UNIVERSITY OF KWAZULU-NATAL

Evaluating the role of innovation hubs to promote entrepreneurship: A case of University of KwaZulu-Natal InQubate

By

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Declaration

I, **MUKHETHWA CHRISTINAH MULAUDZI**, declare that the work presented in this dissertation is original. It has not been presented to any other university or institution. Where the work of other has been used, it has been duly acknowledged.

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Abstract

The business economy is in a disruptive era whereby change can be affected in a matter of seconds to achieve business growth and development. Therefore, this study focused on exploring the use of innovation hubs to disrupt entrepreneurial conventions through UKZN innovation hub. The sample of the study comprised of 50 student entrepreneurs of all sexes, age groups, education status and socio-economic status. A questionnaire was chosen as the best suited tool for an exploratory study.

The results of the study showed a statistical significance between student development and the UKZN innovation hub, equipping student entrepreneurs for the business challenges and gearing them for business leadership. The results revealed the innovation hubs as a key component in developing small businesses for economic grow and through that, the alleviation of unemployment and poverty. However, there are shortcomings in line with the provision of entrepreneurial guidance from academic staff. student entrepreneurs also noted that there is a lack of fundamental support at the initial stages of their businesses, were issues of business registration and provision of equipment and machinery lacked. This study recommends that universities with innovation hub programme must contribute to the economic status of South Africa, by; Intensifying entrepreneurship education by including entrepreneurship in their curriculum programme; make entrepreneurship programme through the innovation hubs more attractive and practical and provide more financial support to student entrepreneurs. Using innovation hubs has proven to be an effective mechanism to develop student entrepreneurs. This will in turn improve our economic status through job creation and the reduction of poverty.

Keywords: Student entrepreneurs, Innovation hub, entrepreneurial conventions

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List of Abbreviations

IH	- Innovation Hub
KEF	- Khula Enterprise Finance
NEF	- National Empowerment Fund
NYDA	- National Youth Development Agency
S.A	- South Africa
SEDA	- Small Enterprise Development Agency
SEFA	- Small Enterprise Finance Agency
SME	- Small Medium Enterprises
SPSS	- Statistical Package for the Social Sciences
TIA	- Technology and Innovation Agency
UKZN	- University of KwaZulu-Natal

Chapter one: Introduction

1.1 Introduction

After two decades of democracy, South Africa (S.A) is still grappling with issues of poverty, unemployment and slow economic growth. Gous (2018) states that South Africans who are most affected by poverty are those that are black, unemployed and less educated. According to StatsS.A (2020), the youth unemployment rate is sitting at 43,2%. This is a dissatisfying statistic and it stresses the need to provide interventions to improve the creation of employment by and for the youth through small businesses. This is particularly so, because Small Micro Medium Enterprises (SMEs) have proven to be the engine continuously in motion to improve the South African economic status in terms of growth and development and reducing the unemployment rate (The banking association South Africa, 2018).

Rose (2016) has described S.A as a country with a lopsided economic scale when compared to other countries in the world. A report by the World bank found that "the top 1% of South Africans own 70.9% of the country's wealth while the bottom 60% only controls 7% of the country's assets" (World bank, 2019, p. para.4). To achieve UKZN's strategic objective of innovation and entrepreneurship, the UKZN InQubate was developed (UKZN, 2019). Through the UKZN InQubate, Enspire, an Entrepreneurship Skills programme was conceived with the aim to equip UKZN students with practical entrepreneurial skills. Enspire aims to translate the entrepreneurial mindsets of students into sustainable businesses. This programme comprises a process that is mentored and managed to unlock the potential of students who have the entrepreneurial spirit. "The Enspire model holistically embraces entrepreneurial development using effective processes to propel student creativity and ideas into functional legal business entities. As our students are at university for limited periods of time, Enspire has been designed as a fast track stage gate model to support novice and seasoned student entrepreneurs" (UKZN, 2019, p. para.2). The programme provides students with financial and non-financial opportunities to develop their businesses as entrepreneurs. The programme focusses on student entrepreneurs who have innovative ideas that are feasible and whose businesses are at a foundation level. Such entrepreneurs should show signs of future potential but are not yet fully developed. This should be viewed as a great

initiative in uplifting the youth, However, one needs to also look at the impact that this initiative has in response to radical innovation by small businesses and the sustainability of such businesses.

1.2 Background

Over the past centuries, businesses have moved from different economies, ranging from industrial to knowledge economies. The current business economic era is considered to be one that is disruptive; it is an era whereby change can be affected in a matter of seconds to achieve business growth and development. Schwab (2015) argued that the evolution of industry 4.0 is moving at a rapid rate in comparison to the industries that came before. Industry 4.0, also known as the Fourth Industrial revolution, is a digital revolution that has been introduced since 2011 coined by the German government. Building on the third revolution, Industry 4.0 is characterised by a blend of technologies that is removing boundaries between the physical, biological, and digital spaces (Schwab, 2016). Schwab further argued that the wavelengths of this disruption are felt in almost the entire business ecosystem and warrants a new modus operandi for management, governance and the production system. SMEs are said to be the future. For them to be able to respond to the constant change of the business environment and sustain themselves over time, they need to be agile and radically innovative.

According to Skibiński & Sipa (2015) innovative activities requires a conducive environment coupled with sufficient financial resources and experienced human resources to be able to create more relevant efficient technologies. However, a rather thought-provoking statement suggested that our current leaders "…. are too often trapped in traditional, linear thinking or too absorbed by the multiple crises demanding their attention, to think strategically about the forces of disruption and innovation shaping our future" (Schwab, 2016, p. 41). This statement substantiates the role young people have in shaping the future. Young entrepreneurs need to be enabled and empowered to respond with agility to the challenges brought about by the business evolutions, now and in the future.

This study focused on the readiness of young entrepreneurs for future evolutions through the support of UKZN innovation hub. In this regard, the problem being researched is whether the support offered by the UKZN Innovation hub is enabling young entrepreneurs

to be agile and ready in response to future evolutions. Therefore, this study sought to examine whether the UKZN Innovation hub program is developing student entrepreneurs and relevantly equip them for the business challenges of the 21st century. If not, establish the kind of mechanism UKZN innovation hub must adopt to capacitate them in order to ensure sustainability in the businesses of young entrepreneurs that they support.

1.3 Research Problem

In this age where humanity faces atrocious iniquities on a daily basis, innovation becomes the most important and powerful tool in achieving economic growth and enhancing the standards of living. Young entrepreneurs are said to be the future leaders, and the future has endless possibilities for innovation. However, S.A is still sitting with a high rate of youth unemployment despite initiatives that are put in place by government development agencies and corporate. Universities are producing graduates on a yearly basis and these numbers are adding to the influx of unemployed skilled youth.

The S.A government is beginning to react to industry 4.0 consequent to the slow economic growth, poverty, unemployment and inequalities as some of the biggest problems faced by humanity. Casey (2018, p. 1) emphasised that “South Africa will not be able to meet its full potential if it is unable to turn the ideas its many bright minds generate into the products and services, which will support the country's industries of the future”. The South African economy requires a large dose of innovation to bring about transformation to society. The youth is being entrusted with a future where constant change is the only thing the world is certain of. Government, through universities, is supporting young entrepreneurs to be equipped for future leadership in businesses through different programme.

This study focuses on exploring the use of innovation hubs to disrupt entrepreneurial conventions through UKZN innovation hub. In this regard, the problem being researched is whether the UKZN Innovation hub program is developing student entrepreneurs and relevantly gearing them up for the business challenges of the 21st century.

1.4 Aim of the study

The aim of this study is to determine if the UKZN innovation hub program is developing student entrepreneurs and relevantly gearing them up for the business challenges of the 21st century. Business ecosystems have transformed and isolated communities are

shifting to what is known as the global community. The growing population is putting pressure on economies globally and South Africa is not exempt to these challenges.

One of the biggest challenges is the increase in the unemployment of skilled workers especially the youth unemployment rate. In response to this, a number of agencies were established by the government namely; The Small Enterprise Development Agency (SEDA), Small Enterprise Finance Agency (SEFA), Khula Enterprise Finance Limited (KEF), National Youth Development Agency (NYDA), Technology and Innovation Agency (TIA) and the National Empowerment Fund (NEF). All of these agencies were commissioned to support SMEs to ensure that they sustain themselves and survive the harsh economic environment. Some of these agencies saw the need to partner with universities to address challenges faced by small businesses owned by student entrepreneurs, providing support for growth and development. Through this is the ability to deal with the issues of unemployment and improve the economic status.

1.5 Research questions

1. How does the UKZN Innovation hub help develop student entrepreneurs?
2. How does the innovation hub programme address the business challenges of the 21st century through student entrepreneurs?
3. How is the UKZN innovation hub gearing up student entrepreneurs to be future business leaders?

1.6 Research objectives

1. To establish whether the UKZN Innovation hub develops student entrepreneurs.
2. To determine whether the UKZN Innovation hub programme are relevant to the business challenges of the 21st century.
3. Examine if the student entrepreneurs are equipped to be future business leaders.

1.7 Literature review

Entrepreneurship is crucial for disruptive and radical innovation. The term entrepreneurship has been defined in various ways, in many instances; it is defined in line with a particular context. A possible conclusion can be that the definition of Entrepreneurship is based on the lens you are viewing it from. Rey-Martí, Ribeiro-Soriano, & Sánchez-García (2016) argued that there is a misnomer of what the term entrepreneurship is. Their study defined entrepreneurship as a process that has five interrelated steps and this definition was adopted for the purpose of this study. The steps were broken down as follows: "(1) Identify an invention worth commercializing; (2) convert the invention into a marketable product or service; (3) create or find a small company to sell the product or service; (4) obtain resources to run the company and sell the product or service; and (5) sell the product or service successfully enough to achieve steady growth and survival" (Rey-Martí *et al.*, 2016, p. 2068).

The concept innovation has taken center stage and has been at the heart of businesses for the past decades. Wijngaarden, Hitters, & V. Bhansing (2016) found that innovation can be viewed from three dimensions, innovation as something that is new in its entirety; innovation as it contributes to the betterment of society; and innovation as an endless concoction of the new and that which is already existing be it in products, ideas or systems. From this perspective, innovation can be said to be the ability to apply creative solutions to problems or opportunities to enhance or enrich people's lives. In short, it is the application of creativity in real business situations.

According to Zhao's study to realise the social and economic value; the process between innovation and entrepreneurship should be viewed as ceaseless and complimenting of each other (as cited in Schmitz, Urbano, Dandolini, de Souza, & Guerrero, 2017). To substantiate this statement, Emami & Dimov (2017) confirm that an important characteristic of entrepreneurship is the ability to translate a business opportunity into the creation of new value. The marriage between the two concepts is one that undeniably stimulate business growth and sustains it if effectively managed. To emphasise the importance of innovation "hubs have become the vessels for, and the beneficiaries of, optimism and excitement about technology entrepreneurship in Africa" (Friederici, 2017, p. 10)

An Innovation hub is seen as a catalyst of innovation and entrepreneurship. Jiménez & Zheng (2018) state that innovation hubs are spaces created for small businesses who are at start-up phase that require financial and non- financial support. Innovation hubs are also commonly known as incubators. Costello (2016, p. 2422) argued that innovation hubs have an objective which is twofold: “to facilitate the emergence of new market-led and knowledge-based companies in the region and to forge strategic links between the college and the world of industry and commerce”. It stresses the need for a collaborative relationship between these industries. He further states that such innovation hubs offer various types of business development support to start-ups such as sales and marketing, mentoring, networking, financial and legal. Furthermore, they also provide Intellectual Property (IP), Patenting, Copyright and Trademarks services.

Jansen, van de Zande, Brinkkemper, Stam, & Varma (2015) clearly states that universities plays a critical role in the climate for entrepreneurship. The challenge facing universities is that they no longer have a choice but to become relevant socially and economically in the current knowledge society Schmitz *et al.* (2017). Juma (2018) found that the biggest challenge the African continent face is the lack of ability to invest in capacity building for an enhanced education. He further states that most of our universities are not keeping abreast with the transformation happening globally in terms of how they teach to promote innovation. Gosen and Washbush’s study highlighted that there has been a rapid shift in the introduction of programs that are meant for student entrepreneurship. This is causing a change in the conventional teaching to more experimental and practical learning meant to result in the reduction of unemployment (as cited in Wright, Siegel, & Mustar, 2017).

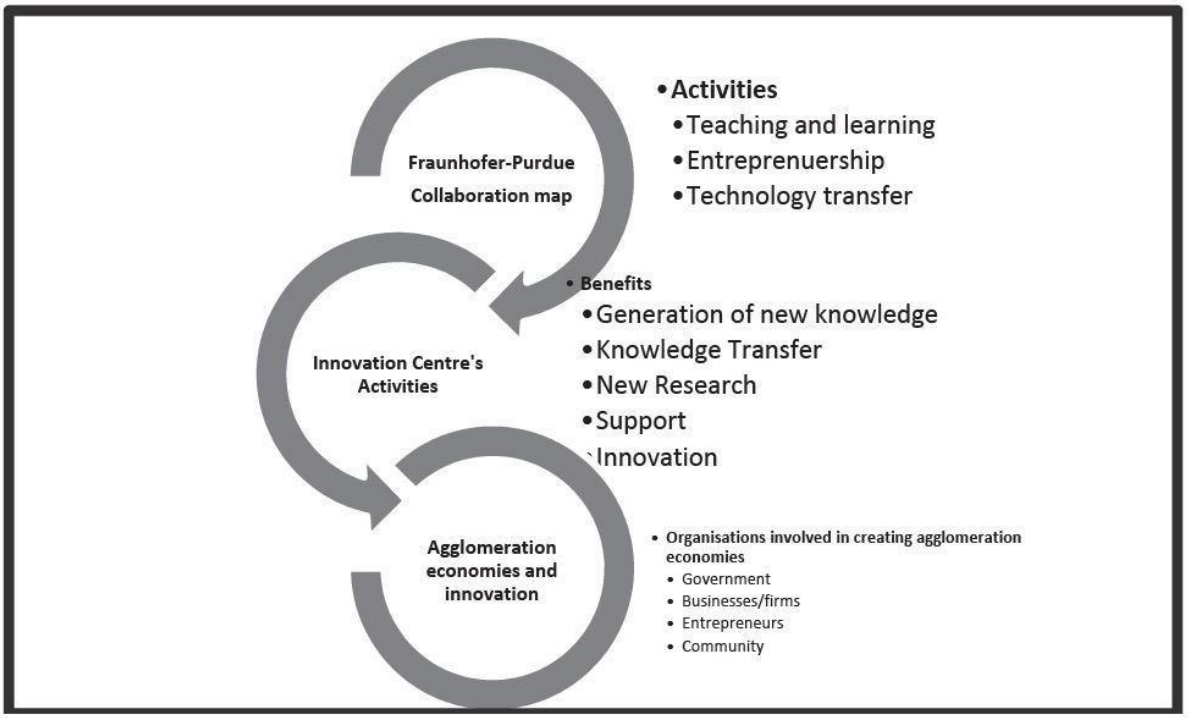
Fini, Fu, Mathisen, Rasmussen & Wright emphasized that government also plays a key role in providing support for start-ups that are innovative. They hold the power and structures in place to draft policies and guidelines that will enact entrepreneurial activities. In response to industry 4.0, government can encourage entrepreneurs to be innovative through providing funding and physical spaces in form of innovation hubs and science parks (as cited in Samo & Huda, 2019).

Xu, David, & Kim (2018) holds the view that Industry 4.0 is driven by more than just technological change. It is disruptive in different sectors and industries however, its

innovation has a positive bearing on businesses, the education system and other various industries in the economy. For instance, the previous revolutions focused on transforming the education industry. This transformation disruptively got universities to rethink the way they went about their teaching and learning particularly in the higher education context. Universities now use the blended learning approach, which is a combination of the traditional method of teaching and technology. There is also a strong concentration on providing incubation spaces for student entrepreneurs which gives students a platform to be innovative.

1.8 Theoretical framework

Figure 1-1: Innovation centres create agglomeration economies



Source: *Edmorrison (as cited in Mashau, 2018, p. 57)*

As demonstrated by figure 1-1, Universities function in an ecosystem where two key points are paramount and these are entrepreneurship and innovation. The United States has adopted the Fraunhofer Model after it demonstrated its success through creation of innovation ecosystems and auxiliating technology transfer in Germany (Edmorrison, 2014, as cited in Mashau, 2018). The Fraunhofer Model resulted in 24,000 people being employed using a research budget of approximately €2.1 billion (Mashau, 2018). The theory is illustrating that there needs to be trust amongst universities within their activities to build relationships with industry and foster collaborations for innovation. “Fraunhofer-Purdue is a collaborative model that shows that activities such as teaching and learning,

entrepreneurship and technology transfer of the research organisation are at the root of centres – as they are selling services. In that way, Innovation Centre Activities will have the following benefits: generation of new knowledge, knowledge transfer, new research, support, and innovation. For the above benefits to be diffused, organisations such as government, businesses/firms, entrepreneurs and the community need to be involved in creating agglomeration economies." (Mashau, 2018, p. 56).

This theory demonstrates the importance of different collaborations within the university space. Innovation hubs form part of the bodies/structures within universities. Such hubs aid in terms of developing an entrepreneurial culture by students, helps create new knowledge, research, knowledge transfers and provide support. For this to work, universities need to collaborate with external stakeholders considering that its research outputs affect the research and development of businesses. This model is best fit for a study looking at innovation hubs in the Higher Education arena.

1.9 Significance of the study

The findings of this study will help improve the UKZN innovation hub programme to make them relevant to industry 4.0 and gear up student entrepreneurs to lead the future through small businesses. The high graduate unemployment rate justifies the need to develop and harness young entrepreneurs to be leaders; to develop and sustain their businesses. Therefore, recommendations made in this study, can assist UKZN InQubate to enhance their entrepreneurial skills programme and better support student entrepreneurs. Student entrepreneurs will be equipped with the necessary skills and geared up to tackle the challenges of industry 4.0.

1.10 Justification/Rationale

SMEs plays a very important role in the growth and development of a country such a S.A. They bring about job creation, which in turn increases tax collection and leads to the improvement of the country's economic status and poverty reduction. The fourth industrial revolution is taking over businesses from different industries and S.A is said to be unprepared for this new wave. Consequently, S.A has been witnessing a slow growth in the economy. Conducting this study will help equip student entrepreneurs to consider taking entrepreneurship after graduation and bring about interventions that will assist in sustaining small businesses and survive the harsh external environment

1.11 Research Methodology

1.11.1 Research design

When conducting a study, different research designs can be utilised, some of which can be:

(1.) An Explanatory research, which is a way to conduct a study while trying to find out what is going on in that current context; to search for fresh ideas and understandings; to gain understanding through asking questions and to look at a phenomenon from a different perspective (Zikmund, Babin, Carr, & Griffin, 2013) ;(2.) Exploratory research, which focuses more on investigating a situation or a problem to be able to get more in-depth explanation of the relationship amongst the different constructs(Zikmund *et al.*, 2013). (3.) Descriptive research, which is a design that a researcher can use to portray a more truthful profile of situations, events and individuals.

This study employed an exploratory research design to determine if the UKZN innovation hub is helping develop student entrepreneurs and relevantly gearing them up for the business challenges of the 21st century. An exploratory study is undertaken when a researcher seeks to gain more insight on the topic of his/her interest and not much research has been conducted on a topic. Exploratory research design further seeks to study the problem area, collect and analyse data and establish the relationship amongst variables (Van Zyl, 2014).

1.11.2 Research Approaches/Paradigms

Researchers can approach research in different ways. They can either use the qualitative, quantitative or mixed methods paradigm. The qualitative research approach is used when exploring the processes that underlie human behaviour (Van Zyl 2014). It focuses on making-meaning, “and the researcher studies the participants in their natural setting” (Given, 2008, p. 9). Quantitative research approach is employed to collect statistical data on the opinions of the target population using a questionnaire instrument. This is used to determine the correlations of specified variables and outcomes (Choy, 2014). The

research approach that is employed in this study is a quantitative approach. There are two quantitative research strategies, surveys and experimental design that can be used: Experimental strategy as indicated by Uma and Bougie (2013), is a form of scientific research. This type of research experiments using hypotheses to test the relationship between variables instead of using a questionnaire. Survey strategy is a questionnaire data collection strategy from a sample chosen to participate in the study (Saunders & Lewis, 2012).

A quantitative survey strategy was used for this study. This method was utilised in the study of student entrepreneurs of the University of KwaZulu-Natal. Student entrepreneurs were selected and questionnaire surveys was be administered to them. The research activities considered the development of a research design; conducting the field survey; gathering data, collating, uploading and analysing; reporting on findings, results and make recommendations.

1.11.3 Study Site

A study site can be viewed as a culture, social or physical site where research will be conducted (Given, 2008). The research for this study was conducted at the University of Kwa-Zulu Natal, within the five different campuses.

1.11.4 Target Population

The population is a group of potential participants that the study wishes to draw results from in order to generalise the result. A target population is a subset of individuals drawn from the population that will take part in a research study (Van Zyl, Salkind & Green, 2014). The target population for this study was 50 student entrepreneurs of all sexes, age groups, education status and socio-economic status. This population was selected because of their involvement in student entrepreneurship under InQubate a division of the Research department within UKZN. The population of 50 student entrepreneurs was deemed appropriate because the UKZN InQubate programme is considered as highly specialised within the university and the respondents are not decision makers in the programme.

1.11.5 Sampling strategies

A researcher can make use of different strategies when selecting a sample. A probability

or non-probability sampling technique can be used. A probability sampling means that a researcher can predict the probability of a participant being included in the study. A non-probability sampling means that a researcher has no means to predict that a participant will be included or not. For this study, a census survey was chosen as the best suited method to collect data from the targeted population. A census is a process whereby information is collected from all units of the target population. It takes into consideration every element of the population which makes the data collected to be accurate and reliable (Daniel, 2012).

Sample size

50 student entrepreneurs were selected to participate in this study. 50 was the total number of student entrepreneurs registered on the UKZN InQubate entrepreneurial skills programme at the time the study was conducted. Therefore, all units of the target population were selected to participate in the study.

Sample

Bearing in mind that at the time the study was conducted, only 50 student entrepreneurs were registered under the entrepreneurial skills programme. Therefore, 50 student entrepreneurs were deemed appropriate for this study because the UKZN InQubate programme is considered as highly specialised within the university and the respondents are not decision makers in the programme, a census of the total population was adopted for the questionnaire survey. By adopting a census, the researcher was sure of the nature of the population and that collecting data from the targeted population will help achieve the objectives of the study.

1.12 Data collection methods

Data collection methods are ways in which data is going to be collected using different tools. There are different instruments of collecting data for both quantitative and qualitative research (Sekaran & Bougie, 2016). For quantitative research these instruments can be questionnaires or standardised measuring instruments and qualitative research instruments can be interviews or questionnaires with open ended responses (Punch, 2000). For this research, questionnaire was used. A Questionnaire is a set of questions reserved for self-completion by respondents taking part in a survey (Brace,

2008). In order to achieve the objectives of this study, secondary data articles, books, journals and internet sources were also be used to extract information.

1.13 Data Quality Control

Researchers need to ensure that validity and reliability are measured correctly in order to produce sound results. Validity means the researcher is measuring the correct concept in order to be able to answer the research questions correctly while Reliability measures how accurate and precise the data is. An Alpha value (0.66) was used in order to indicate the concept validity and to find out if the concepts are measured with sufficient reliability. Content validity was used to measure the adequacy of the sample (Van Zyl, Salkind & Green, 2014)

1.14 Measurements

This empirical study began with basic biographical and general perceptions questions. The six-point Likert scale was used where student entrepreneurs expressed their levels of agreement or disagreement regarding their perceptions on the programme offered by the UKZN innovation hubs (Van Zyl, Salkind & Green, 2014).

1.15 Data analysis

Researchers need to ensure the measure of the right concept, and measure the stability and consistency of the concept which is determined by reliability. For this study, the statistical analysis is performed using two types of software, SPSS (Statistical Package for the Social Sciences) and Excel. The analysis techniques include univariate data analysis, multivariate data analysis and bivariate data (Van Zyl, Salkind & Green, 2014). In this case, a descriptive statistical analysis was conducted.

1.16 Ethical Consideration

It is of utmost importance that the participants are protected from violation and their dignity should be protected. No respondents were forced or tricked to take part in the study. Potential participants were granted the informed consent in their preferred language. The informed consent form did not only act as an invitation to take part in the research but the description of the research carried out was highlighted and the

processes that was involved during the course of the research (Van Zyl, Salkind & Green, 2014).

1.17 Limitations of the study

The first limitation is the fact that the study is only focusing on student Entrepreneurs within the University of KwaZulu-Natal. This is a limitation because student entrepreneurs can be found in most universities in the Kwazulu-Natal province and South Africa as a whole. Secondly, it is placing an emphasis on student entrepreneurs who are on the InQubate programme. Lastly, the study only focused on students and not student entrepreneurs who have already exited the university having started their businesses while they were students. Therefore, it may not present the same experiences other student entrepreneurs have gone through in different universities; even though the experiences might be similar but not necessarily the same.

Chapter outline

The purpose of this study was to determine if the UKZN innovation hub program is developing student entrepreneurs and relevantly gearing them up for the business challenges of the 21st century.

In **chapter 1**, the fourth industrial revolution and the importance of small businesses in the South African economy has been indicated. An abstract of the research methodology, questions, objectives, significance and rationale of the study and limitations encountered is highlighted.

Chapter 2 details scholarly research as it relates to entrepreneurship, small businesses, student entrepreneurs, entrepreneurial universities, innovation hubs and the fourth industrial revolution.

Chapter 3 gives a blueprint of the systematic research process followed to achieve the objectives of the study. This chapter includes the methods used, research approaches and data collection instruments and techniques used to achieve the objectives of this study.

Chapter 4 provides an analysis from the primary research findings. The results from the analysis is presented in graphs and tables and then interpreted and discussed.

Chapter 5 presents a summary of the research findings, propose recommendations, concludes the entire study and also highlights the limitations encountered.

Conclusion

This section introduces and gives an overview of this research study, its purpose and objectives. It highlights the background of the problem, the research exploratory approach methodology that was undertaken, its target population of student entrepreneurs, data collection through a questionnaire survey and analysis using SPSS and Excel to make meaning of the primary research. It also demonstrates the ethical considerations for its respondents and the limitations encountered throughout the study. SMEs plays a pivotal role in the growth and development of economies. They bring about job creation, increase tax collection and improves the economic status and reduces poverty. The UKZN InQubate programme – Enspire can be used to contribute to the S.A economy.

Chapter two: Literature review

2.1 Entrepreneurship

The term entrepreneurship has been defined in various ways. In many instances, it is defined in line with a particular context. For example, Social entrepreneurship would be defined in a social context and innovative entrepreneurship would be defined in its own context. A possible conclusion can be that the definition of Entrepreneurship is based on the lens you are viewing it from. Entrepreneurship can be defined as a process that involves four different stages: Creation of new ideas, the direction and evaluation of activities; formulation of a business plan; organizing necessary resources; business management (Gatiyatullin, 2009; Irismetov et al., 2013; Ibragimov et al., 2015; Tararina et al., 2015 as cited in Safin, Shaidullina, Alikhanova, Muskhanova, Yusupkhadzhieva, Dzhamalkhanova, Mezhidova, Nigmetzyanova, & Akhmetov, 2016). On the other end, Rey-Martí, Ribeiro-Soriano *et al*. (2016) argued that there is a misnomer of what the term entrepreneurship is. Their study defined entrepreneurship as a process that has five interrelated steps and this definition was adopted for the purpose of this study. The steps were broken down as follows: "(1) Identify an invention worth commercializing; (2) convert the invention into a marketable product or service; (3) create or find a small company to sell the product or service; (4) obtain resources to run the company and sell the product or service; and (5) sell the product or service successfully enough to achieve steady growth and survival" (Rey-Martí *et al.*, 2016, p. 2068).

2.2 Entrepreneurial ecosystem

An entrepreneurial ecosystem is a system that starts from a more individualist approach instead of a group of people. However, an interlink with the economy and society needs to be in existence in the entire process as these holistically make up the entrepreneurial ecosystem (Stam & Spigel, 2016). In an entrepreneurial ecosystem, there is vast space for innovation to be created and this is due to the entrepreneurial activities that occur during the process. Stam *et al.* (2016) highlighted that society benefits from the new value added which makes the entrepreneurial activity more transitional between all stakeholders involved. Through the ecosystem, a sprout in entrepreneurs, high growth and innovative start-ups can be seen as an outcome.

2.3 Forms of entrepreneurship

Steve blank's study argued that not all entrepreneurship is the same (as cited in Casnocha & Hoffman, 2012) . They clearly described four different types:

2.3.1. Small Business Entrepreneurship

Today, the overwhelming number of entrepreneurs and start-ups in S.A are still small businesses. Small businesses make up 90% of all companies and employ 60% of all non-governmental workers (SEDA, 2016).

Small businesses are grocery stores, hairdressers, consultants, travel agents, internet commerce storefronts, carpenters, plumbers, electricians, etc. They are anyone who runs his/her own business. They hire local employees or family. Most are barely profitable. Their definition of success is to feed the family and make a profit, not to take over an industry or build a R100 million business. Since they can't provide the scale to attract venture capital, they fund their businesses via friends/family or small business loans.

2.3.2. Scalable Start-up Entrepreneurship

Unlike small businesses, scalable start-ups are what Silicon Valley entrepreneurs and their venture investors do. These entrepreneurs start a company knowing from day one that their vision could change the world. They attract investment from equally risk-taking financial investors – venture capitalists. They hire the best and the brightest. Their job is to search for a repeatable and scalable business model. When they find it, their focus on scale requires even more venture capital to fuel rapid expansion.

Scalable start-ups in innovation clusters (Silicon Valley, Shanghai, New York, Bangalore, Israel, etc.) make up a small percentage of entrepreneurs and start-ups but because of the outsize returns, attract almost all the risk capital and press.

2.3.3. Large Company Entrepreneurship

Large companies have finite life cycles. Most grow through sustaining innovation, offering new products that are variants around their core products. Changes in customer tastes, new technologies, legislation, new competitors, etc. can create pressure for more

disruptive innovation – requiring large companies to create entirely new products sold into new customers in new markets. Existing companies do this by either acquiring innovative companies or attempting to build a disruptive product inside. Ironically, large company size and culture make disruptive innovation extremely difficult to execute.

2.3.4. Social Entrepreneurship

Social entrepreneurs are innovators who focus on creating products and services that solve social needs and problems. But unlike scalable start-ups their goal is to make the world a better place, not to take market share or to create wealth for the founders. They may be non-profit, for-profit, or hybrid (Casnocha *et al.*, 2012).

2.4 Start-ups challenges

Irrespective of the start-up being flexible and innovative, as shown on the table 2-1 they are usually not fully equipped to deal with challenges at foundation phase which leaves them vulnerable (Grandori, 2013, as cited in Chirchietti, 2017). White (2011) as cited in Chirchietti (2017) found that there is a lack of support for funding and from government, some of the challenges are attributed to corruption. In respect of lack of funding Chirchietti (2017) indicated that this is related to the fact that start-ups are still at infant stages and not yet ready for investment. He further stated that a provision for funding, infrastructure and opportunities to network and incubation is also another way to effectively offer support to start-ups. Unlike other businesses, start-ups have challenges that emanate from its characteristics. Nurcahyo, Akbar, & Gabriel (2018) highlighted some of these characteristics in the table below:

Table 2-1: Characteristics of a start-ups

Dimension	Characteristics
Organization	Small scale organization
	Young age
	Homogeny environment
	Informal structure
	Few differentiation
	Centralized
Ownership	Owner-manager
	Intuitive decision making
	Direct supervision
Strategy & Innovation	Niche marketing strategy
	Prefer risky decision than the secure one
	Fast innovation
	First mover or second mover
	Lack of product research
Financial	Funding from personal savings or from relative

Source: Nurcahyo *et al.* (2018, p. 5)

2.5 Entrepreneurial universities

The Ec-Oecd (2012) holds the view through the entrepreneurial universities guiding framework that Universities need to start seeing themselves as organisations that are entrepreneurial and grounded by shared values and not control systems. For this to be achieved the culture of entrepreneurship must be embedded in the guiding strategies of the university. It is generally known that bureaucracy is a problem in institutions like universities and demolishing this is one way to overcome it and is very important for entrepreneurship. Lesser bureaucracies in universities makes it easy to facilitate entrepreneurial activities and fast track the creation of ideas and the making of decisions to develop structures that will enable the institution to be entrepreneurial. For universities to be considered as entrepreneurial, they need to meet certain guides. According to the Ec-Oecd (2012) these are some of the guidelines that must be met:

It is of utmost importance that universities have sustainability strategies for finance through self-funding, and not heavily relying on funding from the public. Having sole dependency on public funding is not realistic if a university wants to achieve the goal of being entrepreneurial. Universities need to fully capitalize their potential and source for funding from different investors. There needs to be a cohesion from within the university stakeholders and its different structures to break borders and silos. This will help create a synergy and link across the entire university ecosystem. The key is to utilise the

university's human resources to deliver on its strategy, strengthen the entrepreneurship education and provide support for any entrepreneurial activity to achieve the university's goal.

For entrepreneurial universities to deliver entrepreneurial learning, they need to have the proper structures to do so. A crucial resource that Entrepreneurial Universities could have is collaboration with the various external stakeholders. Such collaborations should include the university's alumnus, society, local organisations from government and private sector. The benefits from these collaborations could range from a variety of experience, experts and other resources that could be used to build relationships and utilized to provide support to student entrepreneurs (The entrepreneurial guide, 2012).

Being an entrepreneur takes more than just having an idea but it is a step to becoming one. Universities need to play an active role in providing the necessary support required by student entrepreneurs. The range of support could be mentoring, networking opportunities, and infrastructure. Additionally, start-ups should be linked with external organisations. Building relationships with the external stakeholders of the university helps ease the process of accessing funding for student and graduate entrepreneurs. Such relationships can strengthen and help develop the eco-system of university entrepreneurship (The entrepreneurial guide, 2012).

Innovation Hubs are crucial for student start-ups. It is a structure that universities can utilize to provide the necessary support to student entrepreneur's start-ups and spin-offs and build relationships with external stakeholders. Innovation Hubs usually offer "free or subsidised premises, access to laboratories, research facilities and IT services, coaching, mentoring, training and access to financing" (The entrepreneurial guide, 2012, p.11).

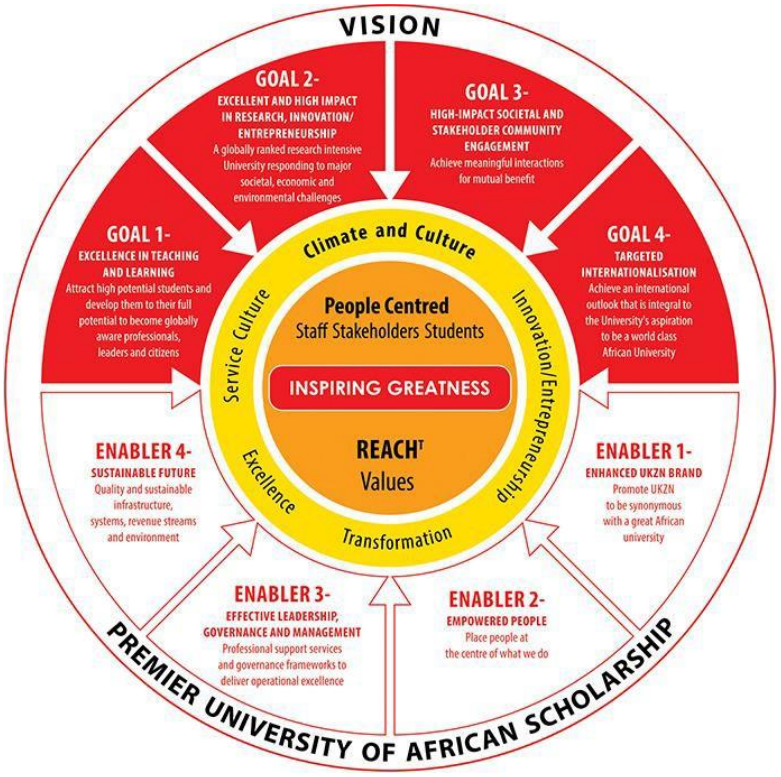
One characteristic that deems a university to be entrepreneurial is internationalization. The international outlook should be recognized at all levels of a university's structure. It should form part of the strategic process as this helps to better direct the institution through making decisions that are informed. Once internationalization is integrated in the strategies it makes it easy to put measurements for performance to assess if the university is achieving its objectives. It is also important to note that "It is not possible for a university to be entrepreneurial without being international but the university can be international without being entrepreneurial" (Ec-Oecd, 2012, p. 14).

As demonstrated by the strategy wheel (figure 2-1), part of the university of KwaZulu-Natal's agenda has been to drive Internationalisation, innovation and entrepreneurship in their strategic plans for 2017 – 2021. Goal 2 and 4 of the UKZN strategic plan 2017 -2021 highlights the context in which the university views these three important strategies:

Goal 4 – targeted Internationalisation of the UKZN strategic plan states that the university "seeks to achieve an international outlook that is integral to its aspiration to be a Premier University of African Scholarship. It aims to promote Africa-led globalisation through African scholarship by positioning the University through its teaching, learning, scholarship, research, innovation and entrepreneurship and bringing knowledge production systems relating to its local context into the global arena" (UKZN Strategic plan, 2017, p. 23).

Goal 2 of the strategic plan focuses on UKZN's aspiration to achieve high impact in research, innovation and entrepreneurship with the aim to respond to the challenges that faces the environment, society and economy.

Figure 2-1: University of KwaZulu-Natal Strategic plan 2017 - 2021



Source: UKZN Strategic plan (2017, p. 18)

Nowadays the role of universities is facing rapid change in the context of “expansion of their tasks, leading to development of an Entrepreneurial University, creating business incubators for students to ensure sustainable higher education” (Bikse, Lusena-Ezera, Rivza, & Volkova, 2016, p. 75).

Entrepreneurial Universities must be able to produce students who can come up with new ideas, have the right kind of skills to tackle societal challenges while creatively thinking in an entrepreneurial way to improve collaboration with external stakeholders in achieving sustainability.

Universities should strive to working towards transformed Teaching and Research traditions to being entrepreneurial to integrate the social and economic development (Dino Arnaut. Towards an Entrepreneurial University). Hence, universities plays a crucial role in educating future entrepreneurs to allow them to develop “intuitive decision making, the capacity to make things happen autonomously, networking, initiative taking, opportunity identification, creative problem solving, strategic thinking, and self-efficacy, upon the ability of an individual to cope with an unpredictable external environment and the associated entrepreneurial ways of doing, thinking, feeling, communicating, organising and learning” (Bikse *et al.*, 2016, p. 79).

The need to teach relevant content that addresses challenges that S.A is facing in the current context becomes paramount. D. V. Bell (2016) stated that students need to learn skills which are relevant to the emerging economies and not just learn business models that were used in the past because their creativity and innovation will help develop new ways of sustainable businesses. Educating with sustainability at the core of the process ensures the development of values, knowledge, competencies, skills that encourages sustainability and the improvement in the quality of life for the next generations through the preservation of the environment (Besong & Holland, 2015).

According to Wright *et al.* (2017) the strength of the entrepreneurial activities will depend on its history, location, culture, scope, research quality, resources, networks and it capabilities. These elements affect the kind of student entrepreneurs that are produced by the university of which the outcome can also be linked to its strategies and objectives. Their study further found that “Universities with strong, world class science, medical and

engineering, as well as computer science faculties, may be able to generate different types of student entrepreneurship than those colleges or universities focused on arts and social sciences" (Wright *et al.*, 2017, p. 913).

2.6 The University Environment in supporting student entrepreneurs

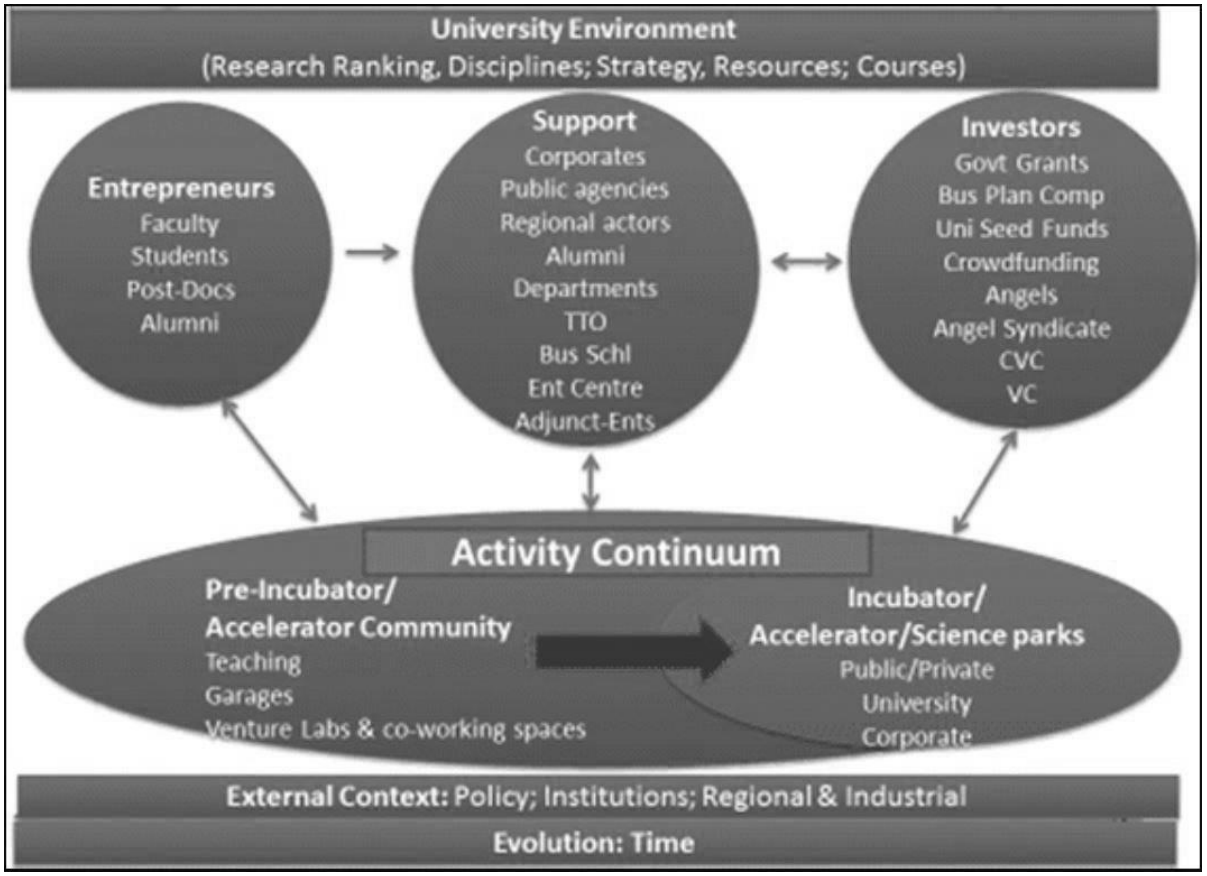
The context in which the university exists in has an impact on the kind of resources and competences that universities can put in place to support student entrepreneurship (Mustar *et al*., 2006, as cited in Wright, Siegal *et al*. 2017). A study by Clarysse, B., Wright, M., Lockett, A., van de Velde, E., & Vohora, A., further supported that there is a known misalignment in respect of the objectives of the university and fostering for entrepreneurship and the resources that are committed to achieve the outlined objectives (as cited in Wright *et al.*, 2017). The misalignment may require to be incorporated in the strategies for the entrepreneurial ecosystem with the purpose of supporting student entrepreneurship. Universities that are well funded through their alumni and other private funders stand a better chance in providing financial support to its student entrepreneurs (Wright *et al.*, 2017).

In institutions of high learning, lecturers play a pivotal role imparting knowledge to students through the 290-teaching model. At the core of the model is the process of delivering content from an individual to multiple learners. This model is viewed as education to entrepreneurship (Aluthgama-Baduge & Mulholland, 2018). Universities can either be Research or Teaching orientated. "Public universities, especially land-grant universities, also have a strong economic development mission, which complements any efforts to enhance academic entrepreneurship and student entrepreneurship. Private universities are typically not as engaged with their communities as public institutions"(Wright *et al.*, 2017, p. 909). Nicolaides (2011) argued that there is an obvious shortage of suitable qualified academics who are able to teach entrepreneurship and that Universities could further provide more support to student entrepreneurs.

Figure 2-2 illustrates a university environment and its impact on an entrepreneurial ecosystem. This framework highlights time as a key element in the evolution of the entrepreneurial ecosystem for start-ups. For a functional ecosystem, there need to be sufficient resources and development of the necessary capabilities (Wright *et al.*, 2017). Any amendments in the policies of government, overcoming policy implementation challenge and a change in university strategies means that the likelihood of the time evolution would

be low and this would require that elements aligned to the evolution must be brought in line and should adapt.

Figure 2-2: University environment



Source: Jansen *et al.* (2015, p. 178)

Jansen *et al.* (2015) clearly states that universities plays a critical role in the climate for entrepreneurship. The challenge facing universities is that they no longer have a choice but to become relevant socially and economically in the current knowledge society (Schmitz *et al.*, 2017). Juma (2018) found that the biggest challenge the African continent face is the lack of ability to invest in capacity building for an enhanced education. He further states that most of our universities are not keeping abreast with the transformation happening globally in terms of how they teach to promote innovation.

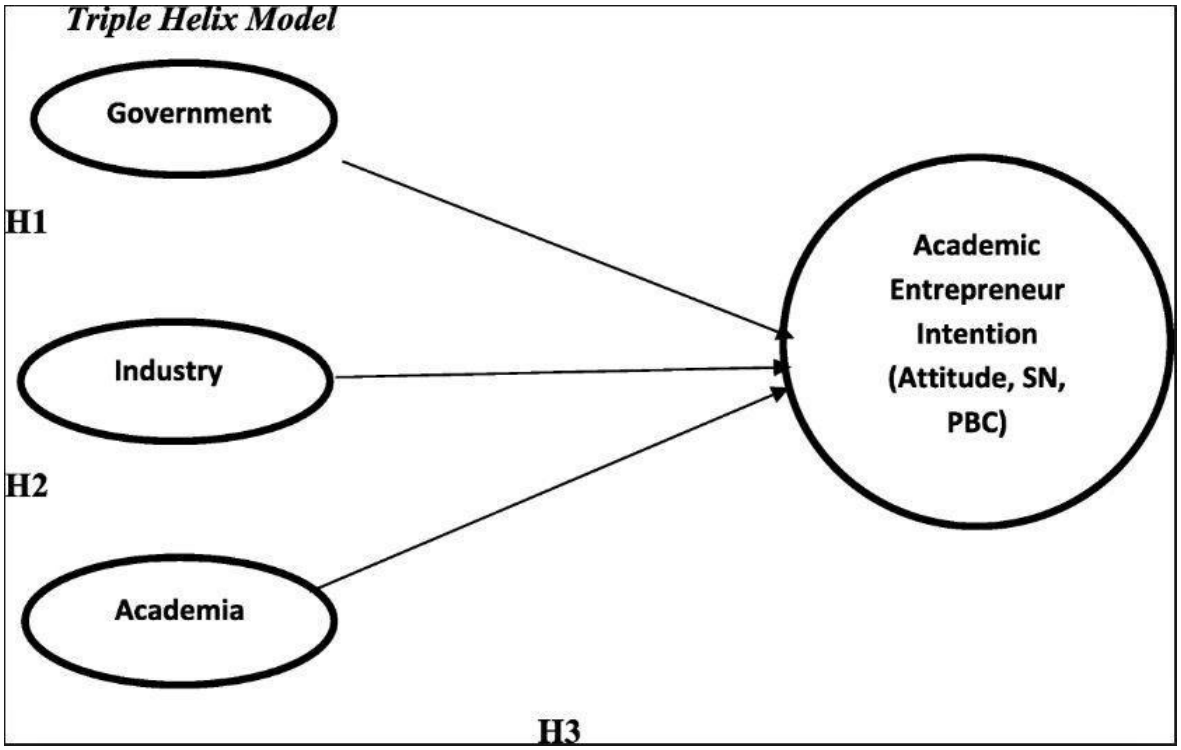
Etzkowitz (2014) indicated that there is a revision of the traditional teaching and learning at universities to encompass the elements of entrepreneurship. He stresses that this is done to draw in external sources and ensuring the knowledge is utilised efficiently. Sadly, most South African universities have not yet fully redesigned their curricula to respond to the current challenges and preparing graduates with the right kind or skills and knowledge for future readiness. On the contrary, there has been a rapid shift in the introduction of programs that are meant for student entrepreneurship. This is causing a change in the

conventional teaching to more experimental and practical learning meant to result in the reduction of unemployment (Wright *et al*., 2017 as cited in Gosen and Washbush in Simul Gaming, 35:270– 293, 2004).

2.7 The Triple Helix on student entrepreneurship

As argued by Schmitz *et al.* (2017) figure 2-3, in a knowledge society, there needs to be a close collaboration between three organs which is industry, universities and government widely known as The Triple Helix. The Triple Helix is known for the intertwining of the three industries with arrays of interlinkages for the purpose of advancing the economy and developing society through strategic innovations Schmitz *et al.* (2017). In this age, the relation between public and private entities is one that is seen to bring about positive results of success.

Figure 2-3: Triple Helix Model



Source: Samo *et al.* (2019, p. 5)

Jansen *et al.* (2015) advocates the view that the government and universities are making available spaces which are highly innovative whereby young entrepreneurs are leading and in turn bringing about economic growth. A study done by Samo and Huda (2019) found that there is a significant correlation between government

and universities with the entrepreneurial intentions whereas the private sector has a positive correlation, but an insignificant relationship.

2.8 Student entrepreneurs

Olugbola (2017) indicated that youth readiness can help create new business and give a country an economic competitive advantage. He further noted that the role played by youth in entrepreneurial activities is concerning and stakeholders need to provide them with the appropriate support structure to break this cycle. To increase the entrepreneurial activity amongst the youth, stakeholder support can be from religious group, family, government, lecturers, and friends.

Entrepreneurial readiness is defined as the "confluence of a set of personal traits that differentiates individuals with readiness for entrepreneurship as especially competent to observe and analyse their environment in such a way that they channel their high creative and productive potentials, so they may deploy their capability to dare and need for self-achievement"(Coduras, Saiz-Alvarez, & Ruiz, 2016; Ruiz, Soriano, & Coduras, 2016 as cited in Olugbola, 2017, p. 158). Olugbola (2017) indicated that entrepreneurs who are likely to be successful are optimistic towards entrepreneurship.

There are various factors that can influence readiness of young people towards entrepreneurial activities. Gibb and Ritchie's study highlighted factors that inclines youth to be entrepreneurial as; occupational choice and development, present lifestyle, class structure, family origin/businesses, social attachments and prior experience (as cited in Olugbola, 2017).

Ramakrishna & Mujumdar (2016) found that one out of a hundred graduates consider being an entrepreneur after graduation, while others go job hunting. They further highlighted that countries such as USA and Israel are motivated by their inability to provide employment to such graduates and therefore put measures to capacitate them. Tshikovhi & Shambare (2011) argues that incorporating practical entrepreneurial training in university curricula is likely to enhance students' entrepreneurship intentions as well as their consideration of entrepreneurship as a possible career choice.

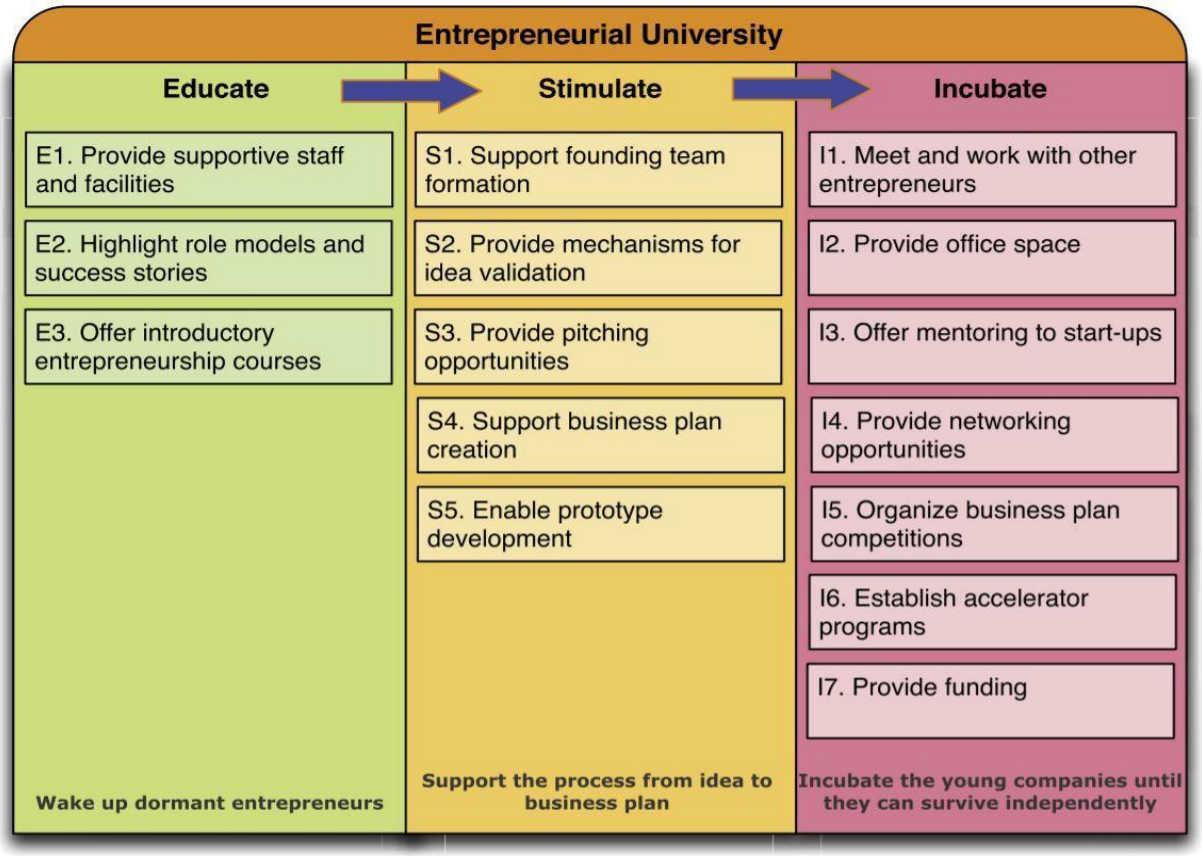
Tshikovhi and Shambare (2011) holds the view that there is a rise of low engagements in entrepreneurial activity by university students. They further highlighted that this is even more concerning for countries such as S.A because of the high unemployment rate. “Without access to jobs, it is therefore reasonable to argue that entrepreneurship and starting and running small businesses invariably becomes the next best option, but the existing literature suggests that students need motivation to embark on this” (Tshikovhi *et al.*, 2011, p. 2).

Universities such as UKZN make provision of physical spaces and other structures for students to utilise and also to stimulate entrepreneurial activities amongst them. However, the question of whether students make use of these resources still arises. Given the rise in unemployment, fewer graduates get the formal training or Learnerships which in many cases don’t help them see their careers through.

Jansen *et al.* (2015) developed a three-stage student entrepreneurship model (figure 2-4). The model illustrated below, demonstrates the stages that students go through in their journey of entrepreneurship. The model distinguishes through the three stages what the university offers: the stages are said to be “a stimulation stage, an education stage, and an incubation stage” (Jansen *et al.*, 2015, p. 172). Every stage has goals that includes specific activities; the goals are put in the order of their importance. This is done bearing in mind the sequence of how they could be supported to achieve the outlined goals, and encourage entrepreneurship in the university context.

According to Wright *et al.* (2017) the context in which the university operates has a significant impact on the resources and capabilities that universities are able to make provision of to support student entrepreneurship. Students entrepreneurs must decide where, when and how they will introduce their start-up company. They further indicated that such decisions are impacted by the availability of opportunities and the embeddedness of student entrepreneurs in the local context (as cited in Larson et al. 2016).

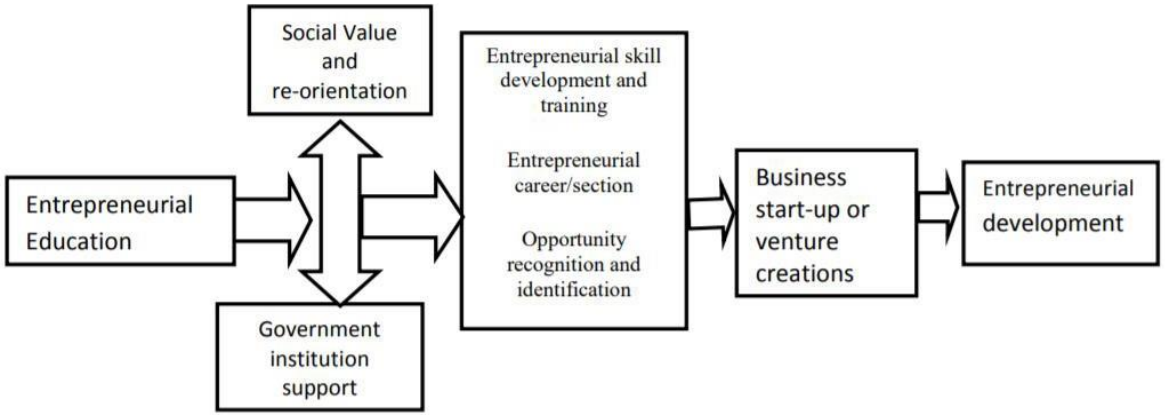
Figure 2-4: The three-stage student entrepreneurship model.



Source: Jansen *et al.* (2015, p. 172)

Wright *et al.* (2017) emphasises the importance of timing element, especially looking at it from the evolution of start-ups lens and the fact that its ecosystem has taken different shapes and forms from the day to day entrepreneurial conventions. At this day and age, time should be dedicated to the development of resources and capabilities to equip start-ups within their entrepreneurial ecosystems to function (Wright *et al.*, 2017). Student entrepreneurship can be supported by internal and external structures from the university. They also found that a key factor in stimulating a student entrepreneurial ecosystem and holding its elements together is dependent on how universities communicates the intended purpose and how the ecosystems will function.

Figure 2-5: The entrepreneurship model



Sources: Offusio, Nwolodo & Dede (as cited in Onuma, 2016, p. 20)

Offusio, Nwolodo & Dede (as cited in Onuma, 2016) emphasizes through the entrepreneurship model (figure 2-5) that students will obtain the necessary skills and training, explore opportunities which will result in them creating their own venture. Therefore, incorporating and integrating entrepreneurship in the school's curriculum is paramount to alleviate socio-economic challenges of high youth unemployment.

2.9 Small Medium Enterprises (SMEs)

According to the Banking Association of S.A, SMEs create over 60% of the jobs in the S.A economy which makes them the critical role players in the labour market with the majority of the employment workforce. They further stated that the use of adequate technology and low productivity remain as challenges that SMEs face in the South African market which ultimately could lead to their survival or failures. With the world evolving and becoming advanced it is now that human capital is meant to be emphasized and SMEs should be at the hub of this innovative change. This emphasis will ensure that human beings are not totally replaced by technology and also ensure that innovation remains at the center of strategic development for SMEs. Small business can be categorised as registered small or medium enterprises that is classified under a set of thresholds (The DTI, 2008). South African "small businesses range from medium-sized enterprises, such as established traditional family businesses employing over a hundred people, to informal micro-enterprises. The latter includes survivalist self-employed persons from the poorest layers of the population. The upper end of the range is comparable to the small- and medium-sized enterprises (SME)

segment found in developed countries" (SEDA, 2016, p.5).

According to DTI (2008) small business sizes are classified as follows:

Table 2-2: Categories to classifying Medium, small, very small and micro businesses.

Sectors or sub-sectors in accordance with the Standard Industrial Classification (SIC)	Site or Class	Total full-time equivalent of paid employees (Less than)	Total annual turnover (Rm) (Less than)	Total gross asset value (fixed property excluded) (Rm) (Less than)
Agriculture	Medium	100	5.00	5.00
	Small	50	3.00	3.00
	Very small	10	0.50	0.50
	Micro	5	0.20	0.10
Mining and Quarrying	Medium	200	39.00	23.00
	Small	50	10.00	6.00
	Very small	20	4.00	2.00
	Micro	5	0.20	0.10
Manufacturing	Medium	200	51.00	19.00
	Small	50	13.00	5.00
	Very small	20	52.00	2.00
	Micro	5	0.20	0.10
Electricity, Gas and Water	Medium	200	51.00	19.00
	Small	50	13.00	5.00
	Very small	20	5.10	1.90
	Micro	5	0.20	0.10
Construction	Medium	200	26.00	5.00
	Small	50	6.00	1.00
	Very small	20	3.00	0.50
	Micro	5	0.20	0.10
Retail and Motor Trade and Repair Services	Medium	200	39.00	6.00
	Small	50	19.00	3.00
	Very small	20	4.00	0.60
	Micro	5	0.20	0.10
Wholesale Trade, Commercial Agents and Allied services	Medium	200	64.00	10.00
	Small	50	32.00	5.00
	Very small	20	6.00	0.60
	Micro	5	0.20	0.10
Catering, Accommodation and Other Trade	Medium	200	13.00	3.00
	Small	50	6.00	1.00
	Very small	20	5.10	1.90
	Micro	5	0.20	0.10
Transport, Storage and Communications	Medium	200	26.00	6.00
	Small	50	13.00	3.00
	Very small	20	3.00	0.60
	Micro	5	0.20	0.10
Finance and Business Services	Medium	200	26.00	5.00
	Small	50	13.00	3.00
	Very small	20	3.00	0.50
	Micro	5	0.20	0.10
Community, Social and Personal Services	Medium	200	13.00	6.00
	Small	50	6.00	3.00
	Very small	20	1.00	0.60
	Micro	5	0.20	0.10

Source: The Department of Trade and Industry (2008, P.180)

The National Youth Development Agency (2011) reported that business ownership by young entrepreneurs is at its lowest when compared to the economically viable population which is at 57%. The report further suggested that the creation of employment and small business support should form part of the fundamental interventions carried out to revive the economy. To achieve this, it requires young entrepreneurs to be "formally trained, mentored, provided with solid work experience and properly funded" (National Youth Development Agency, 2011, para.3).

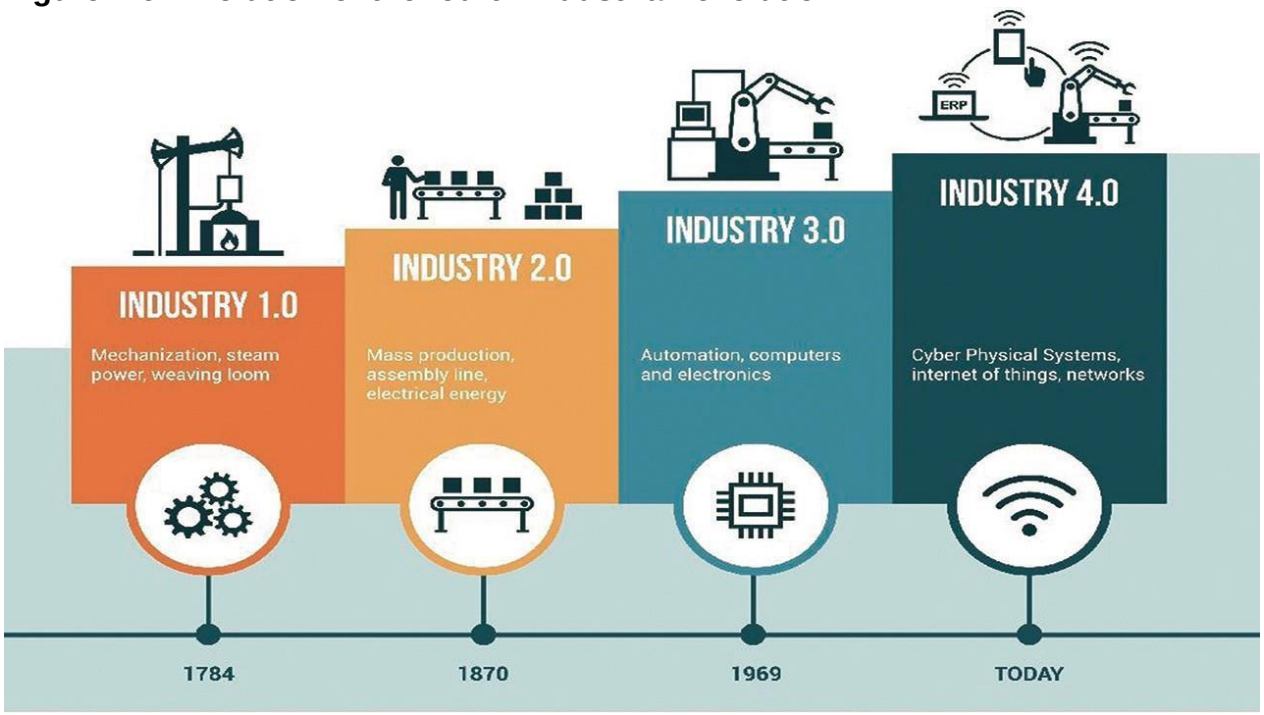
2.10 The opportunities and challenges of the fourth industrial revolution on SMEs

"We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before. We do not yet know just how it will unfold, but one thing is clear: the response to it must be integrated and comprehensive, involving all stakeholders of the global polity, from the public and private sectors to academic and civil society" (Schwab, 2016, p. 1). This statement highlights the magnitude of the future that lies ahead.

2.10.1 History of the fourth Industrial revolution

According to Schwab (2016) the production of material goods that are produced using machines and automation forms part of the industry economy. The genesis of industrialisation shows that technological improvements have led to the evolution of the industrial revolutions. As demonstrated in figure 2-6, Kucera, Haffner, Drahoš, & Kozak (2018) explained that the first industrial revolution made high consumption of electrical energy, the second industrial revolution improved through the introduction of airplanes, fuel engines, airplanes and the use of chemical fertilisers. The third industrial revolution introduced the internet, computers and cloud. The current revolution is the fourth industrial revolution, which is characterised by a blend of technologies (cyber physical systems, networks and internet of things) that is removing boundaries between the physical, biological, and digital spaces (Kucera *et al.*, 2018).

Figure 2-6: Evolution of the fourth industrial revolution



Source: Kucera *et al.* (2018, p. 1)

2.10.2 Fourth Industrial revolution - opportunities

Xu *et al.* (2018) argues that industry 4.0 is driven by more than just technological change. It is disruptive in different sectors and industries however, its innovation has a positive bearing on businesses, the education system and other various industries in the economy. For instance, the previous revolutions focused on transforming the education industry. This transformation disruptively got universities to rethink the way they went about their teaching and Research particularly in the higher education context. Universities now use the blended learning approach, which is a combination of the traditional method of teaching and technology. There is also a strong concentration on providing incubation spaces for student entrepreneurs which gives students a platform to be innovative. Xu *et al.* (2018) mentioned that there are vast opportunities that brought about the fourth industrial revolution, some are known as:

- Integration of different technics and domains
- Improved quality of our lives
- Connected life
- Artificial Intelligence
- Lower barriers between inventors and markets

Some of these opportunities benefited businesses such as UBER through the disruption of the taxi industry; Netflix is doing the same in the television industry. Business operations are shifting in dimension that are unprecedented because of the stir caused by technology. While the opportunities might be great, challenges also form part of the entire process. It is already evident that there will be a significant disruption in human resources where people will be substituted by machines or have to work hand in hand with machines and this requires an upskilling of the labour force.

2.10.3 Fourth Industrial revolution – Challenges

With the use of the sophisticated technologies comes other challenges such as systems hacking, cyber-crime, and risk assessment just to mention the least. Our lives are now fused with technology to an extent where we are interconnected and can no longer see ourselves detached from technology. There is going to be great exposure and vulnerability of information security as a result of the internet (Goode, 2018 as cited in Xu *et al.*, 2018). This affirms that Cyber security is a real threat. “Companies will need to map their networks, assessing the risk and critical factors relating to security. Such an assessment should examine accessibility to systems, such as possible threats from internal sources, from disgruntled employees to internal human error, and external sources including hackers and cyber terrorists” (Xu *et al.*, 2018, p. 93).

2.11 Innovation for SMEs

Entrepreneurship is crucial for disruptive and radical innovation. The concept innovation has taken center stage and has been at the heart of businesses for the past decades. According to Schumpeter & Redvers (1934) innovation in entrepreneurship involves the process of producing a new product using a new method which consequently leads to opening a new market and sourcing for new raw materials. Wijngaarden *et al.* (2016) found that innovation can be viewed from three dimensions, innovation as something that is new in its entirety; innovation as it contributes to the betterment of society; and innovation as an endless concoction of the new and that which is already existing be it in products, ideas or systems. From this perspective, innovation can be said to be the ability to apply creative solutions to problems or opportunities to enhance or enrich people’s lives. In short, it is the application of creativity in real business situations.

Brake and Hanson's study referred to the imperceptibility of the human touch in the process of innovation. Brake and Hanson further made an argument that innovations don't just happen unexpectedly. Innovation is as a result of the beings that are entrenched in the human ecosystems (as cited in Jiménez *et al.*, 2018). The Fourth Industrial Revolution (Industry 4.0) is making waves in all spheres and businesses need to embrace this change. Industry 4.0 "embraces amongst other things, artificial intelligence, Innovation, the Internet of Things (IoT) and next-generation robotics" (Keith Campbell, 2017, para.2). It has brought about a disruptive drastic shift in businesses through its technological efficiency and sophistication. Saunders (2015) holds the view that S.A is not prepared for this technological disruption.

A report from Deloitte (2016) indicated that successful entrepreneurs innovate and create novice business ideas which are on the edge and relevant. it is up to SME's to explore innovate ways to start preparing themselves for Industry 4.0 which is already on our door steps. Given the contributions SME's make to the S.A economy, the continuous growth and development of this country lies in the plans and strategies of the current SME's.

2.12 Innovation hubs

An Innovation hub is seen as a catalyst of innovation and entrepreneurship. Jiménez and Zheng (2018) states that innovation hubs are spaces created for small businesses who are at start-up phase that require financial and non- financial support. Innovation hubs are also commonly known as incubators. According to Friederici (2017), incubators were founded in the 1980,s using the model of a real estate. He states that it was a space that took form of an office and added value through economies of scale and sharing of resources. Friederici (2017) found that offering services only is not an indicator of a hub.

There is a misnomer regarding what innovation hubs are, this has resulted in several names being used to describe what it is. Names such as innovation centers; for-profit and non-profit; real estate through lease of space; technology-based; academic as university-based; pre-incubator and hatcheries just to name a few have been used to describe what an innovation hub is (Robinson, 2010 as cited in Allahar & Brathwaite, 2016).

To achieve UKZN's strategic objective of innovation and entrepreneurship, the UKZN InQubate was developed. Out of the UKZN InQubate, an Entrepreneurship Skills programme called Enspire was born with the aim to equip UKZN students with practical entrepreneurial skills. Enspire aims to translate the entrepreneurial mindsets of students into sustainable businesses. This programme comprises of a process that is mentored and managed to unlock the potential of students who have the entrepreneurial spirit. "The Enspire model holistically embraces entrepreneurial development using effective processes to propel student creativity and ideas into functional legal business entities. As students are at the university for limited periods of time, Enspire has been designed as a fast track stage gate model to support novice and seasoned student entrepreneurs" (UKZN, 2020).

Zhao's study stated that to realise the social and economic value; the process between innovation and entrepreneurship should be viewed as ceaseless and complimenting of each other (as cited in Schmitz *et al.*, 2017). To substantiate this statement Emami *et al.* (2017) confirms that an important characteristic of entrepreneurship is the ability to translate a business opportunity into the creation of new value. The marriage between the two concepts is one that undeniably stimulate business growth and sustains it if effectively managed. To emphasise the importance of innovation "hubs have become the vessels for, and the beneficiaries of, optimism and excitement about technology entrepreneurship in Africa" (Friederici, 2017, p. 10).

Wright *et al.* (2017) argued that Incubators can be another gateway of molding a business idea further and find investors and new markets. Wright *et al.* (2017) further stated that an incubator could be part of the university offering at least some of these services: "(1) access to physical resources; (2) office support services; (3) access to capital; (4) process support; and (5) networking services. Among the different types of incubator models, university incubators have been established to facilitate technology commercialisation" (Wright *et al.*, 2017, p. 918). To become more specialized, Bruneel, J., Ratinho, T., Clarysse, B., & Groen, A., argued in their study that Incubators have evolved over time from being primarily focused on providing office space and in-house business support services, to providing services such as aid in evaluating different market opportunities, access to knowledge intensive services, product development support, access to networks of entrepreneurs and provision of entrepreneurial finance (as cited in Wright *et al.*, 2017).

2.12.1 Characteristics of Innovation Hubs

The current business economy has shifted drastically and this is forcing innovation hubs to also make the necessary changes in line with this shift. Innovation hubs were formally introduced in the 2000s and this was from a further development of Incubation models. “Theory on IHs has largely been derived from the study of incubators operating in Europe and the United States (US). Evolved from the theories of the networked incubator and the bottom up incubator, IHs share the same overall traits as incubators described in the literature” (Chirchietti, 2017, p. 7).

Howells study defined from the National Business Incubation Association that an incubator is an organisation that is intended to fast-track the growth and development of a start-up through a collation of support services. These would include training, capital, networking possibilities and office space. The definition further states that the main objective is to produce successful start-ups that will be financially viable and self-supporting. Incubators provide infrastructure to start-ups as a support mechanism because of their limitation in adequate resources for success (as cited in Chirchietti, 2017). Incubators are created to provide linkages between entrepreneurs and their environs to bring about economic development and growth (Chirchietti 2017)

According to Ford (2017) an Innovation Hub is a space where researchers, government, community, end users, industry and other stakeholders can interact and create innovative solutions together. Innovation Hubs are communal, adaptive and encourage collaboration by enabling innovative products and services to be produced, tested and delivered to market for consumption by the end user. Ford (2017) described the following as characteristics that distinguish innovation hubs from related concepts such as incubators, accelerators, makespaces, fablabs, ecosystems and clusters:

(1) Embraces diversity by building a community of innovators and entrepreneurs who are like-minded. Innovation Hubs help connect diverse people and knowledge, and thus increase the potential of creativity through the continuous flow of diverse stakeholders.
(2) Focuses on impact by accentuating the sense of being a part of a common mission. Innovation hubs encourages stakeholders to not focus on the short-term but rather on the vision and impact.
(3) Encourages networking among the various stakeholder.

(4) Intensive collaborative innovation. Inspires collaboration amongst stakeholders in different of ways. For example, co-creating, crowdsourcing, design thinking, and other various open innovation activities. The distinctiveness of an innovation hub is dependent on the high intensity frequency and the openness of the collaborative innovation activities that stakeholders engage on.

(5) Innovation Hub make the innovation process dynamic by searching for ideas through hackathons, idea competitions, innovation challenges, pitches and brainstorm.

2.12.2 Roles of innovation hubs

In comparison to incubators, innovation hubs provide support to start-ups to assist them through the first challenging phase of starting a business (Hackett and Dilts, 2004 as cited in Chirchietti 2017). Support offered by Innovation Hubs include:

- Assistance with the basics of a business;
- Networking;
- Assisting with Marketing;
- Market Research;
- Providing Internet access that is fast and reliable.

According to Friederici (2014) these support services provides an incomplete picture of what innovation hubs are supposed to be. He added that this could be due to the fact that the term Hub has been inaccurately perceived by organisations to be one that is not aligned with them. Chirchietti (2017) substantiated this by further stating that collaboration and open innovation are concepts that best define what an Innovation Hub is. Innovation hubs could can also be seen as a catalyst for economic growth and development of entrepreneurs.

Innovation hubs brings together a community of diverse stakeholder such as funders, universities, start-up entrepreneurs, and other stakeholders from different sectors (de Bastion, 2013 as cited in Chirchietti 2017). A collaboration of these stakeholders brings about a positive result for the economy. For the purpose of this study, a definition that best describes what an Innovation Hub is that it is a “physical environment that support start-ups and individuals at different stages of development. It is an umbrella term for a community-driven pre-incubator, incubator, accelerator, hacker space and co-working

space that encourage collaboration, networking and innovation" (Chirchietti, 2017, p. 9)

Furthermore, Friederici (2014) added that Innovation Hubs are enablers and not creators. In most of the physical spaces that are provided by these hubs, "events and meet-ups enable new and promising businesses to be discovered and funded. Although training and learning mostly takes places informally, most IHs offer seminars, courses or workshops on business in general, legal issues, marketing and financial management to help start-ups increase their knowledge and field of expertise" (Chirchietti, 2017, pp. 8-9)

2.13 21st century business challenges

Entrepreneurial conventions are becoming a priority of today's business agenda. Are people moving with the times? Are businesses responding to today's business challenges accordingly or are businesses still stuck in the traditional way of doing things? Werwath (2018) observed that in entrepreneurship, during the initial stages of a business the goal should not be to disrupt but to be a monopoly. He argues that companies that aspire to disrupt often enough don't succeed because those already in the market will see such companies as a threat and strategise to eliminate them from the market.

SME's entrepreneurs are faced with various challenges that range from short term to long-term. Mensah, Fobih, & Adom (2017) found that business challenges trends across start-ups and operations as highlighted by entrepreneurs to be: Access and availability of funds; Absence of business planning, Trained labour and suitable management skills; Lacking competitiveness, Innovation and customer loyalty.

Policies and transformation in legislation is required to support innovation in universities (Juma 2018). To turnaround the current state of universities to those that are innovation inclined, amending policies; laws or even going to an extent of creating new laws are imperative if the objective is to be achieved. South Africa has numerous laws in place to support various structures of government. In this instance, " Amendments to laws on higher education, science and technology, research, or agriculture could provide for innovation universities that include research, training, commercialisation, and extension" (Juma, 2018, p. 2)

S.A is not foreign to the challenges of being under capacitated in the areas of mathematics, science, engineering, education and technology. Investing in these areas of development will help advance the economy and can be used as a mechanism to move

away from being heavily dependent on natural resources. African Universities are still grappling with the issues of transforming its curricula to be relevant to the current context and be aligned to industry 4.0.

Much investment is being made by the Department of Higher Education and Training (DHET) to universities through grants to relooking their curriculum and making sure that it is relevant and not outdated. Trencher, Bai, Evans, McCormick, & Yarime (2014) argued that from a global perspective, universities are experimenting with new models that are aimed at economic transformation in that particular location.

Juma (2018) suggested that there needs to be a correlation between innovation and research within universities. At times innovation in a university can be seen as a commercialization exercise and not in any way interlinked with research. Therefore, these functions are at most times run separately. A relevant argument to the current education system by Juma (2018), stated that "the current approach is dysfunctional because universities use established teaching methods without incorporating new research, resulting in graduates with outdated worldviews and skill sets that are not suited to contemporary needs. Research Institutes lack the means to disseminate findings to the public through practical business or community outreach without students. These functions need to be pursued in an integrated way under one institutional structure" (Juma, 2018, p. 2).

2.13.1 21st century business skills

It is crucial that entrepreneurs are able to recover quickly and stay the course in the face of repeated business challenges. The current business landscape has become fast-paced and it is paramount that entrepreneurs be agile and resilient. Germaine, Richards, Koeller, & Schubert-Irastorza (2016) identified the 21st century skills which are prerequisites for success in the global workplace of the future to be creativity and innovation; critical thinking; communication; collaboration; Information, media and technology skills. Table 2-3 provides an explanation of each skill as it relates to entrepreneurs in the 21st century.

Table 2-3: 21st century business skills

Creativity and innovation	Entrepreneurs need to think and work creatively to create new innovations. Entrepreneurs must possess creative skills, produce innovative ideas and solutions; determine whether their ideas are commercially viable and materialise the ideas. In the process of creativity and innovation, entrepreneurs

	must be cognisant of the business macro environment (Alshare & Sewailem, 2018).
Critical thinking	Critical thinking enables an entrepreneur to think clearly and rationally. To be able to face today's business challenges, entrepreneurs must be able to solve problems through logic, seek alternatives, be resourceful and make complex choices and decisions (Alshare *et al.*, 2018).
Communication	Effective communication is an important skill in business. Entrepreneurs must communicate clearly, honestly and be straightforward. Effective communication can help with negotiating, networking and building relationships (Alshare *et al.*, 2018).
Collaboration	Entrepreneurs need to be able to work effectively with different people; identify the strength of others; acknowledge their own strengths and limitations; understand the role of others; able to lead, mentor, coach and resolve conflict (Alshare *et al.*, 2018).
Information, media and technology skills	Technology has become crucial in every business irrespective of size. Crittenden, Crittenden, & Ajjan (2019) Indicated that entrepreneurs cannot survive the digital era without the use of some form of technology for their businesses. Entrepreneurs must be able to practice responsible use of information and technology and show positive attitude towards the use of technology and media for collaboration and productivity (Crittenden *et al.*, 2019).

2.14 The relevance of innovation hubs programme to the business challenges of the 21st century

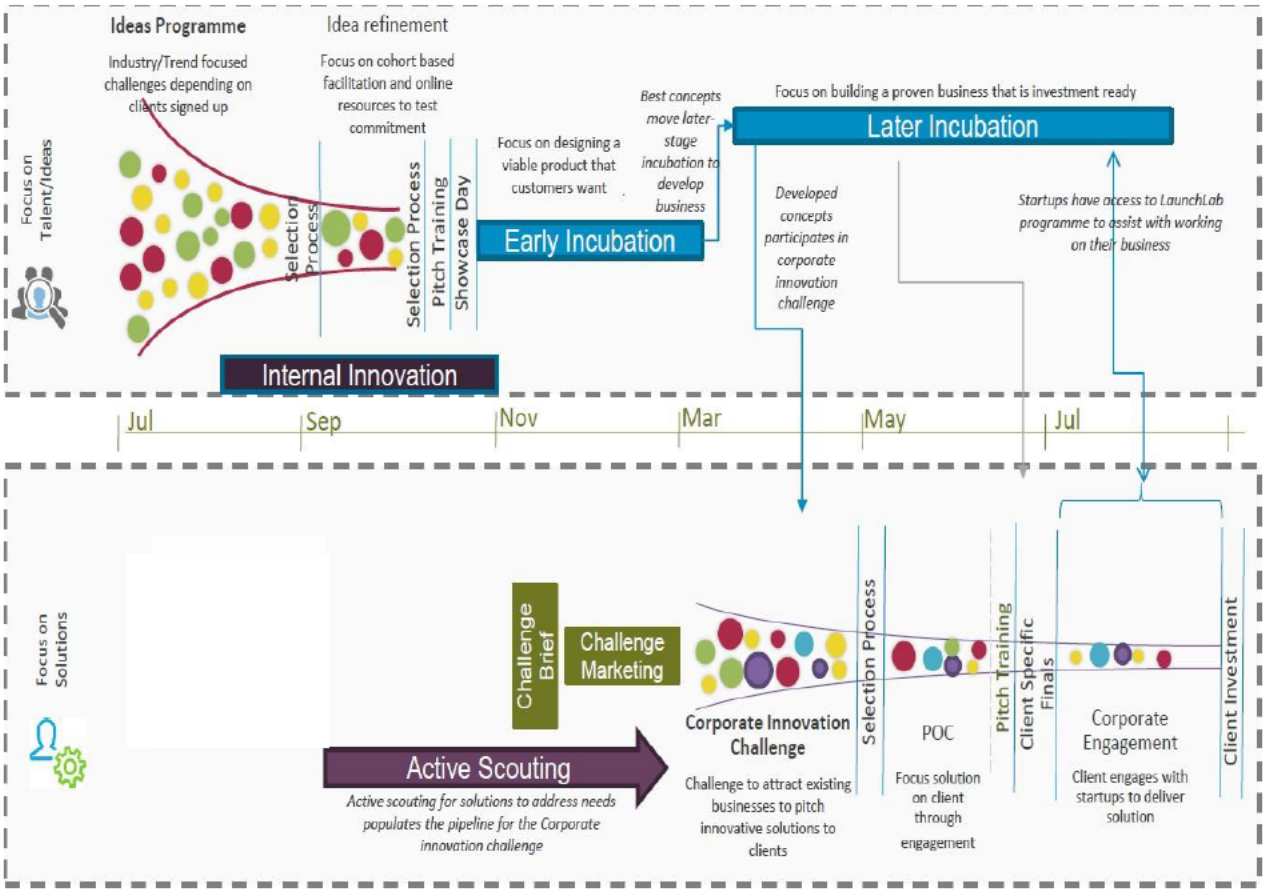
Costello (2016) argued that innovation hubs have an objective which is twofold: "to facilitate the emergence of new market-led and knowledge-based companies in the region and to forge strategic links between the college and the world of industry and commerce" (Costello, 2016, p. 2422). It stresses the need for a collaborative relationship

between these industries. He further states that such innovation hubs offer various types of business development support to start-ups such as sales and marketing, mentoring, networking, financial and legal. Furthermore, innovation hubs also provide Intellectual Property (IP), Patenting, Copyright and Trademarks services.

Mason and Arshed's study also supported the argument that time has come to do away with the old systems of imparting knowledge in terms of teaching, research and development of entrepreneurship. He further agreed that there is still a need to engage in robust debates as to how universities should be teaching entrepreneurship (as cited in Costello, 2016). His study is centred around the reworking of curricula programs to include innovation and entrepreneurship.

Figure 2-7 demonstrates that the link between university and industry is important for stimulating knowledge development that can lead to commercial innovation (Yusuf, 2008). The diagram illustrates the innovation process from idea to client investment. The stages involved in this process are (1) identifying a talent/idea (2) refining the idea (internal innovation) (3) identify the best concept (early incubation) (4) building a proven business idea that is investment ready (later incubation) (5) client investment (Active scouting) (Phillip, n.d). This is further substantiated by Mashau (2018) who indicated that to achieve effective knowledge exchange in the economy different kinds of intermediaries have to work together. Through their transfer of knowledge universities can draw the interest of industry through the innovation activities. The geographic vicinity becomes critical in the process of transferring knowledge and this is because of the much- localised knowledge transfer between the intermediaries (Mashau, 2018). Consequently, it becomes the responsibility of universities to "contribute to the development and expansion of local industries through the provision of skilled graduates who become key players in local industries and knowledge spin-offs" (Mashau, 2018, p. 49)

Figure 2-7: The Innovation and incubation process



Source: (Phillip, n.d)

Mashau (2018) concurs with Jansen *et al.* (2015) that universities across the world no longer have a choice but to be entrepreneurial, stating that this is to ensure that universities are always at their competitive edge, as well as add to their streams of income generation following the policy provisions made by government for contracting and licencing research. He further stated that the greatest resource that is in the possession of universities is to foster the culture of entrepreneurship in their students. Innovation is a prerequisite for entrepreneurs and university are in possession of the cohort who has the knowledge (Mashau 2018). He argues that universities should be active in expediting innovation through their role of being an entrepreneur and at the same time be the advocators for innovation. He found that the best way to do this can be through the business-support and entrepreneurial programme.

Universities are the main drivers of student entrepreneurship through their innovation hubs, incubation and research centres (Voisey P, Jones P and Thomas B, 2013 as cited in Mashau, 2018). These structures can help alleviate the spirit of entrepreneurship and

less that of job seeking. Innovation Centres ran by universities consist of an array of services that allows for a technology entrepreneurship to form (McAdam R, Keogh W, Galbraith B and Laurie D, 2005 as cited in Mashau, 2018). Innovation hubs mainly provide the following services to start ups “generate ideas, create new knowledge, develop spin out and spin in companies, technology licensing, to secure intellectual property, technology appraisal, venture capital and funding, and developing business plans and business growth” (Mashau, 2018, p. 52).

2.15 Equipping student entrepreneurs to be future business leaders

The future looks complex due to the technological disruptions. This will require organisations to strategise in line with this change considering other factors of the business that may get impacted by such strategies. “Organisations that want to remain competitive in a changing environment, need to anticipate shifting behaviours’ of stakeholders and technologies. Technologies such as big data analytics, block chain and artificial intelligence; as well as trends such as the Internet of Things are challenging common industry practices. These technologies challenge organisational design and strategic management and make data more important than ever before. These disruptions to accepted norms require a change in approach to how we organise activities within and across organisations” (van Rijmenam, 2019, p. 9)

Entrepreneurial skills and knowledge are important attributes for students who consider pursuing a more entrepreneurial route to employment. Entrepreneurship is common in South African higher education institutions, nevertheless young citizens require urgent training, education and to be equipped with the necessary knowledge and skills to foster an entrepreneurial trajectory in their complex environment (Hamilton & Mostert, 2018). Hamilton *et al.* (2018) also found that students feel they have the necessary knowledge and skills to be entrepreneurial. Lechner, Sortheix, Obschonka, & Salmela-Aro (2018) argued that becoming a future leader requires one to be exposed to different roles and business functions as much as possible.

Brueckner, Spencer, & Paull (2018) holds the view that universities have the opportunity to mould the behaviours and attitudes of those in leadership through research, training management development programs, business education to mention a few. Brueckner *et al.* (2018), further stated that curriculum that is entrepreneurial focused and the university environment plays a pivotal role in shaping attitudes. Student’s academic progression

and their genders have an impact on their attitudes towards entrepreneurship (Brueckner *et al.*, 2018).

2.16 Government support for student entrepreneurship

DHET has responded to the challenge faced by SMEs by creating a platform to develop entrepreneurship through an Entrepreneurship Development in Higher Education (EDHE) programme. The programme was started to achieve the following goals: (1) Student entrepreneurship, i.e. mobilising the national student and graduate resource to create successful enterprises that will ultimately lead to both wealth and job creation. (2) Entrepreneurship development in academia, i.e. support academics in instilling an entrepreneurial mindset within all students and graduates through the offering of relevant knowledge, transferral of practical skills and the application of business principles, not only to a specific discipline, but across disciplines. (3) Developing entrepreneurial universities, i.e. creating a conducive environment that will enable universities to adapt strategically and embark on projects whereby third-stream income can be generated through innovative business ideas.

This programme was developed to foster the entrepreneurial spirit amongst students and to be the catalyst for economic growth and development. It is aimed at equipping student with the skills and knowledge to be able to decide whether to be an entrepreneur or choose to seek for job opportunities. The programme is not only student focused but includes academics as the drivers of content to instil the mind-set of entrepreneurship.

Although the programme is much more people-oriented, it places a much greater emphasises on developing curriculum. This is done with the intention to include entrepreneurship modules across board. Furthermore, the said curriculum should respond to the context which is relevant and current to ensure that when student graduate they can make impactful contribution to the society and the global arena (EDHE programme, 2016).

Samo and Huda (2019) emphasised that government plays a key role in providing support for start-ups that are innovative. Government hold the power and structures in place to draft policies and guidelines that will enact entrepreneurial activities. government can encourage entrepreneurs to be innovative through providing funding and physical spaces in form of innovation hubs and science parks.

Conclusion

This section provides an in-depth literature search from scholarly research. Different methods of searching for literature were utilised such as books, journals, and other online peer reviewed materials. The literature conducted related to entrepreneurship, small businesses, student entrepreneurs, entrepreneurial universities, innovation hubs and the fourth industrial revolution and this was done in order to gain a broader understanding of the different aspects that impact student entrepreneur's development, growth of small businesses and the use of innovation hubs in a university context.

Chapter three: Research methodology

Introduction

The aim of this study is to determine if the UKZN innovation hub programme are relevant and gearing up student entrepreneurs for the business challenges of the 21st century. A research design that helped achieve the research objectives was chosen. This chapter details a map of how the study was conducted. This section is inclusive of data collection methods and instrument, data analysis, target population, sample and methods used to ensue trustworthiness.

3.1 Research Design

Research design is the blueprint that connects various components of a study in a logically comprehensive manner to answer research questions and objectives arising from the research problem being studied. The overall strategy around the research design is centered on the problem that is being researched. Creswell & Creswell (2017) stated that a research design should include the following: sources that are specific, clear objectives, data collection and analyses methods and ethical consideration.

Zikmund *et al.* (2013) stated different research designs as follows:

- **Causal-comparative research:** This research design aims to find correlations between independent variables and dependent variables after the occurrence of an event or action. A comparison of two individuals or a group as to whether the variables affected the outcome should be what drives the researcher. In a causal-comparative design there are differences and similarities. This design argues from the process, criticism, differences and benefits.
- **Explanatory research:** is a way to conduct a study while trying to find out what is going on in that current context; to search for fresh ideas and understandings; to gain understanding through asking questions and to look at a phenomenon from a different perspective (Zikmund *et al.*, 2013).
- **Exploratory research:** This research design focuses more on investing a situation or a problem to be able to get more in-depth explanation of the relationship amongst the different constructs (Zikmund *et al.*, 2013).

- **Descriptive research:** is a design that a researcher can use to portray a more truthful profile of situations, events and individuals (Zikmund *et al.*, 2013).

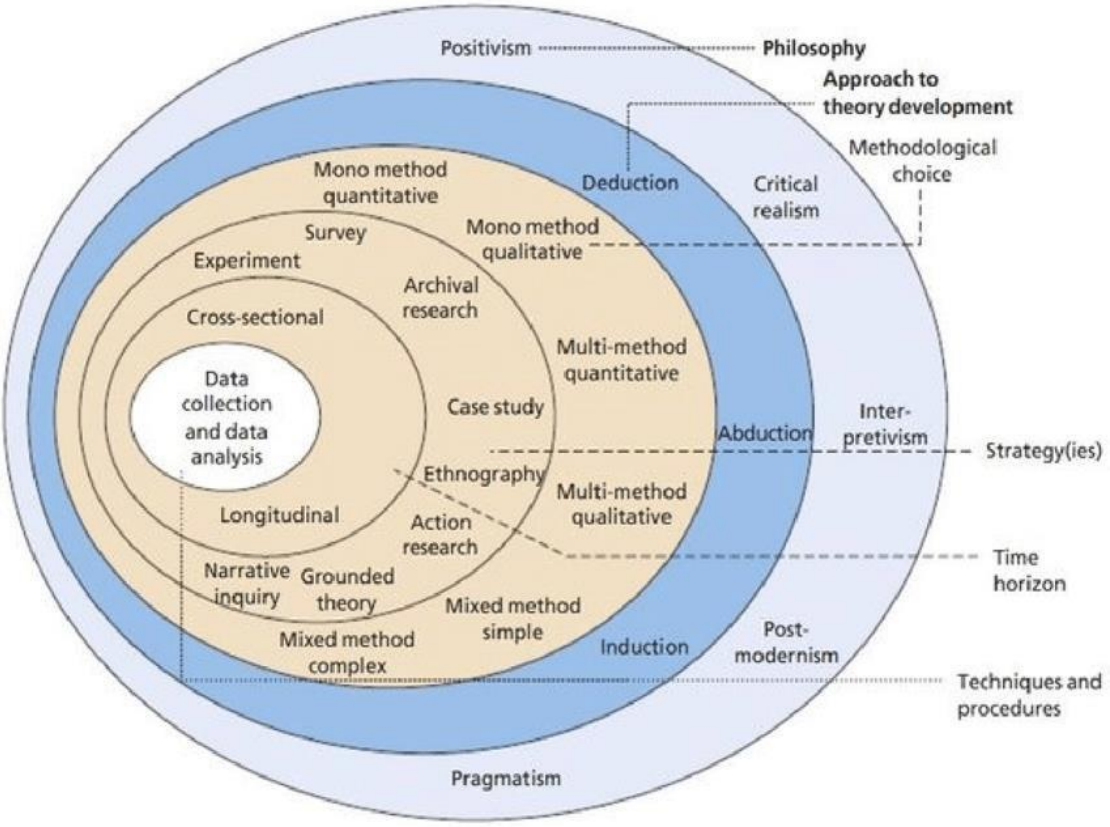
This study has taken an exploratory approach. The exploratory approach was deemed appropriate because the study is focusing particularly on the UKZN InQubate has not been conducted before. Exploratory research focuses more on investing a situation or a problem to be able to get more in-depth explanation of the relationship amongst the different construct. This method involved a survey which was used to explore the status quo.

3.2 The Research Philosophy

Žukauskas, Vveinhardt, & Andriukaitienė (2018) stated that a research philosophy is a term that gives an overall view of how knowledge will be developed and also gives view to its nature. A research philosophy is critical as it forms part of a study's research methodology. It helps ensure that data collection is conducted in a suitable and effective way Walliman (2017). Saunders *et al.* (2012) holds the view that a research philosophy is a way of observing a particular situation in society to gain understanding and explanations.

Figure 3-1 explains the research philosophy as demonstrated on the research onion as termed by Saunders, Lewis et al. (2015). The research onion encompasses the various research designs, strategies, approaches and the data collection methods utilised. The outer layer of the diagram shows the different philosophical positions of research. There are two main research philosophies, positivist philosophy which is associated with quantitative research and interpretivist philosophy which is associated with qualitative research. Below are elaborations of how the research philosophies are applied when conducting a study of any particular social phenomena.

Figure 3-1: The research onion



Source: Saunders, Lewis, Thornhill, & Bristow (2015, pp. 122-161)

3.2.1 The research philosophy for this study

For the purpose of this study a quantitative (positivism) research method has been given preference over the qualitative approach, the researcher also employed a survey format using a Likert scale for closed questions. This is based on the following reason: The decision behind selecting a quantitative method is to help the research determine whether the problem exist. This was achieved by using a closed questionnaire.

3.3 Research Strategies

Badke (2017) defined a research strategy as an overall plan of how the research questions will be answered. The strategy links the philosophy to the data collection and analysing methods. The research strategy is also linked to the quantitative and qualitative research design. What differentiates these designs is the type of questions and the way they are answered. Quantitative research strategies that a researcher can use are surveys and experimental design (Badke, 2017). Research strategies used by qualitative researchers are case study, action research and grounded theory (Opie, 2019).

3.3.1 Research strategy adopted for this study

For the purpose of this study the researcher developed questionnaires for a survey-based study based on the guidance from the literature review and from personal experience. The researcher asked all relevant and potentially relevant questions that were guided by the research objectives. Considering the cost effectiveness and minimum requirements, the researcher distributed all the questionnaires to the sampled respondents through email and handouts. The researcher also gave the respondents adequate time to respond to the survey-based questionnaire.

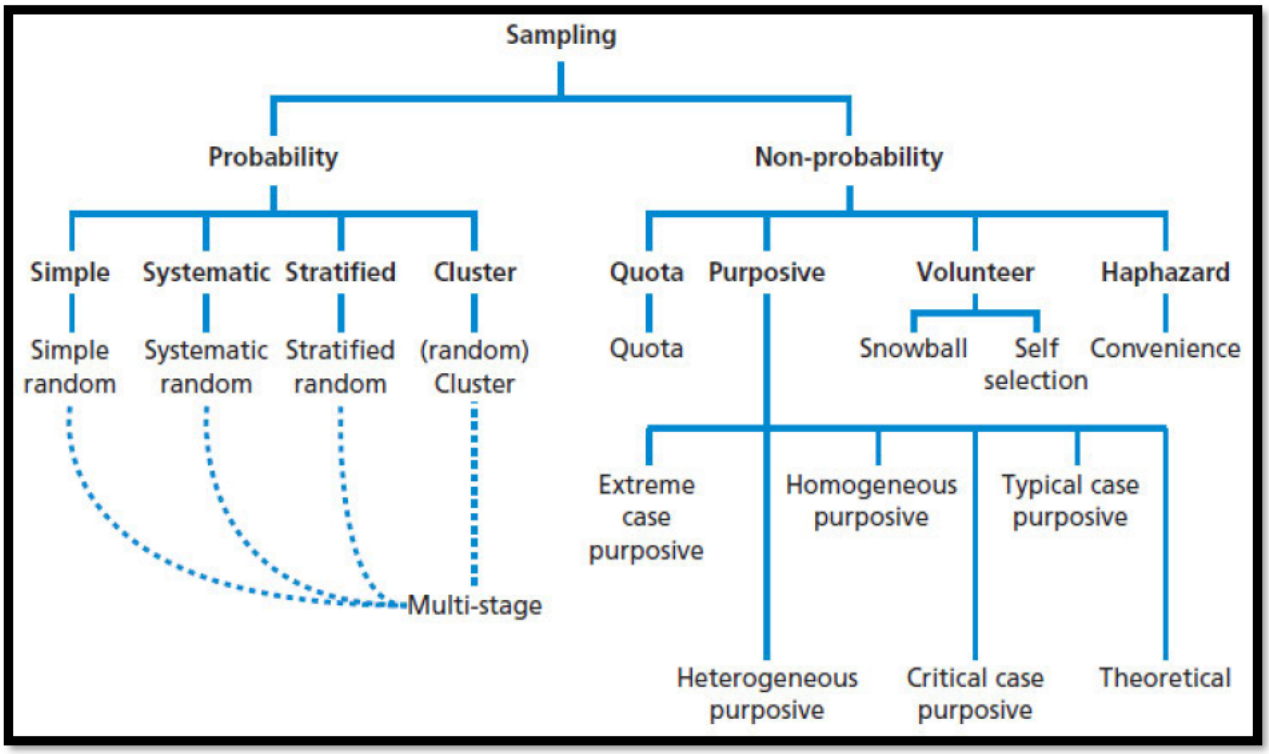
3.4 Target Population

Target population is a group of potential participants that the study wishes to draw results from in order to generalise the result. A target population is a subset of individuals drawn from the population that will take part in a research study (Van Zyl, Salkind & Green, 2014). A sample is drawn from a target population. The target population of this study was 50 student entrepreneurs of all sexes, age groups, education status and socio-economic status. This population was selected because of their involvement in student entrepreneurship under InQubate a division of the Research department within UKZN. The population of 50 student entrepreneurs was deemed appropriate because the UKZN InQubate programme is considered as highly specialised within the university and the respondents are not decision makers in the programme.

3.5 Sampling

Sampling gives a researcher an option to choose a selected number of participants from a pre-set population to partake in a study (E. Bell, Bryman, & Harley, 2018). Researchers make use of different strategies when selecting a sample. A probability or non-probability sampling technique can be used. The differences are further explained below as stated by Saunders *et al.* (2015) as illustrated by figure 3-2 :

Figure 3-2: Sampling techniques



Source: Saunders *et al.* (2015, p. 143)

3.5.1 Non-probability Sampling Techniques

A **non-probability sampling** means that a researcher has no means to predict that a participant will be included or not. This sample method is also known to be judgmental because it does not afford the entire target population an opportunity to partake in the study. There are different types of non-probability sampling which includes snowball sampling, purposive sampling and quota sampling (E. Bell *et al.*, 2018).

3.5.2 Probability Sampling

A **probability sampling** means that a researcher can predict the probability of a participant being included in the study. It is a sampling method that affords everyone who is in the target population an equal opportunity to be chosen to partake in the study of being selected. Probability sampling is also known as non-judgmental sampling, and it consist of systematic sampling, cluster sampling, stratified-random sampling and simple random (E. Bell *et al.*, 2018).

3.7 Census

Daniel (2012) defines census as a process whereby information is collected from all units of the target population. Taking into consideration every element makes the data collected to be accurate and reliable. Daniel (2012) further stated that the census process is also expensive in comparison to sampling and requires an extensive amount of labour to collect data from every member of the population.

Bearing in mind that at the time the study was conducted, only 50 student entrepreneurs were registered under the entrepreneurial skills programme and 50 student entrepreneurs were deemed appropriate for this study because the UKZN InQubate programme is considered as highly specialised within the university and the respondents are not decision makers in the programme, a census of the total population was adopted for the questionnaire survey. By adopting a census, the researcher was sure of the nature of the population and that collecting data from the targeted population will help achieve the objectives of the study.

3.8 The Research Instrument

According to Kumar (2019) a research instrument is a measurement tool used by a researcher when gathering data for a research study. Data can be collected from primary and secondary data collection sources. Primary data source provides first hand direct data about the phenomena being studied. Primary data sources would include but not limited to results of experiments, historical and legal documents and statistical data. Secondary data source gathers data from sources who have already had the data collected to achieve other objectives. Social science research would include censuses, organisational records or information collected by government departments, and evidence that was initially gathered for other purposes.

- **Questionnaires**

A questionnaire is a tool which consist of a set of questions used to gather information from research participants (Quinlan, Babin, Carr, & Griffin, 2019). Questionnaires can be used to gather large set of data because of their objectivity and responses that can be predetermined. It is usually used for survey research based studies. Quinlan *et al.* (2019) highlighted the advantages and disadvantages of using the questionnaire as a tool.

The advantages of questionnaires as a tool of collecting data are as follows:

- In comparison to interviews; questionnaires are much more objective because their responses are collected in a standardized manner;
- A questionnaire is reasonably cost effective and a quick way of collecting data;
- Questionnaires gives the participants an opportunity to make informed responses when populating the survey.

The disadvantages of questionnaires as a tool of collecting data are as follows:

- Questionnaires can be misinterpreted by participants because they are standardized and questions cannot be explained;
- Open-ended questions may result in large data which may take time to analyse and process;
- The response return rate is normally low compared to interviews.

For the purpose of this study, a questionnaire was chosen as the best suited tool for an exploratory study. All questions are typed in English.

3.1 Questionnaire Construction

The questionnaire survey is constructed with two related sections to answer the research questions and achieve the research objective (Flick, 2015). The two sections were constructed as follows:

- Section A: Socio-demographic characteristics such as gender, qualification and age; and
- Section B: Student entrepreneur's insights and recommendations.

Questionnaires gather information by asking questions or by requesting research participants to represent their different views through agreeing or disagreeing with a statement. According to Quinlan *et al.* (2019), to obtain satisfactory results; seven tasks must be fulfilled. A chain of activities and decisions are required, such as:

- Reviewing the questionnaire design and information required for the design;
- Create a list of questions that will help with the information that is required;

- Questions to be included must be considered carefully;
- Questions asked in the study must be determined;
- Words to be used in questions must be decided;
- Determine the questionnaire structure; and
- A pilot study should be conducted to evaluate the questionnaire.

The language used in the questionnaire must be suitable for participants to respond to. Various industry jargon and other technical terms may have different meanings to participants who have a different experience in education and life. Participants must be able to respond to questions and be competent (Flick 2015). The literacy competence of the respondents of the questionnaire survey was taken into consideration when the questionnaire was constructed. Careful consideration as to avoid bias questions was also observed.

3.2 Administration of Questionnaires

Researchers place reliance on surveys as a tool of collecting data from participants. Questionnaires differ depending on how they are administered and presented to the targeted participants. These differences can have an impact on the data collected. The different methods of collecting data have changed with the adoption of technology. Questionnaire and survey data is collected using various administration methods such as but not limited to: Emails, telephone and face to face (Flick 2015).

- **Email or computer aided administration:**

  This method of data collection is cheap, simple and fast. Lower costs are not always upfront because of errors that may occur. Online survey response rate may not be favourable when compared to other types of surveys and to achieve a good response from participants, a researcher may have to incur additional costs;
- **Telephone administration:**

  This method of collecting data is most suited for a qualitative study which will be done through interviews and such a method cannot be used when conducting study that includes graphic, sampling and demonstration. This method encourages participants to respond which in turn leads to an increase response rate.

- **Face-to-face administration:**

  This method of administration can be conducted in a physical location such as a workplace, shopping malls or even participants' homes. Participants are not likely to refuse to populate the survey when using the face to face administration because they find it difficult to not partake in the survey compared to the use of other methods. The researcher is usually available to respond to queries or questions that are more complexly constructed to prompt richer data from the respondent.

To achieve the objectives of this research, the questionnaire was administered through email to the research participants and the second method was face to face which is self-administration method. A research assistant was hired to assist in collecting data face to face. This was done so that all respondents participate in the study and also to fast track the collection of data. The research assistant was acquainted with the purpose of the study to ensure that data is collected from the intended participants.

3.3 Collection of Questionnaires

For the purpose of this study, the expected outcome was communicated with the research participants. A follow-up to ensure that all questionnaires are collected in time was done by the researcher. The researcher and the research assistant ensured that the questionnaires distributed are fully populated for reliability and validity purposes.

3.4 Data Analysis

A process of transforming raw data by adding value to produce meaningful information. Researchers need to ensure the measure of the right concept, and measure the stability and consistency of the concept which is determined by reliability. For this study, the statistical analysis is performed using two types of software, SPSS (Statistical Package for the Social Sciences) and Excel. The analysis techniques include univariate data analysis, multivariate data analysis and bivariate data (Van Zyl, Salkind & Green, 2014). In this case, an inferential statistical analysis was conducted. A Likert scale ranging from strongly disagree to strongly agree was used to capture responses from respondents.

3.12 Validity and Reliability

Researchers need to ensure that validity and reliability are measured correctly in order to produce sound results. Validity means the researcher is measuring the correct concept in order to be able to answer the research questions correctly while Reliability measures how accurate and precise the data is. An Alpha value (0.66) was used in order to indicate the concept validity and to find out if the concepts are measured with sufficient reliability. Content validity was used to measure the adequacy of the sample (Van Zyl, Salkind & Green, 2014)

3.12.1 Validity

Heale & Twycross (2015) stated that validity has four types of tests. These tests were used for this study:

- **Content Validity:** This type of test is used to forecast the usefulness of the tool being used in the study to minimise variable measuring errors that may come up when multiple variable measures are needed to be tested (Bolarinwa, 2015). For this study content validity was tested through asking two student entrepreneurs randomly who are currently pursuing a postgraduate qualification to measure whether the research questions being tested in the questionnaire are adequately addressing the study objectives;

- **Criterion Validity:** This test measures how well variables are able to predict a possible outcome. This test is based on data from other variables. The researcher should ensure that the responses from the questions in categories of the questionnaire are directly related to a participant's behaviour in that particular setting (Heale and Twycross 2015).

- **Concurrent Validity:** This type of data test is used to prove that a measuring test can be utilised to predict other possible outcomes. The questionnaire guide or surveys that was used is a tried and tested method for conducting a quantitative research study (Heale and Twycross 2015).

3.12.2 Reliability

Van Zyl (2014) defined reliability as the dependency that can be placed on the consistent measurement of data. Such consistency increases the degree in which reliance can be placed on the researcher's findings. To guarantee that there is consistency in responses in the data collected, there are two ways in which reliability was tested:

- **Internal consistency reliability**

Internal consistency is used to measure the consistency of an instrument. It questions how a pair of items measure a behaviour in the test being conducted by the researcher. According to Heale and Twycross (2015) to test for internally consistent, the estimation of reliability placed on a set of items being tested is based on the inter-correlations among all the individual items within a test. The method that is popularly used to test internal consistency is coefficient alpha particularly in the behavioural sciences.

- **Test – retest reliability**

Test-retest reliability is defined as the stability of a test from one measurement session to another (Heale *et al.*, 2015). The procedure is to administer the test to a group of respondents and then administer the same test to the same respondents at a later date. The correlation between scores on the identical tests given at different times operationally defines its test-retest reliability.

3.13 Limitations of the Study

Limitations of a study are a guide of the shortcomings that could possibly come about when conducting the research study. They help identify possible challenges that a researcher may come across when conducting the study. The following are the limitations of this study:

- The first limitation is the fact that the study is only focusing on student entrepreneurs within the University of KwaZulu-Natal. This is a limitation because student entrepreneurs can be found in most universities in the Kwazulu-Natal province and South Africa.
- Secondly, it is placing an emphasis on student entrepreneurs who are on the InQubate programme.
- Lastly, the third limitation was that the study focused only on student and not young entrepreneurs who have already exited the university having started their businesses while they were students.

Therefore, it may not present the same experiences other student entrepreneurs have gone through in different universities; even though the experiences might be similar but not necessarily the same.

3.14 Ethical Considerations

It is of utmost importance that the participants are protected from violation and their dignity should be protected. No participants were forced or tricked to take part in the study. Potential participants were granted the informed consent in their preferred language. The informed consent form did not only act as an invitation to take part in the research but the description of the research carried out was highlighted and the processes that was involved during the course of the research (Van Zyl, Salkind & Green, 2014). Some of the ethical consideration that were taken into consideration are discussed below:

- **Obtaining permission from participants**

The researcher provided written permission to survey student entrepreneurs registered under the UKZN InQubate Program.

- **Ensuring participants have been given informed consent**

Respondents were made aware of the time it will take to populate the survey, the research topic being explored and the possible risks that form part of the research which will affect them. The researcher ensured that the risks that are involved in the study are kept at a minimum level. Respondents were required to sign the informed consent form to demonstrate their voluntarily part taking in the study. The researcher explained the study's objectives to the respondents.

- **Ensuring no harm comes to participants**

The respondents did not experience any harm during the time they are participating in the study. Furthermore, the respondents did not report any harm when the researcher followed up after the completion of the survey. The researcher also ensured that harm was avoided during the survey process.

- **Ensuring confidentiality and anonymity**

It was the duty of the researcher to assure the respondents that the informed consents

forms and survey were handled with confidentiality as part of the ethical considerations.

3.15 Conclusion

This section explained the different stages that were undertaken to collect data in ensuring that the data collected is reliable and valid. This chapter also explained the different research philosophies and approach that the researcher has undertaken to achieve the research objectives to solve the research problem. A questionnaire was used as a research instrument. Ethical considerations observed in this research are also demonstrated.

Chapter 4: Results, discussion and interpretation of findings

4.1 Introduction

This chapter focuses on the discussion and interpretation of findings from 35 questionnaires completed by the University of KwaZulu-Natal's InQubate student entrepreneurs who are part of the student entrepreneurship programme during the year 2019. The purpose of this study was to determine if the UKZN innovation hub program is developing student entrepreneurs and relevantly gearing them up for the business challenges of the 21st century.

The objectives of this study were to:

1. To establish whether the UKZN Innovation hub develops student entrepreneurs.
2. To determine whether the UKZN Innovation hub programme are relevant to the business challenges of the 21st century.
3. Examine if the student entrepreneurs are equipped to be future business leaders.

To ensure that the respondents are partaking in the study consensually, they were required to indicate consent prior to completing the questionnaire by completing a consent form. Furthermore, to ensure the anonymity of the respondents that took part in the study by completing the questionnaire, the online google forms survey is password protected and the hard copies were folded and stored in a separate box.

50 questionnaires were handed out to student entrepreneurs. The population of 50 student entrepreneurs was deemed appropriate because the UKZN InQubate programme is considered as highly specialised within the university and the respondents are not decision makers in the programme. A total of 35 out of 50 student entrepreneurs responded to the questionnaire. This response represents 70% of the total sampled population. Version 25 of the SPSS program was used to analyse data. The data analysed was translated into percentages and organised in a form of figures, graphs and tables to make meaning out of the data collected. The findings of the study are discussed in line with the sections as presented on the questionnaire. The questionnaire was divided into sections, A for demographical data and B for more detailed questions aimed at achieving the objectives of the study.

4.2 Method of data analysis and presentation

A descriptive statistical analysis was used to run for the following statistics: Frequencies, percentages, mean, mode and median to respond to the questions in the questionnaire. All respondents that took part in the study responded to all the questions, therefore frequencies and percentages reported in this chapter will mirror the total number of student entrepreneurs' responses to the individual questions.

4.3 Discussion of findings

4.3.1 Demographic data

Demographic data did not form part of the purpose of the study, however the data set demonstrating the demographics is intended to demonstrate the description of the demographic variables of the selected sample. The demographic information of the selected sample is tabled from figure 4.3.1 (a – e) consisting of age, higher level of education, student entrepreneur's business background, Business industry trade and the period the business has been in trade.

Age Category

Respondents who took part in the study were asked to indicate their age group (See Figure 4-1). All 70% of the 100% of the respondents answered the question. Eighty six percent (86%) of the respondents indicated that they are with the age group 18 – 30 years. Four respondents who made up 11% indicated that they belonged to the age group 31 – 50 years. The study also included a respondent who was a student entrepreneur at UKZN and belonged to the age group 51 – 60 years which made up 3% of the total respondents.

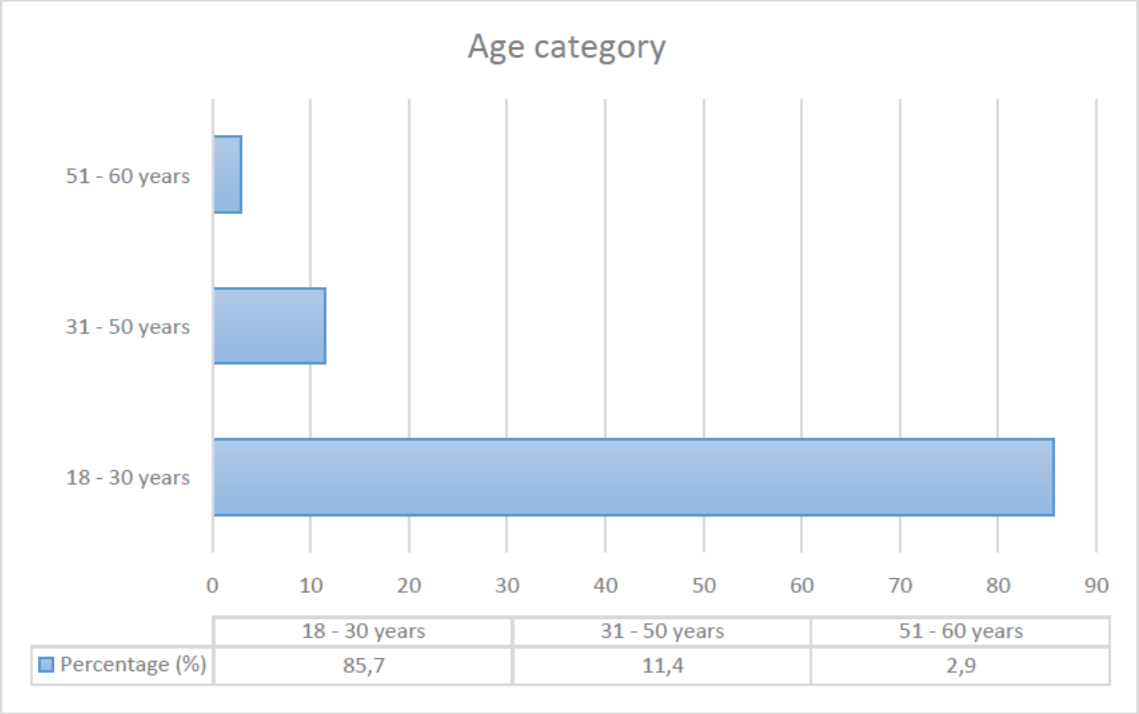


Figure 4-1 (a) Age category

Highest level of education.

The respondents were asked to select their highest level of education next to the relevant option (See Table 4-1). All 35 student entrepreneurs responded. Twenty-three percent (23%) had a matric certificate, eleven student entrepreneurs (31%) reported that they had an Undergraduate degree/Diploma, seven student entrepreneurs held an Honours degree. Twenty three percent (23%) indicated that they are in possession of a Masters degree, whereas only 3% held a PhD.

		Frequency	Percent
Valid	Matric	8	22.9
	Undergraduate degree/Diploma	11	31.4
	Honors	7	20.0
	Masters	8	22.9
	Doctorate or higher	1	2.9
	Total	35	100.0

Table 4-1 Highest level of education

Student entrepreneur's business background

Respondents were asked if they have any business background i.e. anybody from your family has been into a business (See Figure 4-2). A total of 35 respondents (100% response rate) answered the question. Fifty one percent (51%) indicated yes, whereas 49% of the respondents indicated that they did not have any business background.

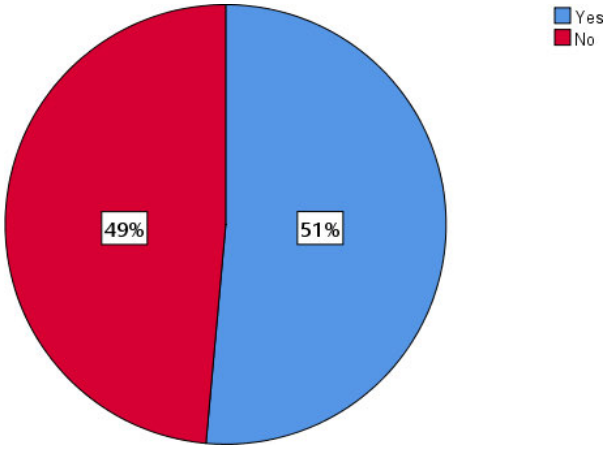


Figure 4-2 Student entrepreneur's business background

Business industry trade

Respondents were asked to specify the industry in which their business trade See Figure 4-3 the technology industry was dominated by most respondents with 23%, Agriculture had 11% and 17% indicated that they were in the health industry. Industries such as Property, Manufacturing and Human Resource Consultants had 6% respectively. Each of the following industries had 3%; Franchise and retail, cleaning, Social welfare, Counselling, chemicals, electricity, Retail, Advertising, Beauty and Energy which was a representation of one respondent per industry.

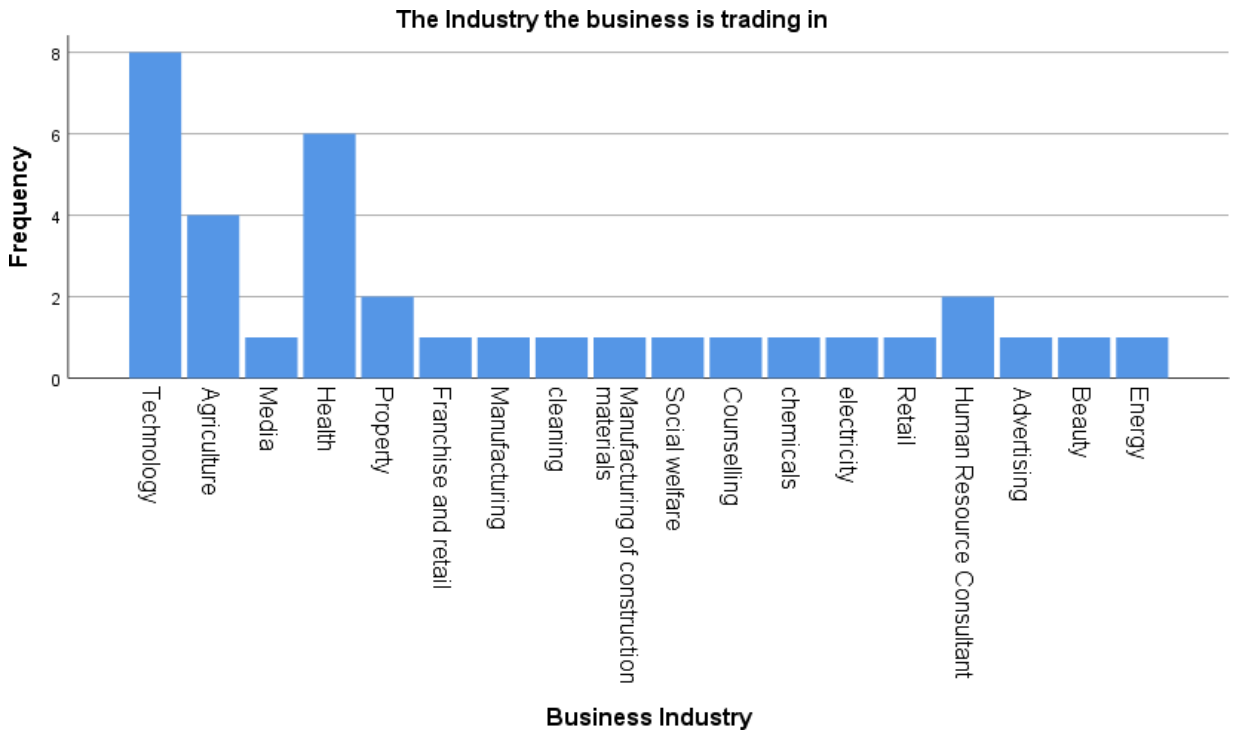


Figure 4-3 Business industry trade

The period the business has been in trade

In addition to their business background and the industry their business trades in, respondents were asked to specify the period their business has been in trade ((See Figure 4-4 Majority of the respondents (86%) indicated that they have been in business for less than a year and 14% having been in business for 1 – 3 years.

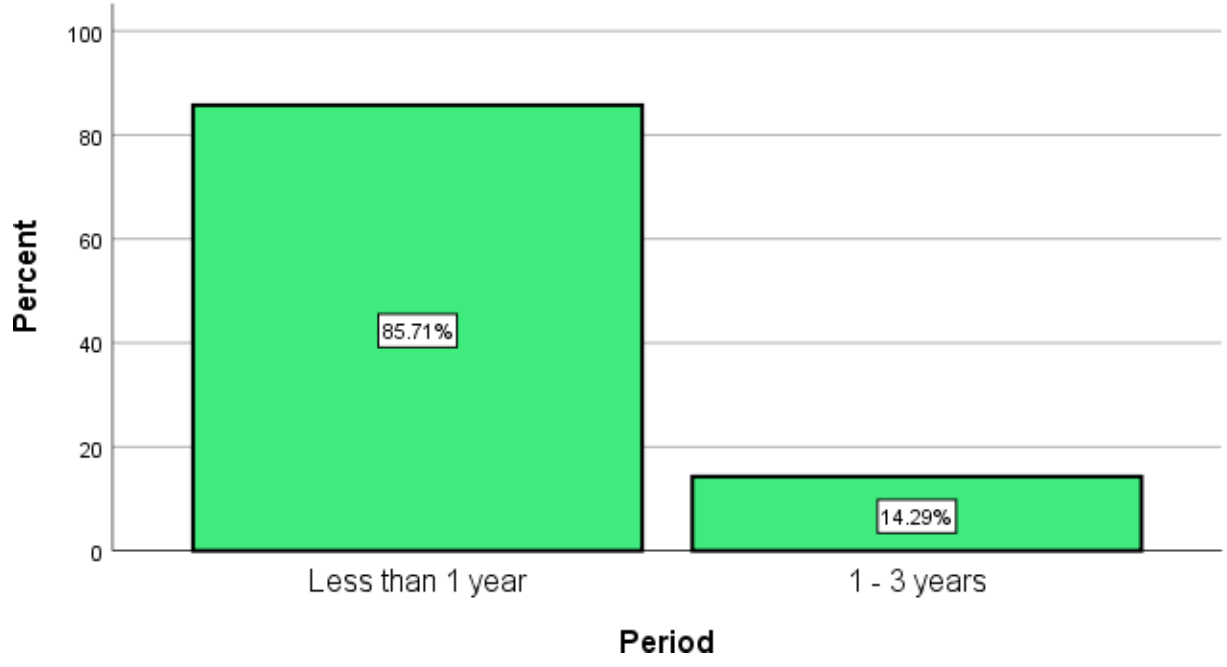


Figure 4-4 The period the business has been in trade

4.3.2 Primary research findings

To achieve the objectives of this study, SPSS software and excel were used to test if the UKZN innovation hub program is developing student entrepreneurs and relevantly gearing them up for the business challenges of the 21st century. A descriptive statistical analysis was employed to describe what the data is telling us. The generated values were used to test the objectives of this study. The values generated are explained in the discussion below.

4.3.2.1 Development of student entrepreneurs

4.3.2.1(a) The student entrepreneur seminar helps me run my business effectively.

Respondents were asked to indicate their level of agreement for the statement: student entrepreneur seminar helps me run my business effectively, namely; 13 (37.1 %) strongly agreed, 18 (51.4%) agreed, 1 (2.9%) slightly disagreed, 2 (5.7%) disagree and 1 (2.9%) strongly disagreed. The median score for this statement was 5.0 (agree). Majority of the respondents (88.5%) agreed or strongly agreed, with a minority number (11.5%) disagreed or strongly disagreed. Therefore, student entrepreneurs agree that seminars do help them run their business effectively as demonstrated by the 88.5% agreed or strongly agreed. This is further substantiated by the statement that in most of the physical spaces that are provided by these hubs, “events and meet-ups enable new and promising businesses to be discovered and funded. Although training and learning mostly takes places informally, most IHs offer seminars, courses or workshops on business in general, legal issues, marketing and financial management to help start-ups increase their knowledge and field of expertise” (Chirchietti, 2017, pp. 8-9).

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		5.03
Median		5
Mode		5

Table 4-2 Attending student entrepreneur seminar

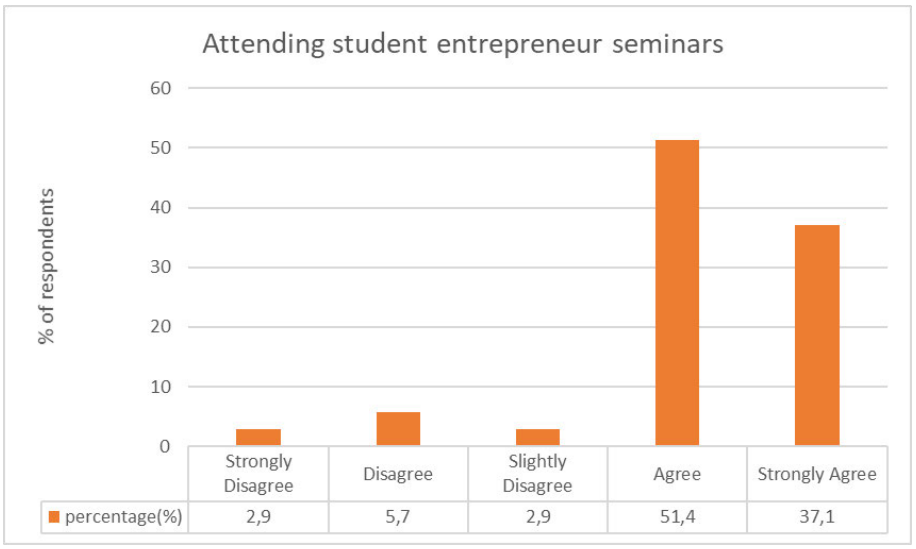


Figure 4-5 Attending student entrepreneur seminars

4.3.2.1(b) I receive entrepreneurial guidance from academic staff within the university

Respondents were asked if they received entrepreneurial guidance from academic staff within the university. Four respondents (11,4%) strongly agreed, thirteen (37,1%) agreed, two (5,7%) slightly agreed, five (14,3%) slightly disagreed, eight (22,9%) disagreed and three (8,6%) strongly disagreed. The mode score for this statement was 5 (agreed). Respondents who strongly agreed or agreed (48,5%) were not significant enough to prove that UKZN academic staff give them entrepreneurial guidance. Respondents who received some form of support were 5,7%. Nicolaides (2011) argued that there is an obvious shortage of suitable qualified academics who are able to teach entrepreneurship and that Universities could further provide more support to student entrepreneurs. This statement is proven by the significant number of respondents that disagreed that UKZN academic staff give them entrepreneurial guidance. In contradiction to the funding, as part of the UKZN strategic plan for 2017 – 2021; it is stated that to reach the goal for high impact in entrepreneurship, research and innovation the university will build “research ethos which acknowledges the responsibility of academic staff to nurture their postgraduate students, and to build UKZN as a pre-eminent producer of new knowledge that is both local and global in context” (UKZN Strategic plan, 2017, p. 22).

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		3.74
Median		4
Mode		5

Table 4-3 Entrepreneurial guide from UKZN academic staff

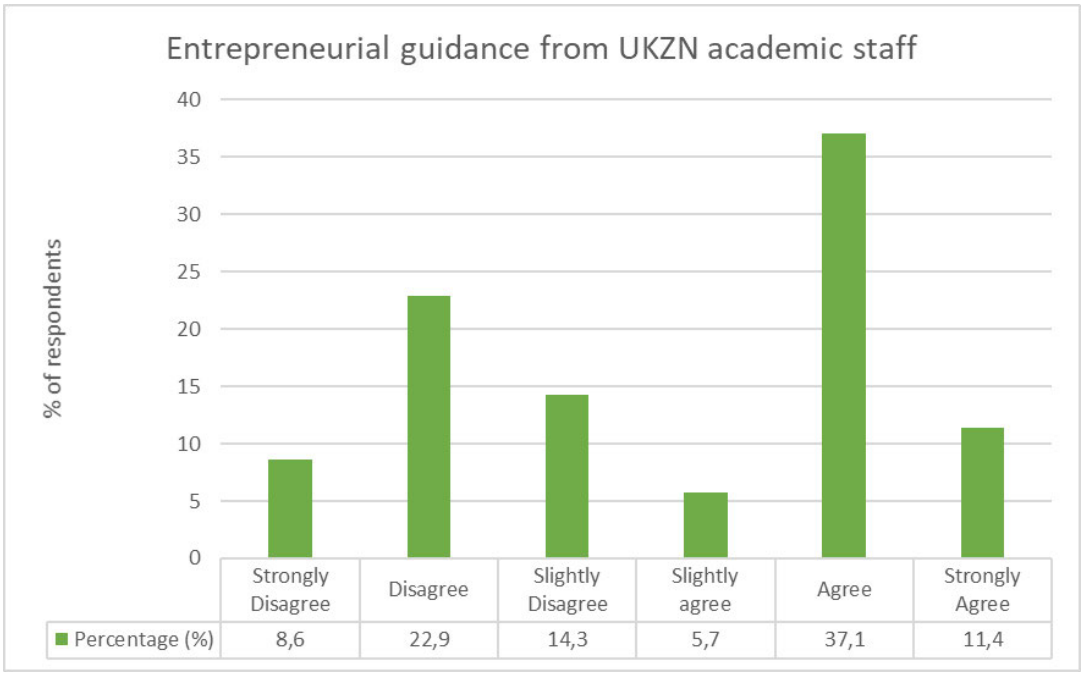


Figure 4-6 Entrepreneurial guidance from UKZN academic staff

4.3.2.1(c) UKZN InQubate provides me with the start-up machinery and equipment I need to be a successful entrepreneur

Respondents were asked to indicate if the UKZN InQubate provides them with the start-up machinery and equipment they need to be a successful entrepreneur. Three respondents (8.6%) strongly disagreed, four (11.4%) disagreed, four (11.4%) slightly disagreed, nine (25.7%) slightly agree, seven (20%) agreed and eight respondents (22,9%) strongly agreed. The mode score was 4 (slightly agree). A total number of respondents (42,9%) strongly agreed or agreed with the statement that UKZN InQubate provides them with the start-up machinery and equipment they need to be a successful entrepreneur. Therefore, a significant number of respondents did not benefit from the provision of start-up machinery and equipment. Wright *et al.* (2017) argued that Incubators can be another gateway of moulding a business idea further and find investors and new markets. Furthermore, they could be part of the university offering some of these services: "(1) access to physical resources; (2) office support services; (3) access to capital; (4) process support; and (5) networking services. Access to physical resources and office support services were indicated as services that should be part of university offering" (Wright *et al.*, 2017, p. 918).

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		4.06
Median		4
Mode		4

Table 4-4 Provision of start-up machinery and equipment

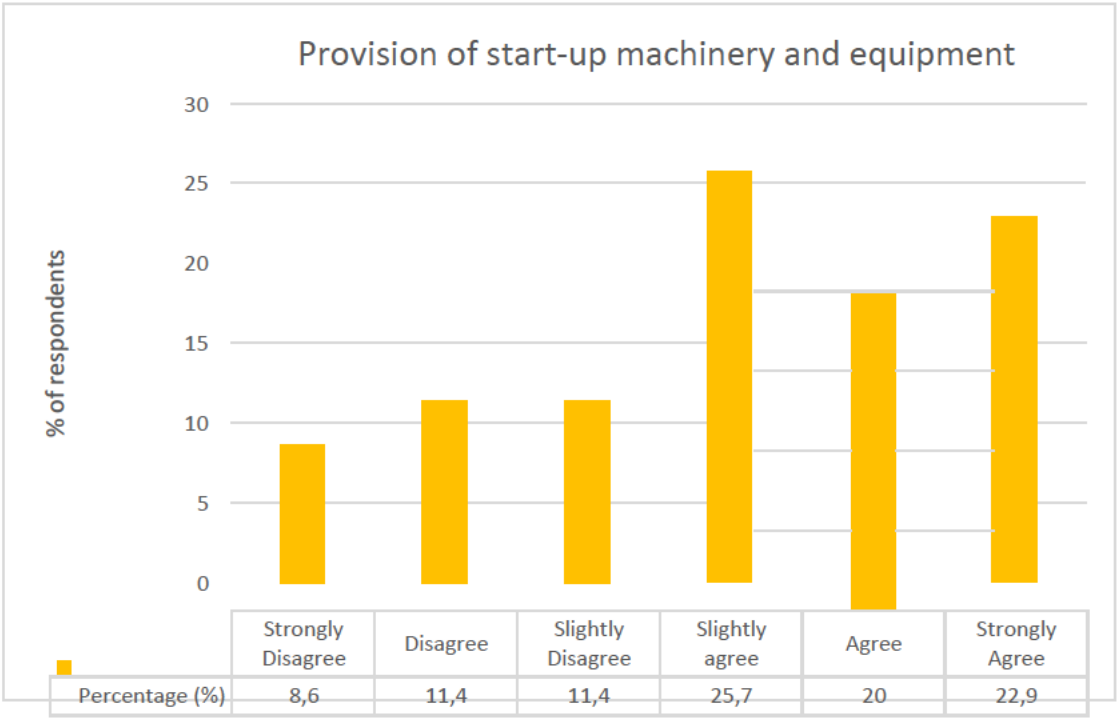


Figure 4-7 Provision of start-up machinery and equipment

4.3.2.1(d) I have access to the university infrastructure when required for my business operations

Respondents were asked to indicate the level of agreement on the statement I have access to the university infrastructure when required for my business operations, namely; 4 (11.4%) strongly disagreed, 6 (17.1%) disagreed, 7 (20%) slightly agreed, 11 (31.4%) agreed, 7 (20%) strongly agreed. The mode score is 5 (agree). A significant number of respondents 25 (71.4%) slightly agreed, agreed or strongly agreed. Therefore, majority of the respondents had access to university infrastructure for their business operations when required. According to Howells study, Incubators provide infrastructure to start-ups as a support mechanism because of their limitation in adequate resources for success (as cited in Chirchietti (2017). Innovation Hubs usually offer "free or subsidised premises, access to laboratories, research facilities and IT services, coaching, mentoring, training and access to financing" (The entrepreneurial guide, 2012, p.11).

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		4.03
Median		5
Mode		5

Table 4-5 Access to the university infrastructure

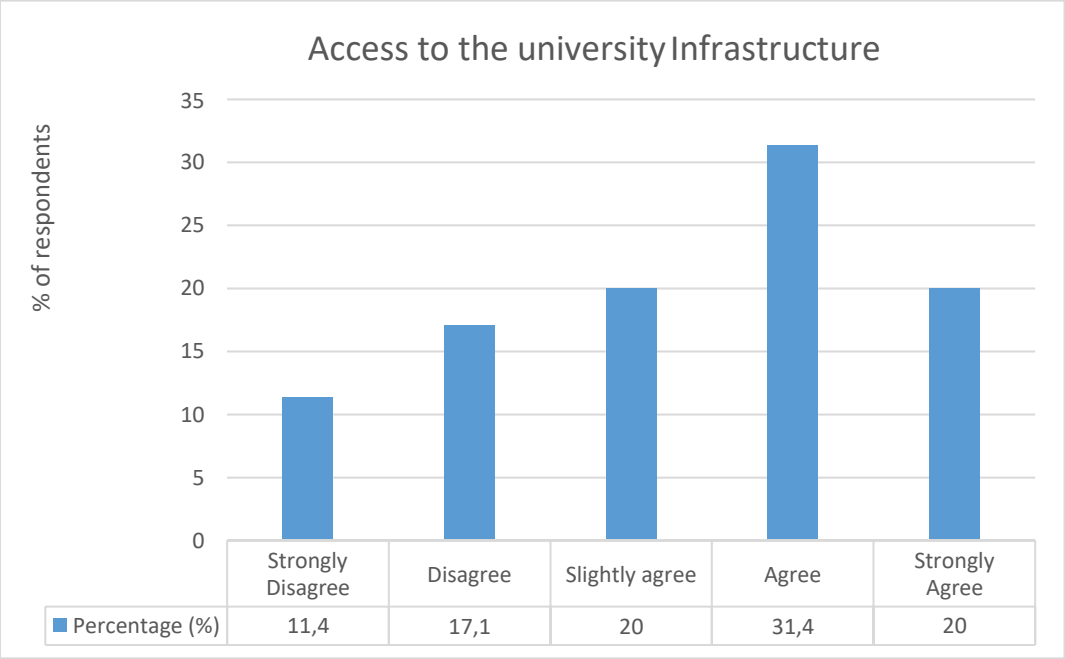


Figure 4-8 Access to the university infrastructure

4.3.2.1(e) I am exposed to role models and business success stories

The respondents were asked to indicate their level of agreement for the statement that they are exposed to role models and business success stories. They indicated their level of agreement as 5.7% strongly disagree, 8.6% disagree, 8.6% slightly disagree, 22.9% slightly agree, 31.4% agree and 22.9% strongly agree. The median score for this statement is 5 (agree). The statement did not limit the respondents to just UKZN InQubate to get a broader view from the respondent. Garo, Kume, & Basho (2015) emphasized that education can make the exposure of entrepreneurial role models to students easy. Education has a significant impact not only for the provision of skills and knowledge required for entrepreneurship but also to instil confidence in students and help implement novice ideas. A substantial majority of the respondents (54,3%) agreed or strongly agreed. Respondents are therefore fairly exposed to role models and business success stories.

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		4.34
Median		5
Mode		5

Table 4-6 Access to role models and business success stories

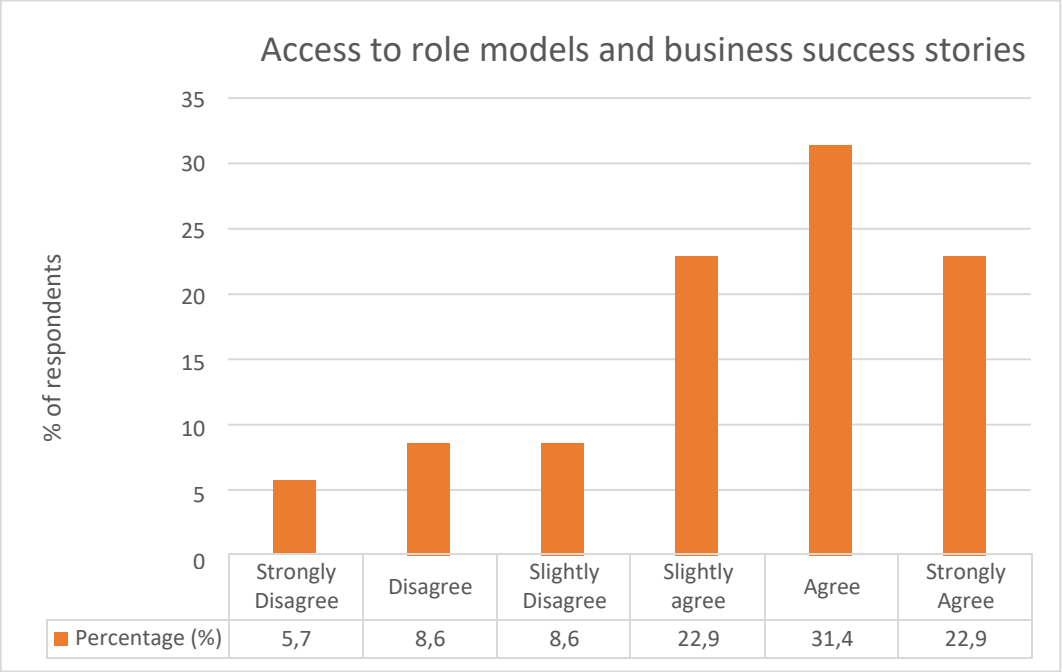


Figure 4-9 Access to the university infrastructure

4.3.2.1(f) I received assistance in registering my business

Respondents were asked to indicate their level of agreement with the statement I for received assistance in registering my business; namely, 5 (14,3%) strongly disagree, 15 (42,9%) disagree, 4 (11.4%) slightly disagree, 5 (14,3%) slightly agree, 4 (11,4%) agree, 2 (5,7%) strongly agree. The median score is 2 (disagree). Therefore, the respondents disagreed or strongly disagreed (57,2%) that they receive assistance in registering their businesses. In comparison to incubators, innovation hubs provide support to start-ups to assist them through the first phase of challenges of starting a business (Hackett and Dilts, 2004 as cited in Chirchietti 2017).

N	**Valid respondents**	35
	Missing respondents	0
Mean		2.83
Median		2
Mode		2

Table 4-7 Assistance in registering a business

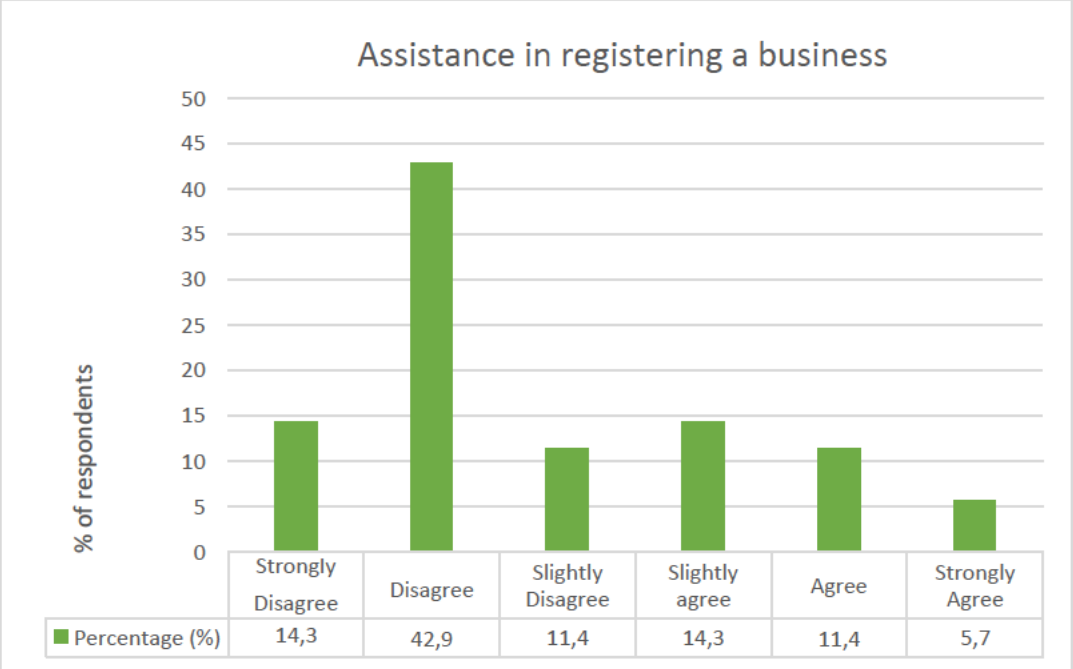


Figure 4-10 Assistance in registering a business

4.3.2.1(g) I received support in creating my business plan

Respondents were asked to indicate their level of agreement with the statement that they received support in creating their business plan; namely 1 (2,9%) strongly disagreed, 3 (8.6%) disagreed, 2 (5,7%) slightly agreed, 10 (28.6%) agreed, 19 (54.3) strongly agreed. The mode score is 6 (strongly agreed). To become more specialized, Bruneel, J., Ratinho, T., Clarysse, B., & Groen, A. argued in their study that Incubators have evolved over time from being primarily focused on providing office space and in-house business support services, to providing services such as aid in evaluating different market opportunities, access to knowledge intensive services, product development support, access to networks of entrepreneurs and provision of entrepreneurial finance (as cited in Wright *et al.*, 2017). Respondents therefore (82.9%) strongly agreed or agreed that there is enough support in creating their business plan.

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		5.11
Median		6
Mode		6

Table 4-8 Support in creating a business plan

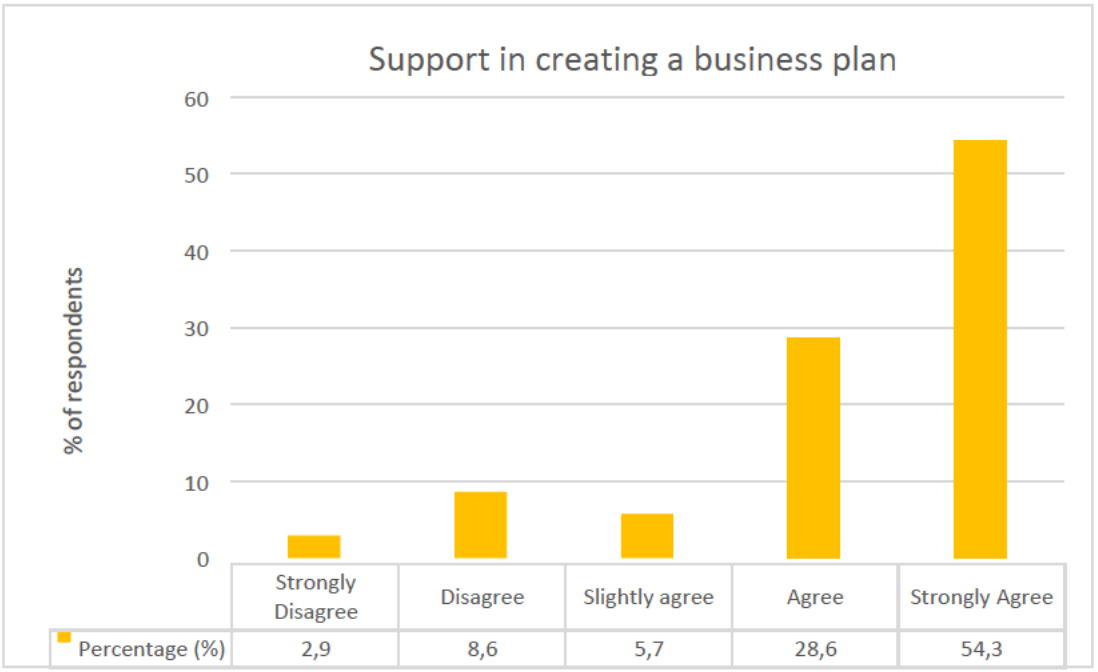


Figure 4-11 Support in creating a business plan

4.3.2.1(h) I have access to UKZN InQubate idea validation mechanism

Respondents were asked to indicate their level of agreement with the statement that they have access to UKZN InQubate idea validation mechanism; namely 5 (14.3%) strongly disagreed, 4 (11.4%) disagreed, 3 (8,6%) slightly disagreed, 12 (34,3%) slightly agreed, 6 (17.1%) agreed and 5 (14.3%) strongly agreed. The mode for this statement is 4 (slightly agree). Over a third (34.3%) of the respondents were not in full agreement with the statement, whereas (31.4%) agreed or strongly agreed. The other third (34,3%) slightly agreed. Therefore, respondents are generally in agreement in line with access to idea validation mechanism but due to the slightly agree being significant than agree and strongly agree combined, access to UKZN InQubate idea validation mechanism can be seen as limited.

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		3.71
Median		4
Mode		4

Table 4-9 Access to idea validation mechanism

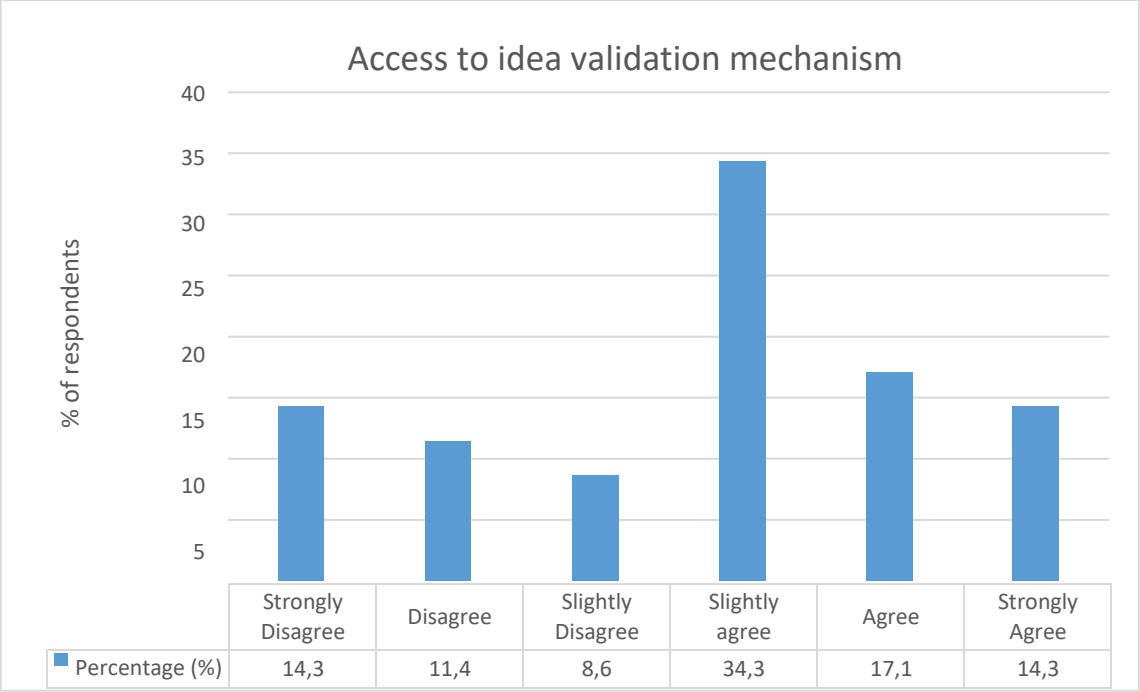


Figure 4-12 Access to idea validation mechanism

4.3.2.1(i) I was provided with idea pitching opportunities

Respondents were asked if they were provided with idea pitching opportunities. They indicated their level of agreement; namely, 1 (2.9%) strongly disagree, 1 (2.9%) disagree, 1 (2.9%) slightly disagree, 1 (2.9%) slightly agree, 9 (25,7%) agree and 22 (62,9%) strongly agreed. The median score is 6 (strongly agree). Start-ups should be linked with external organisations. Building relationships with the external stakeholders of the university helps ease the process of accessing funding for student and graduate entrepreneurs. Such relationships can strengthen and help develop the eco-system of university entrepreneurship. (entrepreneurial guide, 2012). A significant majority (88.6%) strongly agree and agree that they were provided with idea pitching opportunities. Therefore, respondent benefited from the provision of idea pitching opportunities.

Statistics

N	Valid respondents	35
	Missing respondents	0
Mean		5.34
Median		6
Mode		6

Table 4-10 Idea pitching opportunities

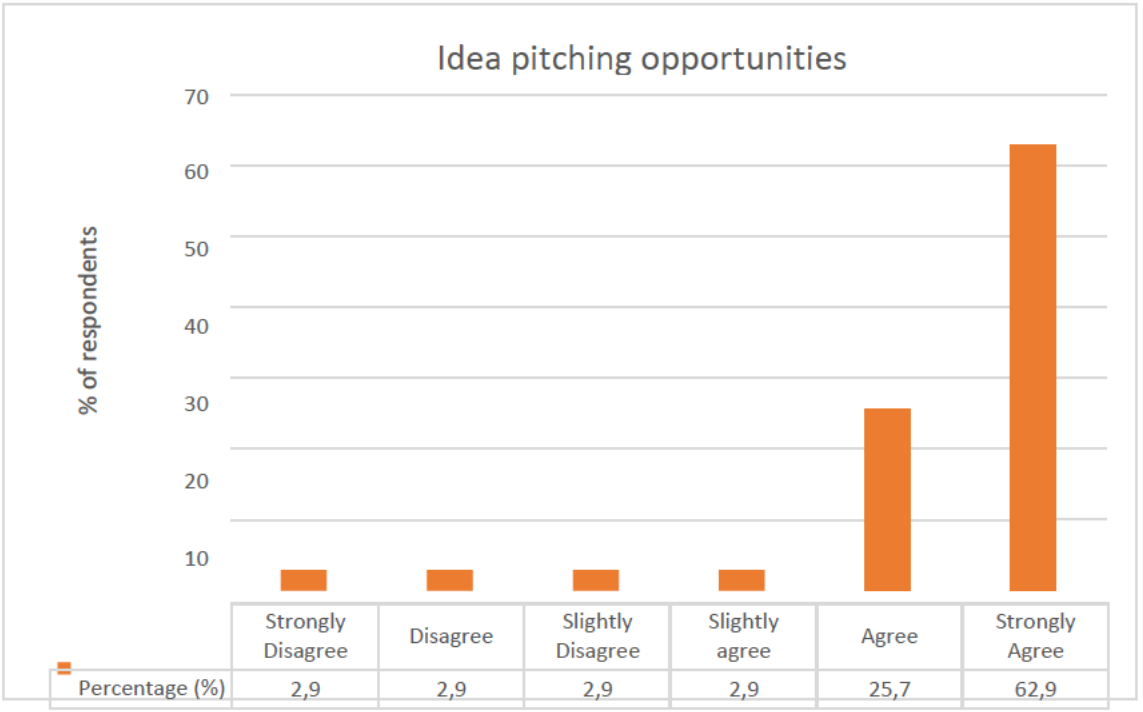


Figure 4-13 Idea pitching opportunities

4.3.2.1(j) I have access to prototype development

Respondents were asked to indicate their level of agreement for the statement I have access to prototype development; namely, 3 (8.6%) strongly disagreed, 5 (14.3%) disagreed, 8 (22,9%) slightly disagreed, 5 (14,3%) slightly agreed, 9 (25,7%) agreed and 5 (14,3%) strongly agreed. The mode score was 5 (agree). Wright *et al.* (2017) reinforced that Incubators have to focus on providing product development support, access to networks of entrepreneurs and provision of entrepreneurial finance. A total of 40% either strongly agreed or agreed that they have access to prototype development. Therefore, a significant number of respondents did not benefit from prototype development opportunities.

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		3.77
Median		4
Mode		5

Table 4-11 Access to prototype development

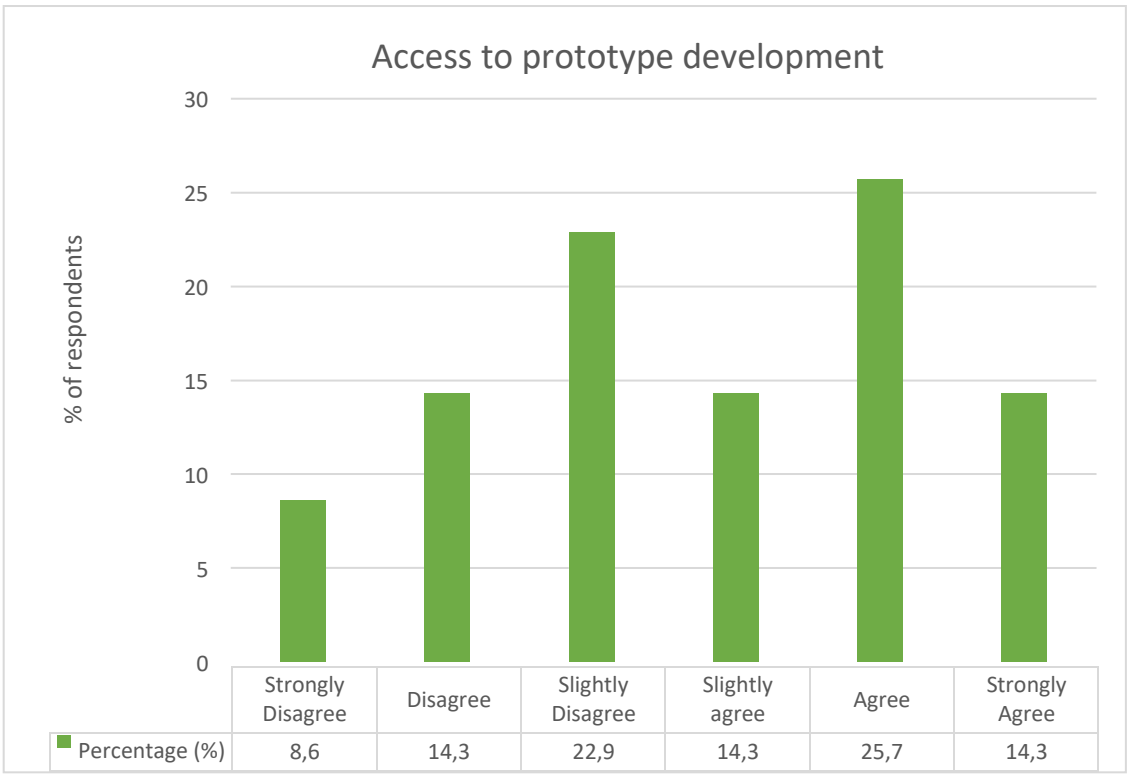


Figure 4-14 Access to prototype development

4.3.2.2 Innovation hub programme address the business challenges of the 21st century

4.3.2.2 (a) The UKZN InQubate programme facilitates collaboration with other entrepreneurs

Respondents were asked to indicate their level of agreement for the statement for UKZN InQubate programme facilitates collaboration with other entrepreneurs; namely, 1 (2,9%) strongly disagrees, 2 (5.7%) disagrees, 1 (2,9%) slightly disagree, 6 (17,1%) slightly agree, 9 (25,7%) agree and 16 (45,7%) strongly agree. The mode score is 6 (strongly agree). Entrepreneurial Universities must be able to produce students who can come up with new ideas, have the right kind of skills to tackle societal challenges and creatively think in an entrepreneurial way to improve collaboration with external stakeholders and

achieve sustainability (Bikse, Lusena-Ezera et al. 2016). Respondents significantly agreed or strongly agreed totaling 71,4% that the UKZN InQubate programme facilitates collaboration with other entrepreneurs. Therefore, majority of the respondents agreed with the statement indicating that they have been exposed to collaborations with other entrepreneurs

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		4.94
Median		5
Mode		6

Table 4-12 Collaboration with other entrepreneurs

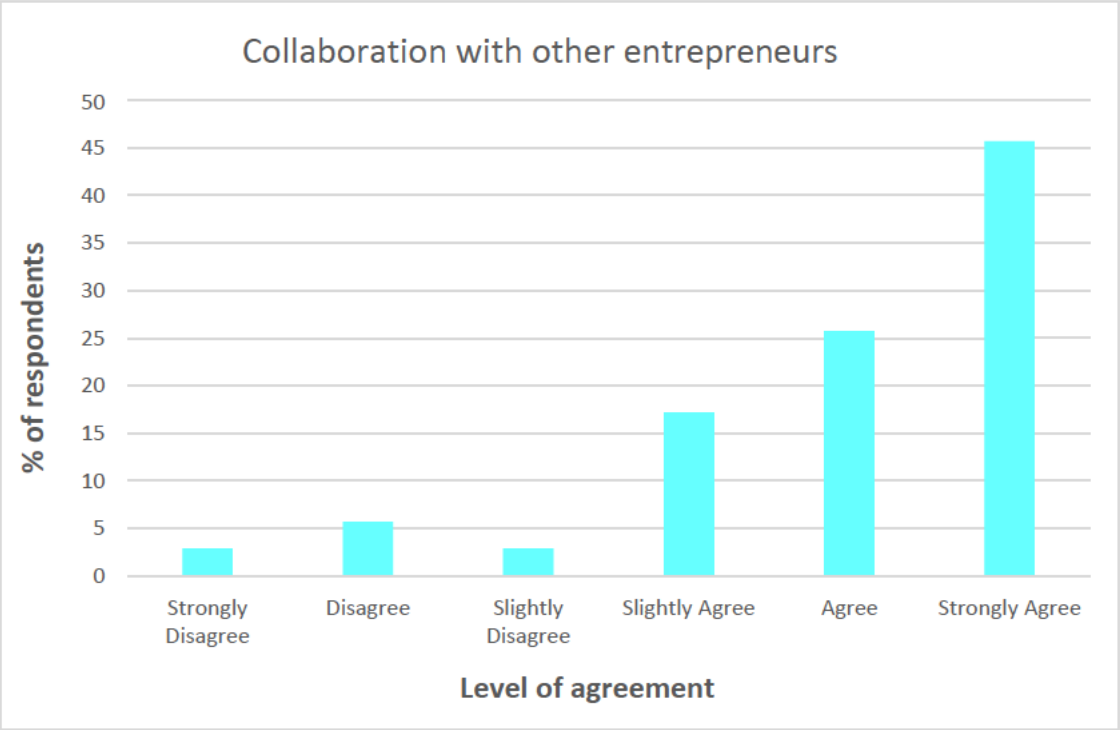


Figure 4-15 Collaboration with other entrepreneurs

4.3.2.2 (b) The UKZN InQubate programme offers mentorship for start-ups.

Respondents were asked to indicate their level of agreement for the statement for UKZN InQubate programme offers mentorship for start-ups; namely, 12 (34,3%) strongly agreed, 13 (37,1%) agreed, 6 (17,1%) slightly agreed, 1 (2,9%) disagreed and 3 (8,6%) strongly disagreed. The median score is 5 (agreed). Innovation Hubs are crucial for student start-ups. It is a structure that universities can utilize to provide the necessary support to student entrepreneur's start-ups and spin-offs and build relationships with external stakeholders.

Innovation Hubs usually offer “free or subsidised premises, access to laboratories, research facilities and IT services, coaching, mentoring, training and access to financing” (The entrepreneurial guide, 2012, p.11). A significant majority (71,4%) strongly agreed or agreed that the UKZN InQubate programme offers mentorship for start-ups. This means that majority of the respondents received mentorship support for their businesses.

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		4.74
Median		5
Mode		5

Table 4-13 Mentorship for start-ups

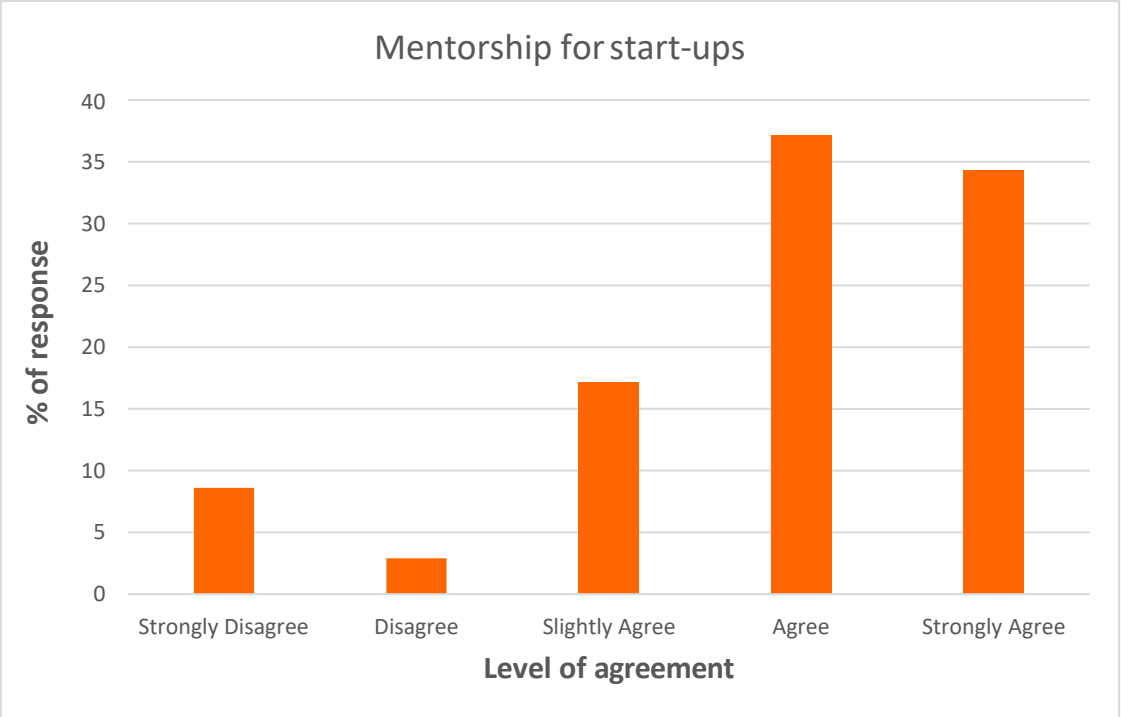


Figure 4-16 Mentorship for start-ups

4.3.2.2 (c) The UKZN InQubate programme Provides networking opportunities

Respondents were asked to indicate their level of agreement for the statement for UKZN InQubate programme Provides networking opportunities; namely, 15 (42,9%) strongly agree, 9 (25,7%) agreed, 5 (14,3%) slightly agreed, 1 (2,9%) slightly disagreed, 2 (5,7%) disagreed and 3 (8,6%) strongly disagreed. The mode score is 6 (strongly agree). Respondents agreed and strongly agreed totalling 68,8% which is a significant positive response for respondents who were provided with networking opportunities. Also, 14,3% slightly agree which means they received some networking opportunities. Therefore, most respondents benefitted from the networking opportunities provided by the UKZN

InQubate. Incubators have evolved over time from being primarily focused on providing office space and in-house business support services, to providing services such as access to networks of entrepreneurs (Wright *et al.*, 2017).

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		4.71
Median		5
Mode		6

Table 4-14 Networking opportunities

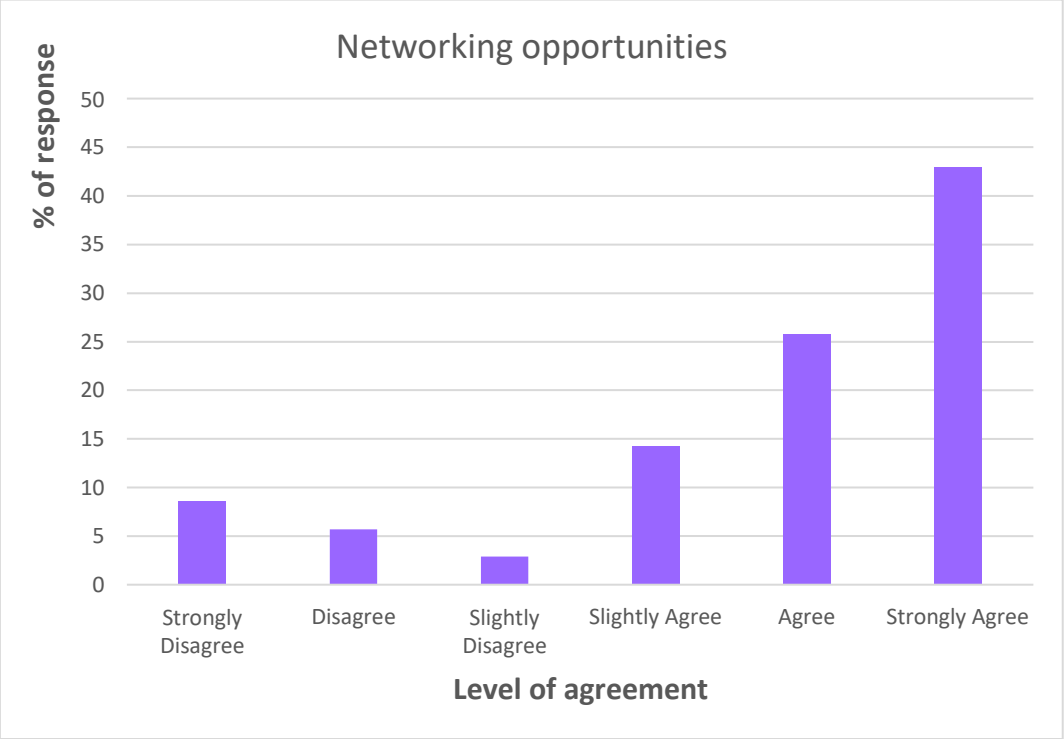


Figure 4-17 Networking opportunities

4.3.2.2 (d) The UKZN InQubate programme helps me to understand processes involved in entrepreneurship

Respondents were asked to indicate their level of agreement for the statement UKZN InQubate programme helps me to understand processes involved in entrepreneurship; namely, 1 (2,9%) strongly disagree, 1 (2.9%) disagreed, 1 (2,9%) slightly disagreed, 11 (31,4%) agreed and 21 (60%) strongly agreed. The median and mode score is 6 (strongly agree). Entrepreneurship is defined as a process that involves four different stages: Creation of new ideas, the direction and evaluation of activities; formulation of a business plan;

organizing necessary resources; business management (Gatiyatullin, 2009; Irismetov et al., 2013; Ibragimov et al., 2015; Tararina et al., 2015 as cited in Safin *et al.*, 2016). The respondents therefore (91,4%) strongly agreed or agreed that the UKZN InQubate programme helps them to understand processes involved in entrepreneurship.

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		5.34
Median		6
Mode		6

Table 4-15 Entrepreneurship process

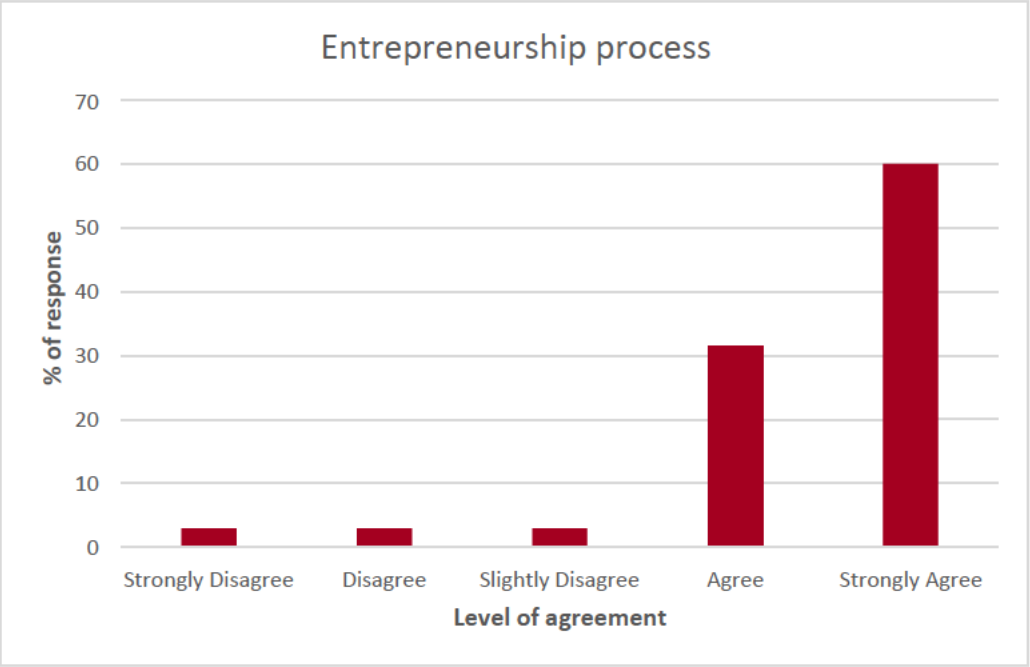


Figure 4-18 Entrepreneurship process

4.3.2.2 (e) The UKZN InQubate provides a working space for the student start ups

Respondents were asked to indicate their level of agreement for the statement UKZN InQubate provides a working space for the student start-ups; namely, 4 (11,4%) strongly disagreed, 6 (17,1%) disagreed, 3 (8,6%) slightly disagreed, 6 (17,1%) slightly agreed, 7 (20%) agreed and 9 (25,7%) strongly agreed. The median score is 4 (slightly agree). Although 45.7% agreed or strongly agreed, it was still below average; whereas, 17,1% somewhat agreed that student start-ups are provided with a working space. Innovation Hub is a "physical environment that support start-ups and individuals at different stages of development. It is an umbrella term for a community-driven pre-incubator, incubator, accelerator, hacker space and co-working space that encourage collaboration, networking

and innovation" (Chirchietti, 2017, p. 9). The respondents who agreed and strongly agreed are not significant enough to say that all involved in the programme benefitted fully from the provision of a working space for the student start-ups.

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		3.94
Median		4
Mode		6

Table 4-16 Provision for a working space

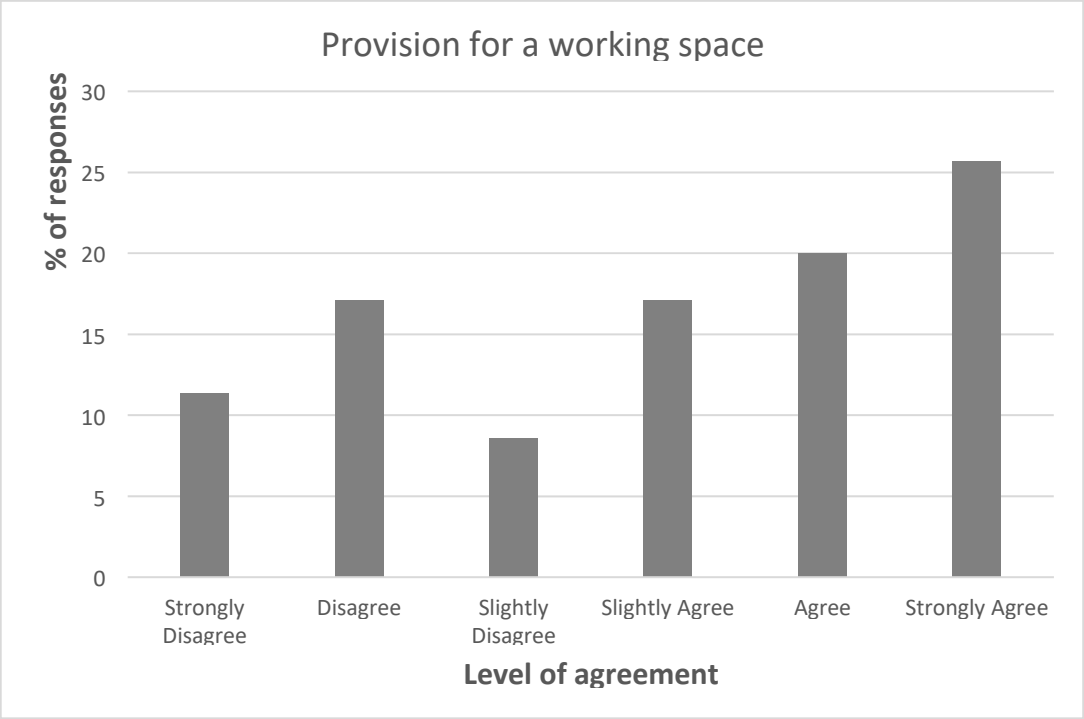


Figure 4-19 Provision for a working space

4.3.2.2 (f) The UKZN InQubate programme assists in facilitating the access to business funding

Respondents were asked to indicate their level of agreement for the statement UKZN InQubate programme assists in facilitating the access to business funding. namely, 12 (34,3%) strongly agreed, 8 (22,9%) agreed, 8 (22,9%) slightly agreed, 1 (2.9%) slightly disagreed, 3 (8,6%) disagreed and 3 (8,6%) strongly disagreed. The median score is 5 (agree). A total of 57,2% respondents agreed or strongly agreed and 22,9% slightly agreed. This significantly shows that respondents show that the UKZN InQubate programme assists in facilitating the access to business funding. Wright *et al.* (2017)

emphasized that Incubators have evolved over time from being primarily focused on providing office space and in-house business support services, to providing services such as aid of entrepreneurial finance (as cited from Bruneel *et al*. 2012).

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		4.46
Median		5
Mode		6

Table 4-17 Access to business funding

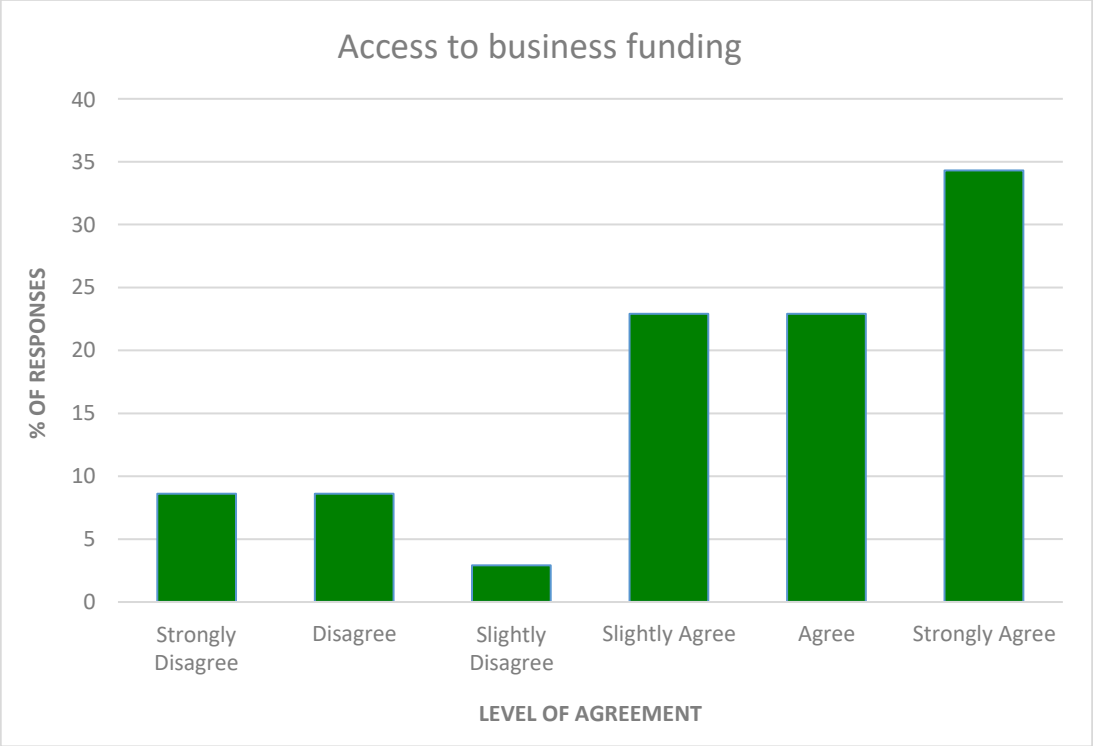


Figure 4-20 Access to business funding

4.3.2.3 Gearing student entrepreneurs to be future business leaders

4.3.2.3 (a) The UKZN InQubate provides student entrepreneurs with opportunities to be future business leader.

Respondents were asked to indicate their level of agreement with the statement for UKZN InQubate provides student entrepreneurs with opportunities to be future business leader; namely, 15(42,9%) strongly agreed, 10 (28,6%) agreed, 4 (11,4%) slightly agreed, 3 (8,6%) slightly disagree and 3 (8,6%) strongly disagreed. The mode score is 6 (strongly agree). Lechner *et al.* (2018) stated that becoming a future leader requires one to be exposed to different roles and business functions as much as possible. A significant majority (71.5%) strongly agreed or agreed that the InQubate provides student

entrepreneurs with opportunities to be future business leaders.

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		4.80
Median		5
Mode		6

Table 4-18 Opportunities to be a future business leader

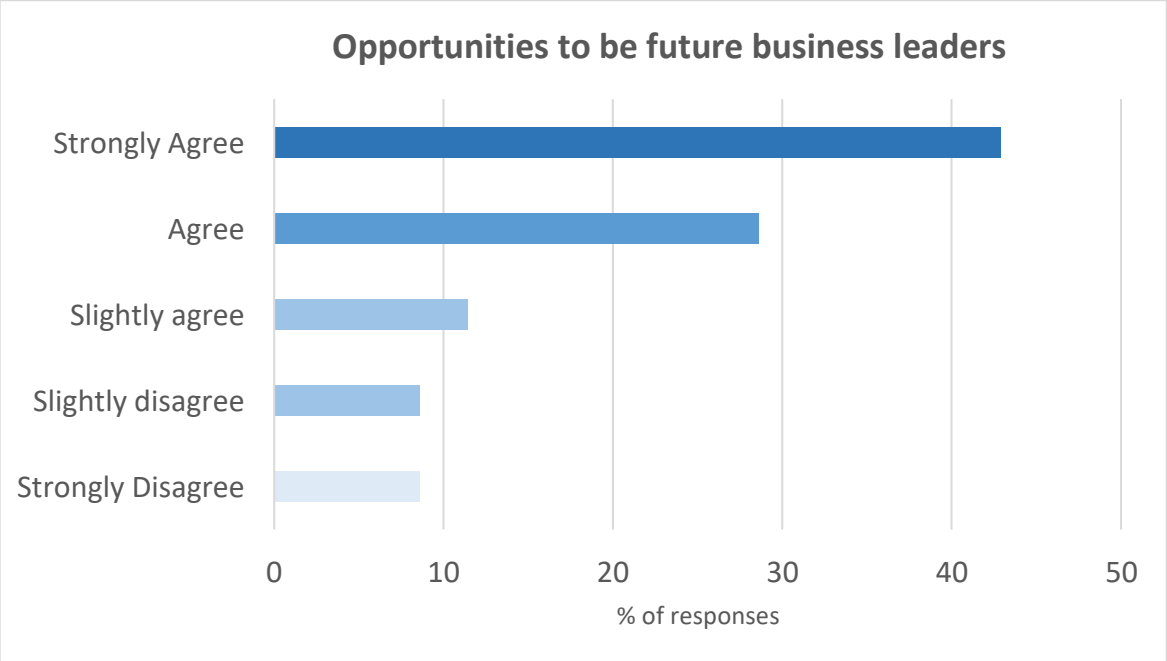


Figure 4-21 Opportunities to be a future business leader

4.3.2.3 (b) The UKZN InQubate programme supports and values leadership development

Respondents were asked to indicate their level of agreement with the statement for UKZN InQubate programme supports and values leadership development; namely, 14 (40%) strongly agreed, 13 (37,1%) agreed, 5 (14,3%) slightly agreed and 3 (8,6%) strongly disagreed. The mode score is 6 (strongly agree). Kane (2017) found that learning and development; peer learning and networking are some of the initiatives that an organization should demonstrate in order to be considered as supportive and valuing of leadership development. Respondents indicated that they agreed or strongly agreed to a total of 77,1% that the UKZN InQubate programme supports and values leadership development. Furthermore, 14,3% slightly agree indicating that to some extent they know

that the InQubate programme supports and values leadership development.

Statistics

N	Valid respondents	35
	Missing respondents	0
Mean		4.91
Median		5
Mode		6

Table 4-19 Support for leadership development

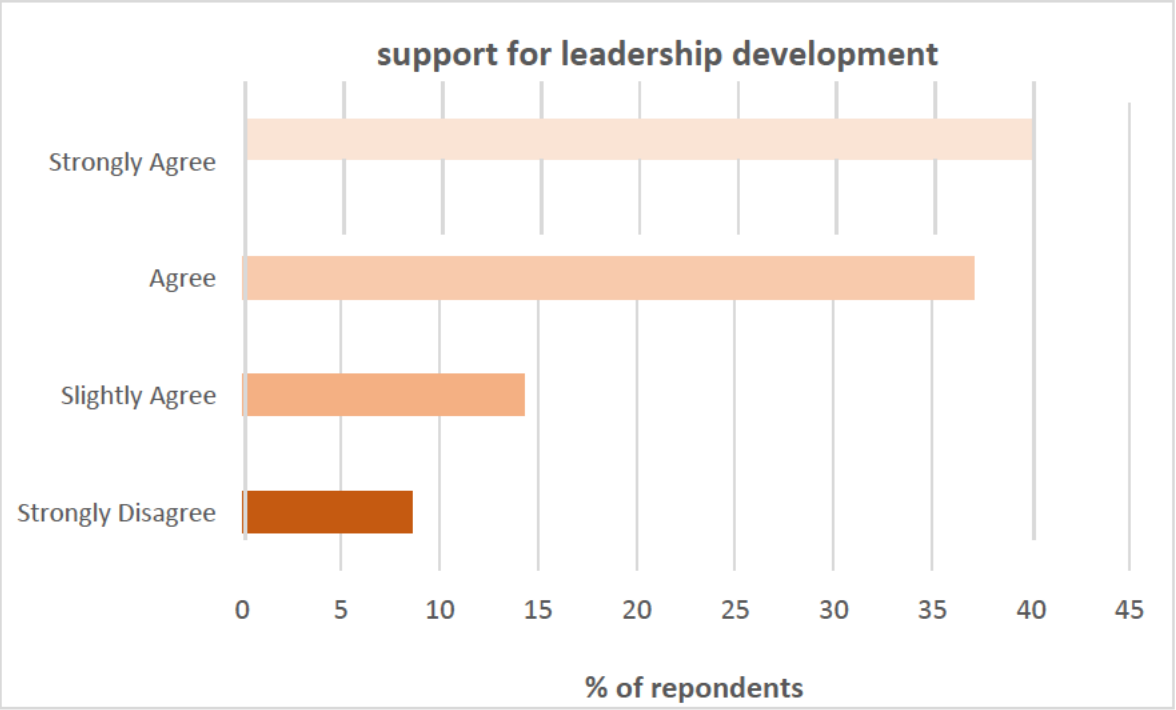


Figure 4-22 Support for leadership development

4.3.2.3 (c) There are sufficient resources such as funds and time invested in developing future business leaders through the programme

Respondents were asked to indicate their level of agreement to the statement for There is sufficient resources such as funds and time invested in developing future business leaders through the programme; namely, 2 (5,7%) strongly disagree, 2 (5,7%) disagree, 6 (17,1%) slightly disagree, 6 (17,1%) slightly agree, 10 (28,6%) agree and 9 (25,7%) strongly agree. The median score is 5 (agree). Leadership development programs are important to the success of an organization in the long term (Panina & Lane, 2018). A majority of respondents 54,5% agreed or strongly agreed with a 17,1% slight agreement that there are sufficient resources such as funds and time invested in developing future business leaders through the programme. Therefore, there is a significant indication that respondents do benefit from sufficient resources invested through the programme.

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		4.34
Median		5
Mode		5

Table 4-20 Allocation of resources for the development of future leaders

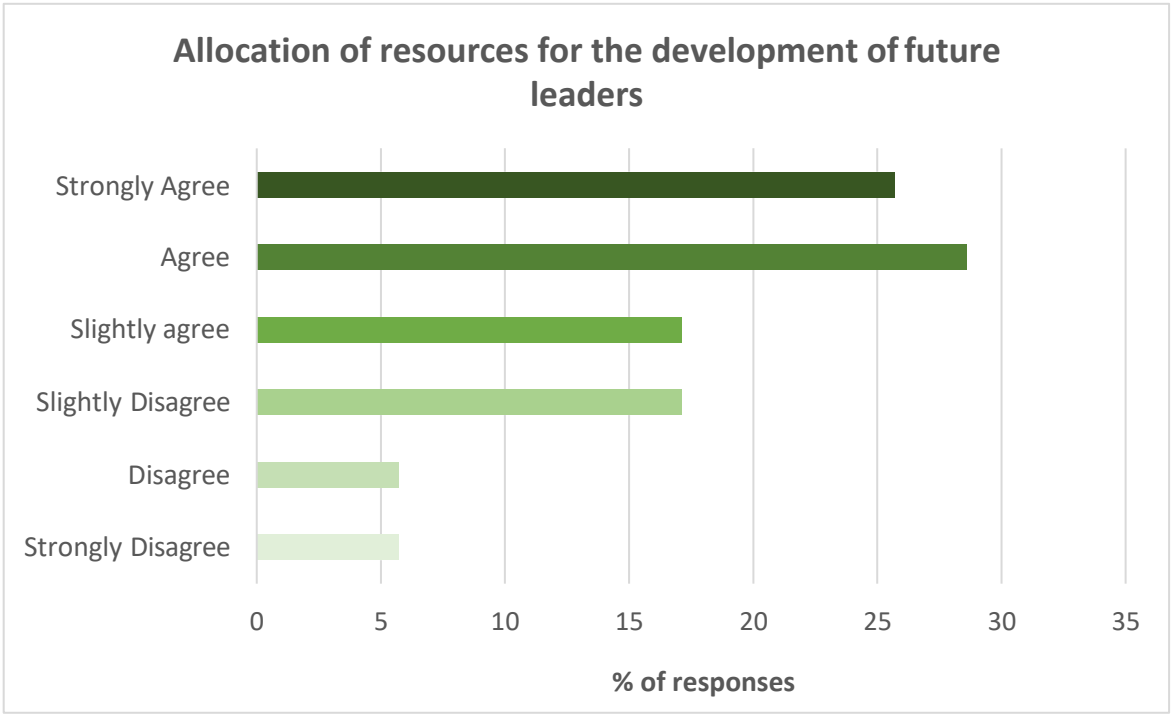


Figure 4-23 Allocation of resources for the development of future leaders

4.3.2.3 (d) I have the necessary skills and competencies to become a future business leader.

Respondents were asked to indicate their level of agreement for the statement *I have the necessary skills and competencies to become a future business leader*; namely, 15 (42,9%) strongly agreed, 12 (34,3%) agreed, 3 (8,6%) slightly agree, 3 (8,6%) disagree and 2 (5,7%) strongly disagree. The mode score is 6 (strongly agree). Brueckner *et al.* (2018) holds the view that universities have the opportunity to mold the behaviors and attitudes of those in leadership through research, training management development programs, business education to mention a few. Furthermore, they stated that a curriculum that is entrepreneurial focused and the university environment plays a pivotal role in shaping attitudes. They also found that student's academic progression and their genders have an impact on their attitudes towards entrepreneurship. A significant majority 77,2% indicated that they agreed or strongly agreed that they had the necessary skills and

competencies to become future business leaders.

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		4.86
Median		5
Mode		6

Table 4-21 Necessary skills and competencies

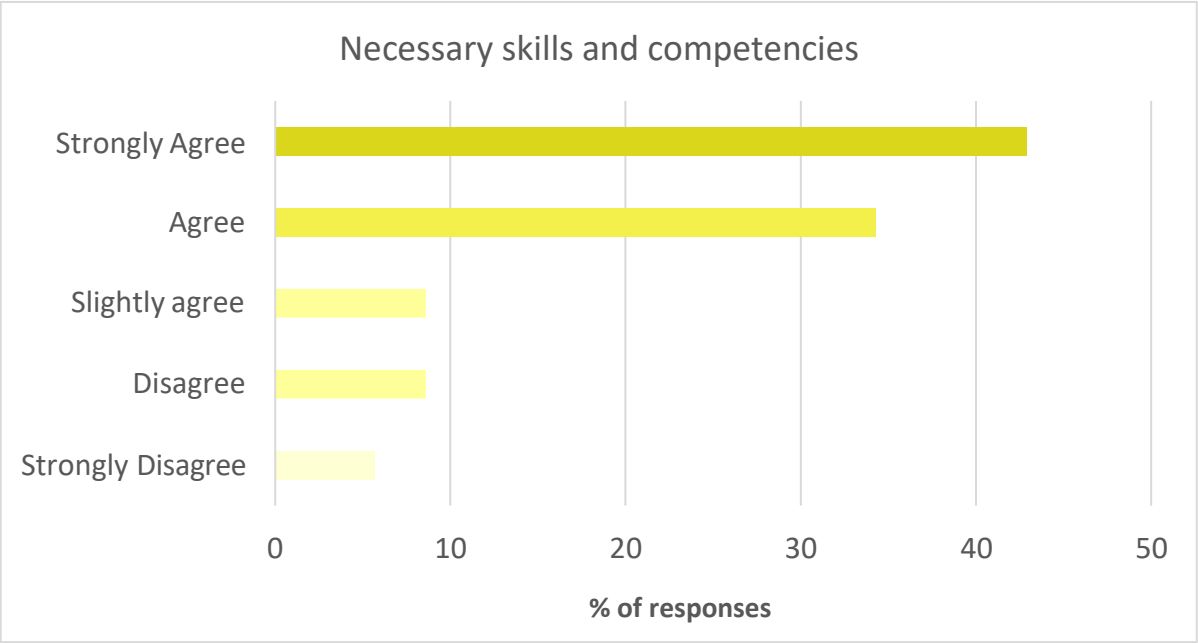


Figure 4-24 Necessary skills and competencies

4.3.2.3 (e) I understand the leadership capacity required to be a future business leader.

Respondents were asked to indicate their level of agreement for the statement *I understand the leadership capacity required to be a future business leader*; namely, 16 (45,7%) strongly agreed, 12 (34,3%) agreed, 5 (14,3%) slightly agree, 1 (2,9%) disagree and 1 (2,9%) strongly disagreed. The mode score is 6 (strongly agreed). Guthrie & Jenkins (2018) indicates that leadership capacity is normally viewed as an extensive combination of attitude, knowledge and skills, which affords individuals the opportunity to engage in the practice of leadership. Majority of the respondents (90%) agreed or strongly agreed that they understood the leadership capacity required to be a future business leader. Therefore, there is high level indication that the respondents involved in the UKZN InQubate programme understand the leadership capacity required to be a future business

leader.

Statistics

N	**Valid respondents**	35
	Missing respondents	0
Mean		5.11
Median		5
Mode		6

Table 4-22 Understanding the leadership capacity required

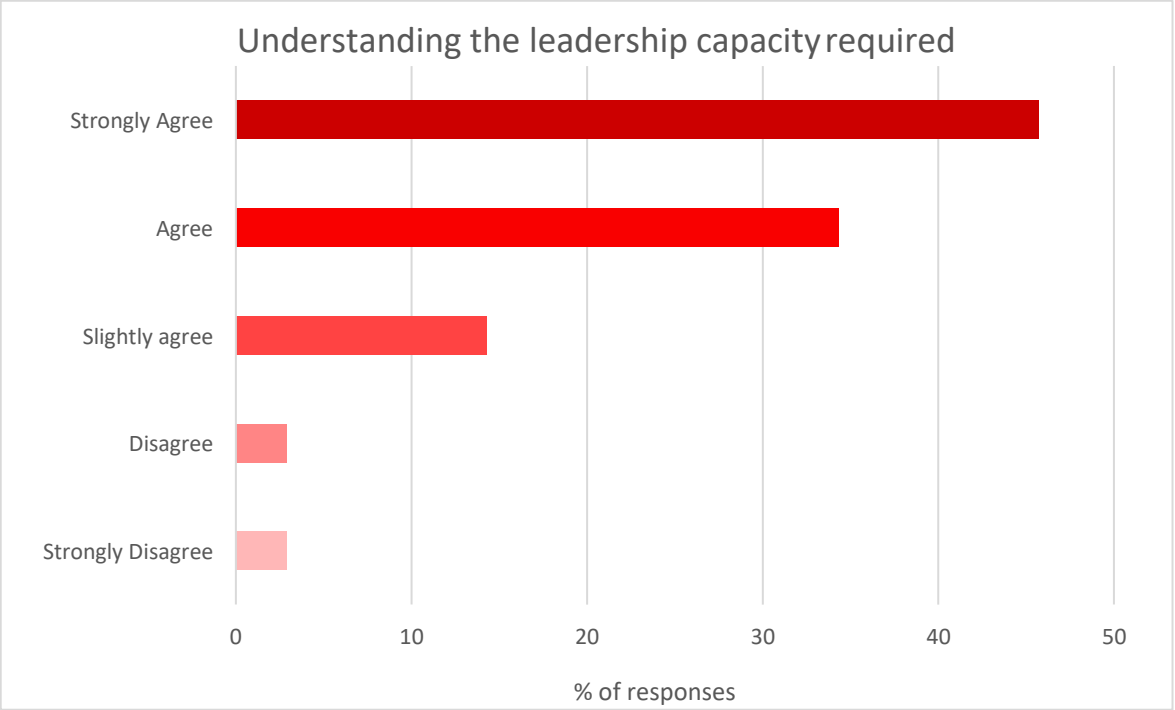


Figure 4-25: Understanding the leadership capacity required

Conclusion

This section provided an analysis from the primary research findings. The results from the analysis were presented in graphs and tables and then interpreted and discussed. The results of this study concluded that the UKZN InQubate does capacitate the student entrepreneurs to tackle the challenges of small businesses by providing them with funding opportunities, mentorship, networking and collaboration with other entrepreneurs. The results revealed a favorable statistic in line with the capacitating of student entrepreneurs to be business leaders. Although majority of the student entrepreneurs indicated that they do not receive entrepreneurial guidance from academic staff, they are not provided with equipment and receiving assistance in registering their businesses, statistics showed that the InQubate is a positive platform that can be used to develop more student entrepreneurs.

Chapter 5: Conclusion and recommendations

5.1 Introduction and conclusion.

This chapter summarises the findings from the study, literature review and the findings from the primary research. It also concludes on the findings from the primary research. Finally, recommendations are provided based on the findings.

5.2 Findings from the Study

The rising unemployment rate is causing an influx in the economic system and this has been amplified now more than ever before. Year on year, higher education institutions are graduating more students and the unfortunate reality is that most of these graduates do not exit these institutions with job assurances. Hence, they add to the already high unemployment statistics of this country. The main focus of this study was to explore the use of innovation hubs to disrupt entrepreneurial conventions through UKZN innovation hub.

In chapter 1 the problem statement was discussed to highlight the significance and value of this study. It is evident from the problem statement that the Industry 4.0 wave has brought about global opportunities and challenges that South Africa is yet to comprehend but is currently still struggling with. Research has proven that innovation is one of the greatest tools if used effectively that will grow the south African economy. Therefore, platforms such as the Innovation hubs can be used to dilute the youth unemployment rate.

The background of this study highlights the different era that businesses had to go through over the centuries and the impact it had of the economies. We are currently living in an era where machines and robots are created to replace humans and this rapid change has brought about great opportunities for growth, at the same time it has threatened many people globally. As for any challenge, government and society needs to be ready to bring about solutions that will see the incorporation of artificial intelligence

that does not wipe off humans off the face off earth. Humans and machines need to co-exist.

Chapter 2 detailed the literature review which focused on reviewing literature from other scholars that have researched about innovation hubs, entrepreneurship, entrepreneurial universities, innovation and the fourth industrial revolution. In the context of the south African economy, we are not ready for the fourth industrial revolution. Additionally, universities are found to be misaligned in line with the objectives of the university and fostering for entrepreneurship and the resources that are committed to achieving the outlined objectives (Wright *et al.*, 2017). The misalignment may require to be incorporated in the strategies for the entrepreneurial ecosystem with the purpose of supporting student entrepreneurship.

Universities play an active role in providing the necessary support required by student entrepreneurs because being an entrepreneur takes more than just having an idea but it is one step to becoming one. Therefore, Innovation Hubs are crucial for student start-ups. It is a structure that universities can utilize to provide the necessary support to student entrepreneur's start-ups and spin-offs and build relationships with external stakeholders.

Chapter 3 is the blueprint of how the research objectives of this study were going to be achieved. It gave an in-depth detail of the approach the researcher took when undertaking research for this study. A questionnaire survey was utilized. This study collect data from the UKZN student entrepreneurs who have registered under the UKZN InQubate programme. The selected study sample was made up of 50 student entrepreneurs (n=50) which were selected by means of simple random sampling. The data collection instrument (questionnaire) is explained in detail, including advantage and disadvantages of using a question as a data collection tool, how the questionnaire was constructed and administered, pilot study, scoring (Likert scale) and reliability and validity and data analysis using software packages.

5.3 Findings from the Literature Review

In trying to understand the UKZN InQubate and the background of innovation hubs and how they came into existence, literature led me to look into the fourth Industrial revolution

and how it influences being innovative and the economic growth that results out of that. Literature shows that the future will be dominated by technology. This is already evident in the way different sectors have been retrenching employees due to technological disruptions. The banking sector is one of these industries that have been significantly impacted by this new change. This calls for more entrepreneurs to enter the business arena in order to create jobs, develop and grow the South African economy. Entrepreneurial universities are highlighted as institutional bodies that plays a pivotal role in producing entrepreneurs. The university of KwaZulu-Natal regards itself as an international institution and in their strategies, they are driving innovation and entrepreneurship. The entrepreneurial guide (2012) indicated that for a university to be considered as entrepreneurial, it needs to meet the following key factors:

- It is paramount that universities have sustainability strategies for finance through self-funding not being heavily relying on funding from the public.
- For entrepreneurial universities to deliver entrepreneurial learning, they need to have the proper structures to do so.
- Internationalisation is one of the factors that deems a university entrepreneurial. Internationalisation must be integrated in the strategies to make it easy to put measurements for performance to assess if the university is achieving its objectives.
- For entrepreneurial universities to deliver entrepreneurial learning, they need to have the proper structures to do so

Policies and transformation in legislation is required to support innovation in universities (Juma 2018). To turnaround the current state of universities to those that are innovation inclined, amending policies; laws or even going to an extent of creating new laws are imperative if the objective is to be achieved.

Universities are the main drivers of student entrepreneurship through their innovation hubs, incubation and research centres (Voisey P, Jones P and Thomas B, 2013 as cited in Mashau, 2018). These structures can help alleviate the spirit of entrepreneurship and less that of job seeking. Innovation Centres ran by universities consist of an array of services that allows for a technology entrepreneurship to form (McAdam R, Keogh W, Galbraith B and Laurie D, 2005 as cited in Mashau, 2018)

Brueckner *et al.* (2018) holds the view that universities have the opportunity to mould the behaviours and attitudes of those in leadership through research, training management

development programs, business education to mention a few. Furthermore, they stated that curriculum that is entrepreneurial focused and the university environment plays a pivotal role in shaping attitudes. They also found that student's academic progression and their genders have an impact on their attitudes towards entrepreneurship.

5.4 Findings from the Primary Research

Due to the importance of SME's and the high youth unemployment in South Africa, the main objective is to test if there is a positive relationship between the UKZN innovation hub and the development of student entrepreneurs. The questionnaire survey findings are reported in two sections. The first sections gave an overall descriptive and understanding of what the demographic characteristics look like. The second section reported on the findings from the primary research as it relates to the Innovation hub and student development, business challenges of the 21st century and whether student entrepreneurs are equipped to be future business leaders.

5.4.1 Demographic characteristic

A total number of 35 student entrepreneurs took part in the study. Majority of the respondents (86%) were within the age group 18 – 30 years. Most respondent's (31.4%) highest qualification was an undergrad degree, which means they had already completed their first degree in an institution of high learning. Those who had a matric certificate were 22.9% and those who held a postgraduate qualification were 45.8%. Majority of the respondents (51%) indicate that they had business background, which means the UKZN InQubate programme was not their first exposure to business practices. Most businesses owned by the respondents have been in existence for less than a year (86%) and the remaining (14%) has been in existence between 1 – 3 years. The industries in which the student entrepreneurs traded in varied widely between manufacturing, consulting, beauty, media, retail and property. The industries which most of their businesses were trading in was health, agriculture and technology. This highlights the most concentrated industries such as the I.T industry due to industry 4.0. Agriculture for food security and health which is always in demand.

5.4.2 Relationship between the UKZN Innovation hub and the development of student entrepreneurs

The discussion of the findings will focus on a descriptive analysis of the variables based on the mean, mode and median scores. The study found that seminars do help student run their business effectively as demonstrated by the 88.5% agreed or strongly agreed and the overall mean result of 5.03. However, it was also found that the UKZN academic staff does not offer students entrepreneurial guidance as shown by the 48,5% respondents who agreed with the statement; the mean score was 3.74. A significant number of student entrepreneurs indicated that the UKZN InQubate did not provide them with the start-up machinery and equipment they need. Only a total of 42.9% agreed or strongly agreed. This could mean that for small businesses that requires some sort of machinery and equipment to operate, they might not be successful in running their business because of the lack thereof. The study found that 71.4% agreed that they have access to the university infrastructure when required for their business operations.

The study also found that student entrepreneurs (54.3%) at the UKZN InQubate are fairly exposed to role models and business success stories. Role models and business success stories gives entrepreneurs inspiration and also a positive aspect on the running of a business. Another finding was that a significant number of students indicated that they did not receive assistance in registering their businesses. The mean for this statement was below average at 2.83. The findings showed that majority of the student entrepreneurs were given support in creating their business plan, the mean score for this statement is 5.11. The mode score of 4 showed that student entrepreneurs were not afforded the idea validation opportunities. This could also be attributed by different factors such the time they joined the programme and also at what stage are they with their business idea. A high mean score of 5.34 demonstrated that student entrepreneurs were provided with idea pitching opportunities. Idea pitching opportunities gives entrepreneurs a platform to market their idea and also test the feasibility of their idea. A mean score of 3.77 which is just above average, showed that student entrepreneurs did not benefit from prototype development opportunities.

5.4.3 Relevance of the UKZN Innovation hub programme to the business challenges of the 21st century.

The study found that a significant majority (71,4%) of student entrepreneurs received mentorship support for their businesses from the UKZN InQubate. Most respondents 68,8% benefitted from the networking opportunities provided by the UKZN InQubate with the mode score is 6 (strongly agree). Majority of the respondents agreed with the statement indicating that they have been exposed to collaborations with other entrepreneurs.

The respondents therefore (91,4%) agreed or strongly agreed that the UKZN InQubate programme helps them to understand processes involved in entrepreneurship. There was no strong indication that student entrepreneurs were provided with a working space**.** However, student entrepreneurs indicated that the UKZN InQubate programme assists in facilitating access to business funding.

5.4.4 Readiness of the student entrepreneurs to be future business leaders

A significant response (71.5%) indicated in the study that the InQubate provides student entrepreneurs with opportunities to be future business leaders. There was a strong indication (77,1%) that the UKZN InQubate programme supports and values leadership development. A significant indication that respondents do benefit from sufficient resources invested through the programme. Most student entrepreneurs (77,2%) indicated that they had the necessary skills and competencies to become future business leaders. There is high level indication (90%) that the respondents involved in the UKZN InQubate programme understand the leadership capacity required to be a future business leader.

5.5 Conclusions of the findings

Innovation hubs are found to be resourceful and key in helping develop entrepreneurs and providing them with the support they need. This study shows that the UKZN innovation hub is helping develop student entrepreneurs. Most students perceived the attendance of entrepreneurial seminars as important in helping them understand how to run their businesses effectively. They also indicated that the they are allowed to use the university infrastructures whenever they needed it and they are provided with the platform to pitch their business ideas. Majority of the students indicate that they have received mentorship support, exposed to networking opportunities and collaborations with other

entrepreneurs. Furthermore, the UKZN InQubate assisted students in gaining access to business funding to support their business. A strong advocacy and support for business leadership was highlighted in the findings. However, the statistics also revealed that UKZN academic staff does not offer students entrepreneurial guidance and this shows that the academic staff are not entirely aligned with the strategic goals of the university of embracing “an entrepreneurial spirit in advancing its mission, and instill a culture and mind-set of entrepreneurship in its graduates and staff” (UKZN strategic plan 2017-2021, pg. 14). Other barriers revealed in the student entrepreneurial journey at UKZN was the lack of support in registering their businesses, opportunities for idea validation and the provision of machinery and equipment to operationalize their businesses.

Therefore, the results of this study conclude that students are being developed as entrepreneurs through the UKZN innovation hub, they are being geared up for business challenges and equipped with business leadership skills. The results reveal that the innovation hubs are a key component in developing small businesses for economic grow and through that, the alleviation of unemployment and poverty.

5.6 Recommendations

The findings of this study cannot be generalized given that the UKZN InQubate had a total of 50 student entrepreneurs registered on their database of which only 35 took part in this study. Obtaining data from 35 students presents a challenge of generalizing the findings from the research findings. However, the results of this study have great implications not only for the UKZN InQubate but for innovation hubs in other universities. For instance, the results show the lack of entrepreneurial guidance from academic staff and the provision of university infrastructure is crucial for start-ups. Therefore, this is a call for universities with innovation hub programme to contribute to the economic status of South Africa, by:

- Intensifying entrepreneurship education and including entrepreneurship in their curriculum programme;
- Make entrepreneurship programme through the innovation hubs more attractive and practical to increase the willingness of university students to become entrepreneurs in their respective fields, in turn reducing graduate’s unemployment rate.

- Provide more financial support to student entrepreneurs who are inclined to be successful business owners through competitions, grants, and sponsorships.

5.7 Limitations of the study

- The study was only done at the UKZN InQubate focusing on student entrepreneurs within the University of KwaZulu-Natal. The research can be extended to other universities across the country.
- The study places an emphasis on student entrepreneurs who are on the InQubate programme. Future research can look at young entrepreneurs on another programme.
- The study focused only on student and not young entrepreneurs who have already exited the university having started their businesses while they were students.

Therefore, the findings of this study cannot be generalized as presenting the same experiences other student entrepreneurs have gone through in different universities; even though the experiences might be similar but not necessarily the same.

5.8 Conclusion of the study

The contribution of SMEs to the economic growth is one that has remained amplified over centuries and still remains one of the key contributors in the world. SMEs can also be used as a platform to alleviate the high youth unemployment in South Africa. Using innovation hubs has proven to be an effective mechanism to develop student entrepreneurs. In addition to the innovation hubs run by universities, DHET has responded to the challenge faced by SMEs by creating a platform to develop entrepreneurship through an Entrepreneurship Development in Higher Education (EDHE) programme. The programme is aimed at equipping student with the skills and knowledge to be able to decide on whether to be an entrepreneur or choose to seek for job opportunities. The programme is not only student focused but includes academics as the drivers of content to instil the mind-set of entrepreneurship. Literature revealed that the provision for funding, infrastructure and opportunities to network and incubation is also another way to effectively offer support to start-ups. The UKZN InQubate has proven to be providing the support that is much need by the student entrepreneurs. However, the results also showed that there are shortcomings in line with the provision of

entrepreneurial guidance from academic staff. Student entrepreneurs also noted that there is a lack of fundamental support at the initial stages of their businesses, issues of business registration and provision of equipment and machinery has come up as lacking. The results of this study give the impression that the provision of support to aspiring entrepreneurs is improving, but this result is not satisfactory because of the following reasons: The number of students impacted are far from being the average student intake at UKZN. This means that the programme is not attracting enough students from the overall students enrolled at UKZN. Literature shows that incorporating practical entrepreneurial training in university curricula is likely to enhance students' entrepreneurship intentions as well as their consideration of entrepreneurship as a possible career choice. As cause for concern, students are not taking advantage of the incubation programme initiatives. Furthermore, UKZN must provide support to their student entrepreneurs and aspiring students beyond just developing them but also for sustainability purposes for when they have exited the university system. This will make sure that that their businesses grow and are sustainable.

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Appendices

Appendix A – Ethical Clearance

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

11 December 2020

Ms Mukhethwa Christinah Mulaudzi (216076295)
School of Management, IT & Governance
Westville Campus

Dear Ms Mulaudzi,

Protocol reference number: HSSREC/00000018/2019
Project title: Evaluating the role of innovation hubs to promote entrepreneurship: A case study of University of KwaZulu-Natal InQubate

Approval Notification – Amendment Application

This letter serves to notify you that your application and request for an amendment received on 03 December 2020 has now been approved as follows:

- Change in title

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form; Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

Best wishes for the successful completion of your research protocol.

Yours faithfully

[redacted]
.....
Professor Dipane Hlalele (Chair)

/ms

Humanities & Social Sciences Research Ethics Committee
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Tel: +27 31 260 8350 / 4557 / 3587
Website: http://research.ukzn.ac.za/Research-Ethics/

Appendix B – Information and consent form

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS

COMMITTEE (HSSREC) APPLICATION FOR ETHICS APPROVAL
For research with human participants

Date: 06 September 2019

Greetings,

My name is **Christinah Mulaudzi** a **MCom: Management** student, at the **School of Management, IT and Governance**, of the University of KwaZulu-Natal.

You are being invited to consider participating in a study that involves research project entitled “Exploring the use of innovative architectures to disrupt entrepreneurial conventions: A case of University of KwaZulu-Natal InQubate”. The aim of this study is to determine if the UKZN innovation hub programmes are relevant and gearing up student entrepreneurs for the business challenges of the 21st century by inviting 50 student entrepreneurs registered under the UKZN InQubate program to respond to the questionnaire. The duration of your participation if you choose to participate and remain in the study is expected to be 15 minutes.

We hope that the study will create the following benefits: to establish whether there is a positive relationship between the UKZN Innovation hub and the development of student entrepreneurs; to determine whether the UKZN Innovation hub programmes are relevant to the business challenges of the 21st century and if the student entrepreneurs are equipped to be future business leaders. The results of the survey are intended to help improve the UKZN innovation hub programmes to make them relevant to industry 4.0 and gear up student entrepreneurs to lead the future through small businesses.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (Approval number - HSSREC/00000018/2019).

In the event of any problems or concerns/questions you may contact the researcher at 216076295@stu.ukzn.ac.za or 031 – 260 7815 or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus
Govan Mbeki Building
PrivateBagX54001
Durban 4000 KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557- Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Your participation in the study is voluntary and by participating, you are granting the researcher permission to use your responses. You may refuse to participate or withdraw from the study at any time with no negative consequence. There will be no monetary gain from participating in the study. Your anonymity will be maintained by the researcher and the School of Management, I.T. & Governance and your responses will not be used for any purposes outside of this study.

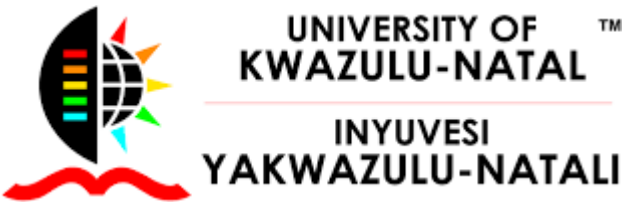
All data, both electronic and hard copy, will be securely stored during the study and archived for 5 years. After this time, all data will be destroyed.

If you have any questions or concerns about participating in the study, please contact me at the numbers listed above or my supervisor Dr Abulla Kader.

Sincerely,

Christinah Mulaudzi
Student no: 216076295

Consent to participate



Exploring the use of innovative architectures to disrupt entrepreneurial conventions: A case of University of KwaZulu-Natal InQubate.

CONSENT TO PARTICIPATE

I…… (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

SIGNATURE OF PARTICIPANT DATE

_____ _____

Signature of Participant **Date**

Appendix C – Questionnaire Survey

Questionnaire:

Section A: Biographical Information (Please tick one box per question)

1.1 Are you a registered student of the University of KwaZulu-Natal?

YES	
NO	

1.1 In which College are you registered in?

Humanities	
Law and Management Studies	
Agriculture, Engineering and Sciences	
Health Sciences	

1.2 Indicate your highest level of education.

Matric/ Grade 12	
Undergraduate degree/diploma	
Honours	
Masters	
Doctorate or higher	

1.3 Indicate your age category

18 – 30 years	
31 – 40 years	
41 – 50 years	
51 – 60 years	
Above 60 years	

1.4 Indicate your race group

Black	
Indian	
Coloured	
White	
Other (Please specify)	

1.5 Indicate the industry your business is trading in

Technology	
Agriculture	
Media	
Health	
Other, please specify…….	

1.6 Indicate the period your business has been in trade

Less than 1 year	
1 – 3 years	
4 – 5 years	
6 – 10 years	
More than 10 years	

1.7 Do you have any business background i.e. anybody from your family has been into a business?

Yes	
No	

1.8 Where did you hear about the UKZN InQubate programme?

UKZN website	
Referral	
Word of mouth	
Social media platforms	
Other: specify……	

Section B:

2.0 Indicate by marking with an X below on the following statements:

Statement	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
2.1.1 The Student entrepreneur seminar helps me run my business effectively.						
2.1.2 The UKZN InQubate programme helps establish accelerator programs						
2.1.3 UKZN InQubate provides me with the start-up machinery and equipment I need to be a successful entrepreneur						
2.1.4 I received support in creating my business plan						
2.1.5 There is sufficient resources such as funds, time etc. invested in developing future business leaders through the Program						
2.1.6 I am exposed to role models and business success stories						
2.1.7 I receive entrepreneurial guidance from academic staff within the university						
2.1.8 I received assistance in registering my business						
2.1.9 I understand the leadership capacity required to be a future business leader.						

2.1.10 The UKZN InQubate programme provides networking opportunities						
2.1.11 I have access to UKZN InQubate idea validation mechanism						
2.1.12 I have the necessary skills and competencies to become a future business leader.						
2.1.13 I was provided with an idea pitching opportunities						
2.1.14 The UKZN InQubate programme facilitates collaboration with other entrepreneurs						
2.1.15 I have access to the university infrastructure when required						
2.1.16 The UKZN InQubate programme offers mentorship for start-ups.						
2.1.17 The UKZN InQubate programme supports and values leadership development						
2.1.18 The UKZN InQubate provides a working space for student start ups						
2.1.19 I have access to prototype development						
2.1.20 The UKZN InQubate programme assists in facilitating the access to business funding						

2.1.21 The UKZN InQubate provides student entrepreneurs with opportunities to be future business leader						

Thank you for your participation.