALL INTERVIEWEES

Respondent name	
Respondent university affiliation	
Respondent function	
Respondent involvement with entrepreneurship	
Respondent E-mail address	
Respondent contact address	
Date of interview	

- Gender:
- Home language (English / other: _____)

INTRODUCTORY QUESTIONS ABOUT UNIVERSITY – ALL INTERVIEWEES

- General University Characteristics
(Interviewer will fill this out before the interview, and verify during the interview)¹

Founding year	
Position in the academic ranking of world universities E.g. Webometrics ²	
Number of faculties/schools	
Number of students	
Number of staff	
Does this university have a partner business school?	Yes / No

- Do you perceive **entrepreneurship to be embedded in the mission** (as reflected in the mission statement) of your university?

¹ These categories are taken from: Huyghe, A., Knockaert, M., Wright, M., & Piva, E. (2014). Technology transfer offices as boundary spanners in the pre-spin-off process: The case of a hybrid model. *Small Business Economics*, 43(2), 289-307.

² Source: Webometrics. 2020. *Ranking Web of Universities*. [Online]. Available: <http://www.webometrics.info/en>

- My university's mission focuses on:³

	1 = Strongly disagree	2	3	4 = Neither agree, nor disagree	5	6	7 = Strongly agree
Generating jobseekers							
Publishing papers with practical implications							
Knowledge transfer (patents, licenses, spin-offs)							
Contributing to regional and social development							
Promoting an entrepreneurial culture							
Generating entrepreneurs							
Publishing scientific, peer-reviewed papers							
Academic excellence (research and teaching)							
Consulting and contract research with industry							
Supporting students to become entrepreneurs							

- Why does your university's mission (not) focus on a specific area?

In what follows, we will discuss some general issues and questions relating to entrepreneurship support and student entrepreneurship support at your university.

UNIVERSITY (STUDENT) ENTREPRENEURSHIP SUPPORT – ALL INTERVIEWEES

- How important do you perceive entrepreneurship to be at your university?
(1 = not important at all, 7 = extremely important)

1 = Not important at all	2	3	4	5	6	7 = Extremely important

- Why have you allocated this level of importance to entrepreneurship at your university?

³ First 9 items: Huyghe, A., & Knockaert, M. Final item on student entrepreneurship added.

- Please indicate your level of agreement with the following statement.⁴
(1 = strongly disagree, 7 = strongly agree)

	1	2	3	4	5	6	7
My university supports entrepreneurship among students .							

- If disagree (i.e. more on the left side):
 - Why is entrepreneurship among students not supported? What are the (historical) barriers?
 - Lack of top management commitment
 - Lack of policy
 - Lack of entrepreneurship promotor/champion
 - Lack of funding
 - Lack of faculty interest
 - Lack of student interest
 - Lack of legitimate staff entrepreneurs
 - Lack of legitimate student entrepreneurs
 - Please elaborate
 - ii. Was such support previously provided? (If yes, why is your university no longer offering this support?)
 - iii. What are the implications of not supporting entrepreneurship?
 - iv. Are there plans to offer such support in the future?

- Please indicate your level of agreement with the following statements.⁵
(1 = strongly disagree , 7 = strongly agree)

	1	2	3	4	5	6	7
My university dedicates much resources to support student entrepreneurship.							

- Which resources does your university dedicate to supporting student entrepreneurship?
- Why are no resources dedicated to supporting student entrepreneurship?

	1	2	3	4	5	6	7
My university supports students at the earlier stages of the venture creation process (i.e. aspiring and nascent entrepreneurs).							
My university supports students who are already at the later stages of the venture creation process (i.e. active entrepreneurs).							

- Why does your university (not) support student entrepreneurs at a particular stage?

⁴ Own development of items. i.e. this is no construct, this is just to avoid simple ‘yes/no’ answers.

⁵ Own development of items. i.e. this is no construct, this is just to avoid simple ‘yes/no’ answers.

	1	2	3	4	5	6	7
My university supports students who operate informally (i.e. unregistered business).							
My university supports students who operate formally (i.e. a registered business).							

➤ Why does your university (not) support student entrepreneurs who operate formally (informally)?

	1	2	3	4	5	6	7
My university supports multidisciplinary collaborations among (prospective) student entrepreneurs.							

➤ Why does your university (not) support multidisciplinary collaboration among (prospective) student entrepreneurs?

➤ How does your university support multidisciplinary collaboration among (prospective) student entrepreneurs?

	1	2	3	4	5	6	7
My university supports as many student entrepreneurs as possible.							
My university supports a limited number of student entrepreneurs.							
My university only supports student entrepreneurs that meet certain criteria .							
My university only supports student entrepreneurs who have business ideas that meet certain criteria .							

- Please indicate the description that best fits the university's strategy with regard to supporting student entrepreneurship.⁶

<input type="checkbox"/> No strategy	- My university has no strategy.
<input type="checkbox"/> Low selective model	- The university is oriented towards maximising the number of student start-ups. - Generation of self-employment oriented student start-ups which only rarely grow beyond a critical size of employees.
<input type="checkbox"/> Supportive model	- Generation of a specific type of student start-up(s), who comply with specific selection criteria.
<input type="checkbox"/> Incubator model	- Generation of exit-oriented student start-ups, with potential growth opportunity, of potential interest to external investors.

⁶ Items adjusted from Huyghe A.

People

> Providers

- How many people are currently concerned with supporting student entrepreneurship within your university? (in 2019)
 - Do you think this number is satisfactory - too low - too high?

- Who is currently concerned with supporting student entrepreneurship within your university?
 - Individual students: _____
 - Student societies and organizations: _____
 - Alumni: _____
 - (Individual) professors: _____
 - Other faculty members: _____
 - University management: _____
 - Technology transfer officers: _____
 - Other: _____
 - What are their functions? What do they do?
- How can people be encouraged to support student entrepreneurship at your university?

> Receivers

Please indicate your level of agreement with the following statements. Please elaborate on your answer. Please give examples if possible.⁷

(1 = strongly disagree, 7 = strongly agree)

	1	2	3	4	5	6	7
The students at my university are interested in entrepreneurship.							

- Why are students at your university in general (not) interested in entrepreneurship?
- How can your university increase student interest in entrepreneurship?

	1	2	3	4	5	6	7
The students at my university who are interested in entrepreneurship start a business during their studies.							

- When do student at your university generally start-up their business(s)?

⁷ Own development of items. i.e. this is no construct, this is just to avoid simple 'yes/no' answers.

	1	2	3	4	5	6	7
The student entrepreneurs at my university typically establish high technology start-ups.							

- Which type of businesses do students at your university typically start-up (in terms of sector, industry, technology intensity)?

	1	2	3	4	5	6	7
The student entrepreneurs at my university typically have high growth intentions.							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the university community.							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the business community (e.g. investors, banks, suppliers).							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the community in general (e.g. family, friends, consumers, peers).							

- Why (not)?

- Please indicate your inclination toward the opposing statements.
(1 = strong inclination toward left statement, 7 = strong inclination toward right statement)

	1	2	3	4	5	6	7	
The student entrepreneurs of this university are typically necessity-driven.								The student entrepreneurs of this university are typically opportunity-driven.

- Why?

	1	2	3	4	5	6	7	
The student entrepreneurs of this university typically operate informally (e.g. unregistered business).								The student entrepreneurs of this university typically operate formally (e.g. registered business).

- Why?

Structure

- Is there a **formal, centralised team/centre** within your university that is concerned with supporting student entrepreneurship, or is the support for student entrepreneurship at your university more **informal and decentralised**?
 - There is no structure:
 - i. Why not?
 - If informal and decentralised:
 - ii. Why?
 - iii. How are activities concerned with supporting student entrepreneurship organised right now?
 - iv. Are there plans to centralise everything concerning student entrepreneurship support in the future?
 - If formal and centralised:
 - v. Since when?
 - vi. How many people are in the centre? (in 2019)
 - vii. Who is in charge? (How is the hierarchical structure of this formal centre organised?)

MOTIVATION TO SUPPORT STUDENT ENTREPRENEURSHIP (PURPOSE)

- Could you please tell me something about the **historical motivation** to start supporting entrepreneurship among **students** at your university?
 - When did it start? (year: _____)
 - Who was involved **at the start**, who initiated this?
 - Students: _____
 - Student societies and organizations: _____
 - Alumni: _____
 - (Individual) professors, other faculty members: _____
 - University management (as strategy): _____
 - Regional parties/government: _____
 - Other parties: _____

- Why does your university support student entrepreneurship?⁸ Indicate the extent to which the following reasons are why your university support student entrepreneurship.

Reasons	1 = Not a reason	2	3	4	5	6	7 = Main reason
To provide revenues for the university.							
To make the university more attractive to current or prospective students.							
To enhance the local/regional economic development.							
To decrease youth unemployment.							
Other _____							

In what follows, we will discuss several issues relating to student entrepreneurship support at your university, as part of the student entrepreneurship support ecosystem.

STUDENT ENTREPRENEURSHIP SUPPORT ACTOR/ELEMENT IN THE UNIVERSITY STUDENT ENTREPRENEURSHIP SUPPORT ECOSYSTEM

1) STUDENT ENTREPRENEURSHIP SUPPORT ACTORS (PRIMARILY)

Purpose

- What is the main aim of providing student entrepreneurship support activities at your university?

⁸ Items based on: Wright, M., Mustar, P. & Siegel, D. (2019). Student Start-Ups: The New Landscape of Academic Entrepreneurship. World Scientific Series on Public Policy and Technological Innovation: Vol1 (p.1)

Activities

- Which of the following student entrepreneurship support activities does your university offer? And (if applicable), how many times a year are these support services offered (in 2019)?

	Yes / No / Unsure
Entrepreneurship education	
An entrepreneurship centre	
A technology transfer office	
An incubator/accelerator (program)	
An incubator/accelerator (program) that is open to students	
A university-linked science park/research park If yes, name of park: _____	
A university venture fund ⁹	
Mentorship (formal or informal?)	
Counselling, provision of advice, coaching	
Extra-curricular training/workshops/seminars	
Organisation of networking events	
Provision of material support: Office and workspace (formal/informal?)	
Provision of material support: Meeting facilities (formal/informal?)	
Provision of material support: Start-up capital, Seed-funding	
A student entrepreneurship support organisation	
A student entrepreneurship policy	
Does your university participate in the student entrepreneurship week?	
Does your university participate in the entrepreneurship intervarsity competition?	
Does your university arrange internal university business plan/pitching competitions?	
Other: _____	

- Are there plans to provide the support that is not currently available in the future?
- What kind of support do students at your university need the most?
- For those that were answered “no”, why does your university not provide such support?
- What assistance would you require to enable the provision of such support in the future?

- If mentorship = ‘yes’: Who serves as mentors? _____
 - E.g. alumni, serial entrepreneurs, local entrepreneurs, professors...

⁹ i.e. investment funds that have a deliberate mission to fund ventures related to the university (Good et al., 2019)

- If counselling, provision of advice, coaching = ‘yes’:
Which topics are dealt with in the counselling, provision of advice, coaching?
 - Advice on business planning and managing a business (e.g. HR)
 - Advice on innovation, R&D and technology
 - Financial and accounting advice
 - Advice/assistance in gaining finance (e.g. crowdfunding)
 - Marketing advice
 - Legal and intellectual property advice
 - Corporate social responsibility, social impact, ethics...
 - Other: _____

- If extra-curricular activities (e.g. training/workshops/seminars) = ‘yes’:
Which topics are dealt with in the extra-curricular training/workshops/seminars?
 - Business planning and managing a business (e.g. HR)
 - Innovation, R&D and technology
 - Legislation and taxation
 - Accounting
 - Gaining finance (e.g. crowdfunding...)
 - Marketing
 - Corporate social responsibility, social impact, ethics
 - Other? _____

- If provision of material (e.g. workspace) support = ‘yes’:
 - How does this work?
 - Which students can make use of this material support?

- How do you track/monitor and evaluate the performance of the various extra-curricular support activities?

People

> Providers

- Is there a person/team in charge of organising these student entrepreneurship support activities?
 - Who are these people?
 - What are their roles at the universities?

> *Receivers*

- *Who takes part in these* student entrepreneurship support activities?
 - All students of the university
 - Students who are interested in entrepreneurship
 - Students who are interested in starting their own business (aspiring)
 - Students who are in the process of starting their own business (nascent)
 - Students who have started their own business (active)
 - Alumni
 - Other: _____

Evaluation

- How do you perceive the extra-curricular student entrepreneurship support activities at your university?
- How do you think these extra-curricular support activities influence the students at your university with regard to their attitude toward entrepreneurship, their intentions, and behaviour?
- Are there support activities that are lacking? What needs of students are not currently being addressed?
- What problems are currently faced in terms of providing student entrepreneurship support activities? (e.g. no time, no interest of students, lack of qualified staff, lack of alumni/serial entrepreneurs that want to come)

Best Practice

- In your view, which public university in South Africa has the best student entrepreneurship support activities?

2) UNIVERSITY VENTURE FUND

- Does your university collaborate with any investment funds that have the deliberate mission of funding ventures that originate from within the university (such as student spin-offs or student start-ups)? Yes / No / Unsure
 - If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Did you previously have such a fund but do not anymore? (If not, why not?)
 - iii. Are there plans to establish such a collaboration with a venture fund in the future?
 - If yes:
 - i. What is the fund called?
 - ii. Can you tell something about the history of the fund and why it was established?
 - iii. What is the size of this fund (in ZAR)?

iv. How much of this fund is invested in ventures related to the university (in 2019, in ZAR)? Of this amount, how much is invested in student ventures (in 2019, in ZAR)?

- Please tick the option that best describes the ownership structure of the university's venture fund.¹⁰
 - The university's venture fund is wholly owned by the university.
 - The university's venture fund is owned by a range of actors, including: _____
- Please tick the option that best describes the governance structure of the university's venture fund.¹¹
 - The university's venture fund is internal to the university
 - The university's venture fund is an external, standalone organisation

Evaluation

- How do you track/monitor and evaluate the performance of the university venture fund?
- How do you perceive the effectiveness of the university's venture fund?
- What works well? What are the current success factors of the university's venture fund?
- How can the university's venture fund be improved?

Best practice

- In your view, which public university in South Africa has the best university venture fund?

COLLABORATION AMONG DIFFERENT ACTORS IN SUPPORTING STUDENT ENTREPRENEURSHIP (ALL INTERVIEWEES)

- Does **collaboration (do relationships) exist between the different actors** within your university's student entrepreneurship support ecosystem?¹²
(i.e. student entrepreneurship support actors, formal entrepreneurship education actors, technology transfer office actors, incubator or accelerator (program) actors and the university's venture fund).
 - If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Did such collaborations exist in the past but not anymore? Why do these collaborations no longer exist?
 - iii. What are the current implications of not collaborating?

¹⁰ Items based on: Good, M., Knockaert, M., Soppe, B., & Wright, M. (2019). The technology transfer ecosystem in academia. An organizational design perspective. *Technovation*, 82, 35-50

¹¹ Items based on: Good, M., Knockaert, M., Soppe, B., & Wright, M. (2019). The technology transfer ecosystem in academia. An organizational design perspective. *Technovation*, 82, 35-50

¹² See: Good, M., Knockaert, M., & Soppe, B. (2019). A typology of technology transfer ecosystems: how structure affects interactions at the science–market divide. *The Journal of Technology Transfer*, 1-27.

- iv. Are there plans to collaborate in the future? Why (not)?
- If yes:
 - i. Which elements/actors are centralised? Which elements/actors are organised, operated by the same people?
 - ii. What elements/actors are in contact/collaborate with each other?
 - iii. What does this contact involve? How and on what do they collaborate?
 - iv. How frequent is this contact/collaboration?
- Are there any elements/actors within the university’s student entrepreneurship support ecosystem that are physically co-located?¹³
 - If no:
 - i. Why not?
 - ii. What are the implications thereof?
 - If yes:
 - i. How are they co-located?
 - ii. What are the benefits thereof?

Evaluation

- How do you perceive the effectiveness of the collaboration between the different actors that support student entrepreneurship within your university?
- What works well? What are the current success factors in this collaboration?
- How can these collaborations be improved?

ENTREPRENEURSHIP SUPPORT OUTSIDE UNIVERSITY (ALL INTERVIEWEES)

1) SUPPORT ACTORS

	Yes / No / Unsure
<ul style="list-style-type: none"> • Are you aware of any local or regional actors (outside the university, e.g. providers of finance, subsidies, consulting, mentoring, business plan development) that support student entrepreneurship? 	
<ul style="list-style-type: none"> • Is your university in touch with local or regional actors that support student entrepreneurship? 	

- If your university is **not in touch** with local or regional actors supporting student entrepreneurship: :
 - i. Why not? What are the (historical) barriers?
 - ii. Are there plans to engage with these actors in the future? Why (not)?

¹³ See: Good, M., Knockaert, M., & Soppe, B. (2019). A typology of technology transfer ecosystems: how structure affects interactions at the science–market divide. *The Journal of Technology Transfer*, 1-27.

- If your university **is in touch** with local or regional actors supporting student entrepreneurship:
 - i. Please specify these particular actors: _____
 - ii. How do these actors support the students at your university? (e.g. provide finance, subsidies, consulting, mentoring, business plan development)
 - iii. How do these actors collaborate with the university?

- Does your university collaborate with **other universities** in South Africa and/or worldwide to support student entrepreneurship?
 - If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Are there plans to collaborate more in the future? Why (not)?
 - If yes:
 - i. With which universities?
 - ii. What does this collaboration involve?

Evaluation

- How do you perceive the effectiveness of local or regional actors that support student entrepreneurship?
 - What works well?
 - How can the effectiveness of local and regional actors supporting student entrepreneurs be improved?
 - Are there support activities that are lacking?

- How do you perceive the effectiveness of your university's collaboration with the local or regional actors that support student entrepreneurship?
 - What works well?
 - How can the effectiveness of the collaboration between your university and local or regional actors supporting student entrepreneurs be improved?
 - Are there support activities that are lacking?

- How do you perceive the effectiveness of your university's collaboration with other universities to support student entrepreneurship?
 - What works well?
 - How can the effectiveness of the collaboration between your university and other universities be improved to support student entrepreneurship?
 - Are there support activities that are lacking?

2) EXTERNAL ENVIRONMENT & NATIONAL CONTEXT

- Please elaborate on:
 - The national government's policy **stances** toward student entrepreneurship
- Are there any other environmental/contextual factors that influence student entrepreneurship in South Africa?
- Are there any other environmental/contextual factors that influence student entrepreneurship at your university?
- General environment characteristics
(To be completed by the interviewer prior to undertaking the interview)¹⁴

Innovation scores in the region	
Unemployment in the region	
Income level in the region	
Economic growth (GDP) in region	
Industry focus in the region	
Poverty index	
Urban / rural environment	
Infrastructure index	
Ease of doing business index	

OUTCOMES

In sum

- What are the **most significant barriers or challenges preventing students** from your university from actually starting a business?
- What is the **most important support** needed by students from your university to assist them in starting a business successfully?
- How does your university aim to **finance** this support needed by students?
- Do you think the **university is successful** in providing the support needed by students to start a business?

Please elaborate on:

¹⁴ These categories are taken from: Huyghe, A., Knockaert, M., Wright, M., & Piva, E. (2014). Technology transfer offices as boundary spanners in the pre-spin-off process: The case of a hybrid model. *Small Business Economics*, 43(2), 289-307.

- Whether student start-ups are monitored by your university.
- If yes: How?
- If no: Why not?
- The number of student start-ups created within your university.
- The amount of funds these student start-ups have raised.
- The number of jobs these student start-ups have created.
- The financial performance of these student start-ups.
- The successful and unsuccessful exits of student start-ups.

ANNEXURE I: INTERVIEW PROTOCOL – STUDENT ENTREPRENEURSHIP CHAMPION/PROMOTOR

GENERAL INFORMATION – ALL INTERVIEWEES

Respondent name	
Respondent university affiliation	
Respondent function	
Respondent involvement with entrepreneurship	
Respondent E-mail address	
Respondent contact address	
Date of interview	

- Gender:
- Home language (English / other: _____)

INTRODUCTORY QUESTIONS ABOUT UNIVERSITY – ALL INTERVIEWEES

- General University Characteristics
(Interviewer will fill this out before the interview, and verify during the interview)¹⁵

Founding year	
Position in the academic ranking of world universities E.g. Webometrics ¹⁶	
Number of faculties/schools	
Number of students	
Number of staff	
Does this university have a partner business school?	Yes / No

- Do you perceive **entrepreneurship to be embedded in the mission** (as reflected in the mission statement) of your university?

¹⁵ These categories are taken from: Huyghe, A., Knockaert, M., Wright, M., & Piva, E. (2014). Technology transfer offices as boundary spanners in the pre-spin-off process: The case of a hybrid model. *Small Business Economics*, 43(2), 289-307.

¹⁶ Source: Webometrics. 2020. *Ranking Web of Universities*. [Online]. Available: <http://www.webometrics.info/en>

- My university's mission focuses on:¹⁷

	1 = Strongly disagree	2	3	4 = Neither agree, nor disagree	5	6	7 = Strongly agree
Generating jobseekers							
Publishing papers with practical implications							
Knowledge transfer (patents, licenses, spin-offs)							
Contributing to regional and social development							
Promoting an entrepreneurial culture							
Generating entrepreneurs							
Publishing scientific, peer-reviewed papers							
Academic excellence (research and teaching)							
Consulting and contract research with industry							
Supporting students to become entrepreneurs							

- Why does your university's mission (not) focus on a specific area?

*In what follows, we will discuss some **general issues and questions relating to entrepreneurship support and student entrepreneurship support at your university.***

UNIVERSITY (STUDENT) ENTREPRENEURSHIP SUPPORT – ALL INTERVIEWEES

- How important do you perceive entrepreneurship to be at your university?
(1 = not important at all, 7 = extremely important)

1 = Not important at all	2	3	4	5	6	7 = Extremely important

- Why have you allocated this level of importance to entrepreneurship at your university?

¹⁷ First 9 items: Huyghe, A., & Knockaert, M. Final item on student entrepreneurship added.

- Please indicate your level of agreement with the following statement.¹⁸
(1 = strongly disagree, 7 = strongly agree)

	1	2	3	4	5	6	7
My university supports entrepreneurship among students .							

➤ If disagree (i.e. more on the left side):

- i. Why is entrepreneurship among students not supported? What are the (historical) barriers?
 - Lack of top management commitment
 - Lack of policy
 - Lack of entrepreneurship promotor/champion
 - Lack of funding
 - Lack of faculty interest
 - Lack of student interest
 - Lack of legitimate staff entrepreneurs
 - Lack of legitimate student entrepreneurs
 - Please elaborate
- ii. Was such support previously provided? (If yes, why is your university no longer offering this support?)
- iii. What are the implications of not supporting entrepreneurship?
- iv. Are there plans to offer such support in the future?

- Please indicate your level of agreement with the following statements.¹⁹
(1 = strongly disagree , 7 = strongly agree)

	1	2	3	4	5	6	7
My university dedicates much resources to support student entrepreneurship.							

- Which resources does your university dedicate to supporting student entrepreneurship?
- Why are no resources dedicated to supporting student entrepreneurship?

¹⁸ Own development of items. i.e. this is no construct, this is just to avoid simple 'yes/no' answers.

¹⁹ Own development of items. i.e. this is no construct, this is just to avoid simple 'yes/no' answers.

	1	2	3	4	5	6	7
My university supports students at the earlier stages of the venture creation process (i.e. aspiring and nascent entrepreneurs).							
My university supports students who are already at the later stages of the venture creation process (i.e. active entrepreneurs).							

- Why does your university (not) support student entrepreneurs at a particular stage?

	1	2	3	4	5	6	7
My university supports students who operate informally (i.e. unregistered business).							
My university supports students who operate formally (i.e. a registered business).							

- Why does your university (not) support student entrepreneurs who operate formally (informally)?

	1	2	3	4	5	6	7
My university supports multidisciplinary collaborations among (prospective) student entrepreneurs.							

- Why does your university (not) support multidisciplinary collaboration among (prospective) student entrepreneurs?
- How does your university support multidisciplinary collaboration among (prospective) student entrepreneurs?

	1	2	3	4	5	6	7
My university supports as many student entrepreneurs as possible.							
My university supports a limited number of student entrepreneurs.							
My university only supports student entrepreneurs that meet certain criteria .							
My university only supports student entrepreneurs who have business ideas that meet certain criteria .							

- Please indicate the description that best fits the university’s strategy with regard to supporting student entrepreneurship.²⁰

<input type="checkbox"/> No strategy	- My university has no strategy.
<input type="checkbox"/> Low selective model	- The university is oriented towards maximising the number of student start-ups. - Generation of self-employment oriented student start-ups which only rarely grow beyond a critical size of employees.
<input type="checkbox"/> Supportive model	- Generation of a specific type of student start-up(s), who comply with specific selection criteria.
<input type="checkbox"/> Incubator model	- Generation of exit-oriented student start-ups, with potential growth opportunity, of potential interest to external investors.

People

> Providers

- How many people are currently concerned with supporting student entrepreneurship within your university? (in 2019)
 - Do you think this number is satisfactory - too low - too high?
- Who is currently concerned with supporting student entrepreneurship within your university?
 - Individual students: _____
 - Student societies and organizations: _____
 - Alumni: _____
 - (Individual) professors: _____
 - Other faculty members: _____
 - University management: _____
 - Technology transfer officers: _____
 - Other: _____
 - What are their functions? What do they do?
- How can people be encouraged to support student entrepreneurship at your university?

> Receivers

Please indicate your level of agreement with the following statements. Please elaborate on your answer. Please give examples if possible.²¹

(1 = strongly disagree, 7 = strongly agree)

	1	2	3	4	5	6	7
The students at my university are interested in entrepreneurship.							

- Why are students at your university in general (not) interested in entrepreneurship?
- How can your university increase student interest in entrepreneurship?

²⁰ Items adjusted from Huyghe A.

²¹ Own development of items. i.e. this is no construct, this is just to avoid simple ‘yes/no’ answers.

	1	2	3	4	5	6	7
The students at my university who are interested in entrepreneurship start a business during their studies.							

- When do student at your university generally start-up their business(s)?

	1	2	3	4	5	6	7
The student entrepreneurs at my university typically establish high technology start-ups.							

- Which type of businesses do students at your university typically start-up (in terms of sector, industry, technology intensity)?

	1	2	3	4	5	6	7
The student entrepreneurs at my university typically have high growth intentions.							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the university community.							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the business community (e.g. investors, banks, suppliers).							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the community in general (e.g. family, friends, consumers, peers).							

- Why (not)?

- Please indicate your inclination toward the opposing statements.
(1 = strong inclination toward left statement, 7 = strong inclination toward right statement)

	1	2	3	4	5	6	7	
The student entrepreneurs of this university are typically necessity-driven.								The student entrepreneurs of this university are typically opportunity-driven.

- Why?

	1	2	3	4	5	6	7	
The student entrepreneurs of this university typically operate informally (e.g. unregistered business).								The student entrepreneurs of this university typically operate formally (e.g. registered business).

- Why?

Structure

- Is there a **formal, centralised team/centre** within your university that is concerned with supporting student entrepreneurship, or is the support for student entrepreneurship at your university more **informal and decentralised**?
 - There is no structure:
 - Why not?
 - If informal and decentralised:
 - Why?
 - How are activities concerned with supporting student entrepreneurship organised right now?
 - Are there plans to centralise everything concerning student entrepreneurship support in the future?
 - If formal and centralised:
 - Since when?
 - How many people are in the centre? (in 2019)
 - Who is in charge? (How is the hierarchical structure of this formal centre organised?)

MOTIVATION TO SUPPORT STUDENT ENTREPRENEURSHIP (PURPOSE)

- Could you please tell me something about the **historical motivation** to start supporting entrepreneurship among **students** at your university?
 - When did it start? (year: _____)
 - Who was involved at the start, who initiated this?
 - Students: _____
 - Student societies and organizations: _____
 - Alumni: _____

- (Individual) professors, other faculty members: _____
- University management (as strategy): _____
- Regional parties/government: _____
- Other parties: _____

- Why does your university support student entrepreneurship?²² Indicate the extent to which the following reasons are why your university support student entrepreneurship.

Reasons	1 = Not a reason	2	3	4	5	6	7 = Main reason
To provide revenues for the university.							
To make the university more attractive to current or prospective students.							
To enhance the local/regional economic development.							
To decrease youth unemployment.							
Other _____							

In what follows, we will discuss several issues relating to student entrepreneurship support at your university, as part of the student entrepreneurship support ecosystem.

STUDENT ENTREPRENEURSHIP SUPPORT ACTOR/ELEMENT IN THE UNIVERSITY STUDENT ENTREPRENEURSHIP SUPPORT ECOSYSTEM

1) STUDENT ENTREPRENEURSHIP SUPPORT ACTORS (PRIMARILY)

Purpose

- What is the main aim of providing student entrepreneurship support activities at your university?

Activities

- Which of the following student entrepreneurship support activities does your university offer? And (if applicable), how many times a year are these support services offered (in 2019)?

	Yes / No / Unsure
Entrepreneurship education	
An entrepreneurship centre	
A technology transfer office	
An incubator/accelerator (program)	

²² Items based on: Wright, M., Mustar, P. & Siegel, D. (2019). Student Start-Ups: The New Landscape of Academic Entrepreneurship. World Scientific Series on Public Policy and Technological Innovation: Vol1 (p.1)

An incubator/accelerator (program) that is open to students	
A university-linked science park/research park If yes, name of park: _____	
A university venture fund ²³	
Mentorship (formal or informal?)	
Counselling, provision of advice, coaching	
Extra-curricular training/workshops/seminars	
Organisation of networking events	
Provision of material support: Office and workspace (formal/informal?)	
Provision of material support: Meeting facilities (formal/informal?)	
Provision of material support: Start-up capital, Seed-funding	
A student entrepreneurship support organisation	
A student entrepreneurship policy	
Does your university participate in the student entrepreneurship week?	
Does your university participate in the entrepreneurship intervarsity competition?	
Does your university arrange internal university business plan/pitching competitions?	
Other: _____	

- Are there plans to provide the support that is not currently available in the future?
- What kind of support do students at your university need the most?
- For those that were answered “no”, why does your university not provide such support?
- What assistance would you require to enable the provision of such support in the future?

- If mentorship = ‘yes’: Who serves as mentors? _____
 - E.g. alumni, serial entrepreneurs, local entrepreneurs, professors...

- If counselling, provision of advice, coaching = ‘yes’:

Which topics are dealt with in the counselling, provision of advice, coaching?

 - Advice on business planning and managing a business (e.g. HR)
 - Advice on innovation, R&D and technology
 - Financial and accounting advice
 - Advice/assistance in gaining finance (e.g. crowdfunding)
 - Marketing advice
 - Legal and intellectual property advice
 - Corporate social responsibility, social impact, ethics...
 - Other: _____

²³ i.e. investment funds that have a deliberate mission to fund ventures related to the university (Good et al., 2019)

- If extra-curricular activities (e.g. training/workshops/seminars) = ‘yes’:
Which topics are dealt with in the extra-curricular training/workshops/seminars?
 - Business planning and managing a business (e.g. HR)
 - Innovation, R&D and technology
 - Legislation and taxation
 - Accounting
 - Gaining finance (e.g. crowdfunding...)
 - Marketing
 - Corporate social responsibility, social impact, ethics
 - Other? _____
- If provision of material (e.g. workspace) support = ‘yes’:
 - How does this work?
 - Which students can make use of this material support?
- How do you track/monitor and evaluate the performance of the various extra-curricular support activities?

People

> Providers

- Is there a person/team in charge of organising these student entrepreneurship support activities?
 - Who are these people?
 - What are their roles at the universities?

> Receivers

- Who takes part in these student entrepreneurship support activities?
 - All students of the university
 - Students who are interested in entrepreneurship
 - Students who are interested in starting their own business (aspiring)
 - Students who are in the process of starting their own business (nascent)
 - Students who have started their own business (active)
 - Alumni
 - Other: _____

Evaluation

- How do you perceive the extra-curricular student entrepreneurship support activities at your university?
- How do you think these extra-curricular support activities influence the students at your university with regard to their attitude toward entrepreneurship, their intentions, and behaviour?

- Are there support activities that are lacking? What needs of students are not currently being addressed?
- What problems are currently faced in terms of providing student entrepreneurship support activities? (e.g. no time, no interest of students, lack of qualified staff, lack of alumni/serial entrepreneurs that want to come)

Best Practice

- In your view, which public university in South Africa has the best student entrepreneurship support activities?

2) UNIVERSITY VENTURE FUND

- Does your university collaborate with any investment funds that have the deliberate mission of funding ventures that originate from within the university (such as student spin-offs or student start-ups)? Yes / No / Unsure
 - If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Did you previously have such a fund but do not anymore? (If not, why not?)
 - iii. Are there plans to establish such a collaboration with a venture fund in the future?
 - If yes:
 - v. What is the fund called?
 - vi. Can you tell something about the history of the fund and why it was established?
 - vii. What is the size of this fund (in ZAR)?
 - viii. How much of this fund is invested in ventures related to the university (in 2019, in ZAR)? Of this amount, how much is invested in student ventures (in 2019, in ZAR)?
- Please tick the option that best describes the ownership structure of the university's venture fund.²⁴
 - The university's venture fund is wholly owned by the university.
 - The university's venture fund is owned by a range of actors, including: _____

²⁴ Items based on: Good, M., Knockaert, M., Soppe, B., & Wright, M. (2019). The technology transfer ecosystem in academia. An organizational design perspective. *Technovation*, 82, 35-50

- Please tick the option that best describes the governance structure of the university's venture fund.²⁵
 - The university's venture fund is internal to the university
 - The university's venture fund is an external, standalone organisation

Evaluation

- How do you track/monitor and evaluate the performance of the university venture fund?
- How do you perceive the effectiveness of the university's venture fund?
- What works well? What are the current success factors of the university's venture fund?
- How can the university's venture fund be improved?

Best practice

- In your view, which public university in South Africa has the best university venture fund?

COLLABORATION AMONG DIFFERENT ACTORS IN SUPPORTING STUDENT ENTREPRENEURSHIP (ALL INTERVIEWEES)

- Does **collaboration (do relationships) exist between the different actors** within your university's student entrepreneurship support ecosystem?²⁶
(i.e. student entrepreneurship support actors, formal entrepreneurship education actors, technology transfer office actors, incubator or accelerator (program) actors and the university's venture fund).
 - If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Did such collaborations exist in the past but not anymore? Why do these collaborations no longer exist?
 - iii. What are the current implications of not collaborating?
 - iv. Are there plans to collaborate in the future? Why (not)?
 - If yes:
 - i. Which elements/actors are centralised? Which elements/actors are organised, operated by the same people?
 - ii. What elements/actors are in contact/collaborate with each other?
 - iii. What does this contact involve? How and on what do they collaborate?
 - iv. How frequent is this contact/collaboration?

²⁵ Items based on: Good, M., Knockaert, M., Soppe, B., & Wright, M. (2019). The technology transfer ecosystem in academia. An organizational design perspective. *Technovation*, 82, 35-50

²⁶ See: Good, M., Knockaert, M., & Soppe, B. (2019). A typology of technology transfer ecosystems: how structure affects interactions at the science–market divide. *The Journal of Technology Transfer*, 1-27.

- Are there any elements/actors within the university’s student entrepreneurship support ecosystem that are physically co-located?²⁷
 - If no:
 - i. Why not?
 - ii. What are the implications thereof?
 - If yes:
 - i. How are they co-located?
 - ii. What are the benefits thereof?

Evaluation

- How do you perceive the effectiveness of the collaboration between the different actors that support student entrepreneurship within your university?
- What works well? What are the current success factors in this collaboration?
- How can these collaborations be improved?

ENTREPRENEURSHIP SUPPORT OUTSIDE UNIVERSITY (ALL INTERVIEWEES)

1) SUPPORT ACTORS

	Yes / No / Unsure
• Are you aware of any local or regional actors (outside the university, e.g. providers of finance, subsidies, consulting, mentoring, business plan development) that support student entrepreneurship?	
• Is your university in touch with local or regional actors that support student entrepreneurship?	

- If your university is **not in touch** with local or regional actors supporting student entrepreneurship: :
 - i. Why not? What are the (historical) barriers?
 - ii. Are there plans to engage with these actors in the future? Why (not)?
- If your university is **in touch** with local or regional actors supporting student entrepreneurship:
 - iv. Please specify these particular actors: _____
 - v. How do these actors support the students at your university? (e.g. provide finance, subsidies, consulting, mentoring, business plan development)
 - vi. How do these actors collaborate with the university?

- Does your university collaborate with **other universities** in South Africa and/or worldwide to support student entrepreneurship?

²⁷ See: Good, M., Knockaert, M., & Soppe, B. (2019). A typology of technology transfer ecosystems: how structure affects interactions at the science–market divide. *The Journal of Technology Transfer*, 1-27.

- If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Are there plans to collaborate more in the future? Why (not)?
- If yes:
 - i. With which universities?
 - ii. What does this collaboration involve?

Evaluation

- How do you perceive the effectiveness of local or regional actors that support student entrepreneurship?
 - What works well?
 - How can the effectiveness of local and regional actors supporting student entrepreneurs be improved?
 - Are there support activities that are lacking?

- How do you perceive the effectiveness of your university's collaboration with the local or regional actors that support student entrepreneurship?
 - What works well?
 - How can the effectiveness of the collaboration between your university and local or regional actors supporting student entrepreneurs be improved?
 - Are there support activities that are lacking?

- How do you perceive the effectiveness of your university's collaboration with other universities to support student entrepreneurship?
 - What works well?
 - How can the effectiveness of the collaboration between your university and other universities be improved to support student entrepreneurship?
 - Are there support activities that are lacking?

2) EXTERNAL ENVIRONMENT & NATIONAL CONTEXT

- Please elaborate on:
 - The national government's policy **stances** toward student entrepreneurship
- Are there any other environmental/contextual factors that influence student entrepreneurship in South Africa?
- Are there any other environmental/contextual factors that influence student entrepreneurship at your university?

- General environment characteristics
(To be completed by the interviewer prior to undertaking the interview)²⁸

Innovation scores in the region	
Unemployment in the region	
Income level in the region	
Economic growth (GDP) in region	
Industry focus in the region	
Poverty index	
Urban / rural environment	
Infrastructure index	
Ease of doing business index	

OUTCOMES

In sum

- What are the **most significant barriers or challenges preventing students** from your university from actually starting a business?
- What is the **most important support** needed by students from your university to assist them in starting a business successfully?
- How does your university aim to **finance** this support needed by students?
- Do you think the **university is successful** in providing the support needed by students to start a business?

Please elaborate on:

- Whether student start-ups are monitored by your university.
 - If yes: How?
 - If no: Why not?
- The number of student start-ups created within your university.
- The amount of funds these student start-ups have raised.
- The number of jobs these student start-ups have created.
- The financial performance of these student start-ups.
- The successful and unsuccessful exits of student start-ups.

²⁸ These categories are taken from: Huyghe, A., Knockaert, M., Wright, M., & Piva, E. (2014). Technology transfer offices as boundary spanners in the pre-spin-off process: The case of a hybrid model. *Small Business Economics*, 43(2), 289-307.

ANNEXURE J: INTERVIEW PROTOCOL – ACADEMIC STAFF

GENERAL INFORMATION – ALL INTERVIEWEES

Respondent name	
Respondent university affiliation	
Respondent function	
Respondent involvement with entrepreneurship	
Respondent E-mail address	
Respondent contact address	
Date of interview	

- Gender:
- Home language (English / other: _____)

INTRODUCTORY QUESTIONS ABOUT UNIVERSITY – ALL INTERVIEWEES

- General University Characteristics
(Interviewer will fill this out before the interview, and verify during the interview)²⁹

Founding year	
Position in the academic ranking of world universities E.g. Webometrics ³⁰	
Number of faculties/schools	
Number of students	
Number of staff	
Does this university have a partner business school?	Yes / No

- Do you perceive **entrepreneurship to be embedded in the mission** (as reflected in the mission statement) of your university?

²⁹ These categories are taken from: Huyghe, A., Knockaert, M., Wright, M., & Piva, E. (2014). Technology transfer offices as boundary spanners in the pre-spin-off process: The case of a hybrid model. *Small Business Economics*, 43(2), 289-307.

³⁰ Source: Webometrics. 2020. *Ranking Web of Universities*. [Online]. Available: <http://www.webometrics.info/en>

- My university's mission focuses on:³¹

	1 = Strongly disagree	2	3	4 = Neither agree, nor disagree	5	6	7 = Strongly agree
Generating jobseekers							
Publishing papers with practical implications							
Knowledge transfer (patents, licenses, spin-offs)							
Contributing to regional and social development							
Promoting an entrepreneurial culture							
Generating entrepreneurs							
Publishing scientific, peer-reviewed papers							
Academic excellence (research and teaching)							
Consulting and contract research with industry							
Supporting students to become entrepreneurs							

- Why does your university's mission (not) focus on a specific area?

*In what follows, we will discuss some **general issues and questions relating to entrepreneurship support and student entrepreneurship support at your university.***

UNIVERSITY (STUDENT) ENTREPRENEURSHIP SUPPORT – ALL INTERVIEWEES

- How important do you perceive entrepreneurship to be at your university?
(1 = not important at all, 7 = extremely important)

1 = Not important at all	2	3	4	5	6	7 = Extremely important

- Why have you allocated this level of importance to entrepreneurship at your university?

³¹ First 9 items: Huyghe, A., & Knockaert, M. Final item on student entrepreneurship added.

- Please indicate your level of agreement with the following statement.³²
(1 = strongly disagree, 7 = strongly agree)

	1	2	3	4	5	6	7
My university supports entrepreneurship among students .							

- If disagree (i.e. more on the left side):
 - Why is entrepreneurship among students not supported? What are the (historical) barriers?
 - Lack of top management commitment
 - Lack of policy
 - Lack of entrepreneurship promotor/champion
 - Lack of funding
 - Lack of faculty interest
 - Lack of student interest
 - Lack of legitimate staff entrepreneurs
 - Lack of legitimate student entrepreneurs
 - Please elaborate
 - ii. Was such support previously provided? (If yes, why is your university no longer offering this support?)
 - iii. What are the implications of not supporting entrepreneurship?
 - iv. Are there plans to offer such support in the future?

- Please indicate your level of agreement with the following statements.³³
(1 = strongly disagree , 7 = strongly agree)

	1	2	3	4	5	6	7
My university dedicates much resources to support student entrepreneurship.							

- Which resources does your university dedicate to supporting student entrepreneurship?
- Why are no resources dedicated to supporting student entrepreneurship?

³² Own development of items. i.e. this is no construct, this is just to avoid simple 'yes/no' answers.

³³ Own development of items. i.e. this is no construct, this is just to avoid simple 'yes/no' answers.

	1	2	3	4	5	6	7
My university supports students at the earlier stages of the venture creation process (i.e. aspiring and nascent entrepreneurs).							
My university supports students who are already at the later stages of the venture creation process (i.e. active entrepreneurs).							

➤ Why does your university (not) support student entrepreneurs at a particular stage?

	1	2	3	4	5	6	7
My university supports students who operate informally (i.e. unregistered business).							
My university supports students who operate formally (i.e. a registered business).							

➤ Why does your university (not) support student entrepreneurs who operate formally (informally)?

	1	2	3	4	5	6	7
My university supports multidisciplinary collaborations among (prospective) student entrepreneurs.							

➤ Why does your university (not) support multidisciplinary collaboration among (prospective) student entrepreneurs?

➤ How does your university support multidisciplinary collaboration among (prospective) student entrepreneurs?

	1	2	3	4	5	6	7
My university supports as many student entrepreneurs as possible.							
My university supports a limited number of student entrepreneurs.							
My university only supports student entrepreneurs that meet certain criteria .							
My university only supports student entrepreneurs who have business ideas that meet certain criteria .							

- Please indicate the description that best fits the university’s strategy with regard to supporting student entrepreneurship.³⁴

<input type="checkbox"/> No strategy	- My university has no strategy.
<input type="checkbox"/> Low selective model	- The university is oriented towards maximising the number of student start-ups. - Generation of self-employment oriented student start-ups which only rarely grow beyond a critical size of employees.
<input type="checkbox"/> Supportive model	- Generation of a specific type of student start-up(s), who comply with specific selection criteria.
<input type="checkbox"/> Incubator model	- Generation of exit-oriented student start-ups, with potential growth opportunity, of potential interest to external investors.

People

> Providers

- How many people are currently concerned with supporting student entrepreneurship within your university? (in 2019)
 - Do you think this number is satisfactory - too low - too high?
- Who is currently concerned with supporting student entrepreneurship within your university?
 - Individual students: _____
 - Student societies and organizations: _____
 - Alumni: _____
 - (Individual) professors: _____
 - Other faculty members: _____
 - University management: _____
 - Technology transfer officers: _____
 - Other: _____
 - What are their functions? What do they do?
- How can people be encouraged to support student entrepreneurship at your university?

³⁴ Items adjusted from Huyghe A.

> *Receivers*

Please indicate your level of agreement with the following statements. Please elaborate on your answer. Please give examples if possible.³⁵

(1 = *strongly disagree*, 7 = *strongly agree*)

	1	2	3	4	5	6	7
The students at my university are interested in entrepreneurship.							

- Why are students at your university in general (not) interested in entrepreneurship?
- How can your university increase student interest in entrepreneurship?

	1	2	3	4	5	6	7
The students at my university who are interested in entrepreneurship start a business during their studies.							

- When do student at your university generally start-up their business(s)?

	1	2	3	4	5	6	7
The student entrepreneurs at my university typically establish high technology start-ups.							

- Which type of businesses do students at your university typically start-up (in terms of sector, industry, technology intensity)?

	1	2	3	4	5	6	7
The student entrepreneurs at my university typically have high growth intentions.							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the university community.							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the business community (e.g. investors, banks, suppliers).							

- Why (not)?

³⁵ Own development of items. i.e. this is no construct, this is just to avoid simple ‘yes/no’ answers.

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the community in general (e.g. family, friends, consumers, peers).							

- Why (not)?

- Please indicate your inclination toward the opposing statements.
(1 = strong inclination toward left statement, 7 = strong inclination toward right statement)

	1	2	3	4	5	6	7	
The student entrepreneurs of this university are typically necessity-driven.								The student entrepreneurs of this university are typically opportunity-driven.

- Why?

	1	2	3	4	5	6	7	
The student entrepreneurs of this university typically operate informally (e.g. unregistered business).								The student entrepreneurs of this university typically operate formally (e.g. registered business).

- Why?

Structure

- Is there a **formal, centralised team/centre** within your university that is concerned with supporting student entrepreneurship, or is the support for student entrepreneurship at your university more **informal and decentralised**?
 - There is no structure:
 - Why not?
 - If informal and decentralised:
 - Why?
 - How are activities concerned with supporting student entrepreneurship organised right now?
 - Are there plans to centralise everything concerning student entrepreneurship support in the future?
 - If formal and centralised:
 - Since when?
 - How many people are in the centre? (in 2019)
 - Who is in charge? (How is the hierarchical structure of this formal centre organised?)

MOTIVATION TO SUPPORT STUDENT ENTREPRENEURSHIP (PURPOSE)

- Could you please tell me something about the **historical motivation** to start supporting entrepreneurship among **students** at your university?
 - When did it start? (year: _____)
 - Who was involved at the start, who initiated this?
 - Students: _____
 - Student societies and organizations: _____
 - Alumni: _____
 - (Individual) professors, other faculty members: _____
 - University management (as strategy): _____
 - Regional parties/government: _____
 - Other parties: _____
- Why does your university support student entrepreneurship?³⁶ Indicate the extent to which the following reasons are why your university support student entrepreneurship.

Reasons	1 = Not a reason	2	3	4	5	6	7 = Main reason
To provide revenues for the university.							
To make the university more attractive to current or prospective students.							
To enhance the local/regional economic development.							
To decrease youth unemployment.							
Other _____							

In what follows, we will discuss several issues relating to formal entrepreneurship education at your university, as part of the student entrepreneurship support ecosystem.

FORMAL ENTREPRENEURSHIP EDUCATION AS ACTOR/ELEMENT IN THE UNIVERSITY STUDENT ENTREPRENEURSHIP SUPPORT ECOSYSTEM

1) FORMAL ENTREPRENEURSHIP EDUCATION ACTORS (PRIMARILY)

Purpose

- What is the main aim of providing formal entrepreneurship education at your university?

³⁶ Items based on: Wright, M., Mustar, P. & Siegel, D. (2019). Student Start-Ups: The New Landscape of Academic Entrepreneurship. World Scientific Series on Public Policy and Technological Innovation: Vol1 (p.1)

Activities

- Since what year has formal entrepreneurship education been offered at your university?
- How many entrepreneurship modules are offered at your university yearly (in 2019)?
- Are these modules offered in all schools of your university?
 - In which schools?
- Are these modules open to students of all faculties of your university?
 - In which faculties?
- Are these modules voluntary, mandatory or both?
- Are the following methods for formal teaching of entrepreneurship employed at your university?³⁷

	Yes / No / Unsure
Traditional lectures	
Guest speakers	
Case studies	
Role-plays	
Simulations: business plan development	
Simulations: (virtual) business games	
Consulting projects (in real companies)	
Internships (in real companies)	
Start-up a real business	
Other: _____	

- If guest speakers = ‘Yes’: which people are invited?
 - Alumni of the university
 - (Successful) Entrepreneurs
 - Experts in particular topics (e.g. finance)
 - Other: _____

People

- How many lecturers are involved in teaching formal classes in entrepreneurship at your university (in 2019)?
 - Is this number satisfactory – too low – too high?
 - If too low:

³⁷ Items from: Shepherd, D. A. (2004). Educating entrepreneurship students about emotion and learning from failure. *Academy of Management Learning & Education*, 3(3), 274-287.
 With slight adjustment based on: Ruskovaara, E., & Pihkala, T. (2013). Teachers implementing entrepreneurship education: classroom practices. *Education+ training*.

- Do you have any suggestions to how your university can increase the interest of lecturers to teach formal entrepreneurship modules?
 - If too high:
 - Why?
- How many students were enrolled in formal entrepreneurship modules (courses) at your university (in 2019)?
 - Is this number satisfactory – too low – too high?
 - If too low:
 - Do you have any suggestions as to how your university can increase the number of students who enrol in formal entrepreneurship modules?
 - If too high:
 - Why?
- How many lecturers/academics undertake research in entrepreneurship at your university (in 2019)?

Evaluation

- How do you perceive the effectiveness of the formal entrepreneurship education at your university?
- What works well? What are the current success factors of the formal entrepreneurship education being offered?
- How do you think the formal entrepreneurship education influences the students at your university with regard to their attitude toward entrepreneurship, their intentions, and behaviour?
- How can the existing formal entrepreneurship education offering be improved?
- Are there any education-related entrepreneurship activities that should be included?

Best practice

- In your view, which public university in South Africa offers the best formal entrepreneurship education?

COLLABORATION AMONG DIFFERENT ACTORS IN SUPPORTING STUDENT ENTREPRENEURSHIP (ALL INTERVIEWEES)

- Does **collaboration (do relationships) exist between the different actors** within your university's student entrepreneurship support ecosystem?³⁸
(i.e. student entrepreneurship support actors, formal entrepreneurship education actors, technology transfer office actors, incubator or accelerator (program) actors and the university's venture fund).
 - If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Did such collaborations exist in the past but not anymore? Why do these collaborations no longer exist?
 - iii. What are the current implications of not collaborating?
 - iv. Are there plans to collaborate in the future? Why (not)?
 - If yes:
 - i. Which elements/actors are centralised? Which elements/actors are organised, operated by the same people?
 - ii. What elements/actors are in contact/collaborate with each other?
 - iii. What does this contact involve? How and on what do they collaborate?
 - iv. How frequent is this contact/collaboration?

- Are there any elements/actors within the university's student entrepreneurship support ecosystem that are physically co-located?³⁹
 - If no:
 - i. Why not?
 - ii. What are the implications thereof?
 - If yes:
 - i. How are they co-located?
 - ii. What are the benefits thereof?

Evaluation

- How do you perceive the effectiveness of the collaboration between the different actors that support student entrepreneurship within your university?
- What works well? What are the current success factors in this collaboration?
- How can these collaborations be improved?

³⁸ See: Good, M., Knockaert, M., & Soppe, B. (2019). A typology of technology transfer ecosystems: how structure affects interactions at the science–market divide. *The Journal of Technology Transfer*, 1-27.

³⁹ See: Good, M., Knockaert, M., & Soppe, B. (2019). A typology of technology transfer ecosystems: how structure affects interactions at the science–market divide. *The Journal of Technology Transfer*, 1-27.

ENTREPRENEURSHIP SUPPORT OUTSIDE UNIVERSITY (ALL INTERVIEWEES)

1) SUPPORT ACTORS

	Yes / No / Unsure
<ul style="list-style-type: none"> • Are you aware of any local or regional actors (outside the university, e.g. providers of finance, subsidies, consulting, mentoring, business plan development) that support student entrepreneurship? 	
<ul style="list-style-type: none"> • Is your university in touch with local or regional actors that support student entrepreneurship? 	

- If your university is **not in touch** with local or regional actors supporting student entrepreneurship: :
 - i. Why not? What are the (historical) barriers?
 - ii. Are there plans to engage with these actors in the future? Why (not)?
- If your university **is in touch** with local or regional actors supporting student entrepreneurship:
 - vii. Please specify these particular actors: _____
 - viii. How do these actors support the students at your university? (e.g. provide finance, subsidies, consulting, mentoring, business plan development)
 - ix. How do these actors collaborate with the university?
- Does your university collaborate with **other universities** in South Africa and/or worldwide to support student entrepreneurship?
 - If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Are there plans to collaborate more in the future? Why (not)?
 - If yes:
 - i. With which universities?
 - ii. What does this collaboration involve?

Evaluation

- How do you perceive the effectiveness of local or regional actors that support student entrepreneurship?
 - What works well?
 - How can the effectiveness of local and regional actors supporting student entrepreneurs be improved?
 - Are there support activities that are lacking?
- How do you perceive the effectiveness of your university's collaboration with the local or regional actors that support student entrepreneurship?
 - What works well?

- How can the effectiveness of the collaboration between your university and local or regional actors supporting student entrepreneurs be improved?
 - Are there support activities that are lacking?
- How do you perceive the effectiveness of your university's collaboration with other universities to support student entrepreneurship?
 - What works well?
 - How can the effectiveness of the collaboration between your university and other universities be improved to support student entrepreneurship?
 - Are there support activities that are lacking?

2) EXTERNAL ENVIRONMENT & NATIONAL CONTEXT

- Please elaborate on:
 - The national government's policy **stances** toward student entrepreneurship
- Are there any other environmental/contextual factors that influence student entrepreneurship in South Africa?
- Are there any other environmental/contextual factors that influence student entrepreneurship at your university?
- General environment characteristics
(To be completed by the interviewer prior to undertaking the interview)⁴⁰

Innovation scores in the region	
Unemployment in the region	
Income level in the region	
Economic growth (GDP) in region	
Industry focus in the region	
Poverty index	
Urban / rural environment	
Infrastructure index	
Ease of doing business index	

⁴⁰ These categories are taken from: Huyghe, A., Knockaert, M., Wright, M., & Piva, E. (2014). Technology transfer offices as boundary spanners in the pre-spin-off process: The case of a hybrid model. *Small Business Economics*, 43(2), 289-307.

OUTCOMES

In sum

- What are the **most significant barriers or challenges preventing students** from your university from actually starting a business?
- What is the **most important support** needed by students from your university to assist them in starting a business successfully?
- How does your university aim to **finance** this support needed by students?
- Do you think the **university is successful** in providing the support needed by students to start a business?

Please elaborate on:

- Whether student start-ups are monitored by your university.
 - If yes: How?
 - If no: Why not?
- The number of student start-ups created within your university.
- The amount of funds these student start-ups have raised.
- The number of jobs these student start-ups have created.
- The financial performance of these student start-ups.
- The successful and unsuccessful exits of student start-ups.

ANNEXURE K: INTERVIEW PROTOCOL – INCUBATOR OR ACCELERATOR STAFF

GENERAL INFORMATION – ALL INTERVIEWEES

Respondent name	
Respondent university affiliation	
Respondent function	
Respondent involvement with entrepreneurship	
Respondent E-mail address	
Respondent contact address	
Date of interview	

- Gender:
- Home language (English / other: _____)

INTRODUCTORY QUESTIONS ABOUT UNIVERSITY – ALL INTERVIEWEES

- General University Characteristics
(Interviewer will fill this out before the interview, and verify during the interview)⁴¹

Founding year	
Position in the academic ranking of world universities E.g. Webometrics ⁴²	
Number of faculties/schools	
Number of students	
Number of staff	
Does this university have a partner business school?	Yes / No

- Do you perceive **entrepreneurship to be embedded in the mission** (as reflected in the mission statement) of your university?

⁴¹ These categories are taken from: Huyghe, A., Knockaert, M., Wright, M., & Piva, E. (2014). Technology transfer offices as boundary spanners in the pre-spin-off process: The case of a hybrid model. *Small Business Economics*, 43(2), 289-307.

⁴² Source: Webometrics. 2020. *Ranking Web of Universities*. [Online]. Available: <http://www.webometrics.info/en>

- My university's mission focuses on:⁴³

	1 = Strongly disagree	2	3	4 = Neither agree, nor disagree	5	6	7 = Strongly agree
Generating jobseekers							
Publishing papers with practical implications							
Knowledge transfer (patents, licenses, spin-offs)							
Contributing to regional and social development							
Promoting an entrepreneurial culture							
Generating entrepreneurs							
Publishing scientific, peer-reviewed papers							
Academic excellence (research and teaching)							
Consulting and contract research with industry							
Supporting students to become entrepreneurs							

- Why does your university's mission (not) focus on a specific area?

*In what follows, we will discuss some **general issues and questions relating to entrepreneurship support and student entrepreneurship support at your university.***

UNIVERSITY (STUDENT) ENTREPRENEURSHIP SUPPORT – ALL INTERVIEWEES

- How important do you perceive entrepreneurship to be at your university?
(1 = not important at all, 7 = extremely important)

1 = Not important at all	2	3	4	5	6	7 = Extremely important

- Why have you allocated this level of importance to entrepreneurship at your university?

⁴³ First 9 items: Huyghe, A., & Knockaert, M. Final item on student entrepreneurship added.

- Please indicate your level of agreement with the following statement.⁴⁴
(1 = strongly disagree, 7 = strongly agree)

	1	2	3	4	5	6	7
My university supports entrepreneurship among students .							

- If disagree (i.e. more on the left side):
 - Why is entrepreneurship among students not supported? What are the (historical) barriers?
 - Lack of top management commitment
 - Lack of policy
 - Lack of entrepreneurship promotor/champion
 - Lack of funding
 - Lack of faculty interest
 - Lack of student interest
 - Lack of legitimate staff entrepreneurs
 - Lack of legitimate student entrepreneurs
 - Please elaborate
 - ii. Was such support previously provided? (If yes, why is your university no longer offering this support?)
 - iii. What are the implications of not supporting entrepreneurship?
 - iv. Are there plans to offer such support in the future?

- Please indicate your level of agreement with the following statements.⁴⁵
(1 = strongly disagree , 7 = strongly agree)

	1	2	3	4	5	6	7
My university dedicates much resources to support student entrepreneurship.							

- Which resources does your university dedicate to supporting student entrepreneurship?
- Why are no resources dedicated to supporting student entrepreneurship?

	1	2	3	4	5	6	7
My university supports students at the earlier stages of the venture creation process (i.e. aspiring and nascent entrepreneurs).							
My university supports students who are already at the later stages of the venture creation process (i.e. active entrepreneurs).							

- Why does your university (not) support student entrepreneurs at a particular stage?

⁴⁴ Own development of items. i.e. this is no construct, this is just to avoid simple 'yes/no' answers.

⁴⁵ Own development of items. i.e. this is no construct, this is just to avoid simple 'yes/no' answers.

	1	2	3	4	5	6	7
My university supports students who operate informally (i.e. unregistered business).							
My university supports students who operate formally (i.e. a registered business).							

➤ Why does your university (not) support student entrepreneurs who operate formally (informally)?

	1	2	3	4	5	6	7
My university supports multidisciplinary collaborations among (prospective) student entrepreneurs.							

➤ Why does your university (not) support multidisciplinary collaboration among (prospective) student entrepreneurs?

➤ How does your university support multidisciplinary collaboration among (prospective) student entrepreneurs?

	1	2	3	4	5	6	7
My university supports as many student entrepreneurs as possible.							
My university supports a limited number of student entrepreneurs.							
My university only supports student entrepreneurs that meet certain criteria .							
My university only supports student entrepreneurs who have business ideas that meet certain criteria .							

- Please indicate the description that best fits the university's strategy with regard to supporting student entrepreneurship.⁴⁶

<input type="checkbox"/> No strategy	- My university has no strategy.
<input type="checkbox"/> Low selective model	- The university is oriented towards maximising the number of student start-ups. - Generation of self-employment oriented student start-ups which only rarely grow beyond a critical size of employees.
<input type="checkbox"/> Supportive model	- Generation of a specific type of student start-up(s), who comply with specific selection criteria.
<input type="checkbox"/> Incubator model	- Generation of exit-oriented student start-ups, with potential growth opportunity, of potential interest to external investors.

⁴⁶ Items adjusted from Huyghe A.

People

> Providers

- How many people are currently concerned with supporting student entrepreneurship within your university? (in 2019)
 - Do you think this number is satisfactory - too low - too high?

- Who is currently concerned with supporting student entrepreneurship within your university?
 - Individual students: _____
 - Student societies and organizations: _____
 - Alumni: _____
 - (Individual) professors: _____
 - Other faculty members: _____
 - University management: _____
 - Technology transfer officers: _____
 - Other: _____
 - What are their functions? What do they do?

- How can people be encouraged to support student entrepreneurship at your university?

> Receivers

Please indicate your level of agreement with the following statements. Please elaborate on your answer. Please give examples if possible.⁴⁷

(1 = strongly disagree, 7 = strongly agree)

	1	2	3	4	5	6	7
The students at my university are interested in entrepreneurship.							

- Why are students at your university in general (not) interested in entrepreneurship?
- How can your university increase student interest in entrepreneurship?

	1	2	3	4	5	6	7
The students at my university who are interested in entrepreneurship start a business during their studies.							

- When do student at your university generally start-up their business(s)?

⁴⁷ Own development of items. i.e. this is no construct, this is just to avoid simple 'yes/no' answers.

	1	2	3	4	5	6	7
The student entrepreneurs at my university typically establish high technology start-ups.							

- Which type of businesses do students at your university typically start-up (in terms of sector, industry, technology intensity)?

	1	2	3	4	5	6	7
The student entrepreneurs at my university typically have high growth intentions.							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the university community.							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the business community (e.g. investors, banks, suppliers).							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the community in general (e.g. family, friends, consumers, peers).							

- Why (not)?

- Please indicate your inclination toward the opposing statements.
(1 = strong inclination toward left statement, 7 = strong inclination toward right statement)

	1	2	3	4	5	6	7	
The student entrepreneurs of this university are typically necessity-driven.								The student entrepreneurs of this university are typically opportunity-driven.

- Why?

	1	2	3	4	5	6	7	
The student entrepreneurs of this university typically operate informally (e.g. unregistered business).								The student entrepreneurs of this university typically operate formally (e.g. registered business).

- Why?

Structure

- Is there a **formal, centralised team/centre** within your university that is concerned with supporting student entrepreneurship, or is the support for student entrepreneurship at your university more **informal and decentralised**?
 - There is no structure:
 - i. Why not?
 - If informal and decentralised:
 - ii. Why?
 - iii. How are activities concerned with supporting student entrepreneurship organised right now?
 - iv. Are there plans to centralise everything concerning student entrepreneurship support in the future?
 - If formal and centralised:
 - v. Since when?
 - vi. How many people are in the centre? (in 2019)
 - vii. Who is in charge? (How is the hierarchical structure of this formal centre organised?)

MOTIVATION TO SUPPORT STUDENT ENTREPRENEURSHIP (PURPOSE)

- Could you please tell me something about the **historical motivation** to start supporting entrepreneurship among **students** at your university?
 - When did it start? (year: _____)
 - Who was involved **at the start**, who initiated this?
 - Students: _____
 - Student societies and organizations: _____
 - Alumni: _____
 - (Individual) professors, other faculty members: _____
 - University management (as strategy): _____
 - Regional parties/government: _____
 - Other parties: _____

- Why does your university support student entrepreneurship?⁴⁸ Indicate the extent to which the following reasons are why your university support student entrepreneurship.

Reasons	1 = Not a reason	2	3	4	5	6	7 = Main reason
To provide revenues for the university.							
To make the university more attractive to current or prospective students.							
To enhance the local/regional economic development.							
To decrease youth unemployment.							
Other _____							

In what follows, we will discuss several issues relating to the incubator or accelerator (program) at your university, as part of the student entrepreneurship support ecosystem.

INCUBATOR OR ACCELERATOR (PROGRAM) AS ACTOR/ELEMENT IN THE UNIVERSITY STUDENT ENTREPRENEURSHIP SUPPORT ECOSYSTEM

1) INCUBATOR OR ACCELERATOR (PROGRAM)⁴⁹ ACTORS

> *If multiple incubators or accelerators, please try to discuss each initiative separately.*

- Could you please tell me something about the **historical motivation** for setting up an incubator/accelerator (program) within your university?
 - When was it established? (year: _____)
 - Who established the incubator/accelerator (program), who initiated this?
 - Students
 - Alumni
 - (Individual) professors, other faculty members: _____
 - University management (as a strategy): _____
 - Regional parties/government: _____
 - Other parties: _____
- Why did these parties establish this incubator/accelerator (program)?

⁴⁸ Items based on: Wright, M., Mustar, P. & Siegel, D. (2019). Student Start-Ups: The New Landscape of Academic Entrepreneurship. World Scientific Series on Public Policy and Technological Innovation: Vol1 (p.1)

⁴⁹ Importance of entrepreneurial university for creation of student startups: Guerrero, M., Urbano, D., Cunningham, J. A., & Gajón, E. (2018). Determinants of Graduates' Start-Ups Creation across a Multi-Campus Entrepreneurial University: The Case of Monterrey Institute of Technology and Higher Education. Journal of Small Business Management, 56(1), 150-178.

Purpose

- What is the main aim of this incubator or accelerator (program)?
- Is this incubator or accelerator (program) also accessible for/targeted at students/student entrepreneurs?

Activities

- Please describe the activities of the incubator or accelerator (program) within your university. How does it work?
 - How does the selection process work? (e.g. competitive, open)
 - Which type of services and activities are offered in this incubator?
 - i. Is it tailored support or more general support?
 - What is the duration of the incubation program?

People

> Providers

- How many people are involved/employed in this incubator or accelerator (program)?
 - Is this number satisfactory – too low – too high?
- Which people are involved/employed in this incubator or accelerator (program)?
 - What roles do these people perform in this incubator?
 - Are these people full-time employees in this incubator?

> Receivers

- How many companies (businesses) or people participate in this incubator or accelerator (program) yearly (in 2019)?
- How many students participate in this incubator or accelerator (program) yearly (in 2019)?

Structure

- Please tick the option that best describes the ownership structure of this incubator or accelerator (program).⁵⁰
 - The incubator or accelerator (program) is fully owned by the university
 - The incubator or accelerator (program) is owned by a range of actors, including_____

⁵⁰ Items based on: Good, M., Knockaert, M., Soppe, B., & Wright, M. (2019). The technology transfer ecosystem in academia. An organizational design perspective. *Technovation*, 82, 35-50

- Please tick the option that best describes the governance structure of this incubator or accelerator (program).⁵¹
 - The incubator or accelerator (program) is fully governed by the university
 - The incubator or accelerator (program) is governed by a range of actors, including _____
- Where is this incubator or accelerator (program) physically located?
 - In the university science park or research park
 - In the TTO
 - Somewhere else on the university campus: _____
 - Somewhere else off the university campus: _____
 - The incubator or accelerator (program) has no physical location

Evaluation

- How do you track/monitor and evaluate the performance of this incubator/accelerator (program)?
- How do you perceive the effectiveness of the incubator or accelerator (program) at your university?
- What works well? What are the current success factors of this incubator or accelerator (program)?
- How can this incubator or accelerator (program) be improved?
- Are there support activities that are lacking?

Best practice

- In your view, which public university in South Africa has the best incubator/accelerator (program)?

COLLABORATION AMONG DIFFERENT ACTORS IN SUPPORTING STUDENT ENTREPRENEURSHIP (ALL INTERVIEWEES)

- Does **collaboration (do relationships) exist between the different actors** within your university's student entrepreneurship support ecosystem?⁵² (i.e. student entrepreneurship support actors, formal entrepreneurship education actors, technology transfer office actors, incubator or accelerator (program) actors and the university's venture fund).
 - If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Did such collaborations exist in the past but not anymore? Why do these collaborations no longer exist?
 - iii. What are the current implications of not collaborating?
 - iv. Are there plans to collaborate in the future? Why (not)?

⁵¹ Items based on: Good, M., Knockaert, M., Soppe, B., & Wright, M. (2019). The technology transfer ecosystem in academia. An organizational design perspective. *Technovation*, 82, 35-50

⁵² See: Good, M., Knockaert, M., & Soppe, B. (2019). A typology of technology transfer ecosystems: how structure affects interactions at the science–market divide. *The Journal of Technology Transfer*, 1-27.

- If yes:
 - i. Which elements/actors are centralised? Which elements/actors are organised, operated by the same people?
 - ii. What elements/actors are in contact/collaborate with each other?
 - iii. What does this contact involve? How and on what do they collaborate?
 - iv. How frequent is this contact/collaboration?
- Are there any elements/actors within the university’s student entrepreneurship support ecosystem that are physically co-located?⁵³
 - If no:
 - i. Why not?
 - ii. What are the implications thereof?
 - If yes:
 - i. How are they co-located?
 - ii. What are the benefits thereof?

Evaluation

- How do you perceive the effectiveness of the collaboration between the different actors that support student entrepreneurship within your university?
- What works well? What are the current success factors in this collaboration?
- How can these collaborations be improved?

ENTREPRENEURSHIP SUPPORT OUTSIDE UNIVERSITY (ALL INTERVIEWEES)

1) SUPPORT ACTORS

	Yes / No / Unsure
• Are you aware of any local or regional actors (outside the university, e.g. providers of finance, subsidies, consulting, mentoring, business plan development) that support student entrepreneurship?	
• Is your university in touch with local or regional actors that support student entrepreneurship?	

- If your university is **not in touch** with local or regional actors supporting student entrepreneurship: :
 - i. Why not? What are the (historical) barriers?
 - ii. Are there plans to engage with these actors in the future? Why (not)?
- If your university **is in touch** with local or regional actors supporting student entrepreneurship:
 - i. Please specify these particular actors: _____

⁵³ See: Good, M., Knockaert, M., & Soppe, B. (2019). A typology of technology transfer ecosystems: how structure affects interactions at the science–market divide. *The Journal of Technology Transfer*, 1-27.

- ii. How do these actors support the students at your university? (e.g. provide finance, subsidies, consulting, mentoring, business plan development)
 - iii. How do these actors collaborate with the university?
- Does your university collaborate with **other universities** in South Africa and/or worldwide to support student entrepreneurship?
 - If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Are there plans to collaborate more in the future? Why (not)?
 - If yes:
 - i. With which universities?
 - ii. What does this collaboration involve?

Evaluation

- How do you perceive the effectiveness of local or regional actors that support student entrepreneurship?
 - What works well?
 - How can the effectiveness of local and regional actors supporting student entrepreneurs be improved?
 - Are there support activities that are lacking?
- How do you perceive the effectiveness of your university's collaboration with the local or regional actors that support student entrepreneurship?
 - What works well?
 - How can the effectiveness of the collaboration between your university and local or regional actors supporting student entrepreneurs be improved?
 - Are there support activities that are lacking?
- How do you perceive the effectiveness of your university's collaboration with other universities to support student entrepreneurship?
 - What works well?
 - How can the effectiveness of the collaboration between your university and other universities be improved to support student entrepreneurship?
 - Are there support activities that are lacking?

2) EXTERNAL ENVIRONMENT & NATIONAL CONTEXT

- Please elaborate on:
 - The national government's policy **stances** toward student entrepreneurship
- Are there any other environmental/contextual factors that influence student entrepreneurship in South Africa?
- Are there any other environmental/contextual factors that influence student entrepreneurship at your university?
- General environment characteristics
 (To be completed by the interviewer prior to undertaking the interview)⁵⁴

Innovation scores in the region	
Unemployment in the region	
Income level in the region	
Economic growth (GDP) in region	
Industry focus in the region	
Poverty index	
Urban / rural environment	
Infrastructure index	
Ease of doing business index	

OUTCOMES

In sum

- What are the **most significant barriers or challenges preventing students** from your university from actually starting a business?
- What is the **most important support** needed by students from your university to assist them in starting a business successfully?
- How does your university aim to **finance** this support needed by students?
- Do you think the **university is successful** in providing the support needed by students to start a business?

⁵⁴ These categories are taken from: Huyghe, A., Knockaert, M., Wright, M., & Piva, E. (2014). Technology transfer offices as boundary spanners in the pre-spin-off process: The case of a hybrid model. *Small Business Economics*, 43(2), 289-307.

Please elaborate on:

- Whether student start-ups are monitored by your university.
- If yes: How?
- If no: Why not?
- The number of student start-ups created within your university.
- The amount of funds these student start-ups have raised.
- The number of jobs these student start-ups have created.
- The financial performance of these student start-ups.
- The successful and unsuccessful exits of student start-ups.

ANNEXURE L: INTERVIEW PROTOCOL - TECHNOLOGY TRANSFER OFFICE STAFF

GENERAL INFORMATION – ALL INTERVIEWEES

Respondent name	
Respondent university affiliation	
Respondent function	
Respondent involvement with entrepreneurship	
Respondent E-mail address	
Respondent contact address	
Date of interview	

- Gender:
- Home language (English / other: _____)

INTRODUCTORY QUESTIONS ABOUT UNIVERSITY – ALL INTERVIEWEES

- General University Characteristics
(Interviewer will fill this out before the interview, and verify during the interview)⁵⁵

Founding year	
Position in the academic ranking of world universities E.g. Webometrics ⁵⁶	
Number of faculties/schools	
Number of students	
Number of staff	
Does this university have a partner business school?	Yes / No

- Do you perceive **entrepreneurship to be embedded in the mission** (as reflected in the mission statement) of your university?

⁵⁵ These categories are taken from: Huyghe, A., Knockaert, M., Wright, M., & Piva, E. (2014). Technology transfer offices as boundary spanners in the pre-spin-off process: The case of a hybrid model. *Small Business Economics*, 43(2), 289-307.

⁵⁶ Source: Webometrics. 2020. *Ranking Web of Universities*. [Online]. Available: <http://www.webometrics.info/en>

- My university's mission focuses on:⁵⁷

	1 = Strongly disagree	2	3	4 = Neither agree, nor disagree	5	6	7 = Strongly agree
Generating jobseekers							
Publishing papers with practical implications							
Knowledge transfer (patents, licenses, spin-offs)							
Contributing to regional and social development							
Promoting an entrepreneurial culture							
Generating entrepreneurs							
Publishing scientific, peer-reviewed papers							
Academic excellence (research and teaching)							
Consulting and contract research with industry							
Supporting students to become entrepreneurs							

- Why does your university's mission (not) focus on a specific area?

*In what follows, we will discuss some **general issues and questions relating to entrepreneurship support and student entrepreneurship support at your university.***

UNIVERSITY (STUDENT) ENTREPRENEURSHIP SUPPORT – ALL INTERVIEWEES

- How important do you perceive entrepreneurship to be at your university?
(1 = not important at all, 7 = extremely important)

1 = Not important at all	2	3	4	5	6	7 = Extremely important

- Why have you allocated this level of importance to entrepreneurship at your university?

⁵⁷ First 9 items: Huyghe, A., & Knockaert, M. Final item on student entrepreneurship added.

- Please indicate your level of agreement with the following statement.⁵⁸
(1 = strongly disagree, 7 = strongly agree)

	1	2	3	4	5	6	7
My university supports entrepreneurship among students .							

- If disagree (i.e. more on the left side):
 - Why is entrepreneurship among students not supported? What are the (historical) barriers?
 - Lack of top management commitment
 - Lack of policy
 - Lack of entrepreneurship promotor/champion
 - Lack of funding
 - Lack of faculty interest
 - Lack of student interest
 - Lack of legitimate staff entrepreneurs
 - Lack of legitimate student entrepreneurs
 - Please elaborate
 - ii. Was such support previously provided? (If yes, why is your university no longer offering this support?)
 - iii. What are the implications of not supporting entrepreneurship?
 - iv. Are there plans to offer such support in the future?

- Please indicate your level of agreement with the following statements.⁵⁹
(1 = strongly disagree , 7 = strongly agree)

	1	2	3	4	5	6	7
My university dedicates much resources to support student entrepreneurship.							

- Which resources does your university dedicate to supporting student entrepreneurship?
- Why are no resources dedicated to supporting student entrepreneurship?

	1	2	3	4	5	6	7
My university supports students at the earlier stages of the venture creation process (i.e. aspiring and nascent entrepreneurs).							
My university supports students who are already at the later stages of the venture creation process (i.e. active entrepreneurs).							

- Why does your university (not) support student entrepreneurs at a particular stage?

⁵⁸ Own development of items. i.e. this is no construct, this is just to avoid simple 'yes/no' answers.

⁵⁹ Own development of items. i.e. this is no construct, this is just to avoid simple 'yes/no' answers.

	1	2	3	4	5	6	7
My university supports students who operate informally (i.e. unregistered business).							
My university supports students who operate formally (i.e. a registered business).							

- Why does your university (not) support student entrepreneurs who operate formally (informally)?

	1	2	3	4	5	6	7
My university supports multidisciplinary collaborations among (prospective) student entrepreneurs.							

- Why does your university (not) support multidisciplinary collaboration among (prospective) student entrepreneurs?
- How does your university support multidisciplinary collaboration among (prospective) student entrepreneurs?

	1	2	3	4	5	6	7
My university supports as many student entrepreneurs as possible.							
My university supports a limited number of student entrepreneurs.							
My university only supports student entrepreneurs that meet certain criteria .							
My university only supports student entrepreneurs who have business ideas that meet certain criteria .							

- Please indicate the description that best fits the university's strategy with regard to supporting student entrepreneurship.⁶⁰

<input type="checkbox"/> No strategy	- My university has no strategy.
<input type="checkbox"/> Low selective model	- The university is oriented towards maximising the number of student start-ups. - Generation of self-employment oriented student start-ups which only rarely grow beyond a critical size of employees.
<input type="checkbox"/> Supportive model	- Generation of a specific type of student start-up(s), who comply with specific selection criteria.
<input type="checkbox"/> Incubator model	- Generation of exit-oriented student start-ups, with potential growth opportunity, of potential interest to external investors.

⁶⁰ Items adjusted from Huyghe A.

People

> Providers

- How many people are currently concerned with supporting student entrepreneurship within your university? (in 2019)
 - Do you think this number is satisfactory - too low - too high?

- Who is currently concerned with supporting student entrepreneurship within your university?
 - Individual students: _____
 - Student societies and organizations: _____
 - Alumni: _____
 - (Individual) professors: _____
 - Other faculty members: _____
 - University management: _____
 - Technology transfer officers: _____
 - Other: _____
 - What are their functions? What do they do?
- How can people be encouraged to support student entrepreneurship at your university?

> Receivers

Please indicate your level of agreement with the following statements. Please elaborate on your answer. Please give examples if possible.⁶¹

(1 = strongly disagree, 7 = strongly agree)

	1	2	3	4	5	6	7
The students at my university are interested in entrepreneurship.							

- Why are students at your university in general (not) interested in entrepreneurship?
- How can your university increase student interest in entrepreneurship?

	1	2	3	4	5	6	7
The students at my university who are interested in entrepreneurship start a business during their studies.							

- When do student at your university generally start-up their business(s)?

⁶¹ Own development of items. i.e. this is no construct, this is just to avoid simple 'yes/no' answers.

	1	2	3	4	5	6	7
The student entrepreneurs at my university typically establish high technology start-ups.							

- Which type of businesses do students at your university typically start-up (in terms of sector, industry, technology intensity)?

	1	2	3	4	5	6	7
The student entrepreneurs at my university typically have high growth intentions.							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the university community.							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the business community (e.g. investors, banks, suppliers).							

- Why (not)?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the community in general (e.g. family, friends, consumers, peers).							

- Why (not)?

- Please indicate your inclination toward the opposing statements.
(1 = strong inclination toward left statement, 7 = strong inclination toward right statement)

	1	2	3	4	5	6	7	
The student entrepreneurs of this university are typically necessity-driven.								The student entrepreneurs of this university are typically opportunity-driven.

- Why?

	1	2	3	4	5	6	7	
The student entrepreneurs of this university typically operate informally (e.g. unregistered business).								The student entrepreneurs of this university typically operate formally (e.g. registered business).

- Why?

Structure

- Is there a **formal, centralised team/centre** within your university that is concerned with supporting student entrepreneurship, or is the support for student entrepreneurship at your university more **informal and decentralised**?
 - There is no structure:
 - i. Why not?
 - If informal and decentralised:
 - ii. Why?
 - iii. How are activities concerned with supporting student entrepreneurship organised right now?
 - iv. Are there plans to centralise everything concerning student entrepreneurship support in the future?
 - If formal and centralised:
 - v. Since when?
 - vi. How many people are in the centre? (in 2019)
 - vii. Who is in charge? (How is the hierarchical structure of this formal centre organised?)

MOTIVATION TO SUPPORT STUDENT ENTREPRENEURSHIP (PURPOSE)

- Could you please tell me something about the **historical motivation** to start supporting entrepreneurship among **students** at your university?
 - When did it start? (year: _____)
 - Who was involved **at the start**, who initiated this?
 - Students: _____
 - Student societies and organizations: _____
 - Alumni: _____
 - (Individual) professors, other faculty members: _____
 - University management (as strategy): _____
 - Regional parties/government: _____
 - Other parties: _____

- Why does your university support student entrepreneurship?⁶² Indicate the extent to which the following reasons are why your university support student entrepreneurship.

Reasons	1 = Not a reason	2	3	4	5	6	7 = Main reason
To provide revenues for the university.							
To make the university more attractive to current or prospective students.							
To enhance the local/regional economic development.							
To decrease youth unemployment.							
Other _____							

In what follows, we will discuss several issues relating to the technology transfer office at your university, as part of the student entrepreneurship support ecosystem.

TECHNOLOGY TRANSFER OFFICE AS ACTOR/ELEMENT IN THE UNIVERSITY STUDENT ENTREPRENEURSHIP SUPPORT ECOSYSTEM

1) TECHNOLOGY TRANSFER OFFICE (TTO) ACTORS

Purpose

- Could you please tell me something about the historical motivation for starting the TTO within your university?
 - When was it established? (year: _____)
 - Who was involved at the start, who initiated this? (indicate & specify)
 - (Individual) professors, other faculty members: _____
 - University management (as a strategy): _____
 - Regional parties/government: _____
 - Other parties: _____
- What is the main aim of this TTO? What is the focus of this TTO?

⁶² Items based on: Wright, M., Mustar, P. & Siegel, D. (2019). Student Start-Ups: The New Landscape of Academic Entrepreneurship. World Scientific Series on Public Policy and Technological Innovation: Vol1 (p.1)

- To what extent are the following important objectives of this TTO? ⁶³

	1 = Not an objective	2	3	4	5	6	7 = Main objective
Act as a bridge between the university and the market environment.							
Protect university proprietary rights in order to generate returns.							
Support pre-commercialisation of inventions.							
Support local or regional economic development.							
Support students in commercialising ideas and engaging in entrepreneurship.							

- If supporting students is not an objective of this TTO, why not?

- Please tick the option that best describes the **technology transfer strategy** within your university. ⁶⁴

<input type="checkbox"/> Low selective model	- The mission is oriented towards maximising the number of entrepreneurial ventures - Generation of self-employment oriented start-ups which only rarely grow beyond a critical size of employees
<input type="checkbox"/> Supportive model	- The mission is oriented towards creating spin-outs as an alternative to licensing out intellectual property - Generation of profit-oriented spin-offs with the potential to grow
<input type="checkbox"/> Incubator model	- The trade-off is made between the use of a body of research to generate contract research versus spinning-off this research in a separate company - Generation of exit-oriented spin-offs

⁶³ First 4 items: Good, M., Knockaert, M., Soppe, B., & Wright, M. (2019). The technology transfer ecosystem in academia. An organizational design perspective. *Technovation*, 82, 35-50.

Final item added on student entrepreneurship: Wright, M., Siegel, D. S., & Mustar, P. (2017). An emerging ecosystem for student start-ups. *The Journal of Technology Transfer*, 42(4), 909-922. P.

⁶⁴ Items from Huyghe A.

Activities

- Does the TTO within your university engage in the following activities?⁶⁵

	Yes / No / Unsure
Encouraging the participation of researchers in technology commercialisation	
Identifying high potential technologies	
Securing funding or other resources where more research is required	
Determining an intellectual property rights strategy and securing intellectual property rights for university-based inventions	
Assessing the commercialisation potential of technologies	
Determining the ideal commercialisation strategy relating to licensing, spin-offs and research contracts	
Developing a licensing strategy	
Engaging in spin-off creations	
Engaging in both internal and external network building: connecting with industry actors, business support organisations, government representatives, and researchers	
Engaging in student entrepreneurship	
Other: _____ _____	

- If ‘engage in student entrepreneurship’ = ‘Yes’: how does this TTO support student entrepreneurship?
- Has the TTO within your university previously generated any student spin-offs⁶⁶?
 - Yes (number: _____)
 - No, (reason: _____)
 - The university does not track spinoff activity
 - I don’t know

People

- How many people are employed in this TTO? (in 2019, in FTE)
 - Is this number satisfactory – too low – too high?
 - If too low:
 - Why?
 - If too high:
 - Why?

⁶⁵ Items based on: Good, M., Knockaert, M., Soppe, B., & Wright, M. (2019). The technology transfer ecosystem in academia. An organizational design perspective. *Technovation*, 82, 35-50.

⁶⁶ With a university spinoff = A firm created to commercially exploit knowledge, technology or research results developed within a university.

- What skills do the TTO employees have (OR contribute to this office)?
- What skills are still lacking but necessary?
- How many students were helped/assisted by this TTO? (in 2019)

Structure

- Please tick the option that best describes the TTO within your university.⁶⁷
 - The TTO is internally integrated into the university administration.
 - The TTO is an external organisation, (partly) owned by non-university actors such as public or private actors.
 - The TTO is an external organisation owned by multiple universities.
 - None of the above, but: _____

- Please tick the option that best describes the TTO within your university.⁶⁸
 - The TTO is centralised in one central office.
 - The TTO is decentralised, and technology transfer officers are placed within faculties or specific research centres
 - A combination of the two above

- Please tick the option that best describes the TTO within your university.⁶⁹

<input type="checkbox"/> Traditional university structure	- The TTO is a department within the university structure. - It is run primarily by an assistant/vice president/director of the university and generally is funded by the research office.
<input type="checkbox"/> Nonprofit research foundation	- The TTO is a separate entity or part of a separate “research” entity outside of the university structure. - Research foundation is set by university/state government specifically to grant greater autonomy to conduct research.
<input type="checkbox"/> For-profit private extension	- The TTO is either part of university structure or a research foundation, with a private venture extension. - The private venture extension is generally focused on economic development and creating start-up companies.
<input type="checkbox"/> Other:	

⁶⁷ Items based on: Good, M., Knockaert, M., Soppe, B., & Wright, M. (2019). The technology transfer ecosystem in academia. An organizational design perspective. *Technovation*, 82, 35-50

⁶⁸ Items based on: Good, M., Knockaert, M., Soppe, B., & Wright, M. (2019). The technology transfer ecosystem in academia. An organizational design perspective. *Technovation*, 82, 35-50

⁶⁹ Items from: Huyghe, A., & Knockaert, M.

Evaluation

- How do you track/monitor and evaluate the performance of this TTO in general?
- How do you track/monitor and evaluate the performance of your university spin-offs?
- How do you perceive the effectiveness of the TTO at your university?
- What works well? What are the current success factors of this TTO?
- How can this TTO be improved?
- Are there support activities that are lacking?

Best practice

- In your view, which public university in South Africa has the best technology transfer office?

COLLABORATION AMONG DIFFERENT ACTORS IN SUPPORTING STUDENT ENTREPRENEURSHIP (ALL INTERVIEWEES)

- Does **collaboration (do relationships) exist between the different actors** within your university's student entrepreneurship support ecosystem?⁷⁰
(i.e. student entrepreneurship support actors, formal entrepreneurship education actors, technology transfer office actors, incubator or accelerator (program) actors and the university's venture fund).
 - If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Did such collaborations exist in the past but not anymore? Why do these collaborations no longer exist?
 - iii. What are the current implications of not collaborating?
 - iv. Are there plans to collaborate in the future? Why (not)?
 - If yes:
 - i. Which elements/actors are centralised? Which elements/actors are organised, operated by the same people?
 - ii. What elements/actors are in contact/collaborate with each other?
 - iii. What does this contact involve? How and on what do they collaborate?
 - iv. How frequent is this contact/collaboration?

⁷⁰ See: Good, M., Knockaert, M., & Soppe, B. (2019). A typology of technology transfer ecosystems: how structure affects interactions at the science–market divide. *The Journal of Technology Transfer*, 1-27.

- Are there any elements/actors within the university’s student entrepreneurship support ecosystem that are physically co-located?⁷¹
 - If no:
 - i. Why not?
 - ii. What are the implications thereof?
 - If yes:
 - i. How are they co-located?
 - ii. What are the benefits thereof?

Evaluation

- How do you perceive the effectiveness of the collaboration between the different actors that support student entrepreneurship within your university?
- What works well? What are the current success factors in this collaboration?
- How can these collaborations be improved?

ENTREPRENEURSHIP SUPPORT OUTSIDE UNIVERSITY (ALL INTERVIEWEES)

1) SUPPORT ACTORS

	Yes / No / Unsure
• Are you aware of any local or regional actors (outside the university, e.g. providers of finance, subsidies, consulting, mentoring, business plan development) that support student entrepreneurship?	
• Is your university in touch with local or regional actors that support student entrepreneurship?	

- If your university is **not in touch** with local or regional actors supporting student entrepreneurship: :
 - i. Why not? What are the (historical) barriers?
 - ii. Are there plans to engage with these actors in the future? Why (not)?
- If your university **is in touch** with local or regional actors supporting student entrepreneurship:
 - iv. Please specify these particular actors: _____
 - v. How do these actors support the students at your university? (e.g. provide finance, subsidies, consulting, mentoring, business plan development)
 - vi. How do these actors collaborate with the university?

⁷¹ See: Good, M., Knockaert, M., & Soppe, B. (2019). A typology of technology transfer ecosystems: how structure affects interactions at the science–market divide. *The Journal of Technology Transfer*, 1-27.

- Does your university collaborate with **other universities** in South Africa and/or worldwide to support student entrepreneurship?
 - If no:
 - i. Why not? What are the (historical) barriers?
 - ii. Are there plans to collaborate more in the future? Why (not)?
 - If yes:
 - i. With which universities?
 - ii. What does this collaboration involve?

Evaluation

- How do you perceive the effectiveness of local or regional actors that support student entrepreneurship?
 - What works well?
 - How can the effectiveness of local and regional actors supporting student entrepreneurs be improved?
 - Are there support activities that are lacking?
- How do you perceive the effectiveness of your university's collaboration with the local or regional actors that support student entrepreneurship?
 - What works well?
 - How can the effectiveness of the collaboration between your university and local or regional actors supporting student entrepreneurs be improved?
 - Are there support activities that are lacking?
- How do you perceive the effectiveness of your university's collaboration with other universities to support student entrepreneurship?
 - What works well?
 - How can the effectiveness of the collaboration between your university and other universities be improved to support student entrepreneurship?
 - Are there support activities that are lacking?

2) EXTERNAL ENVIRONMENT & NATIONAL CONTEXT

- Please elaborate on:
 - The national government's policy **stances** toward student entrepreneurship
- Are there any other environmental/contextual factors that influence student entrepreneurship in South Africa?
- Are there any other environmental/contextual factors that influence student entrepreneurship at your university?

- General environment characteristics
(To be completed by the interviewer prior to undertaking the interview)⁷²

Innovation scores in the region	
Unemployment in the region	
Income level in the region	
Economic growth (GDP) in region	
Industry focus in the region	
Poverty index	
Urban / rural environment	
Infrastructure index	
Ease of doing business index	

OUTCOMES

In sum

- What are the **most significant barriers or challenges preventing students** from your university from actually starting a business?
- What is the **most important support** needed by students from your university to assist them in starting a business successfully?
- How does your university aim to **finance** this support needed by students?
- Do you think the **university is successful** in providing the support needed by students to start a business?

Please elaborate on:

- Whether student start-ups are monitored by your university.
 - If yes: How?
 - If no: Why not?
- The number of student start-ups created within your university.
- The amount of funds these student start-ups have raised.
- The number of jobs these student start-ups have created.
- The financial performance of these student start-ups.
- The successful and unsuccessful exits of student start-ups.

⁷² These categories are taken from: Huyghe, A., Knockaert, M., Wright, M., & Piva, E. (2014). Technology transfer offices as boundary spanners in the pre-spin-off process: The case of a hybrid model. *Small Business Economics*, 43(2), 289-307.

ANNEXURE M: INTERVIEW PROTOCOL – STUDENT ENTREPRENEURS

GENERAL INFORMATION

Respondent name	
Respondent university affiliation	
Respondent E-mail address	
Respondent contact address	
Date of interview	

- Gender:
- Year of birth:
- Home language (English / Other: _____)

EDUCATION

- Could you please tell me something about your tertiary education?
 - In which year did you start your studies?
 - Which studies did/do you follow? What qualification are you studying towards?
 - In which faculty(ies) did you/are you enrolled?
 - Full-time/part-time student?
 - Undergraduate/postgraduate?

WORK EXPERIENCE

- Have you been employed before?
 - No:
 - Why not?
 - Yes:
 - Could you please tell me about your (employed) work experience so far?
 - What were your responsibilities/duties?
 - Full-time/part-time jobs?
 - Holiday jobs, weekend jobs?
- Have you previously started and run a business in which you are no longer involved in, or previously started and run a business that is no longer active?
 - How many?
 - Which business(es)? (what sector?)
 - When did you start this/these?
 - Is/are this/these business(es) still active?
 - If no:
 - Why is the business not active anymore?

- If yes:
 - Why are you not involved anymore?

STUDENT STARTUP

- Could you please tell me something about your current business(es)?
 - When established?
 - In which year of your studies?
 - What does your business(es) offer? Sector?
 - How much money did you require to start your business(es)?
 - Where did you obtain this money?
 - Family, friends, relatives: _____
 - Self-funded: _____
 - Loans: _____
 - Other: _____
 - Why did you start this/these business(es)?
- Indicate the extent to which the following are reasons why you have started your current business(es):

Reasons	1 = Not a reason	2	3	4	5	6	7 = Main reason
Allows me to do what I am passionate about.							
Allows me to experience personal fulfilment.							
Allows me to make a significant contribution to society.							
Gives me the freedom to do my own thing.							
Helps me to increase my personal income.							
I enjoy the challenge.							

- The formalisation of your business(es):
 - Did you develop a business plan before starting your business?
 - If no:
 - Why not?
 - If yes:
 - Why?
 - Did it contain a financial plan?
 - Did you find it beneficial to have a business plan?
 - Did you do any other form of planning?
 - Have you registered your business?
 - As a separate legal entity (CIPC - Companies and intellectual property commission)?

- SARS registration (e.g. employee tax, value-added tax, unemployment insurance fund, income tax, workmans compensation)?
- Employment in the business(es)
 - Do you have a co-founder(s) in your business(es)?
 - Can you tell me something about your co-founder(s) (i.e. skills, education, studies)
 - Where did you meet your co-founder(s)? How did your collaboration start?
 - How much time are you spending on your business(es)?

Amount of hours spent working on your business per day							
< 1	1-2	2-3	3-4	4-5	5-6	6-7	7 <

- Do you employ other people in your business?
 - If no:
 - Why not? (e.g. you do not need any employees; you cannot afford employees?)
 - If yes:
 - How many?
 - Are they formally employed (employment contracts) or informally employed (no employment contracts)?
- Performance of this business(es):
 - Do you monitor and evaluate the performance of your business(es)?
 - If no:
 - Why not?
 - If yes:
 - How?
 - Do you have a bookkeeping system? If no, why not? If yes, who does these books for you?
 - Do you prepare financial statements? If no, why not? If yes, who prepares these statements for you?
 - How much revenue (sales) did you generate during the last month (approximately)?
 - Compared to what you had in mind when starting this business,
 - Are your sales higher, lower or equal to what you expected?
 - Is your employment higher, lower or equal to what you expected?
 - Would you like to expand your business? Do you currently have any plans to expand?
 - Would you like this business to be your primary source of income in the future?
 - Where do you see yourself / the business(es) in five years?

CHALLENGES EXPERIENCED

In general

- Did you experience any challenges when starting up your business(es)?
 - If no:
 - What resources did you make use of that led to you not experiencing any challenges?
 - If yes:
 - What challenges did you experience?
 - Are you still experiencing these challenges?
 - If no: How did you overcome these challenges?
 - If yes: How do you cope with these challenges?
- Are there any other challenges that you experienced while running your business?
- Please indicate to what extent you have experienced each of the following challenges when starting up your business.
- Are you currently experiencing any of these challenges when operating your business?
 - If it was a challenge and is not anymore, how did you overcome it?
 - If it is still a challenge, how are you coping with it?

(1 = No challenge; 7 = Major challenge)

Challenge	The extent to which you experienced the challenge when you started up your business							The extent to which you are currently experiencing the challenge						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Lack of entrepreneurial knowledge														
Lack of finance														
Problems relating to employees														
Fear of failure														
Repaying school/university loans														
Lack of collateral														
Lack of contacts/network														
Irregular income														
Working long hours														
Lack of information about how to start a business														
Lack of information about government support														
Lack of practical business experience														
Lack of self-confidence														
Lack of business ideas														
Unable to access the market														
Compliance with statutory requirements														
Lack of legal aid/counselling														
Lack of encouragement from people around me														

The university

- How can the university assist you in overcoming these challenges?
- Do you experience any challenges specific to the university environment (e.g. university policy that makes it harder to start a business, the university that does not provide operating/working space)?
 - How can the university address these challenges?

Perception of student entrepreneurs

Please indicate your extent of agreement with each of the following statements. Please elaborate on your answer. Please give examples if possible.⁷³

(1 = strongly disagree, 7 = strongly agree)

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the university community.							

- Why?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the business community (e.g. investors, banks, suppliers).							

- Why?

	1	2	3	4	5	6	7
Student entrepreneurs are seen as legitimate entrepreneurs by the community in general (e.g. family, friends, consumers, peers).							

- Why?

SUPPORT RECEIVED

Internal support – university

First general,

- Does your university motivate students to become entrepreneurs?
 - If no:
 - Why do you think that?
 - If yes:
 - How do they motivate students to become entrepreneurs?
- Does your university support student entrepreneurs?
 - If no:

⁷³ Own development of items. i.e. this is no construct, this is just to avoid simple ‘yes/no’ answers.

- Why do you think that?
- If yes:
 - What support does your university offer to student entrepreneurs?
 - Have you ever used any of this support?
 - What was your experience with this support?
 - How useful was this support?
 - Did you or your business benefit from making use of this support? How?

Support	Does your university offer this?	Have you ever used it?	How useful was the support?						
	Yes / No / Unsure		1 = Not useful at all	2	3	4	5	6	7 = Very useful
Entrepreneurship education		Number of modules completed?							
An entrepreneurship centre		Number of visits per month?							
A technology transfer office		Frequency of interaction?							
An incubator/accelerator (program)		Frequency of interaction?							
A university venture fund ⁷⁴		Frequency of interaction?							
Provision of material support: Office and workspace		Duration?							
Provision of material support: Meeting facilities		Number of time used per month?							
Provision of material support: Startup capital, seed-funding		How much?							
Business plan competition									
Pitching competition									
Mentorship (who is this?)		Number of visits a month?							
Networking events		How much a month?							
Entrepreneurship bootcamps		Duration?							
Individual counselling, advice, coaching > What kind? What topics?		How much a month?							
Extra-curricular seminars/workshops > What kind? What topics?		How much a month?							

⁷⁴ i.e. investment funds that have a deliberate mission to fund ventures related to the university (Good *et al.*, 2019)

Support	Does your university offer this?	Have you ever used it?	How useful was the support?						
	Yes / No / Unsure		1 = Not useful at all	2	3	4	5	6	7 = Very useful
A student entrepreneurship support organisation/society									
A student entrepreneurship policy		Have you read it?							
A student entrepreneurship week		Have you participated?							
An entrepreneurship intervarsity competition		Have you participated?							

External support (excluding the university)

- Have you received any other support in establishing your business?
 - If no:
 - Why not?
 - If yes:
 - From who?
 - What support did you receive?
- Are you currently receiving any other support in operating your business?
 - If no:
 - Why not?
 - If yes:
 - From who?
 - What support are you receiving?

In general,

- Does your government (local, regional and/or national) support student entrepreneurs?
 - If no:
 - Why do you think that?
 - If yes:
 - What initiatives are you aware of?
 - Have you used any of these initiatives?
 - What is (was) your experience with regard to these initiatives?
- Does the business community (e.g. investors, banks, suppliers) support student entrepreneurs?
 - If no:
 - Why do you think that?
 - If yes:
 - What support do they provide?
 - Have you used any of the support they provide?
 - What is (was) your experience with regard to this support offered?

ANNEXURE N: INVIVO CODING BOOK

University	Meaning Units	Condensation	Codes/Items
Uni-A	The focus of the workshops is to help aspiring and practising entrepreneurs to unpack and explore their business ideas, devise their strategy and craft a compelling story.	Workshop aims to help aspiring and practising entrepreneurs to unpack and explore their business ideas.	Entrepreneurship Workshops
Uni-A	The competition presented teams with a realistic simulated business scenario in which they had to provide marketing strategy and operations support.	In the competition students had to develop a marketing strategy and business plan for a company.	Entrepreneurship Competitions
Uni-A	Collaborative competitions to promote entrepreneurship among their respective students, and their surrounding communities.	This pitching competition promotes entrepreneurship among students.	Entrepreneurship Competitions
Uni-A	Wow the judges with their ideas and businesses that have the potential to change the world, change the lives of others and create jobs.	Wow the judges with their ideas and businesses.	Entrepreneurship Competitions
Uni-A	Entrepreneurship and Empowerment in South Africa (EESA) programme is aimed at addressing the shortfall in entrepreneurial success in South Africa by aiding small businesses in developing sound business skills, thereby growing their businesses.	Aimed at addressing the shortfall in entrepreneurial success in South Africa.	Practical Entrepreneurship Programmes
Uni-A	Student attends GESS, a joint programme of Munich's university entrepreneurship centres organised by the Social Entrepreneurship Akademie in cooperation with Tecnológico de Monterrey (Mexico), Tongji University (China) and LifeCo UnLtd South Africa.	A joint programme of Munich's university entrepreneurship centres organised by the Social Entrepreneurship Akademie.	International Presence
Uni-A	International Entrepreneurship Forum was led by the University of Essex Business School and co-organised with Uni-A.	International Entrepreneurship Forum was led by the University of Essex Business School and co-organised with Uni-A.	International Collaboration
Uni-A	Support and facilitate the protection and commercialisation Intellectual Property (IP) and promoting entrepreneurship and innovation.	Focus on intellectual property and commercialisation.	Technology Transfer Office
Uni-A	The first design and entrepreneurship incubator store of its kind in South Africa.	The first design and entrepreneurship incubator.	Incubators

Uni-A	A mini biotechnology incubation programme was designed where the students are introduced to the fundamentals of taking a biotechnology concept to market.	A mini biotechnology incubation programme.	Incubation Programmes
Uni-A	An innovation challenge for students across faculties with interest in social innovation and entrepreneurship.	Challenge for students with interest in social innovation and entrepreneurship.	Entrepreneurship Competitions
Uni-A	The Entrepreneurship Initiative offers a variety of activities to develop the entrepreneurial skills of the student community.	Offers a variety of activities to develop the entrepreneurial skills of the student community.	Entrepreneurship Initiatives
Uni-A	To consolidate, coordinate and synergise entrepreneurship activities	To consolidate, coordinate and synergise entrepreneurship activities	Centre for Entrepreneurship
Uni-A	Entrepreneurship Programme received R1.2 million rand to invest in and support start-up businesses.	Received R1.2 million rand to invest in and support start-up businesses.	Entrepreneurship Funding
Uni-A	Week aims to raise awareness of entrepreneurship as a career option, business growth and to unpack why and how “Entrepreneurship is a Career.”	Week aims to raise awareness of entrepreneurship as a career option.	Student Entrepreneurship Week
Uni-A	Programme could help reduce the youth unemployment rate - and empower a new generation of entrepreneurs, especially in rural communities.	Help reduce the youth unemployment rate - and empower a new generation of entrepreneurs.	Practical Entrepreneurship Programmes
Uni-A	The Entrepreneurship Initiative Seminar focused on making the most of every opportunity and using every resource possible.	Seminar focused on making the most of every opportunity and using every resource possible.	Entrepreneurship Seminar
Uni-A	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-A	An institutional priority is to expand opportunities for entrepreneurship at the university.	Priority is to expand opportunities for entrepreneurship.	Entrepreneurship Strategic Plan
Uni-B	Leading business incubator to convert innovations and technologies into sustainable, commercially viable businesses.	Convert innovations and new technologies into sustainable and commercially viable businesses.	Incubators
Uni-B	The aim of the technology transfer unit is to promote innovation, technology transfer and entrepreneurship.	Promote innovation, technology transfer and entrepreneurship.	Technology Transfer Office
Uni-B	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-B	Commit to developing and promoting sustainable social entrepreneurship through mentorship and strategic partnerships with Industry, Government, and Community.	To commit to developing and promoting sustainable social entrepreneurship.	Centre for Social Entrepreneurship

Uni-B	Hosted its first entrepreneurship pitching workshop.	Entrepreneurship pitching workshop.	Entrepreneurship Workshops
Uni-B	The centre offers both theoretical and technical entrepreneurial learning, support and activities to students, neighbouring community and local entrepreneurs.	Offers both theoretical and technical entrepreneurial learning, support and activities.	Centre for Entrepreneurship
Uni-B	Hosted its second annual Student Entrepreneurship week.	Second annual Student Entrepreneurship week.	Student Entrepreneurship Week
Uni-B	Programme aimed at developing businesses who are still on a start-up level and accelerating those who are already operating.	Programme aimed at developing businesses.	Practical Entrepreneurship Programmes
Uni-B	The aim was to ignite students about Germany perspective on entrepreneurship and student support.	Ignite students about Germany perspective on entrepreneurship and student support.	International Collaboration
Uni-B	The workshop aimed at equipping students with industry-based skills from experts in their field.	Aimed at equipping students with industry-based skills.	Entrepreneurship Workshops
Uni-B	The university hosted a 6-week business start-up training aimed at filling the knowledge gap on the practical skills and knowledge required to launch a business.	Hosted a 6 weeks business start-up training.	Entrepreneurship Workshops
Uni-B	The main objective of the Entrepreneurship boot camp was to teach entrepreneurship in a fun, impactful, engaging and practical manner that is slightly different from the traditional method of teaching and learning.	To teach entrepreneurship in a fun, impactful, engaging and practical manner.	Entrepreneurship Workshops
Uni-B	Entrepreneurship Day is an event to help stir, instil and enhance entrepreneurship interest among students through exhibitions, business talks and panel discussions.	An event to help stir, instil and enhance entrepreneurship interest among students.	Entrepreneurship Initiatives
Uni-B	Presented a Business and Entrepreneurship Seminar.	Presented a Business and Entrepreneurship Seminar.	Entrepreneurship Seminar
Uni-B	Competition aimed at promoting innovation and entrepreneurship within the agricultural sector.	Competition aimed at promoting innovation and entrepreneurship within the agricultural sector.	Entrepreneurship Competitions
Uni-B	We will build an enabling environment that supports dynamic curricula that inspire innovation and entrepreneurship.	Build an enabling environment that inspires innovation and entrepreneurship.	Entrepreneurship Strategic Plan
Uni-C	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies

Uni-C	The two-day workshop was one of many being held across the country, with a focus on matters such as entrepreneurship, leadership, project management, identifying projects and upscaling projects.	Workshop focused on matters such as entrepreneurship, leadership, project management, identifying projects and upscaling projects.	Entrepreneurship Workshops
Uni-C	This workshop runs entrepreneurs-to-be through the Business Model Canvas and the Growth Wheel.	Workshop runs entrepreneurs-to-be through the Business Model Canvas and the Growth Wheel.	Entrepreneurship Workshops
Uni-C	The university hosted their student entrepreneurship week for students who want to become employers, rather than employees.	The university hosted their student entrepreneurship week.	Student Entrepreneurship Week
Uni-C	Hosts pitching sessions on the last Friday of every month.	Pitching Sessions on the last Friday of every month.	Entrepreneurship Competitions
Uni-C	For early-stage business concepts, prototypes and businesses from students looking to validate their concepts or improve their technology offering to their market and gain traction for the solution they are currently working on.	For early-stage business concepts, prototypes and businesses from students looking to validate their concepts or improve their technology offering.	Incubators
Uni-C	Manage the commercialisation of the University's innovation and intellectual property portfolio through patenting, licensing and the formation of spin-out companies.	Focus on intellectual property and commercialisation.	Technology Transfer Office
Uni-C	This programme aims to equip students with the necessary business skills required to produce successful entrepreneurs.	Aims to equip students with the necessary business skills required to produce successful entrepreneurs.	Practical Entrepreneurship Programmes
Uni-C	Student entrepreneurs are invited to submit their innovative ideas and businesses for this unique opportunity offered by the EDHE intervarsity competition.	Student entrepreneurs are invited to submit their innovative ideas and businesses for this unique opportunity.	Student Entrepreneurship Intersarsity
Uni-C	An institutional goal is to create an entrepreneurial culture that advances innovation institutionally.	Create an entrepreneurial culture that advances innovation institutionally.	Entrepreneurship Strategic Plan
Uni-C	Student was crowned the South African Champion of the Global Student Entrepreneur Awards.	Student crowned the South African Champion of the Global Student Entrepreneur Awards.	International Presence
Uni-C	Start-up incubator, founded for university spin-outs and also incubates start-ups from the start-up ecosystem and partner universities in South Africa and Africa.	Start-up incubator that incubates start-ups from the start-up ecosystem.	Incubators
Uni-C	An opportunity to receive a share of R150 000 in seed capital.	A share of R150 000 in seed capital.	Entrepreneurship Funding

Uni-D	Student Entrepreneurship Week 2019 (SEW2019), took place through which the students were able to learn from their peers and see what they are up to, as well as having the opportunity to gain the in-demand skills of design thinking.	Student Entrepreneurship Week 2019 (SEW2019).	Student Entrepreneurship Week
Uni-D	University hosted the values-driven entrepreneurship and societal conference this year.	Values-driven entrepreneurship and societal conference	Entrepreneurship Conferences
Uni-D	Academic centre in Africa dedicated to advancing social innovation and entrepreneurship.	Centre dedicated to advancing social innovation and entrepreneurship.	Centre for Social Entrepreneurship
Uni-D	The university has a Technology transfer office to create new IP's fit for industry adaptation which provides mentoring, business plan reviews, formal IP protection, and administers various forms of seed funding to aspiring entrepreneurs.	Mentoring, business plan reviews, formal IP protection, and administration of various forms of seed funding to aspiring entrepreneurs are offered.	Technology Transfer Office
Uni-D	Our mission is to inspire, nurture and equip the next generation of leaders to build a better future by supporting to entrepreneurs to learn and grow, providing them with access to resources, corporate partners, mentors, advisory services, co-working space, speakers, and partnerships.	Support entrepreneurs to learn and grow, providing them with access to resources, corporate partners, mentors, advisory services, co-working space, speakers, and partnerships.	Centre for Entrepreneurship
Uni-D	The competition is an event that gives students a chance to pitch their business or business idea and stand a chance of winning a monetary and mentorship prize.	Gives students the chance to pitch their business or business ideas.	Entrepreneurship Competitions
Uni-D	The 12-week, mentor-led incubation programme combines mentorship, workshops and a community of start-ups to create a holistic approach to testing and validating a business model.	Incubation Programme that is designed to help entrepreneurial teams to test and validate their business models.	Incubation Programmes
Uni-D	An initiative of the Entrepreneurship Development in Higher Education (EDHE) programme, Entrepreneurship Intersociety Competition, with the purpose to identify the top student entrepreneurs at each public university, to recognise and showcase their businesses, and to prompt investment is hosted at the university.	Purpose of the competition is to identify the top student entrepreneurs at each public university, to recognise and showcase their businesses, and to prompt investment.	Student Entrepreneurship Intersociety
Uni-D	Entrepreneurship societies exist at the university such as <i>The Entrepreneurship Society</i> and <i>Enactus</i> .	Entrepreneurship Society and Enactus.	Entrepreneurship Societies

Uni-D	The lunches bring together investors and funders, typically within a particular sector, but that sector is loosely defined so that a broad mix of interests and capabilities can interchange.	Initiative to bring inventors in contact with funders and industry.	Entrepreneurship Initiatives
Uni-D	A high-level objective is to expand opportunities for developing entrepreneurial skills.	objective to expand opportunities for developing entrepreneurial skills.	Entrepreneurship Strategic Plan
Uni-D	Practical workshops focusing on desirability, feasibility and the viability of businesses.	Workshops focusing on desirability, feasibility and the viability of a business.	Entrepreneurship Workshops
Uni-D	The Student Seed Fund is an initiative that provided funding to 26 early-stage student ventures.	Initiative that provided funding to stage student ventures.	Entrepreneurship Funding
Uni-E	Entrepreneurship and Innovation Seminar aimed at presenting and discussing best practices on how best to nurture entrepreneurship among the student population.	Entrepreneurship and Innovation Seminar aimed at presenting and discussing best practices.	Entrepreneurship Seminar
Uni-E	Entrepreneurship society at the university, Enactus.	Enactus	Entrepreneurship Societies
Uni-E	Student Entrepreneurship Week is presented in collaboration between the university's centre for entrepreneurship and management sciences.	The university presented a Student Entrepreneurship Week.	Student Entrepreneurship Week
Uni-E	This centre offers support for all stages of the start-up entrepreneurial cycle, including pre-incubation incubation and entry-level business support.	This centre offers support for all stages of the start-up entrepreneurial cycle.	Centre for Entrepreneurship
Uni-E	There are various incubation programmes offered by the centre for entrepreneurs at this university.	There are various incubation programmes available.	Incubation Programmes
Uni-E	This programme aims to promote regional innovation and entrepreneurship, as well as to develop capacity in technology entrepreneurship to address South Africa's current socio-economic challenges.	This programme aims to promote regional innovation and entrepreneurship.	Practical Entrepreneurship Programmes
Uni-E	Programme that aims to promote and stimulate the culture of innovation and entrepreneurship among the youth of South-Africa.	Programme that aims to promote a culture of innovation and entrepreneurship.	Practical Entrepreneurship Programmes

Uni-E	Assist with idea evaluation, market research, business plan development, intellectual property (IP) novelty searches, IP infringement searches, registration of patents, registration of trademarks, copyright protection, registration and support of start-up companies, licensing contracts, non-disclosure agreements, IP negotiations, consultation, assisting in product development and assisting with funding applications.	Focus on intellectual property and commercialisation.	Technology Transfer Office
Uni-E	This seed fund provides small capital injections for entrepreneurial start-up companies.	Provides small capital injections for entrepreneurial start-up companies.	Entrepreneurship Funding
Uni-E	Seeking opportunities for our entrepreneurs to share their ideas on international platforms.	Share ideas on international platforms.	International Presence
Uni-E	Competition offers students to become future employers and henceforth job creators by embracing the value of entrepreneurship as a career choice.	Competition offers students to become future employers.	Entrepreneurship Competitions
Uni-E	Boasts entrepreneurial initiatives aimed at empowering staff, students and community to become financially independent.	Boasts entrepreneurial initiatives.	Entrepreneurship Initiatives
Uni-F	Partake and attend the International Centre for Transformational Entrepreneurship (ICTE) conference.	Partake and attend the International Centre for Transformational Entrepreneurship (ICTE) conference.	Entrepreneurship Conferences
Uni-F	Developmental hub where students and staff will work in small groups in support of experts and lecturers to unlock their creative minds and develop their ideas into commercial products.	Developmental hub where students and staff can unlock their creative minds and develop their ideas into commercial products.	Centre for Entrepreneurship
Uni-F	Encouraged to participated in the innovation and entrepreneurship competition and presented their smart ideas.	Innovation and entrepreneurship competition where business ideas are pitched.	Entrepreneurship Competitions
Uni-F	Hosted its first pitching session to inculcate the entrepreneurial spirit and innovation amongst students	Hosted its first pitching session at the university.	Pitching Competition
Uni-F	The aim of the competition is to identify and support student entrepreneurs who have been able to establish their businesses, along with those who have innovative ideas that they would like to pursue while studying.	The aim is to identify and support student entrepreneurs who have been able to establish their businesses.	Student Entrepreneurship Intervarsity
Uni-F	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies

Uni-F	Hosted the 2nd International Conference on Entrepreneurship Development (ICED) under the theme: Sustainable Entrepreneurship Development for the 4th Industrial Revolution.	Hosted the 2nd International Conference on Entrepreneurship Development (ICED).	Entrepreneurship Conferences
Uni-F	A youth entrepreneurship development programme aimed at investing and supporting young entrepreneurs in building sustainable and economically viable enterprises.	Programme aimed at investing and supporting young entrepreneurs.	Practical Entrepreneurship Programmes
Uni-F	Two international experts from Finland and France helped us explore the role of innovation-driven partnerships in promoting entrepreneurship and regional development.	International experts helped us explore the role of innovation-driven partnerships in promoting entrepreneurship.	International Collaboration
Uni-F	By making technology and expertise available to the entrepreneur through the Science Park, the development of new business in the region is encouraged and jobs are created.	Science Park makes technology and expertise available to entrepreneur.	Science Park
Uni-F	We develop new ideas into products, or improve existing products with detailed engineering, in this way we support businesses and individuals through the entire new product development process.	Develop new ideas into products, or improve existing products with detailed engineering.	Incubators
Uni-F	Can be used to enable grassroots inventions by providing a platform where anyone can have access to advanced tools that can help people make products to address local needs.	Access to advanced tools that can help people make products to address local needs.	Incubation Programmes
Uni-F	The focus of the technology and innovation unit focuses on technology transfer, intellectual property, commercialisation and incubation at the university.	Focuses on technology transfer, intellectual property, commercialisation and incubation.	Technology Transfer Office
Uni-G	The Entrepreneurship Week is an opportunity for students to get excited, motivated and market their products/business idea at the largest entrepreneurship exhibition for start-ups and innovators.	A week where students can get excited, motivated and market their products/business idea.	Student Entrepreneurship Week
Uni-G	Centre that offers integrated entrepreneurial development services aimed at building the culture of entrepreneurship, developing start-ups and existing businesses for increased employment and participation in the economy such as short learning programme in entrepreneurship development; hosting entrepreneurial public lectures and events; and mobilising stakeholder support through value-adding partnerships.	Provide short learning programme in entrepreneurship development; hosting entrepreneurial public lectures and events; and mobilising stakeholder support through value-adding partnerships.	Centre for Entrepreneurship

Uni-G	Strategic intent is to be an internationally recognized centre of excellence in researching, educating, finding, supporting and developing social entrepreneurial projects within the social economy and promote scholarship in the emerging field of inquiry.	Centre of excellence in researching, educating, finding, supporting and developing social entrepreneurial projects	Centre for Social Entrepreneurship
Uni-G	The university has partnered with Glasgow Caledonian University (GCU), in Scotland, on the Common Good First pilot project to raise the profile of social entrepreneurship	Partnered with Glasgow Caledonian University (GCU), raise the profile of social entrepreneurship	International Collaboration
Uni-G	An initiative, in partnership with the National Youth Development Agency (NYDA), focused on developing fledgeling student business start-up ideas and nurturing business skills and life skills in equal measure among students between the ages of 18 and 35, thus growing future-fit entrepreneurship.	Focus on developing fledgeling student business start-up ideas and nurturing business skills	Entrepreneurship Initiatives
Uni-G	Initiative that aims to inject the entrepreneurial DNA in the student community by fostering an entrepreneurship culture that will impact the skills required to start a business.	Initiative that aims to inject the entrepreneurial DNA in the student community by fostering an entrepreneurship culture.	Entrepreneurship Initiatives
Uni-G	The university hosts a two-day Conference on Entrepreneurship themed "High-Tech Urban Agribusiness and Green Economy is Big Business: The Future of Gauteng Township Entrepreneurship Reimagined.	Conference on Entrepreneurship themed "High-Tech Urban Agribusiness and Green Economy is Big Business: The Future of Gauteng Township Entrepreneurship Reimagined.	Entrepreneurship Conferences
Uni-G	Student selected to attend the global entrepreneurship summit, which is a seven0day program where 105 global change-agents develop solutions to solve global challenges.	Student selected to attend the Global Entrepreneurship Summit.	International Presence
Uni-G	Student social entrepreneurship team competes in global semi-finals of Enactus competition in Toronto, Canada.	Team competes in global semi-finals of Enactus competition.	Entrepreneurship Competitions
Uni-G	Entrepreneurship society at the university, Enactus.	Enactus	Entrepreneurship Societies
Uni-G	The aim of the student entrepreneurship project is to inject entrepreneurial DNA in the student community by fostering an entrepreneurship culture, environment, tools and resources to help student entrepreneurs to think-start-validate.	The aim is to inject entrepreneurial DNA in the student community.	Practical Entrepreneurship Programmes

Uni-G	We will promote the culture of innovation and entrepreneurship by providing a stimulating and supportive environment, especially in its technology stations, for problem-solving research projects that can be commercialised, and applied technology-driven research and development with the potential to lead to patents and technology transfer.	We will also promote the culture of innovation and entrepreneurship by providing a stimulating and supportive environment.	Entrepreneurship Strategic Plan
Uni-G	The Commercialisation and Technology Transfer Office is responsible for patents, licensing, intellectual property and commercialisation.	Responsible for patents, licensing, intellectual property and commercialisation.	Technology Transfer Office
Uni-H	This innovative programme aims to convert the vibrant entrepreneurial spirit of the students into sustainable viable businesses.	Aims to convert the vibrant entrepreneurial spirit of the students into sustainable viable businesses.	Practical Entrepreneurship Programmes
Uni-H	Open annual calls for Innovation funding that assist technologies at Technology Readiness Level 3 and above to advance toward commercialisation.	Open annual calls for Innovation funding	Entrepreneurship Funding
Uni-H	The Technology Transfer Office involves the integration of many aspects, including management of the Intellectual Property, negotiations, commercial contracts, licenses, and other things (routinely referred to as Commercialisation).	Assist you with management of the Intellectual Property, negotiations, commercial contracts, licenses, and other things.	Technology Transfer Office
Uni-H	University hosted a highly successful Student Entrepreneurship Week (SEW) programme, themed #Beyond ideas, into action and targeted staff and students at the university.	University hosted a highly successful Student Entrepreneurship Week (SEW) programme.	Student Entrepreneurship Week
Uni-H	The university will actively strive to cultivate a culture of innovation and entrepreneurship at the university, and will position the institution at the epicentre of the innovation and entrepreneurship ecosystem in the region.	Actively strive to cultivate a culture of innovation and entrepreneurship at the university.	Entrepreneurship Strategic Plan
Uni-H	Entrepreneurship society at the university, Enactus.	Enactus	Entrepreneurship Societies
Uni-H	This international entrepreneurship weekend for woman event, which is part of the globally known Start-up Weekend aimed to bring together women from across the globe, to allow them to immerse themselves in a start-up environment.	International Entrepreneurship Weekend for Women	International Presence

Uni-H	Entrepreneurship Skills Programme to equip the university's students with entrepreneurial skills at a practical level.	Programme aims to equip students with entrepreneurial skills.	Practical Entrepreneurship Programmes
Uni-H	Academic staff and postgraduate students are invited to enter an innovation competition.	Invitation to enter an innovation competition.	Entrepreneurship Competitions
Uni-H	The objective of the Student Entrepreneurship Policy ("the Policy") is to boost job creation and economic prosperity in South Africa through the development of entrepreneurial skills and the promotion of commercially viable start-ups and social enterprises at the university.	Policy focuses on developing entrepreneurial skills and the promoting of commercially viable start-ups and social enterprises at the university.	Entrepreneurship Policy
Uni-H	Held a seminar which focused on the 4th industrial revolution, intellectual property, commercialisation and entrepreneurship.	Seminar on the 4th industrial revolution, intellectual property, commercialisation and entrepreneurship.	Entrepreneurship Seminar
Uni-H	Workshop will take student entrepreneurs through the basics of handling their business finances responsibly.	Workshop on the basics of handling their business finances responsibly.	Entrepreneurship Workshops
Uni-H	The technology transfer office help researchers and inventors to protect their innovations, focusing on intellectual property and technology transfer.	Focus on intellectual property and technology transfer.	Technology Transfer Office
Uni-I	Manages and administers all commercialisation and technology transfer of projects.	Focus on commercialisation and technology transfer.	Technology Transfer Office
Uni-I	They are officially hosting the Student Training for Entrepreneurial Promotion (STEP).	Hosting the Student Training for Entrepreneurial Promotion (STEP).	Student Training for Entrepreneurial Promotion (STEP)
Uni-I	The students at the university participated in EDHE's Student entrepreneurship Intersarsity Competition.	Participated in EDHE's Student entrepreneurship Intersarsity Competition.	Student Entrepreneurship Intersarsity
Uni-I	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-I	The university provides workshop aimed at promoting research and innovation	Workshop aimed at promoting research and innovation	Entrepreneurship Workshops
Uni-I	The competition promotes the spirit of entrepreneurship, provide investment and incubation opportunities, and provides funding for innovative ideas	The competition promotes the spirit of entrepreneurship, provide investment and incubation opportunities, and funding for innovative ideas.	Entrepreneurship Competitions

Uni-I	The university launched their first-ever entrepreneurship week.	Launched their first-ever entrepreneurship week.	Student Entrepreneurship Week
Uni-I	The summit promoted partnerships to accelerate social innovations to Africa's most pressing challenges by inspiring and connecting social entrepreneurs, changemakers, investors, and other ecosystem stakeholders across Africa.	Summit provides inspiration to social entrepreneurs, changemakers, investors, and other ecosystem stakeholders across Africa.	Entrepreneurship Conferences
Uni-I	One of the primary focuses will be on entrepreneurship and providing entrepreneurship training to address issues of employability	Institutional focuses on entrepreneurship and providing entrepreneurship training.	Entrepreneurship Strategic Plan
Uni-J	Entrepreneurship society at the university, Enactus and Ecosystem Student Entrepreneurship Society	Enactus & Ecosystem Student Entrepreneurship society	Entrepreneurship Societies
Uni-J	The Innovation Office assists researchers with innovation support (grant and contract management; proposal and business plan development; prototype and proof of concept funding) and technology transfer (intellectual property management and commercialisation).	Assist with intellectual property, IP identification and protection, IP management, IP commercialisation	Technology Transfer Office
Uni-J	Entrepreneurship week advances student entrepreneurship towards a wider ecosystem.	Entrepreneurship week advances student entrepreneurship towards a wider ecosystem.	Student Entrepreneurship Week
Uni-J	Through the Student Entrepreneurship Challenge, student entrepreneurs from multiple faculties will take part in a business challenge that will offer them an opportunity to get mentorship, coaching, pre-seed investment and capacity building.	Student entrepreneurs take part in a business challenge that will offer them an opportunity to get mentorship, coaching, pre-seed investment and capacity building.	Entrepreneurship Competitions
Uni-J	The working group is a structure that aims to develop and create a platform for aspiring and existing student entrepreneurs to have access to opportunities and information on how to develop and grow their businesses.	Platform for student entrepreneurs to have access to opportunities and information.	Entrepreneurship Initiatives
Uni-J	The purpose of the intervarsity competition is to identify the top student entrepreneurs at each university, showcase their ideas and create a platform for investment opportunities.	Identify the top student entrepreneurs at each university, showcase their ideas and create a platform for investment opportunities.	Student Entrepreneurship Intersarsity

Uni-J	The second annual China-South Africa Youth Innovation and Entrepreneurship Forum was jointly organised by this university and the Zhejiang Normal University from Jinhua, China.	Second annual China-South Africa Youth Innovation and Entrepreneurship Forum	International Collaboration
Uni-J	A business incubator that provides an operation location and infrastructure, pre-incubation support, incubation services and acceleration support.	Provides an operation location and infrastructure, pre-incubation support, incubation services and acceleration support.	Incubators
Uni-J	Student Entrepreneurship Framework	Student Entrepreneurship Framework	Entrepreneurship Policy
Uni-K	Research workshop on forming research collaborations in the field of social entrepreneurship in Africa.	Research workshop on social entrepreneurship in Africa.	Entrepreneurship Workshops
Uni-K	Rapid business incubator which helps aspiring young entrepreneurs build their companies that will shape the future by equipping them with the tools, skills and connections that they need to turn that dream into a tangible reality.	Rapid business incubator which helps aspiring young entrepreneurs build their companies.	Incubators
Uni-K	The competition aims to identify the best student entrepreneurs at South African universities and to showcase their businesses with the aim of attracting investment.	The competition aims to identify the best student entrepreneurs at South African universities.	Student Entrepreneurship Intersarsity
Uni-K	The university hosted a Student Entrepreneurship Week over four days.	Hosted a Student Entrepreneurship Week over four days.	Student Entrepreneurship Week
Uni-K	Incubates technologies and solutions from proof of concept to start-up and growth stages by providing mentorship, prototyping facilities and workspaces, networking opportunities, and support services.	Incubates technologies and solutions from proof of concept to start-up and growth stages.	Incubators
Uni-K	Business plan pitching event that gives entrepreneurs an opportunity to present their innovative start-ups to a panel of expert judges.	Pitching event that gives entrepreneurs an opportunity to present their innovative start-ups.	Entrepreneurship Competitions
Uni-K	Annual competition searching for innovative technologies and start-ups that can be grown into successful businesses.	Annual competition searching for innovative technologies and start-ups.	Entrepreneurship Competitions
Uni-K	Competition aimed at equipping young entrepreneurs with improved entrepreneurship skills and the capacity to develop a functional prototype to turn their ideas into a commercial reality.	Competition aimed at equipping young entrepreneurs with improved entrepreneurship skills.	Entrepreneurship Competitions

Uni-K	An initiative where student entrepreneurs get the opportunity to gain insightful knowledge from township and rural-based business owners.	Gain insightful knowledge from township and rural-based business owners.	Practical Entrepreneurship Programmes
Uni-K	Instrumental in the identification, protection and commercialisation of Intellectual Property (IP).	Instrumental in the identification, protection and commercialisation of Intellectual Property (IP).	Technology Transfer Office
Uni-K	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-K	Must endeavour to produce graduates who appreciate the importance of community service, entrepreneurial endeavours and innovative actions.	Create an environment that appreciates the importance of community service, entrepreneurial endeavours and innovative actions.	Entrepreneurship Strategic Plan
Uni-L	This programme is for learners who have a passion to develop their own business and have the drive for entrepreneurship.	For learners who have a drive for entrepreneurship and wish to develop their own business.	Practical Entrepreneurship Programmes
Uni-L	A three-month research collaboration with five Scandinavian universities focusing on Innovation Hubs, Centres for Entrepreneurship and niche-focused innovation such as an Engineering Innovation Hub.	A research collaboration with five Scandinavian universities.	International Collaboration
Uni-L	The Science and Technology Park operates a unique, world-class Additive Manufacturing precinct specialising in assisting entrepreneurs to develop product prototypes and employs engineers, scientists and designers.	The Science and Technology Park assist entrepreneurs to develop product prototypes and employs engineers, scientists and designers.	Science Park
Uni-L	The aim of the Centre for Entrepreneurship is to provide entrepreneurial skills to the youth, students and start-up entrepreneurs.	The aim is to provide entrepreneurial skills to the youth, students and start-up entrepreneurs.	Centre for Entrepreneurship
Uni-L	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-L	The purpose of the competition was to empower the youth and fund young entrepreneurs.	Competition empowers the youth and fund young entrepreneurs.	Entrepreneurship Competitions
Uni-L	Technology transfer office of the university offering services such as intellectual property services, legal support services, commercialisation services and short learning programmes.	Services focused on intellectual property, legal support, commercialisation, and short learning programmes.	Technology Transfer Office
Uni-M	The focus areas of the Centre are Entrepreneurship and Start-up Business development.	The focus areas are on entrepreneurship and start-up business development.	Centre for Entrepreneurship

Uni-M	The Youth Entrepreneurship Conference and Expo form part of the city-wide Telkom Entrepreneurship Week.	Conference and Expo form part of the city-wide TelkoM Entrepreneurship Week.	Entrepreneurship Conferences
Uni-M	Active societies that aim to promote the entrepreneurship culture in the institution.	Societies that aim to promote entrepreneurship culture.	Entrepreneurship Societies
Uni-M	A competition to discover innovative initiatives and entrepreneurial skills among students by encouraging them to showcase their originality and creative ideas.	A competition to discover innovative initiatives and entrepreneurial skills among students.	Entrepreneurship Competitions
Uni-M	The aim of the TTO is to facilitate, protect and enhance the transfer of IP and to enhance commercialization	Focus on facilitating, protecting and enhancing the transfer of IP and enhancing commercialization	Technology Transfer Office
Uni-M	Innovation Fund assists in the conversion of research ideas into commercially useful end-products by funding items such as equipment, research and development expertise, managerial skills, securing of Intellectual Property rights (IP) and construction of prototypes.	Assists in the conversion of research ideas into commercially useful end-products by providing funding.	Entrepreneurship Funding
Uni-M	The intervarsity competition tasks students to come up with innovative business ideas, and students are encouraged to partake.	Students are encouraged to partake in the intervarsity competition.	Student Entrepreneurship Intersarsity
Uni-M	The incubation centre provides up-and-coming innovators with the necessary infrastructure, such as offices, telephone lines and computers, in a bid to get their companies up and running.	Provide infrastructure, such as offices, telephone lines and computers, to student entrepreneurs.	Incubators
Uni-N	Three-tiered approach: Generator – for aspiring entrepreneurs, focusing on entrepreneurial orientation; Incubator – for businesses getting established; Accelerator – for businesses that are ready to scale-up.	Three-tiered approach to entrepreneurial development: Generator; Incubator; Accelerator	Incubators
Uni-N	Many clubs and societies to grow within the university focused on different issues, including entrepreneurship.	Clubs and societies focused on entrepreneurship.	Entrepreneurship Societies
Uni-N	Of all the entrepreneurship events each year, the entrepreneurship week is one of the most prominent.	Entrepreneurship week is one of the most prominent.	Student Entrepreneurship Week
Uni-N	Partnered with Ryerson University in Canada and the Bombay Stock Exchange Institute in India to boost growth opportunities for entrepreneurs and accelerate start-up incubation in the three partner countries.	Partnered with Ryerson University in Canada and the Bombay Stock Exchange Institute in India to boost growth opportunities for entrepreneurs.	International Collaboration

Uni-N	The Business Pitch Competition promotes creativity, idea generation, and entrepreneurship by recognising innovative ideas for new products, services, and technology.	Competition promotes creativity, idea generation, and entrepreneurship.	Entrepreneurship Competitions
Uni-O	The Arts Incubator will help emerging enterprising arts students gain access to mentors, training, shared space, professional assistance, access to capital, and other services to ensure the successful development of their business ideas.	The Arts Incubator ensures the successful development of student business ideas.	Incubators
Uni-O	The university hosted their second National Student Entrepreneurship Week.	Hosted their second National Student Entrepreneurship Week.	Student Entrepreneurship Week
Uni-O	Collaboration with Finish based Haaga Helia University of Applied Sciences is bound to boost and change the face of local entrepreneurship forever.	Collaboration with Finish based Haaga Helia University of Applied Sciences.	International Collaboration
Uni-O	The unit focuses on Intellectual Property Management and Administration, Business Partnership Management, Marketing and Business Development Agreement Management	Focus is on intellectual property management.	Technology Transfer Office
Uni-O	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-O	Promoting entrepreneurship and innovation is seen as a prerequisite for success in the strategy presented.	Strategy emphasises the importance of promoting entrepreneurship and innovation.	Entrepreneurship Strategic Plan
Uni-P	Protect and commercialise the promising Intellectual Property emanating from the University.	Protect and commercialise the promising Intellectual Property emanating from the University.	Technology Transfer Office
Uni-P	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-P	Innovation Centre provides an enabling space to narrow the gap between applied research in Higher Education Institutions and technology transfer.	Innovation Centre provides an enabling space for student entrepreneurs.	Centre for Entrepreneurship
Uni-P	Students from across the world were challenged to take on a social-entrepreneurship start-up that has the potential of creating more than 10 000 meaningful jobs in the next decade.	Students from across the world were challenged to take on a social-entrepreneurship start-up.	International Presence

Uni-P	A student panel discussion was held to open the 2019 Student Entrepreneurship Week.	A student panel discussion was held to open the 2019 Student Entrepreneurship Week.	Student Entrepreneurship Week
Uni-P	Compete in the 1st National Intervarsity Student Entrepreneurship Challenge	Compete in the 1st National Intervarsity Student Entrepreneurship Challenge	Student Entrepreneurship Intervarsity
Uni-Q	The workshop will introduce university stakeholders to the increasingly important role that Social Entrepreneurship plays in the field of funding/resource mobilisation as well as facilitating self-employment or study opportunities for graduates and research teams.	The workshop will introduce university stakeholders to the increasingly important role that Social Entrepreneurship plays.	Entrepreneurship Workshops
Uni-Q	Conduct a two-hour workshop in order to empower students with the ethos of good entrepreneurship, as well as opportunities available for the future.	Workshop to empower students with the ethos of good entrepreneurship	Entrepreneurship Workshops
Uni-Q	The 12-week long Student Training for Entrepreneurial Promotion (STEP) programme equipped students with entrepreneurial and business management skills.	Student Training for Entrepreneurial Promotion (STEP) programme equipped students with entrepreneurial and business management skills.	Student Training for Entrepreneurial Promotion (STEP)
Uni-Q	This roadshow is aimed at raising awareness of entrepreneurship as a career and a means of participating in the economy, against the backdrop of graduate and youth unemployment.	Roadshow aimed at raising awareness of entrepreneurship as a career and a means of participating in the economy.	Entrepreneurship Roadshow
Uni-Q	Entrepreneurship society at the university, Enactus.	Enactus	Entrepreneurship Societies
Uni-Q	Establish the seed fund that will provide start-up capital to a number of students' business innovation.	Seed funding for student start-ups	Entrepreneurship Funding
Uni-R	The university encourages its students to participate in the entrepreneurship intervarsity competition, which takes place between a couple of schools in South Africa.	Encourages its students to participate in the entrepreneurship intervarsity competition	Student Entrepreneurship Intervarsity
Uni-R	Incubation project aimed at providing students with the necessary activity or process for their business ideas to be implemented correctly and successfully.	Provide students with the activity or process for their business ideas to be implemented correctly and successfully.	Incubation Programmes

Uni-R	Celebrated Entrepreneurship Month by having workshops and events with the aim of creating a platform for the university's students to network and learn from the expert entrepreneurs.	Workshops and events for the university's students to network and learn from the expert entrepreneurs.	Entrepreneurship Workshops
Uni-R	Entrepreneurship societies such as Enactus.	Enactus	Entrepreneurship Societies
Uni-R	The technology transfer office is mainly focused on licensing intellectual property, commercialisation and disclosure process.	Focuses on commercialisation, Intellectual Property and Disclosure Process	Technology Transfer Office
Uni-S	A program which offers support services to SMMEs, student entrepreneurs, and large industries, who specialise in operations relating to chemicals.	A program which offers support services to SMMEs, student entrepreneurs, and large industries.	Practical Entrepreneurship Programmes
Uni-S	The university was one of the first to participate in the student entrepreneurship week to raise awareness of entrepreneurship as a career path while passing down knowledge and skills to students.	The university was one of the first to participate in the student entrepreneurship week.	Student Entrepreneurship Week
Uni-S	A state-of-the-art building for Research, Innovation, Technology Transfer, Commercialisation and Community Engagements	Focus on Research Innovation, Technology Transfer, Commercialisation and Community Engagement.	Technology Transfer Office
Uni-S	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-S	The strategic objectives emphasise the development of curricula that will equip our students with the requisite skills and competencies such as empowerment through the fostering of entrepreneurship culture.	Strategic objective to empower students through the fostering of entrepreneurship culture.	Entrepreneurship Strategic Plan
Uni-T	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-T	Dedicate 2-3 days during August every year to promote student entrepreneurs through a series of presentations, training opportunities, as well a platform to present ideas to a panel of successful entrepreneurs.	Dedicate 2-3 days during August every year to promote student entrepreneurs.	Student Entrepreneurship Week
Uni-T	Students are invited to enter the second annual national Entrepreneurship Intervarsity	Students are invited to enter the second annual national Entrepreneurship Intervarsity	Student Entrepreneurship Intervarsity

Uni-T	The Innovators Entrepreneurship Workshop will be facilitated by business development experts and will run over a period of 7 weeks.	The workshop will be facilitated by business development experts.	Entrepreneurship Workshops
Uni-T	Programme aims to stimulate and support the development of high-quality, innovative student projects which seek to provide solutions to the challenges that society faces.	Aims to stimulate and support the development of high-quality, innovative student projects.	Practical Entrepreneurship Programmes
Uni-T	Programme is designed to support research projects by staff that are directed at providing innovative solutions to challenges that society faces.	Support research projects by staff that are directed at providing innovative solutions to challenges that society faces.	Practical Entrepreneurship Programmes
Uni-U	Strives to become the premium incubator in the world by ensuring that small enterprises become competitive, self-sustainable and profitable.	Ensuring that small enterprises become competitive, self-sustainable and profitable.	Incubators
Uni-U	Student entrepreneurship week aims to raise student awareness of entrepreneurship as a career and a means to participate in the mainstream economy while creating much-needed jobs.	Aims to raise student awareness of entrepreneurship as a career.	Student Entrepreneurship Week
Uni-U	Students from the university made it to the national finals of the EDHE Student Entrepreneurship Intervarsity Competition.	Made it to the national finals of the EDHE Student Entrepreneurship Intervarsity Competition.	Student Entrepreneurship Intervarsity
Uni-U	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-V	The 2019 Student Entrepreneurship Week was held between 30th September and 5th October with the aim of providing knowledge and skills to students on how to start a sustainable business.	Student entrepreneurship week, where participants are given knowledge and skills on how to start a sustainable business.	Student Entrepreneurship Week
Uni-V	An entrepreneurship roadshow is presented by the Entrepreneurship Development in Higher Education in which the university took part, where students could attend and hear motivational speeches and get a chance to pitch their own ideas.	Students attend the roadshow to hear motivational speeches and also get a chance to pitch their own ideas	Entrepreneurship Roadshow
Uni-V	Entrepreneurship societies exist at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-V	Students were encouraged to hone their elevator pitch skills in preparation for the upcoming annual EDHE Intervarsity competition.	Students were encouraged to partake in the annual EDHE Intervarsity competition.	Student Entrepreneurship Intervarsity

Uni-V	The university hosted their Student Entrepreneurship Week (SEW) for the year 2019.	Hosted their Student Entrepreneurship Week.	Student Entrepreneurship Week
Uni-W	A two-day conference geared towards developing entrepreneurship.	Conference geared towards developing entrepreneurship.	Entrepreneurship Conferences
Uni-W	The Student Entrepreneurship Week took place from August 20 to 22, where students were assisted with tips and strategies from experts, mentors and investors on how to go into entrepreneurship.	Student entrepreneurship week assisted students with tips and strategies on how to go into entrepreneurship.	Student Entrepreneurship Week
Uni-W	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-X	The university hosted their second annual Student Entrepreneurship Week in 2019.	The second annual Student Entrepreneurship Week	Student Entrepreneurship Week
Uni-X	The university took part in the Intersarsity Competition for Student Entrepreneurs in Institutions of Higher Learning	Intersarsity Competition for Student Entrepreneurs in Institutions of Higher Learning	Student Entrepreneurship Intersarsity
Uni-X	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-Y	The Entrepreneurship Roadshow is coming to the university.	The Entrepreneurship Roadshow is coming to the university.	Entrepreneurship Roadshow
Uni-Y	Entrepreneurship societies at the university, such as Enactus.	Enactus	Entrepreneurship Societies
Uni-Z	Entrepreneurship society at the university, Enactus.	Enactus	Entrepreneurship Societies
Uni-Z	Advance entrepreneurship and economic growth are stated as a priority in the strategic plan of this university.	Entrepreneurship is a priority in the strategic plan of this university.	Entrepreneurship Strategic Plan

ANNEXURE O: TURNITIN REPORT

Student Entrepreneurship Support at South African Public Universities

ORIGINALITY REPORT

9%	6%	3%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Matthew Good, Mirjam Knockaert, Birthe Soppe, Mike Wright. "The technology transfer ecosystem in academia. An organizational design perspective", Technovation, 2019 Publication	<1 %
2	www.researchsquare.com Internet Source	<1 %
3	www.richtmann.org Internet Source	<1 %
4	www.tandfonline.com Internet Source	<1 %
5	repository.nwu.ac.za Internet Source	<1 %
6	uir.unisa.ac.za Internet Source	<1 %
7	hdl.handle.net Internet Source	<1 %
8	link.springer.com Internet Source	<1 %