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EXPANDING ENTREPRENEURSHIP EDUCATION TO BOOST STUDENTS' INNOVATION IN SOUTH AFRICAN UNIVERSITIES

BY

THABO WONDER MTSHALI (210534694)

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SUPERVISOR: DOCTOR VANGELI GAMEDE

CO-SUPERVISOR: PROFESSOR PFANO MASHAU

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DECLARATION

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I dedicate this work to the almighty God,

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ABSTRACT

The COVID-19 pandemic caused strain on businesses, some have suffered resulting in downsizing staff or closing permanently. The South African unemployment rate currently is at 32.9%. The labour market in South Africa is struggling to create opportunities and failing to counteract unemployment with relevant skills. The pandemic resulted in more people losing jobs which then contributed to the increase in unemployment. The country should reduce poverty by developing innovative entrepreneurs at a tertiary level. These difficulties indicate that people are facing challenges in getting decent jobs due to a lack of skills.

Universities have a responsibility to operate entrepreneurially since they are affected by the reduction of public funds, educational market competence, and economic and social changes. Hence, the study focus is expanding entrepreneurship education in South African universities to strengthen the economy and create job opportunities in the country. Entrepreneurship education plays a significant role in educating people about business development and reducing poverty while creating job opportunities using innovation. The aim is to expand university entrepreneurship education by adding entrepreneurship education across all qualifications to help students develop entrepreneurial intention and a positive mindset towards business start-ups. The research focuses on the University of KwaZulu-Natal and the University of Zululand, both located in KwaZulu-Natal Province. The research followed a mixed method.

Qualitative data were collected using interviews with academic staff and were analysed using NVIVO thematic analysis programmes. The quantitative data were collected using questionnaires on students and were analysed using SPSS's latest version. The sample size was made up of 371 students and 4 academic staff from the University of KwaZulu-Natal, and 348 students and 4 academic staff from the University of Zululand. The researcher got a 99.3 percent response rate from students and staff from both universities.

The findings obtained reveal that expanding entrepreneurship education can help stimulate an entrepreneurial mindset and innovation in students. More than 88% of students agree that adding entrepreneurship education to the curriculum will help them stimulate an entrepreneurial mindset. However, students said, “universities do not have adequate infrastructure to support innovation and entrepreneurship education”. Academic staff members believe that higher education must have an active role in introducing and promoting entrepreneurship education because they have strong guiding policies and ideas but unsatisfactory implementation strategies.

The research could help develop a curriculum that will stimulate an entrepreneurial mindset in students while exposing the university to industry and other external sponsors. The entrepreneurial spirit needs to be revived amongst students by restructuring various degrees, enhancing entrepreneurial thinking, developing student entrepreneurship programmes, and supporting venture creation. The study recommends expanding entrepreneurship education to give students more career options and employment opportunities. This could give students equal business opportunities and teach students that entrepreneurship can be taken as a career.

Keywords: Entrepreneurship Education, Entrepreneurial Intention, Innovation, Curriculum Development, Department of Higher Education and Training (DHET), Technology, University of KwaZulu-Natal (UKZN), University of Zululand (UNIZULU), Skills.

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LIST OF ABBREVIATIONS

4IR – Fourth Industrial Revolution

ANOVA – Analysis of Variance

BRICS – Brazil, Russia, India, China and South Africa

CHET – Council on Higher Education and Training

DVC – Deputy Vice-Chancellor

DHET – Department of Higher Education and Training

DSBD – Department of Small Business Development

DTI – Department of Trade and Industry

ED – Economic Development

EDA – Exploratory Data Analysis

EDHE – Entrepreneurship Development in Higher Education

EE – Entrepreneurship Education

EF – Environmental Factors

EI – Entrepreneurial Intention

HESA – Higher Education South Africa

HSSREC – Humanities and Social Sciences Research Ethics Committee

HOD – Head of Department

IF – Internal factors

ITC – Information Technology Communication

KM – Knowledge Management

KPI – Key Performance Indicators

LBSC – Local Business Service Centre

MAC – Manufacturing Advice Centre

MIT – Massachusetts Institute of Technology

NEF – National Empowerment Fund

NGAP – New Generation of Academics Programme

NGO – Non-Governmental Organisations

NIE – Newly Industrialised Economics

NIS – National Innovation System

NRF – National Research Foundation

NYDA – National Youth Development Agency

PSUT – Princess Sumaya University for Technology

QH – Quadruple Helix

RFI – Retail Financial Intermediaries

R&D – Research and Development

RIS - Regional Innovation Systems

RSA – Republic of South Africa

SEDA – Small Enterprise Development Agency

SEFA – Small Enterprise Finance Agency

SHAPE – Shifting Hope Activating Potential Entrepreneurship

SMEs – Small and Medium Enterprises

SMMEs – Small Medium and Micro-Sized Enterprises

SOEs – State Own Entities

SONA – State of the Nation Address

SPSS – Statistical Package for the Social Science

StatsSA – Statistics South Africa

SWOT – Strengths, Weaknesses, Opportunities and Threats

TAC – Tender Advice Centre

TEA – Total Entrepreneurial Activity

TTO – Technology Transfer Office

TH – Triple Helix

UHI – University of Highlands and Island

UKZN – University of KwaZulu-Natal

UNIZULU – University of Zululand

CONTENTS

CHAPTER 1

1.1 INTRODUCTION

Entrepreneurship implies the discovery of opportunities and the creation of new economic activities in the form of business. It is the process of discovering, assessing and creating something new to add value to society while creating wealth for yourself (Dees, 2017). The entrepreneurs aim to provide service, produce new products, or introduce new strategies in the market. The process of introducing services or products contributes to the economy and creates job opportunities in the market. Entrepreneurship becomes the backbone of the economy when businesses create jobs, individuals become financially independent and poverty is eradicated (StatsSA, 2017). Community benefits as citizens get jobs and criminal activities reduce (Keat *et al*., 2011).

In the State of the Nation Address (2021), the President Cyril Ramaphosa stated that the graduate unemployment rate is 9.3% in South Africa. The current unemployment rate is 32.1% (StatsSA, 2024). The only way to revive growth and accelerate the economy is through innovation and empowering Small Medium and Micro-sized Enterprises (Ramaphosa, 2020). In addition, the President emphasised that entrepreneurship through innovation and the creation of new ventures could reduce the unemployment rate in South Africa. Introducing entrepreneurship education in all colleges/ faculties may help universities to produce graduates who think entrepreneurially (UKZN, 2020). Integration of society-university-industry may develop innovation skills and produce desired businesses in the country (Cegielski & Jones-Farmer, 2016).

It has been identified that those who take entrepreneurship education are creative, they create more ventures, take calculative risks, and make higher investments in their business compared to non-academic entrepreneurs who are passive and resist change (Iqbal *et al.*, 2012). A study by Gundry *et al*. (2014) highlighted that entrepreneurship programs enable students to discover opportunities and new ideas that lead to innovation. Research by Gundry *et al.* (2014), supported by Wei *et al.* (2019), has shown that there is a positive relationship between entrepreneurship education and innovation.

The COVID-19 pandemic caused strain on businesses, some have suffered resulting in downsizing staff or closing permanently (Jackson *et al.,* 2020). The pandemic resulted in more people losing jobs which then contributed to the increase in unemployment. Post COVID-19 the unemployment rate is currently at 32.1%, this reflect slight decrease of 0.8% from beginning the beginning of 2024 (StatsSA, 2024). These difficulties indicate that people are facing challenges in getting decent jobs due to a lack of skills. Henderson and Robertson (1999) mentioned that youth do not regard entrepreneurship as a career option due to the poor presentation of entrepreneurship education by the institutions. Hence, the South African government encourage youth and graduate entrepreneurship to minimise unemployment; the aim is to change students' attitude towards entrepreneurship (Igwe & Icha-Ituma, 2020).

The South African government has policies in place to aid small and upcoming businesses (Geitlinger, 2016). The policies guide organisations on how to support small businesses in various aspects of business such as mentoring, finance management, recruitment and training. Berry *et al*. (2002) mentioned that the National Youth Development Agency (NYDA), Tender Advice Centres (TACs), Local Business Service Centres (LBSCs), Department of Trade and Industry (DTI), Manufacturing Advice Centres (MACs) and Retail Financial Intermediaries (RFI) are listed organisations that are known to support businesses in South Africa. Businesses must be able to respond to the needs of the target market by using technology to their advantage (Moses *et al*., 2012).

Roper and Turner (2020) defined innovation as the process of creating something new or significantly improving the existing products, services, processes, or ideas to meet a need, solve a problem, or capitalising on an identified opportunity. They further said, it involves the application of knowledge, creativity, and resources to develop solutions that provide value to the society, individuals, and organizations as a whole. However, Moses *et al*. (2012) said innovation is identified as the best method to increase competitiveness and productivity of the business sector while reducing challenges to economic growth. Innovation and entrepreneurship have their own meaning in literature; however, they are related. Various businesses have different drawbacks and advantages with innovation. Entrepreneurship education allows students to have good entrepreneurial intentions. It is believed that small businesses provide a conducive space for creativity and innovation that does not require large-scale production, but commitment from company members (Sahut & Peris-Ortiz, 2014).

Shane (2012) explains that innovation is a significant part of entrepreneurship, it involves creative business ideas and how to combine resources to exploit opportunities in the market. He further explains the dominance of innovation and entrepreneurship, and how it is used to creatively combine resources to exploit profitable opportunities.

Robson *et al*. (2009) conducted a study focusing on strategic renewal, innovation and venturing. Their study revealed the importance of entrepreneurship, innovation, productive transformation process, combination of resources, risk-taking and proactiveness towards developing new technology, products, services or new strategies. Shane (2012) agreed with Robson *et al*. (2009) that entrepreneurship and innovation must go hand-in-hand to enable multiple functions for business growth. Smith and Woodworth (2012) emphasised that entrepreneurship and innovation must converge to strengthen and grow the economy. This can be achieved by introducing innovation and entrepreneurship in all business school programs (Smith & Woodworth, 2012).

Research by (Wong *et al.*, 2005; Rodrigues *et al*., 2012; Keat *et al*., 2011; Crumpton, 2012; Sahut & Peris-Ortiz, 2014; Cassim, 2018), has revealed the positive contribution of entrepreneurship towards a better economy.

Introducing entrepreneurship to students may improve innovation, create new ventures, reduce unemployment and revive the economy in South Africa (Ramaphosa, 2020). Entrepreneurship curriculum equip students with skills to think beyond getting employment, develop creativity, self-reliance and identify business opportunities. Students with entrepreneurship education will spot the business opportunity, create a business which will establish vacancies to the society. Hence, the study focus is expanding entrepreneurship education in South African universities to strengthen the economy and create job opportunities in the country.

1.2 BACKGROUND

The research focuses on postgraduate students registered at the University of KwaZulu-Natal (UKZN) and the University of Zululand (UNIZULU), both located in KwaZulu Natal Province.

Figure 1.1: The Republic of South Africa

Source: Adapted from Google

Key represents the province of KwaZulu-Natal:

The postgraduate students are the target population of the study because they have already had junior degrees, so it may be easy for them to reflect on the curriculum. Postgraduate students can provide significant contributions to the current curriculum delivered by lecturers. This group of students can suggest whether the current curriculum addresses social challenges, whether it provides information required by industry, if the information provided is current/ outdated, or if curriculum development is required. Curriculum development aims to keep education relevant, allow the curriculum to address the status quo, and equip students with the necessary skills required by industry and the latest technology. The other focus area is academic staff such as senior lecturers, academic leaders, Heads of Departments (HODs), Professors and module developers because they may have significant input on modifying or updating the existing curriculum.

The aim is to expand university entrepreneurship education that will help students develop entrepreneurial intentions and a positive mindset towards business start-ups. The University of KwaZulu-Natal has four colleges: College of Agriculture, Engineering and Science, College of Health Sciences, College of Humanities and College of Law and Management Studies (UKZN, 2022). The University of Zululand has four faculties: Faculty of Arts, Faculty of Commerce,

Administration and Law, Faculty of Education and Faculty of Science, Agriculture, and Engineering. In these two institutions, the common trait is that the College/ Faculty of Law and Management Studies offers introductory and intermediate entrepreneurship and business management modules (UKZN, 2022; UNIZULU, 2022). The other colleges/ faculties offer modules that are in their area of expertise.

Students from the Faculty/ College of Arts, Agriculture, Engineering and Science, Health Sciences and Humanities are not given alternatives if they fail to find jobs using their qualifications. This contributes to high unemployment and becomes a disadvantage to students who might want to explore entrepreneurship as an alternative career option. Students are at a disadvantage if they want to pursue business using skills they obtained from their qualifications. In other qualifications, it can be advantageous to diversify the curriculum by giving students extra options in one degree. Following the history of Sir William Ashely, an educator of economic history, who started a program in 1907 to introduce different fields in one school, the aim was to give students options to add modules in one degree; this was evidence that diversification is significant in the curriculum (Kerr, 2016; Nwambam *et al*., 2018; Etieyibo, 2019).

The job market is struggling to create job opportunities, some individuals may not find jobs using their qualifications and decide to become entrepreneurs (StatsSA, 2021). Some students may start businesses but end up failing or at a disadvantage due to a lack of business knowledge. Running a business requires skills such as financial management, customer service, marketing, communication, negotiating, leadership, time management, problem-solving, project management, and networking for business to grow. The students with no entrepreneurship education may be disadvantaged when they plan to start businesses, as they may lack entrepreneurship intent. Entrepreneurship education combined with knowledge obtained from their qualifications may help students to start innovative ventures. Giving entrepreneurship education to students may benefit the country in terms of creativity, innovation, career advancement and portfolio diversification (Shongwe, 2020).

Entrepreneurship education enables students to self-employ, and develop and improve competencies while raising entrepreneurial awareness (Shongwe, 2020). As the world of technology emerges, the curriculum should be revised to eliminate outdated material or content and replace it with current informative content. This could make a positive contribution to the upcoming young entrepreneurs and good impact on the country's economy.

1.3 PROBLEM STATEMENT

Worldwide more professional qualifications have come under serious scrutiny due to job scarcity, changes in technology, globalisation of the world's economy and corporate failures. There has been a lot of change in a decade, and the space in the job market is limited since the competition is very high among organisations and employees to secure employment. The biggest challenge globally is youth unemployment, approximately 73 million of the youth population are living without jobs (Zabetian, 2021). The major concern is to decrease unemployment by introducing innovative entrepreneurship education. In 2022, the South African unemployment rate increased to 35.3%, which was the highest recorded since 2008 (StatsSA, 2022).

The number of unemployed graduates is drastically increasing contributing to the total unemployment in South Africa (StatsSA, 2021). The alarming statistics call for urgent intervention by government, universities, industries, and Small Medium and Micro Enterprises. Each stakeholder must go back to a drawing board and brainstorm ideas on how to interject strategy to reduce unemployment. Sometimes the misbehaviour of youth is caused by a lack of better opportunities. The impact of unemployment results in poverty, increased crime rate, unrest, mental stress and corruption (Banda *et al.*, 2016; Onwuka, 2020). This could be mitigated by active intervention and introducing opportunities to the public (Gibb *et al*., 2012). Creating opportunities for the youth may stimulate the job creator's mindset (Jesselyn Co & Mitchell, 2006). Jonathan *et al.* (2021) agrees with Mafiri (2005) observation that there is a direct relationship between unemployment and the well-being of the economy. He mentioned that job opportunities increase in a country with a growing economy (Mafiri, 2005).

Brixiová *et al*. (2015) emphasised the significance of education to equip youth with skills to pursue a business career. Providing youth with skills may allow them to positively contribute towards community development (SONA, 2017). Newly established ventures can build working relations with existing innovative businesses, this could yield fast-growing businesses and strengthen the country's economy. The support they can get from long-existing businesses can reduce the number of new businesses that are failing. In South Africa, the Department of Small Business Development (DSBD) was established to specifically guide and support new or small businesses (SONA, 2017).

The graduate unemployment rate is contributing 30% to the total unemployment rate; introducing entrepreneurship across all colleges/ faculties may help students to take entrepreneurship as a career. Expanding entrepreneurship education may add value to the universities, provinces, and the country because graduates will have the opportunity to put theory into practice. Entrepreneurship education creates good entrepreneurial intention for students and allows a positive mindset toward business creation (Pihie & Akmaliah, 2009; Mukhtar *et al.*, 2021; Jiatong *et al.*, 2021). This could open a platform of collaboration among students from different disciplines. Education allows an individual to believe in their skills and abilities to initiate tasks (Ajzen, 2011; Jiatong *et al.*, 2021). While the lack of entrepreneurial skills results in people looking for employment when companies are downsizing, improving entrepreneurship education means empowering owners of Small Medium and Micro Enterprises with skills to grow businesses (Chimucheka, 2014). It is crucial to create awareness among students and youth about entrepreneurship to show that starting a business is a career option; one does not have to only depend on getting employment (Shongwe, 2020).

Jena (2020) mentioned the youth of India constitute more than 65% of the population and yet facing high level of unemployment while entrepreneurship opportunities have not been fully explored. The statement by Jena (2020) supports research by Sanchez (2011) when discussing that careers in entrepreneurship have not been utilised properly, entrepreneurship education must stimulate entrepreneurial intent and efficacy in students. Each university must have a Shifting Hope Activating Potential Entrepreneurship (SHAPE) programme to educate students about skills development, and entrepreneurship careers and introduce more workshops focusing on entrepreneurship development (Van der Westhuizen, 2017). Entrepreneurship must create job opportunities, and contribute to social development and economic growth (Sanchez, 2011). Skills development programmes can encourage students to participate in business start-ups. Promoting innovative entrepreneurship and training can be a good solution to resolve the crisis facing the country (Nicolaides, 2011).

Youth with informal businesses collapse easily due to limited knowledge of business management. Entrepreneurship education may provide knowledge from business experts on how to draw up a business plan, apply for funding, manage daily activities and do SWOT analysis prior to establishment (Sammut-Bonnici & Galea, 2014). The South African government promotes the development of student entrepreneurship to diversify careers and minimise the lack of job opportunities in the country (Ramaphosa, 2020). Fields and Kunene

(2017) explained that student entrepreneurship has been investigated and identified as a solution to unemployment, however, it has not yielded the expected outcome because newly established businesses are still failing. The world was negatively affected by COVID-19 which left a huge dent in the economy (Arndt *et al.*, 2020). The lockdown was introduced as a tool to mitigate the severe spread of the virus. Announcing the lockdown imposed a negative shock on the economy which then resulted in negative economic effects (Arndt *et al.*, 2020).

Introducing a lock-down resulted in a major reduction in production, closing non-essential businesses, travelling, movements (especially global production exports and imports disrupted) and business investments were uncertain (De Villiers *et al*., 2020). COVID-19 disrupted supply and demand for suppliers and users. Introducing the lockdown affected all activities that were deemed non-essential for example schools, universities, colleges, gatherings and travelling (Chitiga-Mabugu *et al*., 2021). Chitiga-Mabugu (2021) stated that it was difficult to understand the impact of COVID-19 due to limited information about the disease and researchers had nothing to compare with it from history. The pandemic gave rise to economic and social vulnerabilities, and individuals depending on the informal economy were more affected (Khambule, 2020). The period of early 2020 to 2021 was a challenging time for the South African job market because the unemployment rate increased drastically, and non-essential and informal businesses were closed. South African unemployment rate is still remain high even after COVID-19 pandemic and sectors are slowly recovering from the economic knock.

The current economy must be revived by introducing education that helps develop job opportunities in the country. Willingness to develop something combined with education can influence the creation of innovative ventures. The majority of degrees provide skills that mainly focus on their areas of expertise, provide knowledge that is required in the specific field, and do not allow students to start businesses after graduation or at a later stage. This becomes a challenge when students want to attempt venture creation and become entrepreneurs, the business takes strain and fails due to a lack of entrepreneurial intent and skills (Mtshali, 2019). Kojo (2010) mentioned financial literature and entrepreneurship education as an example of a good combination, it allows students to have the excellent financial management required to operate a successful business.

This study may assist universities in alleviating poverty and unemployment, and instituting new strategies for developing innovative businesses. The study may assist South African universities to equip students with entrepreneurship education and innovation, and to offer

students the necessary skills to compete in the outside world. Using the Theory U Model will allow students to get adequate education and reliable skills that will help them create new businesses that will contribute to the economy. The study aims to investigate if expanding universities' entrepreneurship education will increase students' innovation and business interest. The section below presents the research questions.

1.4 RESEARCH QUESTIONS

The research questions of this study are:

1. Does the existing education equip students with innovation skills across the institution?
2. To what extent do qualifications offered in the institution expose students to innovative ideas?
3. What is the assumption/ views the students have towards innovative entrepreneurship?
4. What are the attitudes students have towards innovation and entrepreneurship education?
5. Can entrepreneurship education help to boost innovation among students?

1.5 RESEARCH OBJECTIVES

The research objectives of this study are to:

1. Determine if the existing education equips students with innovation skills across the institution.
2. Determine if knowledge acquired from qualification exposes students to innovative ideas.
3. Investigate the assumptions/views the students have towards innovative entrepreneurship.
4. Determine the attitude students have towards innovation and entrepreneurship education.
5. Determine if entrepreneurship education can help boost innovation among students.

1.6 THEORETICAL FRAMEWORK

Theory U: This plays a significant role as a disseminating institution and knowledge producer. It shows how organisations' and groups' leadership capabilities can be used to create a future that would not otherwise be feasible. We live in a time where the unemployment rate is high, violence, poverty, hunger, and massive institutional failure are prevalent (Peschl & Fundneider, 2014). This calls for new leadership strategies to develop capacity that would allow transformation for future possibilities. The shortage of skills and innovation hinders youth from participating in entrepreneurship activities. Education gives students proper entrepreneurial orientation and influence towards business start-ups (Steenekamp *et al*., 2011).

Entrepreneurial activities develop an entrepreneurial society where knowledge-based entrepreneurship is a driving force for employment creation, economic growth and competitiveness (Guerrero & Urbano, 2012).

The transition period in the entire world calls for urgent change from how we used to do things, to how we do things and how we are going to do things in the future. Theory U provides a step-by-step guideline to the solution.

1.6.1 Application of the theory

The study will be guided by Theory U to assess the current impact of entrepreneurship education on students who had the opportunity to get entrepreneurship education and students without it. The researcher will be guided by the same theory to expand entrepreneurship education across colleges/ faculties to boost student innovation in South African universities. The study will focus on entrepreneurship development in teaching and learning, revisiting curriculum and looking at the possible ways to introduce entrepreneurship education across the colleges/ faculties in the institutions.

The research methodology for this study is summarised below.

1.7 RESEARCH METHODOLOGY

The research methodology used in this study is summarised as follows:

Table 1.1: Research methodology breakdown

Methods	**Application to study**
Location/ Study area	• University of KwaZulu-Natal: Westville Campus, Howard College, Nelson R. Mandela School of Medicine, Edgewood campus, Pietermaritzburg campus. • University of Zululand: Richards Bay Campus and Kwadlangezwa.
Target population	• University of KwaZulu-Natal postgraduate students 10 627, academic staff 1331 • University of Zululand Postgraduate students 3 604, academic staff 277

Sample size	• University of KwaZulu-Natal postgraduate students 371, academic staff 4 • University of Zululand postgraduate students 348, academic staff 4
Exclusion / Inclusion criteria	• Students were divided per college they registered in (quota sampling) and selected to participate. • Academic staff (Professors, academic leader, course coordinator, head of department and module developers).
Instrument used for data collection	• Data were collected from postgraduate students using a questionnaire • Data were collected from academic staff using interviews
Process and study period for data collection	• A link was sent to students to answer the questionnaire, which took 20 minutes to complete. • Interviews were scheduled with academic staff at their convenient time. Time differed due to the information provided.
Data management process	• Data collected will be stored for five years following supervisors' instruction.
Data analysis	• Quantitative data were analysed using SPSS version 24 (ANOVA, Correlation & Regression analysis). • Qualitative data were analysed using NVIVO programme thematic analysis (using codes to organise and analyse data).

Researcher's own work (2023)

1.8 DELIMITATIONS

This study focuses on the University of KwaZulu-Natal, University of Zululand postgraduate students and academic staff only. The study may have yielded different results if five or more universities were part of the research. The challenging economy resulted in limited funding therefore the researcher focused on two universities. Due to a delay in response when applying for a gatekeeper letter and ethical clearance, the researcher decided to use two institutions, both universities are based in the KwaZulu-Natal Province. The impact of COVID-19 pandemic resulted in people working remotely, the response rate was very poor. When seeking information, it was hard to get a permit to access other institutions. The focus area was to collect data from postgraduate students since they can have significant contributions towards curriculum development. This group was badly affected by the COVID-19 pandemic; the curriculum was reduced and practical knowledge was limited which can affect the results of the research. The results may have been different if students from other institutions were included in the study.

The section below explicates the importance of conducting this study.

1.9 SIGNIFICANCE OF STUDY

The study focused on expanding entrepreneurship education to boost student innovation in South African universities. There is a need to conduct the study to bridge the existing gap in low levels of entrepreneurship education among students in the institutions. Studies by different scholars (Rozali *et al*., 2017; Marič *et al.,* 2010; Chigunta, 2017; Bokhari, 2013) reveal that entrepreneurship can be a solution to unemployment. Adding entrepreneurship education will aid all colleges/ faculties in producing creative and innovative graduates. The Department of Higher Education and Training (DHET) embarked on a journey to promote student entrepreneurship which started in 2017 across South African universities (UKZN, 2017).

This was proof that entrepreneurship education plays a significant role in the economy. Allowing students to get an entrepreneurship education may stimulate entrepreneurial intention in students, increase the number of innovations, independence, and successful business owners. An increase in business start-ups will increase vacancies in the job market, and decrease unemployment which is a significant factor in economic growth. The study looks at qualifications offered by two different universities and suggests the inclusion of entrepreneurship education to help students obtain knowledge to create and maintain businesses.

The results will help curriculum developers decide on whether to revisit the curriculum, align modules, remove irrelevant content and update with recent content. This may allow academics to engage with students using course evaluation to understand what should be done to improve the teaching and learning process. Findings will allow academics, students, researchers, government officials and members of society to see entrepreneurship as a career, not a hobby. Innovation ideas will surface, and stronger collaborations will emerge. This could benefit society since more independent entrepreneurs may be produced.

1.10 CHAPTER OUTLINE

Chapter 1: Nature and scope of the study

Chapter 1 introduces the research topic of the study, the significance of entrepreneurship education in the South African economy. This chapter explains the background and reveals the existing gap leading to the research undertaken, specifically the gap identified that motivated the researcher to conduct this study. The chapter also presents the outcomes this research will provide as a solution to the existing problem. It also briefly presents the theoretical framework, chapter outline, objectives, research questions and significance of the study.

Chapter 2: Literature review on entrepreneurship

Chapter 2 presents the existing knowledge of what other scholars have found. This chapter looks at the relationship between entrepreneurship education and innovation. It explores the contribution made by the Department of Higher Education and Training towards the establishment of entrepreneurship drive/education in South African universities. This chapter further discusses the importance of entrepreneurship education towards innovative businesses, education to shape students' mindset, significant contribution to economic development and suppression of unemployment.

Chapter 3: Theoretical framework

This chapter introduces the theory employed in the study and provides detailed information on the theory underpinning the study and five components that support innovative developments. The chapter reveals how theory is used to develop research questions and explores the link between theory and research questions. The chapter reveals international institutions that are utilising Theory U and have become successful in promoting entrepreneurship education.

Chapter 4: Research methodology

Research methodology helps to understand and solve research problems scientifically and systematically by obtaining, analysing and organising data (Kothari, 2004). According to Saunders *et al.* (2009), the research methodology has five stages namely: (1) research philosophy, (2) research approaches, (3) research strategies, (4) time horizons, and (5) data collection methods. The research onion will be used in the study to elaborate each step on what and why each technique is chosen for the study. Both qualitative and quantitative methods are explained in each step.

Chapter 5: Quantitative data analysis and discussions

The chapter provides an analysis and discussion of the obtained results at the University of KwaZulu-Natal and the University of Zululand from postgraduate students. Data were collected from a total of 719 postgraduate students. The total sample was made up of 371 postgraduate students from the University of KwaZulu-Natal and 348 postgraduate students from the University of Zululand. Data were collected using questionnaires in the form of links since COVID-19 restrictions needed to be observed. Quantitative data were analysed and measured using SPSS's latest version.

The chapter reveals research findings and covers the significance of entrepreneurship education, innovation, students' attitudes towards entrepreneurship, and the likelihood of students starting innovative businesses using education obtained from their qualification of choice. This section reveals whether the objectives were attained or not. This chapter further concludes by giving a summary of the entire research.

Chapter 6: Qualitative data analysis and discussions

The chapter provides dialogue, analysis and discussion of the interviews obtained from academic staff at the University of KwaZulu-Natal and University of Zululand. Data were collected from a total of eight academic staff members. The total sample is made up of four academic staff from the University of KwaZulu-Natal and four academic staff members from the University of Zululand. Since the institutions had four colleges/faculties, the researcher conducted one interview per college/faculty to minimise or avoid the repetition of information from academic staff. Data were collected using Zoom, Microsoft Teams and face-to-face interviews. Qualitative data were analysed using NVIVO thematic analysis programme. This

was a mixed method study, therefore it reflects qualitative and quantitative result summaries before triangulation.

Chapter 7: Discussion and recommendations

This section provides recommendations and discuss limitations and the impact of limitation encountered on the study. The importance of the results and the need for further research in this area are discussed in this chapter.

1.11 CHAPTER SUMMARY

The fourth industrial revolution came with robotic/ automotive processes or systems which led to an increase in production rate and a decrease in manual labour. More work is done remotely for example people are buying clothes online, food using shopping apps, paying for accounts, and accessing banks using banking apps. Companies decided to downsize staff due to limited work, other workers were forced to take early retirement. Other companies without funds to upgrade existing systems were liquidated. The global pandemic of COVID-19 had a huge impact which forced businesses to close. These factors increased unemployment in the country, it was evidence that traditional ways of doing business are no longer effective. Introducing innovative entrepreneurship can help create job opportunities and contribute towards a better economy.

This chapter introduces the topic of expanding entrepreneurship education to boost students' innovation in South African universities because innovative businesses are seen as a solution to reduce unemployment currently and in the future. A brief statement of the problem is discussed to support why there is a need to conduct the study. Background information is discussed leading to the gap which is a focus area of the study. Research questions were developed guided by Theory U and were based on the objectives of the study. The next chapter will focus on the importance of innovation, entrepreneurship education, government contribution towards innovation, student entrepreneurship, and the importance of expanding entrepreneurship education in South African universities.

CHAPTER 2

LITERATURE ON ENTREPRENEURSHIP AND INNOVATION

2.1 ENTREPRENEURSHIP LITERATURE

This section investigates the importance of entrepreneurship education, innovation, the University of KwaZulu-Natal curriculum, the University of Zululand curriculum, student entrepreneurship, the development of innovative businesses, and the significance of expanding education to assist students in gaining a positive mindset toward innovative businesses. In this section, the researcher reads more about past studies to attain information regarding the role and contribution of innovative entrepreneurship development in the economy. The innovation and entrepreneurship literature was used to investigate the contribution it has made to Small Medium and Micro Enterprises (SMMEs), universities, civil society, and industry. The past information can reveal how innovation and entrepreneurship have contributed to job creation, successful career choices, innovative businesses, and society.

Universities around the world are shifting from being educational providers to entrepreneurial universities, as a result, universities have a major contribution towards innovation (Wong *et al.,* 2007). The essential part of the transition is to develop the capacity towards knowledge commercialisation and an entrepreneurial mindset by inventing technology that will minimise manpower in the workplace and introduce new technology (Etzkowitz & Zhou, 2007). Maziriri and Chivandi (2020) supports research by Wong *et al.* (2007) when they highlight that entrepreneurship education may introduce innovative initiatives to improve an existing product to accommodate technology commercialisation and introduce stronger entrepreneurial elements in the market. In South Africa, entrepreneurship is in the infancy stage due to a lack of capital, support, and lack of skills (Fatoki & Chindoga, 2011). Bignotti and Le Roux (2020) argue that large portion of entrepreneurship are developed out of necessity, previous life experiences may lead to entrepreneurial intentions. Youth entrepreneurship needs to be promoted to exist in digital marketing where most activities take place and advertising easily gets to potential clients (Fatoki & Chindoga, 2011).

Crumpton (2012) said, innovation is creating more efficient or effective processes that will produce creativity, whereas Saunila (2020) described innovation as the process of continuously transform ideas and knowledge into new process, systems and products. It is a driving force for solutions and ideas when improving products and services. Innovation may include discontinuing outdated services and using creative thinking to introduce efficient solutions

(Crumpton, 2012). The link between innovation and entrepreneurship arises when exploiting opportunities and combining resources to develop new technologies, products and services (Sahut & Peris-Ortiz, 2014). Innovation and entrepreneurship must go hand in hand to allow sufficient resource allocation, commercialisation, and create strong associations with large companies for long-term investments (Sahut & Peris-Ortiz, 2014).

It is mentioned that Small, Medium and Micro Enterprises with relevant skills grow whereas Small, Medium and Micro Enterprises without appropriate skills find it difficult to grow (Chimucheka, 2014). Booyens (2011) observed that it is worth considering Small, Medium and Micro Enterprises for their conclusive contribution in terms of facilitating change, introducing innovation, and increasing competition among enterprises. She further mentioned that small businesses alleviate poverty by generating employment, adopting new technologies, and providing space for innovative start-ups (Booyens, 2011). Radipere (2012) observed that entrepreneurship programmes in South Africa do not yield the desired outcome because of the old traditional way of teaching. Kroon and Meyer (2001) stated that experts in business and government agreed that entrepreneurship is important in determining the well-being of South Africans.

Productive entrepreneurship and innovation have attracted interest in the country, it is a birthplace of new ideas that place value in the economy (Nieman & Nieuwenhuizen, 2009). Students are expected to have a job seeker mindset in their first year at the university, but they should be transformed by the entrepreneurship education curriculum to learning proficiency, innovation, and technology. In the past decade, graduates used to get jobs after obtaining a degree but recently this is no longer happening, which challenges the universities to adapt to this technological world by implementing new strategies that will equip students with the necessary skills to adapt.

The statement by the former president supports the initiative when he said, "*Entrepreneurship has been identified as a tool to stimulate the economy, reduce unemployment and introduce cutting-edge innovations to the market".* In the State of the Nation Address (SONA) 2017, the former president mentioned that the South African economy can be revived by empowering small medium and micro-sized enterprises (Zuma, 2017). The entrepreneurial opportunities are open to all citizens but require education, ambition, dedication, and goal-driven individuals (Naughton & Cornwall, 2010). The skills development component is one of the necessities required to give students exposure. Skills development workshops may create awareness and

exposure to students and society holistically (Mamabolo *et al.,* 2017). Cuervo *et al.* (2007) highlighted that small and medium-sized enterprises are undervalued components in growing the economy. He further observed that discovering and exploiting entrepreneurial opportunities requires leadership skills and a business mindset.

Even in business, the competition is high, prior investing in a business requires in-depth research to weigh the pros and cons in terms of demand and supply, and the positive impact on society, in the country, and globally (Isenberg, 2011). Mazzorol (2014) supported the research on entrepreneurial ecosystem by Isenberg (2010), he mentioned nine components that safeguard and support entrepreneurial ecosystem. Mazzorol (2014) said innovation hub (e.g. incubators, universities, research and development hubs) must be developed to foster and stimulate new innovations. Companies or successful entrepreneurs should become role models to new business owners. He further encouraged the needs for safety nets where young entrepreneurs should be taught about tax and bankruptcy, be cautioned about risk and failure (Mazzorol, 2014).

The curriculum should be up to date to address the status quo and teach relevant information. For instance, the Department of Higher Education and Training (DHET) had a national workshop to discuss the need for strengthening, recognition and profiling of teaching and learning by all universities (DHET, 2018). The Entrepreneurship Development in Higher Education (EDHE) programme in partnership with the Department of Higher Education and Training has been working together to grow the entrepreneurship capacity of students, academics, universities, and leaders in society (DTI, 2005). This was the evidence that teaching and learning need a fresh look, reconstruction, and development of new areas of excellence (UKZN, 2018). The Department of Higher Education and Training aimed to establish an entrepreneurial environment for students to meet incubators and form long-lasting innovative partnerships.

The significance of entrepreneurship education cannot be denied since it gives alternative career options and provides various skills like leadership, marketing, and management skills (Ahmad & Seymour, 2006). An additional form of encouragement was when the Department of Higher Education and Training together with the Department of Small Business Development started giving support to small businesses through universities' InQubate by promoting commercial start-ups and social enterprises at the universities (UKZN, 2017). The Department of Higher Education and Training stated that tertiary institutions are responsible

for developing students' knowledge like negotiating, networking, and risk-assessing skills (DHET, 2018). Higher education institutions should equip students with external and internal skills to run a business. On the one hand, external content deals with trade associations, customers, media, landlords, consultants, suppliers, and the sourcing of capital (Barry, 2017). On the other hand, internal content deals with hiring of staff, training, supervising, motivating, daily operations of a business, and disciplinary hearings of employees (Barry, 2017).

The focus will be on productive business where businesses contribute to society's wellbeing by providing goods or services while creating employment opportunities (Lucas & Fuller, 2017). Innovation activities are part of productive entrepreneurship because they improve existing goods or introduce something completely new on the market (Baumol & Strom, 2007). The study may help the institutions rate the importance of entrepreneurship and decide whether to expand entrepreneurship education to all colleges/faculties across higher education institutions.

2.2 IMPORTANCE OF ENTREPRENEURSHIP EDUCATION

Student entrepreneurship has become popular in higher education institutions. The government is supporting the initiative to give youth diversified career options. Improving entrepreneurship education means empowering graduates, managers, and owners of Small, Medium and Micro Enterprises (SMMEs) with skills to grow and sustain businesses. The advantages of having entrepreneurial skills include developing self-reliance, and individual capacity, and boosting confidence towards any challenge (Zakarevičius & Župerka, 2010). Education helps students to have an open mind, engage in different activities and allows students to reach their full potential. Employers in the industry are looking for individuals with diverse skills in leadership, marketing, management, etc. (Ahmad & Seymour, 2006). Van Stel *et al*. (2005) observed that there is a strong positive link between entrepreneurship and economic growth.

The low total entrepreneurial activity (TEA) is a threat to the economy; therefore, the South African government, universities, and well-established businesses are helping Small, Medium, and Micro Enterprises with skills to change the total entrepreneurial activity of South Africa (Chimucheka, 2014). Steenekamp *et al*. (2011) discussed the significance of promoting good grades at an early age, schools must encourage scholars to get good marks to get access to tertiary institutions. They further observed that tertiary institutions provide more knowledge, skills and training that could develop an entrepreneurial mindset compared to high school education. Entrepreneurship has been identified as a tool to save the collapsing economy in the country, hence more researchers are looking at entrepreneurship education to promote

productive and innovative businesses. Kunene (2009) indicated that entrepreneurship education can be beneficial and enhance certain behaviours. Stokes *et al.* (2010) further emphasised that entrepreneurship education can be used to develop attributes and skills through learning, reduce unemployment and contribute to South African economic growth.

Rodrigues *et al*. (2012) emphasised that students with entrepreneurship education as part of their curriculum are creative. Von Graevenitz *et al*. (2010) argue that there are doubts and limited information to prove that entrepreneurship education contributes significantly or affects Small, Medium, and Micro Enterprises positively. The shortage of entrepreneurship education harms the economy and investing in entrepreneurship education may boost the low rate of Small, Medium, and Micro Enterprises in South Africa (Fatoki & Garwe, 2010). Van der Westhuizen (2017) mentioned that factors discouraging students towards entrepreneurship are: a) inappropriate syllabuses and content; b) lack of interest in entrepreneurship; c) inappropriate teaching and learning methods; d) lack of exposure to reality; and e) lack of entrepreneurial support. Fatoki and Garwe (2010) further mentioned that addressing unemployment while reviving the economy can be achieved by introducing entrepreneurship education to the youth, helping with innovation, and providing information on the advantages when becoming an entrepreneur. Wong *et al.* (2005) highlighted that the contribution of innovation and entrepreneurship education to economic growth has been established in the economic literature.

Entrepreneurship education is more effective when practical examples and interactive methods are used when teaching the programme (Radipere, 2012). Entrepreneurship education may allow different stakeholders, alumni, companies, or business owners to form an incubation facility where students learn additional skills before facing the outside world (Etzkowitz, 2003). The smooth incorporation of entrepreneurship education may connect students and external business firms to transfer knowledge and technology innovations (Etzkowitz, 2003).

Universities are crucial instruments in facilitating a knowledge-based economy, universities contribute to social development and increase the regional economy through knowledge sharing. Information sharing between government, universities, industries, and civil society is beneficial to society (Guerrero-Cano *et al*., 2006). Entrepreneurship education contributes to innovation, gross domestic product, and job creation and reduces unemployment as it allows the development of new ventures, and collaborations among industries, government, and universities (Schulte, 2004). The collaborations give students opportunities to learn new skills, get practical skills, meet mentors, expand their network, and become motivated (Bernasconi,

2005). These seminars, webinars, and external collaborations bring cutting-edge innovation to the market and have a positive impact on the economy (Van Stel *et al*., 2005). In this context, the purpose of the study is to expand entrepreneurship education to have a positive impact on student development.

The country is struggling to balance the scarcity of relevant skills and the level of unemployment due to an unstable economy. The South African labour market is struggling to generate job opportunities for citizens, but entrepreneurial opportunities are not fully explored (Netshifhefhe, 2014). Entrepreneurship education exploits unnoticed and unidentified opportunities by allowing industries to use research facilities in institutions in exchange for funding and job opportunities for graduates (Birley, 2002). Universities are the catalyst for social, economic, and regional development. Adopting an entrepreneurial university model provides insight into policy development, stimulates entrepreneurial activity in developing countries, and provides transformation in the research university (Guerrero *et al*., 2015).

During the first academic revolution, teaching was the only focus, and at a later stage, research was introduced as an academic function (Guerrero-Cano *et al.,* 2006). The second revolution incorporates social and economic development as an additional function in the emerging entrepreneurial university. The entrepreneurial university provides a platform and resources where the university community can explore and exploit creative and innovative ideas (Guerrero & Urbano, 2012). The entrepreneurial university can generate a strategic direction that translates knowledge produced into social and economic utility. A university is a propitious place for innovation due to the high number of students as potential inventors. A university also provides support for students to create new ventures. The education strategy is used to stimulate technology commercialisation and economic growth through research, attract foreign talent, and instil an entrepreneurial mindset (Wong *et al.*,2007). This is a transition from an investment-driven to an innovation-driven economy.

The table below shows the changes in economic development and innovation systems over the years.

Table 2.1: Stages of economic development and national innovation system

	1960 – 1970	**1971 – 1980**	**1981 – 1990**	**1991 – Late**
Economic development (ED)	Beginning of driven export-led industrialisation.	Transition to newly industrialised economies (NIEs).	Transition from newly industrialised economies to development economies.	Transition to knowledge-based economy.
National innovation system (NIS)	The primary focus is on developing the operative capacity to man production.	The focus is on developing adaptive capacity to support process technological deepening.	The focus is on developing innovative capacity to support applied research and development.	Developing intellectual capital creation and commercialisation. Entrepreneurial capacity to aid knowledge-based economic growth.

Source: Adapted from Wong et al. (2007)

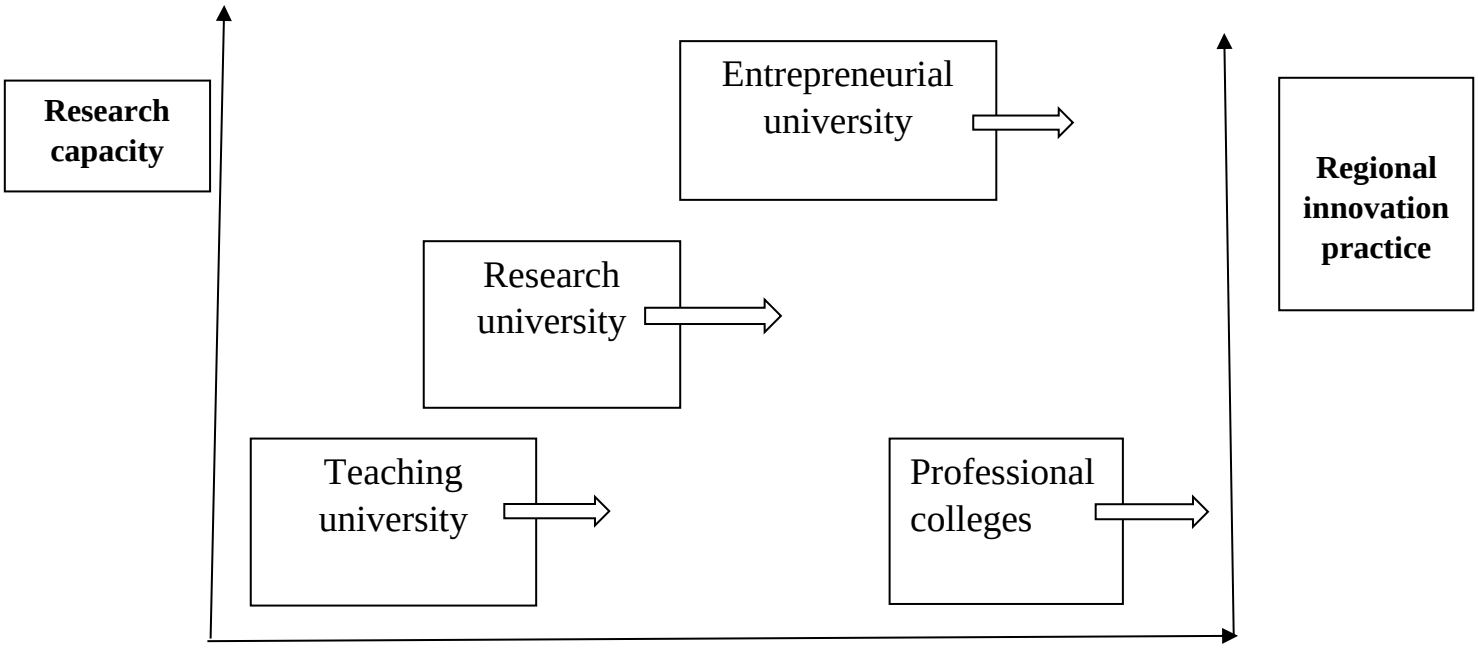
Entrepreneurship education plays a significant role in university-pushed, government-pulled, and industry-led innovation. The model's key elements are policies for defining ownership of intellectual property, research base with commercial potential, the habit of generating start-ups, an entrepreneurial atmosphere on campus, participation in innovation strategy, sharing profit, and regulating conflict of interest (Etzkowitz & Zhou, 2007).

According to Etzkowitz and Zhou (2007) an entrepreneurial university has three characteristics to balance research, teaching, and services:

1. Entrepreneurial activities are accepted and systematically supported.
2. Interface mechanism, for example, a technology transfer office and corresponding achievement.
3. Significant numbers of staff members from firms that can generate income to support university research and other activities.

This relationship between university and industry is significant because organisations play a reverse linear role by sharing external problems and seeking research or academic input.

Figure 2.1: The evolution of entrepreneurship education in tertiary institutions

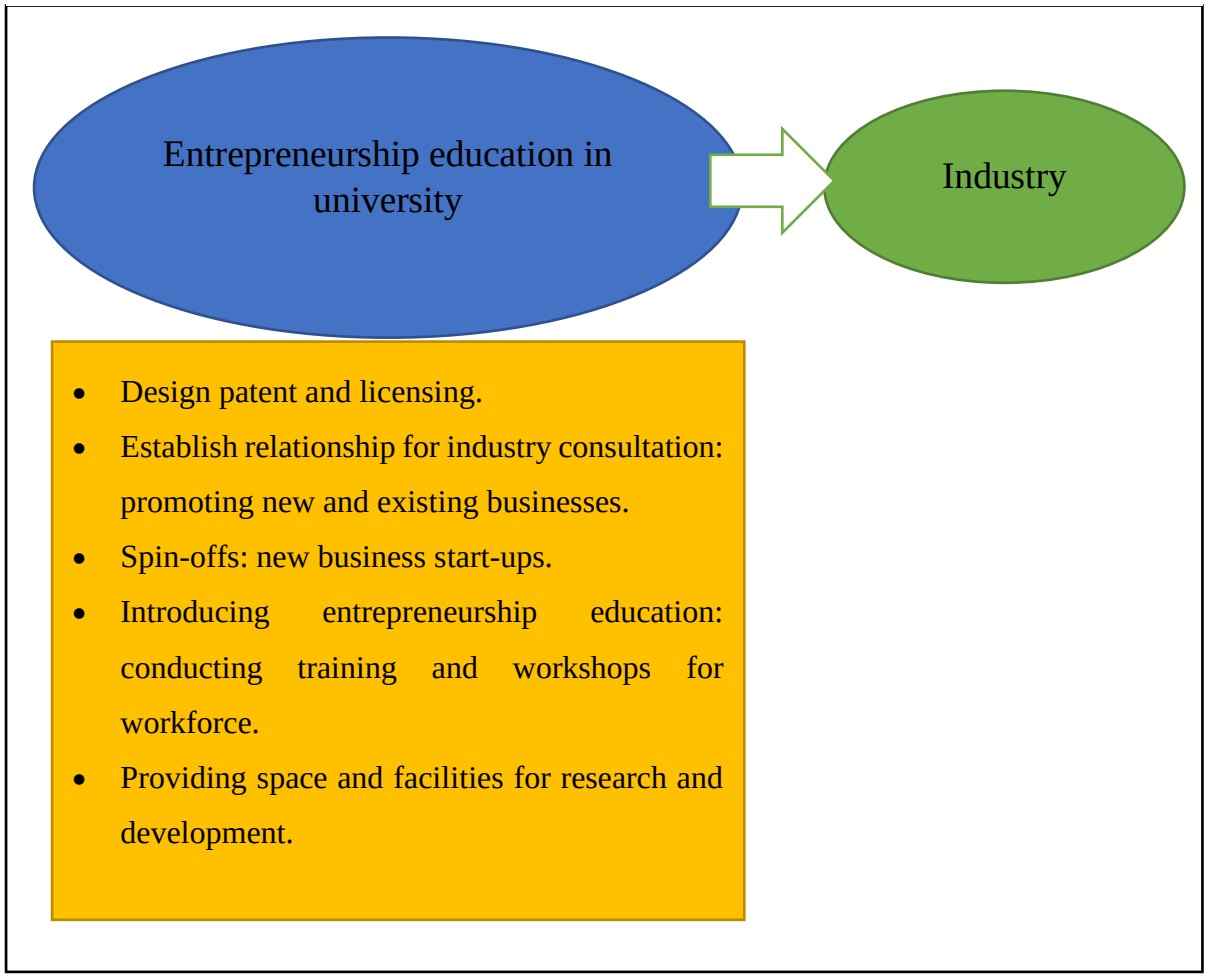


Source: Adapted from Etzkowitz & Zhou (2007)

Figure 2.1 above illustrates that the entrepreneurial university model is overlays on a research university whereas the research university overlays on a teaching university. The transition from the initial phase and current phase are connected to professional college to contribute to industrial innovation. Teaching universities focus on education and human capital development (Etzkowitz & Dzisah, 2007). Research university focuses on providing new knowledge and teaching strategies. An entrepreneurial university collaborates with research, teaching, and services for society. It can complete a circulation of trilateral cooperation. A professional college in partnership with an entrepreneurial university can contribute to a high level of innovation and high-tech.

The diagram below summarises entrepreneurship education's contribution to industry.

Figure 2.2: Entrepreneurship education role to the industry



Source: Adapted from Etzkowitz & Zhou (2007)

Entrepreneurship education may introduce initiatives to revise university policies to accommodate technology commercialisation and introduce stronger entrepreneurial elements in education (Wong *et al.*, 2007). Entrepreneurial mode infuses strategic vision and entrepreneurial attitudes and allows collaboration with other stakeholders to bridge the gap between university and industry. Therefore, there is a need to expand entrepreneurship education to boost students' innovation in this advanced technology. In the past decade, graduates used to get jobs after obtaining a degree but recently this is no longer happening, this problem challenges the university to adapt to this technological world by implementing new strategies that will equip students with the necessary skills to adapt. Keat *et al.* (2011) examined the inclination towards entrepreneurship among university students. His study mentioned the

importance of entrepreneurship around the world and explored ideas from policymakers, university students, and academics.

Entrepreneurship is the best economic development strategy to boost a country's job creation, competitiveness, and economic growth (Elmuti *et al*., 2012). Studies revealed a positive relationship between entrepreneurship and economic growth, with regards to firm survival technological change, and job creation (Keat *et al*., 2011). Elmuti *et al.* (2012) revealed that the labour market has shown entrepreneurship as a major contributor to competitiveness, innovation, and economic growth. He also said education must focus on reflecting on innovation, career, and principles to help with creativity. Higher education in most countries encounters a shortage of resources and that made entrepreneurial universities gain the attention of government, academics, and policymakers by encouraging its existence (Grimaldi *et al.*, 2011).

The literature is not entirely the same globally, in developed countries entrepreneurship education is practised/ applied daily, and the outputs are a true reflection of transformation. In developing countries, the literature is limited, and entrepreneurial platforms are not utilised adequately (Etzkowitz & Carvalho de Mello, 2004). This framework considers internal and environmental factors to fulfil research, teaching, and entrepreneurial activities (Guerrero & Urbano, 2011). Environmental factors (EFs) key focus areas are support measures, entrepreneurial educational programmes, organisational and governance structures, reward systems, and attitudes toward entrepreneurship (Thornton *et al.*, 2011). Internal factors (IFs) focus on competitive advantage using human resources, physical resources, diversified sources of income, and reliable networks to source funding (O'Shea *et al*., 2007). The entrepreneurship education focus is to ensure teaching, research, and innovative entrepreneurship are always the core business of any development (Guerrero & Urbano, 2011).

These two factors are the evidence that the inclusion of entrepreneurship education in the curriculum can bring transformation in any institution, it brings a strong entrepreneurial mindset, knowledge transfer, and innovation (O'Shea *et al*., 2005). The Department of Higher Education and Training urges institutions to operate entrepreneurially by commercialising research findings and venturing into knowledge-based enterprises (Guerrero-Cano *et al*., 2006). The university's responsibility is to respond to the everchanging societal needs by developing content, processes, and skills that will grow relatively to the demand (Secundo *et al.*, 2019). Entrepreneurship education teaches collaboration strategies which play a significant role when

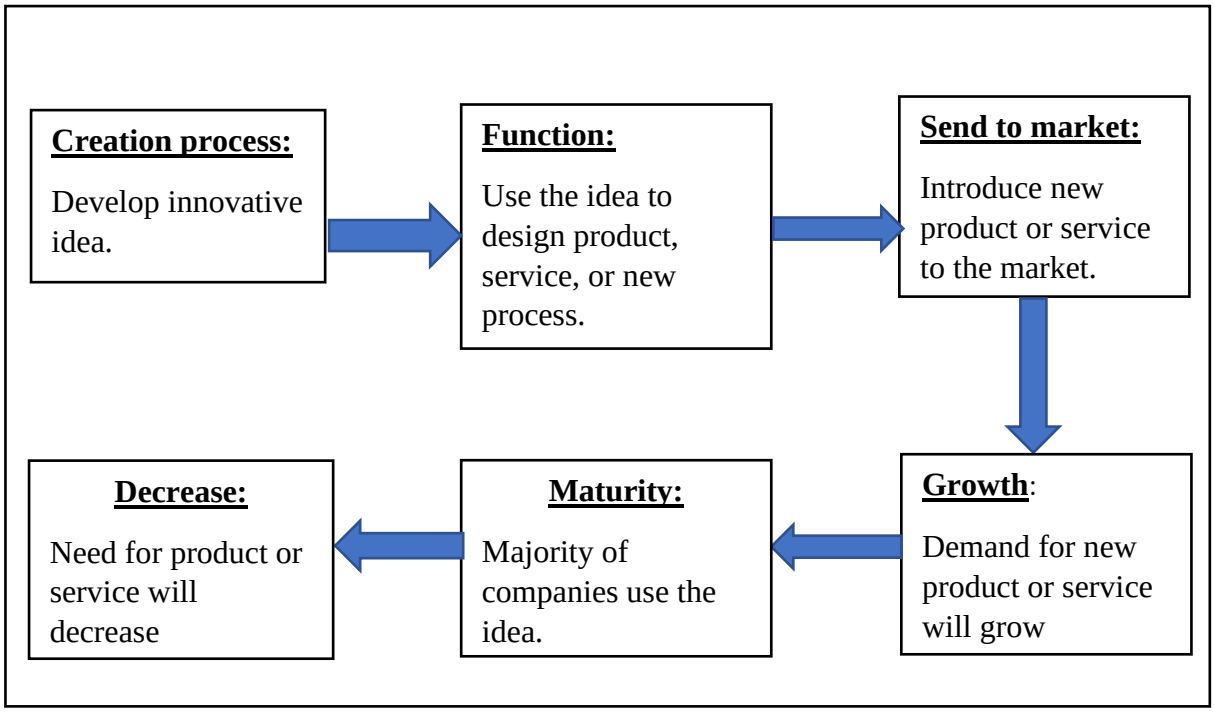
meeting major stakeholders and contributing towards developing a civil society. Etzkowitz and Zhou (2007) observed that successful collaboration involves the contribution of different stakeholders in building and sustaining relationships. The university environment has a positive influence on shaping and developing entrepreneurial intention in students (Bazan *et al.*, 2020). Each university has developed an incubate, mentorship office that identifies and supports student enterprise development. The sooner students are exposed to entrepreneurship, the sooner they can participate in the process and receive mentorship. This could influence students positively towards an entrepreneurship career.

2.3 CONTRIBUTION OF INNOVATION

Innovation is an important aspect of any organisation. It is essential for survival, growth, and success. Innovation is applicable in management methods, product development, efficiency, and improved service delivery (Tohidi & Jabbari, 2012). It can help entrepreneurs to upgrade or produce something new while utilising market space to promote the product (Baumol & Storm, 2007). Small businesses introduce innovative ideas at a cheaper price, which then creates jobs, attracts more people and the business thrives (Henrekson & Sanandaji, 2011).

Some researchers call innovation a success key, while others define it as the behaviour point of view pushed by intention. Entrepreneurial Intention (EI) consists of three supporting constructs, namely, personal attitude, social norms, and perceived behavioural control (Ajzen, 2011). These constructs are used to understand and predict the changing human social behaviour. The personal attitude construct is looking at the perception and possibilities of a person to perform a behaviour (Habib *et al*., 2011). The social norm construct refers to the society, family, friends, culture, or environment's influence on a person (Ajzen, 2011). The perceived behavioural control focuses on the ability of a person to fulfil the task. This construct depends on how difficult or easy it is to perform a behaviour based on individual interests. A person with education, a positive attitude surrounded by a stable support structure may have the ability to create a business. A positive mindset yields creativity that can lead to discoveries. Feldman (2004) explained innovation as the desire to introduce, commercialise, or improve new products or services. Product innovation usually explores new knowledge, this process relies on the research and development (R&D) of the organisation. The diagram on the following page below summarises the innovation process.

Figure 2.3: The innovation process



Source: Adapted from Tohidi and Jabbari (2012)

Figure 2.3 above illustrates processes of innovation from the creation process to the decrease stage. The decrease stage is when the new product/ service is in the market and everyone has access to it. The product demand decreases and eventually, the idea will be replaced. This pushes research and development (R&D) departments to do more research, this proves that innovation is an ongoing process for every organisation to dominate the market space. Innovation does not only mean creating something new, but it includes improving existing products. The relationship between innovation and entrepreneurship comprises innovative and independent ideas. The success of a business depends on the flexibility of individuals to practise entrepreneurship innovation (Oksanen & Rilla, 2019).

Creative ideas can breakthrough and change the impossible to possible as an output. Technological advancement has changed the way to work and there is a need to embrace changes and push for creative and innovative entrepreneurship businesses (Gupta *et al.*, 2021). The fourth industrial revolution has changed the way we live globally, the changes demand research innovation and creativity to evolve to meet social needs and economic development. The success or failure of a business depends on innovation which should address the environmental crisis. This challenges entrepreneurs to demonstrate strong leadership character by motivating employees and encouraging innovative mindsets. Technology advancement

highlighted the important role of innovation entrepreneurship where digital innovation businesses are not fully utilised (Gupta *et al*., 2021).

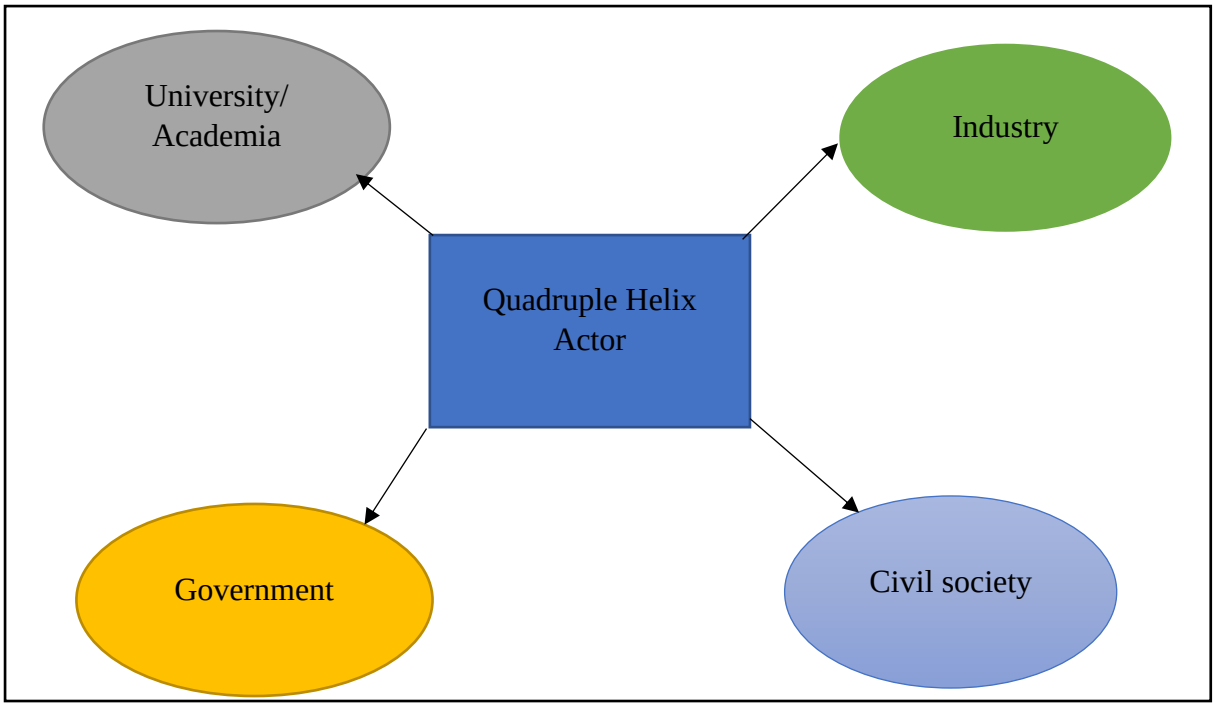
Innovation is a key factor in promoting economic development; the progress in innovation lowers unemployment and improves welfare (Nissan *et al.,* 2012). Higher education, politicians, and economists are of the view that innovation and economic growth are dominantly supported by Small, Medium, and Micro Enterprises and new ventures (Henrekson & Sanandaji, 2011).

2.4 INNOVATION CONTRIBUTING TO QUADRUPLE HELIX ACTOR

The quadruple helix actor of innovation is not well-established, it does not have a well-known definition (Arnkil *et al.,* 2010). Therefore, a better definition of the quadruple helix model is that it is an innovation model where universities, firms, civil society, and government cooperate to produce scarce skills, and innovations (Arnkil *et al.,* 2010). Innovation can be either social, product, technological, commercial, non-commercial, service, public sector or private sector innovations (Arnkil *et al.,* 2010). The quadruple helix actor was built from the triple helix innovation theory after discovering that triple helix is not adequate for long-term innovation; the aim was to encourage the significance of integrating with culture-based citizens (Etzkowitz & Zhou, 2007). The quadruple helix plays a major role in allowing stakeholders to fully understand their role in the success or failure of an entrepreneurial university.

The quadruple helix actor consists of four components, namely, university, industry, government, and civil society (Kolehmainen *et al*., 2016). Each component must have influence and positive contribution towards job creation, new venture creation, innovation, and local economic development (Leydesdorff & Meyer, 2006). Utilising quadruple helix components under entrepreneurial university confirmed an increase in productive units, higher growth, and productive government expenditure in developed countries (Afonso *et al.,* 2012). The quadruple helix actor may be utilised for network development, policy guidance, the importance of the university role, knowledge transfer, and development of start-ups (Leydesdorff, 2012). The figure on the following page represents the quadruple helix actor.

Figure 2.4: The quadruple helix actors



Source: Adapted from Lindberg et al. (2014)

2.4.1 University/ Academia

Years ago, higher education institutions had to focus solely on education, and the research aspect was introduced to provide knowledge and new strategies (Etzkowitz & Dzisah, 2007). In an environment of teaching, learning and research innovation and technological development were identified as concepts that provide a solution to existing problems (Afonso *et al.*, 2012). The major innovation concepts arise when there is strong collaboration and partnership among universities, government, firms and citizens (Arnkil *et al.*, 2010). The model was derived through university-industry-government collaboration. During the analysis of Boston's economy, academic research had a major contribution towards firm formation. This led to university-industry-government to invest in knowledge-producing institutions that may have a greater contribution to the society and economy (Arnkil *et al.*, 2010). The role of academia (university and college) and science-based technologies is to discover new technology, knowledge, products, and services (Leydesdorff & Meyer, 2006).

Higher education institutions provide knowledge to students, support economic growth and regional competitiveness by giving access to education and high-value research (Goddard & Vallance, 2013). The higher education institutions that apply quadruple helix actors are aiming to use national, international, and global research to impact business innovation and the economy (Kolehmainen *et al.*, 2016). This is important because these innovation strategies are

aimed at developing rural, less favoured, and peripheral regions (Karlsen *et al*., 2011). The universities contribute to knowledge-based development by introducing innovations, skills, and job opportunities to society which places quadruple helix innovation actors at the centre of the entire process (Kolehmainen *et al*., 2016). The findings obtained by Kolehmainen *et al.* (2016) was evidence that education can be utilised as a tool to bring positive change in the society. Introducing entrepreneurship will yield positive output that will contribute significantly towards job creation, innovation and community development (Karlsen *et al*., 2011). This research aims to expand entrepreneurship education to boost students' innovation, it may be achieved by triggering entrepreneurial potential in students by adding entrepreneurship education to every qualification across the institutions.

2.4.1.1 Student entrepreneurship

The entrepreneurial academic originated in the United States University in the late 19th century. This was considered as first academic revolution caused by significant constraints in research funding. The constraints placed a responsibility on individuals to obtain funding or resources to support research centres (Etzkowitz, 2003). A second academic revolution took place around 1862, it transformed the university into a research institution, teaching and learning, and economic development enterprise. The entrepreneurial academic model was introduced into arts universities in the mid-20th century to stimulate productivity growth and employment (Etzkowitz, 2003). This phenomenon established a good relationship between the economy, university, and technology initially in agriculture and industry (Etzkowitz & Dzisah, 2007).

One of the initiatives taken by the Department of Higher Education and Training (DHET) was to promote student entrepreneurship in the institutions. In 2017, the University of Kwazulu-Natal introduced the Entrepreneurship Week which aimed to bring the entire university community together to share amazing experiences. The Entrepreneurship Week was designed to develop a business mindset, establish an entrepreneurial spirit among students, meet incubators, present business ideas, and get motivation from successful entrepreneurs (UKZN, 2018). The aim was to address the high rate of unemployed graduates in South Africa.

The Department of Higher Education and Training (DHET), the Council on Higher Education and Training (CHET) and Higher Education South Africa (HESA) had a national workshop in Port Elizabeth to discuss the need for strengthening, recognition, and profiling of teaching and learning by all universities (DHET, 2018). The University of KwaZulu-Natal teaching and learning organisation suffered a great decline in stature and profile and a significant loss in

critical projects like internal and external resource support stream (UKZN, 2017). This was the evidence that teaching and learning need a fresh look, reconstruction, and development of new areas of excellence (UKZN, 2017). Entrepreneurship education focuses on student transformation and social justice. The universities promise to produce entrepreneurs, the plan is to work on the student's mindset. Students are expected to have job job-seeking mindset in their first year at the university, but they should be transformed by the curriculum committed to learning proficiency, innovation, and technology.

The teaching and learning departments in the institutions must use a module evaluation strategy or use key performance indicators (KPI) to decide whether to phase out irrelevant content or transform the curriculum to achieve high-level performance and make a great impact in society (UKZN, 2017). The smooth incorporation of research university and entrepreneurial university was made by connecting with business firms to transfer knowledge and technology innovations (Etzkowitz, 2003). The universities play a role as regional innovation organisers by expanding the focus from an individual patent to bring different stakeholders together to formulate a development strategy. Research contributes to the regional growth of society; therefore, the university's responsibility is teaching and learning, conducting research, and sourcing funding for research and development for the institution (Steenkamp, 2019). The quadruple helix synergies challenged traditional ways of operation; they urge academia, politics, business, and society to collaborate to increase patent applications and innovation (Steenkamp, 2019).

Highly ranked universities such as Harvard, Stanford, Massachusetts Institute of Technology (MIT), North Carolina, Princeton, and Yale are examples of a few universities that adopted entrepreneurship education and experienced good changes (Klasová & Korobaničová, 2017). These universities adapted to public awareness and an intelligent society where there are more sectors and markets open for innovation (Klasová & Korobaničová, 2017). The new kind of knowledge management (KM) established university-business cooperation and industry-science links. Van Looy *et al.* (2004) mentioned that entrepreneurial activities and scientific performance promote research output in academia. As innovation takes place, technology is generated (Caruso, 2018). The academic side contributes by creating incubation facilities and licensing rights as intellectual property (Etzkowitz, 2003). The evidence shows that universities contribute to technological development, enhance economic development, and provide consultation services and custom-made diplomas/courses for industry workers (Jacob & Karn, 2003).

The research is the core for the university to contribute to industry performance and economic growth. The applied research aimed to spill over knowledge to society using applied programs (Audretsch, 2014). A good example of an entrepreneurial university is shown during the development of the University of Highlands and Islands. The University of Highlands and Islands (UHI) is the product of a collaboration of 13 research institutions and independent colleges (Kolehmainen *et al*., 2016). The institution was developed to become the innovation hub that brings together research, training, education, business development, and knowledge transfer platforms.

2.4.2 Industry

There are many industries, and the types of industries differ based on the products or services they offer. The industry manufactures/provides goods and services such as transportation, agriculture, and hospitality, to name a few. Primary industries produce raw materials, secondary industries convert or process raw materials into usable products, whereas tertiary industries support and provide essential services to allow other industries to operate (Alserhan & Alserhan, 2012). Universities and industries can be used to advance technology and solve internal or local problems while attracting foreign investments (Etzkowitz, 2003). In developed countries, conurbation closer to universities is pushed by the government to support entrepreneurial universities.

The industries can grow or operate without government intervention; however, they may have to understand the changing needs of the external environment which includes suppliers, competitors, and customers (Leydesdorff, 2012). The quadruple helix actors raised an argument that each actor is linked to another to form the interface between them. The evidence is when the industry shares values with universities as well as gain and protect knowledge (Razak & White, 2015). The university-industry has mutual interests, industries improve their competitiveness and innovation capacity by using basic and applied research findings (Razak & White, 2015). The technological knowledge and challenges encountered in the industry are transferred to the academic research space to access more possible solutions. Martins *et al*. (2018) agreed that universities benefit financially and gain applied knowledge that can be used for teaching and academic research. The industry becomes the national champion since it can expand without government intervention. The industry becomes the national champion since some of them are independent entity, industries generate job opportunities, generate revenue, pay employees and manage daily running cost of the business while paying taxes to the

government. A group of firms may merge for different reasons to achieve long-term goals (Razak & White, 2015). The challenges faced by industries are the ineffectiveness of policies, where universities do more research focusing on existing problems and government programs neglecting industry needs (Razak & White, 2015). Political influence pushed by government officials causes conflict between industry, government and university as research and development funding from the government does not respond to demands and needs from industry (Razak & White, 2015). The industry must invest in developing technology transfer offices (TTOs), and assist in developing university infrastructure to support and encourage applied research. To support industry-university collaboration, the company and university representatives must be part of Technology Transfer Offices and decision-making that affect collaboration.

The quadruple helix actor of innovation reveals the contribution of business, government, higher education institutions, and community groups in social development to uplift economic growth. The purpose is to make a contribution that will turn current economic difficulty into a desirable future using innovation. In Scotland, big businesses under digital healthcare contributed to ITC-solution to overcome the challenges of distance learning (Kolehmainen *et al*., 2016). This is a good example of industry-community collaboration since the aim was to turn the disadvantaged situation into a mutual collaboration between quadruple helix actors (Kolehmainen *et al*., 2016).

Sarpong *et al.* (2017) observed that the industry is the champion of innovation because it can exploit knowledge gathered through research. The university plays an entrepreneurial role when the private sector and government consult to obtain new research findings on how to improve the current state of business, set up commercial units, and manage the intellectual property capacity (Sarpong *et al.,* 2017). Input by the university may lead to the creation of collaborations and relationships, furthermore the university may probe emerging technologies that may lead to radical innovation and achieve transformative synergies (Magaudda, 2011). The hybrid triple helix model eliminated inequality among stakeholders and introduced corporatisation in public universities that allowed technology commercialising and increased tripartite innovation and technology partnerships (Sarpong *et al*., 2017).

The hybrid triple helix actor of innovation assisted industry using applied research to expand production to meet local and global needs while sustaining key values to remain competitive globally (Van Looy *et al*., 2004). The advantage of highly industrialised regions may be

dominant in institutional arrangements or technologies, the institutional arrangements provide knowledge infrastructure which then contributes to the retention mechanism (Leydesdorff & Ivanova, 2016). One may assume that industries are well off without the influence of political economy but the transformation into a knowledge-based economy may be best achieved when the four pillars of the quadruple helix agents of innovation are utilised (Arnkil *et al.*, 2010).

2.4.3 Government

The role of government is to support development, formulate policies, and formulate strategic alliances for developing firms' innovation (Leydesdorff & Meyer, 2006). Razak and White (2015) mentioned that when policies are implemented and followed correctly by the government-university-industry the innovation capacity increases and all stakeholders tend to benefit from findings obtained through research. The government may solve societal problems by using academic research to find solutions while industries and universities may develop and test prototypes using research space (Razak & White, 2015). Nieminen and Kaukonen (2001) revealed that collaboration is stronger when people have something in common, for example, language sharing, habits, cultural traits, and ways of working. They further highlighted that trust is a starting point and a key ingredient if the collaboration is between organisations with different cultures.

Bianco and Viscardi (2008) identified a gap between the strategy adopted by industry and research policy, these challenges are caused by poor integration of knowledge generated through research and lack of intellectual property protection. Razak and White (2015) observed that policies set by the government tend to cause challenges for industries, which agrees with a study conducted by Bianco and Viscardi (2008). Rhaiem and Amara (2021) blamed policy developers in government for innovation failure and mentioned the lack of policy implementation in government structures. The government should have a vast network of semi-public, private, and third-sector organisations to get more innovation ideas that can contribute to regional development (Kolehmainen *et al*., 2016).

In the 1990s, South Ostrobothnia faced a recession and high outmigration flow, this was due to weak academic labour (Kolehmainen *et al.*, 2016). After a few years, people in academia collaborated with government administration for a leap towards the knowledge economy. The collaboration brought education activities, innovation, and regional research to a South Ostrobothnia community which resulted in institutional breakthroughs and new ventures. A good example of an entrepreneurial university took place when industry, the regional chamber

of commerce, and the University of Debrecen joined forces to open an innovation agency with the aim of enhancing innovation to meet market demands (Kolehmainen *et al*., 2016). Lindberg *et al*. (2014) highlighted that Etzkowitz and Leydesdorff (2000) criticised the double helix system which says academia and the industry contribute to the innovation system concept. Etzkowitz and Leydesdorff (2000) highlighted that government entities provide significant networks for promoting innovation.

Sarpong *et al*. (2017) highlighted that the government directs, controls, and plans the relationship between academia and industry in search of innovation. The Malaysian government was forced to change its operational strategy and rethink science and technology policies around early 2000 since the national economy experienced massive pressure due to changes in technology (Sarpong *et al.,* 2017). The government provides stable interaction, ensures smooth exchange with other countries and manages contractual relations. Government higher structures should lead the process of policymaking and implementation, and the new policy channels interaction among quadruple helix agencies (Etzkowitz, 2003). The major role of government among other quadruple helix agencies is to raise financial capital to support research and development (R&D), procure infrastructure, and support societal developments (Etzkowitz, 2003).

As technology transfer diffuses around the world, the configurations become the evidence of diversification, collaboration, and firm formation process (Leydesdorff & Etzkowitz, 2003). In the static triple helix stage, the government controls both industry and academia and these institutions become part of the state, and the state-owned industries are dominating. The idea of this stage is to keep local industries unique from the rest of the world.

The laissez-faire triple helix stage allows three agents to be independent. The university's role is to supply knowledge and provide research, whereas the industry approaches the university for access to specific knowledge (Leydesdorff & Etzkowitz, 2003). The interaction between government and industry is limited to as little as possible, for example, buying products for the government and monitoring regulations. Lastly, in the event of company failure, the government may contribute funds to support or rescue a business. The hybrid-triple helix stage promotes collaboration among government-industry-university to develop innovation strategies (Etzkowitz, 2003). This collaboration creates science parks, venture capital firms, and incubators, and promotes innovation. These three agents identify a problem that should be

addressed in society and utilise innovation hub to work towards the solution (Van Stel *et al*., 2005).

New technology contributes to new systematic venture creation, creating job opportunities for the community, allowing the government to invest a start-up capital and agree to partner with universities for further research (Etzkowitz, 2003). The development of the quadruple helix allows advanced technology program (ATP) information sharing where lecturers meet recruiters and identify job opportunities for students (Leydesdorff & Etzkowitz, 2003). According to Etzkowitz (2003), a strong relationship in the United States between university-government started during the Second World War when scientists used scientific applications to advance weaponry and solve military problems. The relationship transcended after the Second World War when academics realised the impact of research on advancing known theory. Innovation occurred due to a combination of experience and knowledge where "learning by doing" was put into practice.

2.4.4 Civil Society

The triple helix actor was the integration between university-government-industry, the additional component namely civil society was introduced to bridge the existing gap in policies between innovation and civil society. Steenkamp (2019) highlighted that the emerging technologies in the triple helix actor sometimes do not match the needs and demands of society. This setup results in a low level of innovation and limits their potential impact. Introducing the fourth component allows each stakeholder to provide sound contributions that may result in more creativity and powerful innovation (Carayannis & Campbell, 2009). This phenomenon was initially proposed by Carayannis and Campbell (2009) in the 21st Century Innovation Ecosystem Symposium. Introducing the fourth component was adopted because it allows co-evolution and co-existence of different knowledge paradigms.

Years later, the quadruple helix actor was reported as a tool to accelerate innovation and research resulting in major regional growth of society (Cavallini *et al*., 2016). The civil society's role is to emphasise the importance of education, the building of universities, and investing in research to build a united and knowledge-based society (Carayannis & Campbell, 2009). Caruso (2018) agrees with Carayannis and Campbell (2009) by saying civil society has become prominent. He further mentioned that society has a voice in customer service, customer expectations, organisational development, organisational design, product enhancement, and collaborative innovation. The civil society needs universities to work tirelessly to produce

graduates who can create/invent services or products that can address challenges faced in the fourth industrial world of technology (Steenkamp, 2019). The fundamental reason for the civil society component is to support participatory policy; the overall goal is to allow the active involvement of groups or individuals to increase the transparency of policymaking (Roman & Fellnhofer, 2022).

Civil society seeks to increase accountability and push the government to do research prior to final decision-making (Cavallini *et al*., 2016). The idea of adding the fourth component was brought to simplify and clarify the fourth industrial revolution innovation. This allowed leaders within the workspace to adapt and respond to fast growing digital economy, new business models, and the ability to collaborate with different stakeholders for new developments (Steenkamp, 2020).

2.5 ATTITUDE AND BEHAVIOUR TOWARDS ENTREPRENEURSHIP

The entrepreneurial attitude refers to the extent to which an individual has a positive or negative capacity to become an entrepreneur; it predicts the likelihood for an individual to become an entrepreneur in the future (Karali, 2013). This part looks at past research regarding the behaviour of students towards entrepreneurship. It was discovered that not everyone wants to have a business. Other people might prefer to get hired, report to someone, and have job security. Entrepreneurship education influences the behaviour and attitude of the individual; it may stimulate good entrepreneurial intention from students (Soomro *et al*., 2020). Education is a significant factor when developing an entrepreneurial mindset, it keeps individuals interested in innovative venture creation and maintains interest in self-employment.

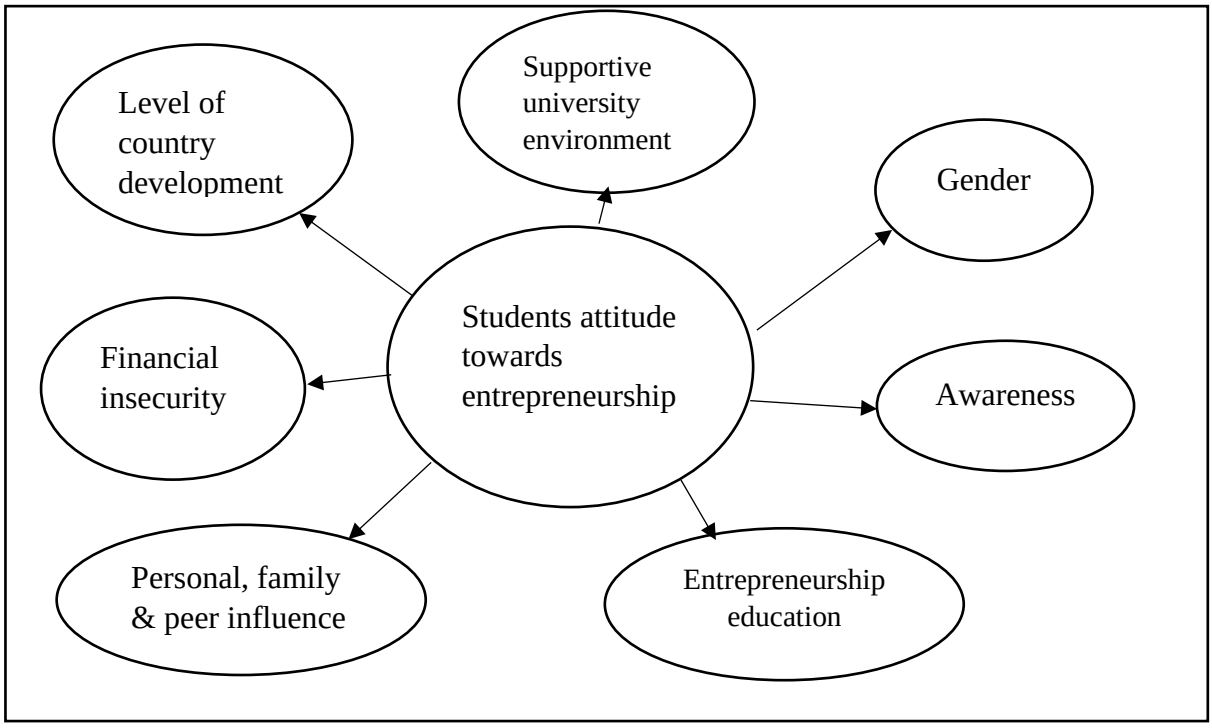
Entrepreneurship education must implement strategies that can inspire and motivate students toward entrepreneurship. Zollo *et al.* (2017) mentioned that universities have a great impact on advancing students' entrepreneurial intentions and positive attitudes, inspiring skills development, and widening perceived behaviour. A desire to own a business and good support from family, friends, or society could influence the behaviour and attitude of an individual (Mtshali, 2019). Research by Rajendrakumar (2022) discussed that an individual who wants independence, more income, and more ownership rights has a positive entrepreneurial intention. His findings support Othman and Ishak's (2009) findings when they discovered graduates' inclination towards entrepreneurship in Malaysia. Due to the high level of unemployment in India, graduates viewed entrepreneurship as a solution to economic growth

and unemployment (Rajendrakumar, 2022). This encouraged high attitude and high aspiration towards new innovative businesses.

A person who had a challenging childhood growing up is more likely to start a business; this is influenced by fighting for survival which has a direct impact on attitude resulting in good intentions (Drennan & Saleh, 2008). Entrepreneurship education provides a proper understanding of entrepreneurship. It provides the necessary skills to implement and develop strategies. The Princess Sumaya University for Technology (PSUT) was the first institution to introduce entrepreneurship in Jordan; the initiative was supported by creating an incubator and promoting business education to students on campus (Abualbasal & Badran, 2019). Having agreement and receiving support from business accelerators made entrepreneurship gain popularity and catch the attention of students.

There are several factors affecting student attitudes toward entrepreneurship. The factors are supporting university environment, gender, awareness, entrepreneurship education, personal family and peer influence, financial insecurity, and level of country development (Abualbasal & Badran, 2019). Hence, proper entrepreneurship education influences behaviour and attitude of individuals (Soomro *et al.,* 2020).

Figure 2.5: Factors affecting students attitude towards entrepreneurship



Source: adapted from Abualbasal and Badran (2019)

1st *Factor:* ***Supportive university environment*** - Refers to the preferred conducive environment, learning opportunities, available resources, flexible curriculum, and implementing appropriate learning environment (Valtonen *et al*., 2021).

2nd *Factor:* ***Gender*** - The population must be diverse, and males and females must be exposed to similar opportunities (Majumdar & Varadarajan, 2013).

3rd Factor*:* ***Awareness*** - Is to get more information to stimulate attitude and interest in the phenomenon to shape the inclination to start a business in the future (Kallany & Suresh, 2018).

4th Factor*:* ***Entrepreneurship education*** - This is the process of teaching (using different methods/ platforms/ setups) to give knowledge that will equip students with innovation and skills (Lackéus, 2015).

5th Factor*:* ***Personal, family and peer influence*** - It is called social influence or social norm in the Theory of Planned Behaviour when thoughts are influenced by culture, society, friends, family, or environment (Ajzen, 2011).

6th Factor*:* ***Financial insecurity*** - Refers to the financial stress and financial concern caused by an unstable economy (Osberg, 2021).

7th Factor*:* ***Level of country development*** – There are two categories of development: developed countries and developing countries. The country's level of development is categorised based on basic indicators such as income, health, education, living conditions, and inequality (Nastu *et al.,* 2019). People from developing countries are trying to move up the ladder to meet basic needs and explore opportunities to lead richer (Nastu *et al*., 2019).

In other areas, attitude towards entrepreneurship is negatively affected by a lack of resources such as limited knowledge, bureaucracy when looking for information, and lack of support and education (Kgagara, 2011). An entrepreneur must be proactive, recognise patterns to identify opportunities, and must possess information-seeking skills. A positive attitude in a business becomes a motivation when things get tough, an individual becomes passionate about business and has the energy to explore different opportunities available in the market (Yimamu, 2018).

2.6 CHAPTER SUMMARY

The chapter provided literature on the topic of entrepreneurship. The chapter explained the importance of entrepreneurship education, the importance of innovation, innovation contribution to quadruple helix actor, and attitude and behaviour towards entrepreneurship. Figure 5, the quadruple helix actors with four components, was discussed to show the contribution of each construct towards high innovation growth. Figure 6 diagram showed

factors affecting students toward entrepreneurship and seven factors were discussed to reveal how each factor influences students' attitudes. The chapter revealed that more research has been done on entrepreneurship education, however, there is a need to expand entrepreneurship education to close a gap that exists in different qualifications that are offered in the South African universities. Chapter 3 will discuss the theory underpinning the study.

CHAPTER 3

THEORETICAL FRAMEWORK

3.1 INTRODUCTION

The chapter focuses on the theory underpinning the study. Theory U will be utilised to investigate the levels of understanding students have concerning the curriculum given by the institutions currently. The research investigates if entrepreneurship education can be added to all qualifications to equip students with skills to start businesses as an alternative career option. Entrepreneurship education can help open the mind by collaborating skills offered in any qualification plus business education to stimulate an entrepreneurial mindset. Theory U will assist in terms of understanding the current curriculum, and its limitations and it can guide development in terms of expanding entrepreneurship education to boost students' innovation in tertiary institutions.

3.2 THE UNIVERSITY MODELS

3.2.1 University of KwaZulu-Natal model

The University of KwaZulu-Natal model aims to promote effective student learning and enhance teaching and learning practice in the institution. The University of KwaZulu-Natal is a research-led university, which contributes to student development as the researcher and the university community have a role in creating a conducive environment that will promote excellence and success (UKZN, 2022). The model supports the strategic plan of the university and promotes excellence and innovative curriculum design in teaching and learning. The university goal states that the institution will provide exceptional programmes for undergraduates and postgraduates, ensure that curricula meet the needs of society, and are rooted in African scholarship (UKZN, 2022). The institution's goal should evaluate and amend teaching modes, assess practice in line with student needs and higher education principles, encourage creativity and innovation, reward excellent scholarship in teaching and learning, and present an environment that promotes work ethic and deep learning among students (UKZN, 2022).

The University of KwaZulu-Natal model is set out in principles that give direction to the institution.

- Methods of teaching and learning must respond to national importance by ensuring all students have access to resources, provide extra help for disadvantaged students to redress the lack of equity, and developing curricula, assessment methods and teaching methods that respond to the diversity of students (UKZN, 2022).
- Teaching and learning must encourage active learning and promote a culture of inquiry-led scholarship and retention of skills and knowledge. Modules context must cultivate critical thinking in all aspects including research. One of the main key values is to develop citizens who are socially responsible (UKZN, 2022).
- The model must reflect strong educational reasoning informed by evidence-based practice, theory, and current research. The model must promote regular updates in course content, advance research, and develop an inquiry and educational environment that allows student input (UKZN, 2022).
- The fundamental part of the learning cycle must assess learning tasks, improve student progress and quality of planning, and diagnose strengths and limitations in the curriculum. The institution must ensure consistency between teaching approaches, curriculum purpose, learning outcomes, and assessment criteria and articulate the policy on assessments (UKZN, 2022).

3.2.2 University of Zululand model

The University of Zululand model thrives for quality and fosters an innovative collaborative culture with urban and rural areas. The institution model seeks to produce graduates who are competitive globally and engage with the community for betterment of the society. The university is committed to promoting academic benefits through generating new knowledge across all disciplines and contributing to the economic and social environment of the continent (UNIZULU, 2022). The University of Zululand aims to promote a culture of learning in a conducive environment, and supports personal growth and academic development (UNIZULU, 2022).

The University of Zululand model is set out in principles that give direction to the institution.

- The institution must provide quality facilities to staff and students, and support different modes of teaching and learning incorporating online, e-learning, and experimental.

- Students must be provided with opportunities outside the classroom to further instil disciplinary and generic competencies (UNIZULU, 2022).
- The model encourages responsible citizens and optimises students' employability.
- Teaching and learning must enable students to build confidence, expertise and knowledge to participate.
- The institution must ensure consistency between teaching approaches, curriculum purpose, learning outcomes, and assessment criteria and articulate the policy on assessments.

The Department of Higher Education and Training must find innovative strategies to promote and ensure research, new teaching and learning styles meet the needs of society (UKZN, 2017). This is evidence that entrepreneurship education could be a solution to the difficulties faced by the country because it supports University of KwaZulu-Natal model where it says "*methods of teaching and learning must respond to national importance by ensuring all students have access to resources, provide extra help for disadvantaged students to redress the lack of equity, and developing curricula, assessment methods and teaching methods that respond to the diversity of students* (UKZN, 2024). This research will supports University of Zululand model since it state that, "*teaching and learning must enable students to build confidence, expertise and knowledge to participate*". The University of Zululand model further emphasize that, "*the institution must ensure consistency between teaching approaches, curriculum purpose, learning outcomes, and assessment criteria and articulate the policy on assessments*" (UNIZULU, 2024). Therefore, expanding entrepreneurship education across all qualifications could be a solution to suppress unemployment while creating more innovative businesses. Education emphasises that educators must be innovative and willing to learn to develop their teaching capacity (Kuratko, 2005). This could help increase innovation, leadership skills, product development, and negotiating skills (Lacho & Bradley, 2010). Innovative entrepreneurship could be a dominant productive hub in the coming years (Sauka & Welter, 2007).

Productive businesses are constructive and innovative ventures that seek to provide society with quality services and opportunities (Baumol & Strom, 2007). Entrepreneurship education can be used to equip students with adequate skills to start and maintain successful businesses. Education emphasises the significance of good behaviour towards customers, communication

skills, and management skills. The above-mentioned factors lead to successful business, high-quality investments, and good performance from employees (Van der Sluis *et al.*, 2008).

3.3 THEORY UNDERPINNING THE STUDY

Theory U is used to guide the way of doing things to keep up with technology. The theory may help institutions to look beyond past patterns and focus on developing strategies for the desired future and new possibilities. It promotes opportunity exploitation with an open mind, open heart, and connection to the source. There is increasing pressure to review old ways of thinking and enact new ways of doing things. Theory U reveals that the current systems in place work for the minority while the majority struggles (Scharmer, 2009). Exploring the open mind, open heart, and open will and connecting to sources may establish networks and partnerships with private and public organisations creating a platform for interaction, cooperation, and collaboration for ongoing research and innovation.

Sharing knowledge, creating social capital via networks, conducting workshops, training students, adding entrepreneurship modules, and introducing entrepreneurial culture will benefit the university community and South African citizens at large (Ondimu, 2013). This can be achieved by collaborating university community, industry, government, and community members to create ventures in society. Theory U mentioned a place around us where intention and attention originate. A blind spot is a place we utilise occasionally when we do something, but the invisible dimension of our daily experience in social interactions.

Scharmer (2009) mentioned two sources of learning: learning from past experiences and learning from the future as it emerges.

- Learning from the past experience – using the past experience to predict the future. This source of learning is well developed and well known but sometimes past experience does not help when solving current issues.
- Learning from the future as it emerges – designing a creative response to solve challenges at hand and future possibilities (Scharmer, 2009). This theory was developed based on acting on the future that is seeking to arise.

The first part is to identify the blind spot (the inner place from which we operate) because challenges cannot be solved without understanding the nature of a problem.

Theory U can be applied using five movements of capacity development for presencing. These movements are Co-initiating, Co-sensing, Co-presencing, Co-creating, and Co-evolving (Van der Westhuizen, 2018).

1st *Component:* ***Co-initiating*** is when an individual or organisation establishes a common intent, and pays attention to others and to what life calls them to execute.

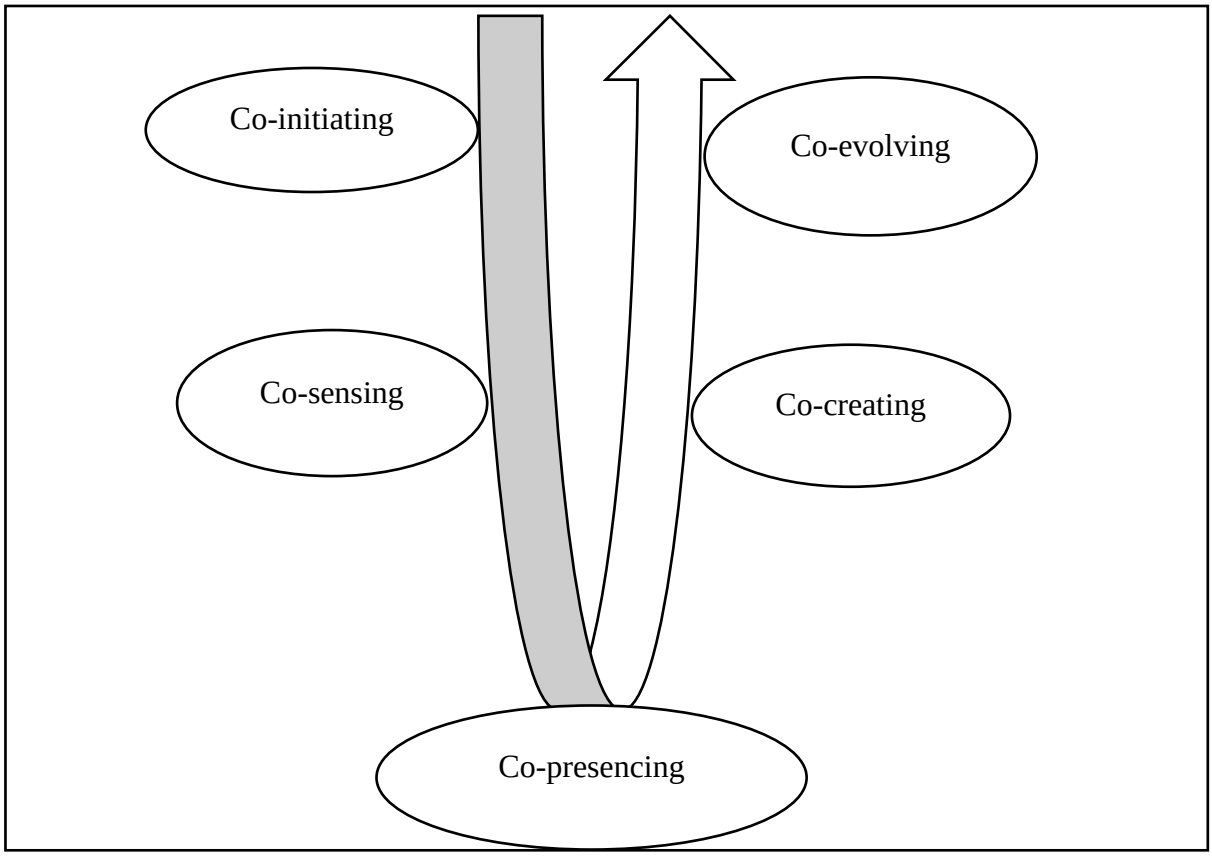
2nd *Component:* ***Co-sensing*** is an observation period that involves discovering potential and listening with your heart, and opening your mind while avoiding your voice of judgement.

3rd *Component:* ***Co-presencing*** is a time when you let go of old habits, reflect on a personal mission, connect to a source, and get a sense of purpose and commitment.

4th *Component:* ***Co-creating*** is connecting vision and intention by putting theory into practice.

5th *Component:* ***Co-evolving*** is a period to clarify, consolidate, facilitate, and operate the process from the whole. The movements of this theory are presented in the figure below.

Figure 3.1: The Theory U schematic diagram



Source: Adapted from Scharmer (2009)

With the help of this theory, it has been shown that each person (individual) or organisation will trigger their full potential if they realise their ability. Individual behaviour will not trigger automatically, it follows a consistent and reasonable way, especially when relevant information is available (Ajzen, 2011). However, the theory U has it shortcomings, it has a structure similar to management fashion which is never satisfied by simple and straight forward processes (Kühl, 2020). Theory U seeks to control the change in society and individuals, meaning that whatever is proven scientifically to work can be helpful in any organisation (Kühl, 2016). An individual or organisation that does not share same sentiments with innovative elements of theory U stand a chance of being considered as those who resist change. The study will focus on expanding entrepreneurship education to boost student innovation in South African universities. Theory U is an innovation-based theory since it supports products and services to develop by learning from the future as it emerges (Scharmer, 2009). This theory will be employed to understand how students may be equipped with skills and knowledge through repurposing curriculum and expanding entrepreneurship education. Research may push curriculum to change and prepare students for future business models.

Entrepreneurship education study has been conducted before with a different focus area in South Africa. Research has been conducted to investigate significance and contribution of entrepreneurship in South Africa and globally. A research by Iwu *et al*. (2021) investigating high unemployment rate and suggesting entrepreneurship as a solution to generate employment. Naudé (2017) investigated opportunities and threat posed by fourth industrial revolution (4IR) in Africa. Hameed and Irfan (2019) were investigating challenges encountered by entrepreneurs. The universities that conducted the study are Massachusetts Institute of Technology (MIT), Stanford University, Blekinge Institute of Technology, National University of Singapore Enterprise, the State University of Rio de Janeiro (Friburgo campus) and the University of California (Haas School of Business) and many more (Etzkowitz & Zhou, 2007). The information retrieved and the calibre of the universities that have utilised entrepreneurship education develop modern technology that creates millions of jobs for Americans (MIT, 2022). It is significant to conduct the study on the topic to investigate if introducing entrepreneurship education to other colleges/ faculties in South African universities will equip students with the necessary skills to be innovative.

With the aid of Theory U, individuals will trigger entrepreneurial potential if they get exposed to entrepreneurship education and learn about the benefits of entrepreneurship. The behaviour

of an individual is influenced by consistent exposure to relevant information which then gives motivation to execute (Ajzen, 2011).

3.4 CHAPTER SUMMARY

The chapter outlines the theory used in the study. It discussed the University of KwaZulu-Natal and the University of Zululand models and goals. Figure 12 above was used to thoroughly discuss Theory U in detail and the five components on how to apply it in decision making. The components are Co-initiating, Co-sensing, Co-presencing, Co-creating and Co-evolving (Scharmer, 2009). Several questions were created to test all five components, aiming to investigate if expanding entrepreneurship education to all qualifications would be possible to boost students' innovation in South African universities. A well-designed curriculum could be a solution to the escalating unemployment crisis. Introducing training to students together with practical applications will address the existing gap and students may focus on innovative businesses (Iqbal *et al*., 2012). Chapter 4 below presents the research methodology employed in the study including reliability, validity, and ethics.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

The chapter outlines the plan, research design, techniques, and philosophy underpinning the study. It presents methods and provides detailed information on specific procedures used during the process of conducting the research. The methods were used to investigate if expanding entrepreneurship education can help boost student innovation in South African universities.

4.2 RESEARCH DESIGN

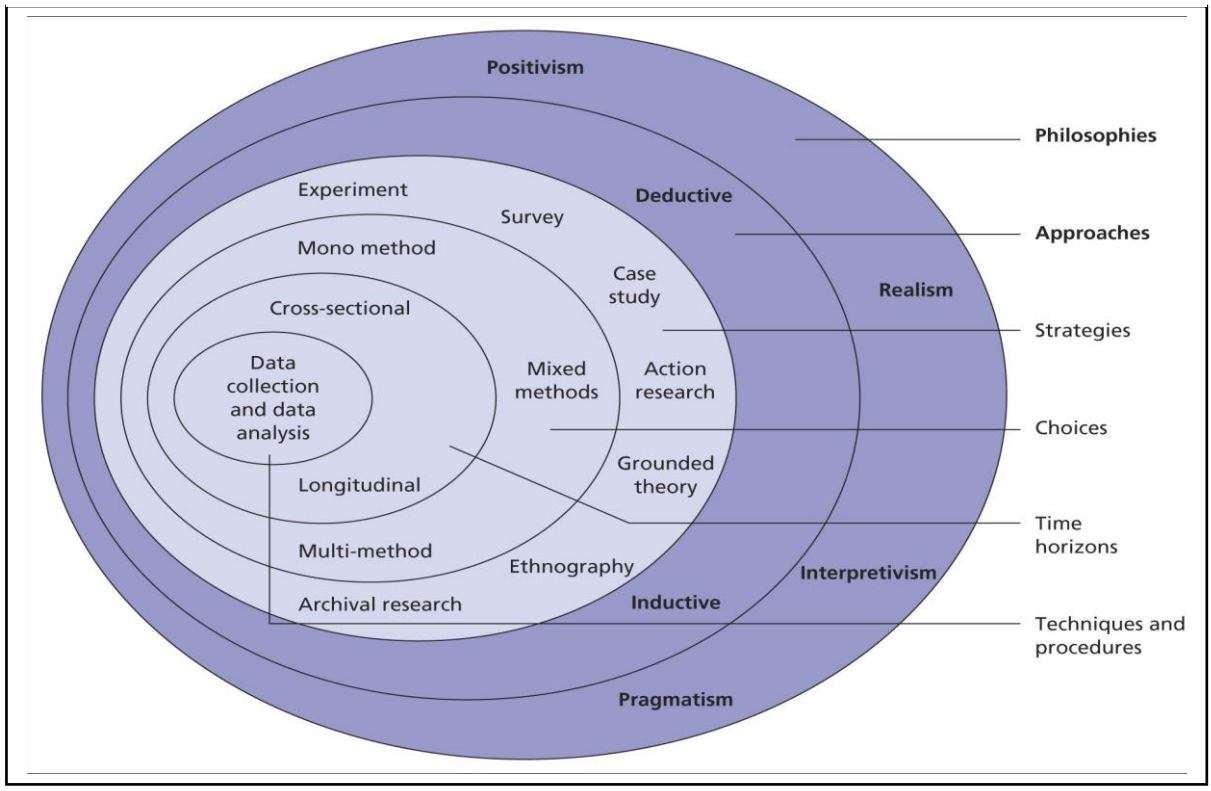
Research methodology creates a stable foundation for facilitating theory and advancing the development of knowledge (Snyder, 2019). Integrating different findings from studies builds a strong literature that can address questions and reveal areas where more research is needed. With the guidance of research onion, this chapter will explain the philosophy, target population, sampling technique, sampling size, data collection, validity, data analysis, ethical consideration, and reliability of the study.

The research methodology will thoroughly focus on mixed method techniques that were utilised from the beginning of research to the final stage of data analysis and interpretation. Research methodology helps to understand, guide and solve research problems scientifically and systematically by obtaining, analysing and organising data (Kothari, 2004). According to Saunders (2009), the research methodology has six stages namely: (1) research philosophy, (2) research approaches, (3) research strategies, (4) choices, (5) time horizons and (5) techniques and procedures. Each layer/ step guides the decision that was taken to develop the methodology underpinning the study.

Based on the type of research, a researcher must identify if the research is aimed at providing a solution for an urgent, long-existing problem or research is based on generalising. Applied research only focuses on finding and providing solutions for business organisations, society, or industry (Kothari, 2004). On the other hand, fundamental research is concerned with formulating theory and generalisation (Kothari, 2004). The challenges affecting society and industry usually pose negative implications to the economy, which then requires urgent attention to resolve the negative impact that might arise. In this study, applied research will be utilised since the purpose is to find a solution to the issues of unemployment facing graduates.

This will be achieved by expanding the curriculum to address challenges brought by fast changing world to reduce unemployment in the country at large. This study investigates if expanding entrepreneurship education could assist in reducing the crisis faced by the country. The research onion will be used in the study to elaborate on what and why each technique is chosen for the study.

Figure 4.1: The research onion



Source: Saunders (2009)

The research design underpinning the study is informed by the research onion discussed above. The following section will discuss research philosophies.

4.3 RESEARCH PHILOSOPHY

Research philosophy is a system that deals with assumptions and beliefs about creating or growing knowledge (Dean *et al*., 2006). The philosophy helps develop knowledge in a specific field and it answers problems based on a type of assumption that was made at an early stage of research (Saunders *et al.,* 2015). Research philosophy includes the number of assumptions about reality investigators encounter in the process of research, human knowledge, and how researchers' values influence the process (Snyder, 2019). A philosophy that constitutes more consistent and well-thought-out assumptions is a credible research philosophy (Starbuck,

2003). This should be cautiously chosen because it shapes the type of research project, method to be used, research questions, and interpretation of findings (Crotty, 1998). Each philosophy is reliable depending on the researcher's plan and the type of data aimed to be collected. There are four types of research philosophies mentioned in Figure 4.1 above namely positivism, realism, interpretivism, and pragmatism (Saunders, 2009). Looking at the research assumption prior to engaging philosophies makes it easy to understand differences in research philosophies. There are three types of assumptions based on research philosophies, namely, epistemology, ontology, and axiology (Starbuck, 2003).

4.3.1 Ontology

Ontology is a branch of philosophy that deals with the study of existence, reality, and the nature of being (Smith, 2003). It explores questions about what exists, what can be said to exist and how things relate to one another in terms of true reality (Smith, 2003). Ontology is the nature of reality concerned with the kind of world that is investigated (Ahmed, 2008). This philosophy reflects individual interpretation of what constitutes reality, and helps researchers to get tangible knowledge about investigated truth (Moon & Blackman, 2017). Ontology discusses reality as it relates to individual experience with respect to place and time (Scotland, 2012).

Busse *et al*. (2015) explain that ontology gives the classification of being, and covers the existence of being holistically. Ontology allows researchers to understand reality and how things operate and may influence how researchers perceive reality. Furlong and Marsh (2010) discussed key questions in ontology as: what needs to be known, the nature of reality, and a description of how things work. This research did not employ this philosophy because it focuses on the existence of being and the reality of how things work. This philosophy is best suited when investigating classification or if things definitely exist or not.

4.3.2 Axiology

Axiology is a branch of philosophy that focuses on the study of values and judgements (Tomar, 2014). It seeks to understand and evaluate concepts related to ethics, aesthetics, and other different forms of value (Khan, 2015). It explores and considers what adds value, and how individuals, organisations and societies make judgements about concepts. Khan (2015) explains that there are two branches of axiology, namely, ethics and aesthetics.

- Ethics – focuses on questions of principles and moral values (Mertens, 2010). It seeks to determine what is right or wrong, good or bad, and how individuals or societies should make ethical and responsible decisions (Nozick, 2002).
- Aesthetics – concerned with questions related to beauty and artistic value. It explores the nature of beauty, criteria for evaluating art, and cultural aspects of aesthetic judgements (Sharma *et al*., 2018).

Axiology philosophy informs decision-making in everyday life (Tomar, 2014). This philosophy highly recommends ethical behaviour. Researchers want to respect human rights, treat people with courtesy, and get unbiased results, therefore axiology philosophy was observed and considered in this research.

4.3.3 Epistemology

Epistemology is a branch of philosophy that deals with the study of knowledge, beliefs, and justification (Rescher, 2012). It seeks to respond to questions about the nature of knowledge, how knowledge is acquired, and how to determine whether a particular belief is justified or true (Rescher, 2012). Epistemology is a rich and diverse field of philosophy that intersects with other areas of philosophy such as metaphysics (the study of reality) and ethics (the study of morality) making it a fundamental part of philosophical inquiry (Ahmed, 2008). Ahmed (2008) further defines epistemology as a method used to understand and explain a concept of how we know things we know.

The philosophy prioritises philosophical grounding and provides legitimate and adequate knowledge. In epistemology, a researcher is independent, and should not influence objects or units being studied (Dew Jr & Foreman, 2020). Epistemology is called a study of knowledge because it develops the theory of knowledge using nature and the source of knowledge (Dew Jr & Foreman, 2020). Epistemology philosophy focuses on acquiring detailed knowledge on how to differentiate between falsehood and truth (Audi, 2003). The philosophy was used in this study because it looks at the relationship between reality and how reality is obtained, it clearly states that the researcher, participants, and topic must be independent from one another to produce unbiased findings.

4.3.4 Positivism

The three paradigms guide research methods, data collection, and analysis. A researcher conducting a study must be able to justify the action and why the philosophy was adopted for specific academic research. The positivism paradigm was labelled in the 19th century by Auguste Comte. This paradigm focuses on quantitative and experimental research (Ryan, 2018). The paradigm supports the view that knowledge is obtained through measurement and observation where the researcher is objective (Dudovskiy, 2016). This implies that a researcher distances his/her views, feelings, interference, or any other personal values that might interfere with the study.

In positivist research, a researcher is viewed to be an independent being with no personal interests in the study. The positivism paradigm viewpoint is that research must concentrate on factual content (Henderson, 2011). To support positivist research, the following principles are given to provide guidance (Weber, 2004).

1. The main objective of research is to explain and predict.
2. There is a specific set of principles across science.
3. Research must be observable through the human sense; an inductive approach must be used to develop a hypothesis that should be tested.
4. Common sense is not the same as science, therefore, research findings should not be influenced.
5. Science must be judged by logic and be value-free.

Positivism research philosophy uses existing theories to develop questions or hypotheses to be examined during the research process (Dudovskiy, 2016). The structure used by positivists allows a similar study to be conducted in the future, positivist research seeks facts, therefore, the employed method must be highly structured and the study must be replicable (Weber, 2004). Scientific research is an example of positivist research philosophy. The shortcoming of positivist research is that findings are descriptive and lack a deep understanding of the problem (Pham, 2018). This might be caused by closed-ended questions or short questions which do not allow participants to fully elaborate challenges.

The advantages of using positivist research are that it focuses on facts, a hypothesis is tested, and data are reduced to the simplest elements. The positivist paradigm may provide reliability, high-quality validity, and can be generalised to represent large-scale population (Cohen, 2007).

The key strength of this approach allows statistical analysis by identifying consistency and correlation in variables using the Cronbach alpha coefficient (Pham, 2018). Positivism research emphasises minimum interaction between participants and the researcher during data collection. In this study, data collection was conducted using a questionnaire and interviews. There was minimum interaction with participants who were not influenced by the researcher in giving responses. The study did not utilise positivism research philosophy since the philosophy believes that data must be numerical and can be analysed using statistical methods only.

4.3.5 Realism

Realism philosophy defines that a phenomenon exists independently from people's point of view about them; it reflects the world's real features (Maxwell, 2012). In other words, objects and events of the world have an objective, independent existence regardless of how anyone perceives or thinks about them. From social science and natural science, realism philosophy has played a significant role. The philosophy reveals the idea of the real world that we interact with through using existing theories and concepts. Scientific realism believes that there could be different scientific methods to understand reality with more than one category and objective (Fleetwood, 2007). This is evidence that the world exists in a way that is independent of our experiences and expectations (Dean et *al.,* 2006). Critical realists retain a statement that says, the world must exist independently from our theories, constructions and perceptions (Dean et *al.,* 2006). Realists take theoretical terms as actual properties and features of the real world, however, critical realists believe that attributes (intentions and meanings) and mental states form a big part of the real world (Maxwell, 2012). This statement was denied by constructivism and logical positivism.

Edward Sapir quoted from Maxwell (2012, p2) once mentioned that “if different societies using different languages are living in a different place, that should be considered as different worlds due to how they perceive it.” A realist must be able to defend historical scientific work using recent or relevant science and must establish theoretical progress using historical theoretical knowledge (Boyd, 1990). Many researchers raised a concern about the realist’s capacity to provide or account for the development of scientific theories and involvement in growing theoretical knowledge (Boyd, 1990). They further said scientific realists must adopt natural concepts of central issues and philosophical methodology. The meaning of direct realism says there is nothing hidden, what you see is exactly what you get, whereas critical realism reveals

that humans may encounter the image and sensation of the real world (Saunders *et al*., 2012). Critical realists believe in multiple studies before reaching a conclusion.

Of the two realist approaches, the critical realist philosophy is more reliable because it provides more details and gives a broader picture when studying a phenomenon. This philosophy believes that reality is independent of the human mind and assumptions are based on a scientific approach. The table below illustrates the realism research philosophy.

This means that the objects and events perceived in the world are not only appearances or illusions, but they have concrete and objective existence (Reed, 2009). The philosophy can be further divided into different subtypes depending on the claim made about the nature of reality and the knowledge about it. Some realists believe that knowledge of the world is direct and unmediated, while others argue that knowledge is mediated by the sense organs and cognitive process (Reed, 2009). Realism is often contrasted with idealism with the view that the external world is a mere construct of the mind or consciousness. In some instances, realism is contrasted with scepticism with the view that people cannot have certain knowledge of the eternal world (Smart, 2014). Realism philosophy has significant influence in different fields including philosophy, science, social science, and arts. In the scientific context, realism is associated with the view that science aims to describe the world as it is, rather than providing useful models or predictions (Smart, 2014). In the arts, realism is a movement that emphasises the depiction of life and society as they are, rather than idealising them (Yeung, 1997). The realism philosophy was not employed in the study.

4.3.6 Interpretivism

The interpretivism research philosophy is a direct opposition to the positivism research philosophy. It values subjectivity, and argues that knowledge and truth are subjective, historically and naturally depending on the understanding and experience of them (Ryan, 2018). This philosophy advocates that a researcher cannot be separate from their personal beliefs and values; this link may influence data collection, analysis and interpretation (Bryman, 2016). Ryan (2018) quoted Blumer (1969) when presenting interactionism core principles, namely that:

- Human behaviour can be interpreted based on its meaning.
- Meaning can be generated or interpreted based on social interaction.
- Meaning can change depending on individual perception or experience.

Interpretivism explains the difference between reality and the truth, and foregrounds that there is no single reality as reality is knowable through social meanings (Richie & Lewis, 2013). They further explained that reality can be presented in different ways. What motivates different ways of explaining is understanding, norms, culture, definitions of situations, and social reality. The truth may reflect on multiple realities since individuals have different perceptions of how they view the world. Interpretivism explains the meaning of people's participation and characters in cultural and social life. The philosophy investigates motives behind individuals' actions such as interactions and behaviour in society (De Villiers, 2005).

Interpretivism is a school of thought where human action and the influence of culture are studied. Chowdhury (2014) adopted from Boas (1995) said culture is an integrated system of values, symbols, and ideas that must be studied as a system. The researcher uses preconception to guide the research process and interact with participants to change their perceptions. Chowdhury (2014) further explained that researchers investigate specific ways of explaining how the phenomenon occurred, this allows researchers to go beyond to discover detailed information. Interpretivism represents views opposite to positivism by understanding the social setting and human behaviour. Bryman and Bell (2007) highlighted that interpretivism maintains that knowledge is obtained through social setups such as consciousness, language, documents, shared meaning, and other social dynamics that have an impact on people's lives. This allows researchers to have opinions, and have their own interpretations, understanding, and world views on issues investigated due to historical and cultural influence. Therefore, the background has a significant influence on the interpretations of the investigated phenomenon. The table below reveals the differences between interpretivism and positivism.

The advantage of using interpretivism is that it allows researchers to obtain in-depth, rich data from participants. Researchers collect information that is a lived experience, therefore, the participants can give extra or additional information on the researched phenomenon. Interpretivism stands in contrast to positivist approaches to social and cultural research which focus on objective measurements and the research for universal patterns or laws. Interpretivists argue that the positivist approach is unable to capture the complexity and subjectivity of social and cultural phenomena. Interpretive approaches are important to gain a more nuanced and complete understanding of the phenomena. Interpretivism allows researchers to influence participants and data collection methods, the total opposite of positivism philosophy. It believes in engagement discussions to obtain in-depth information. The study did not use this philosophy

because the researcher did not influence participants' responses to questions and the data collection process was not biased.

4.3.7 Pragmatism

Pragmatism philosophy encourages individuals to seek out appropriate processes and utilise efficient strategies that work best to achieve desirable ends (Sharma *et al*., 2018). The philosophy allows practical investigation processes, and is a better way of assessing situations, and approaching or solving complex problems. The pragmatists acknowledge the fact that what works for one person might not work for another person. Pragmatism is a direct translation of a Greek word that means work. Darwin's evolution theory inspired the theory of experience, which supports the notion that says, "the truth is integral to experience that is ongoing" (Carlsen, 2016, p112). The philosophy was created by William James, Charles Pierce and John Dewey between the late 19th century to early 20th century in the United States of America (Saunders *et al*., 2015).

The pragmatism followers believe that the truth of knowledge, beliefs, and scientific concepts is defined by usage in ongoing events. The pragmatism research philosophy believes that apart from the knower, there is no knowledge, this discussion gave two definite streams of inquiry: the theory of experience and the theory of truth (Carlsen, 2016).

- ***Theory of truth*** – knowledge and beliefs cannot be separated from subject and possibilities for action. The theory of truth rejects the separation between cognition and purpose.
- ***Theory of experience*** – experience is considered an ongoing and active practice. Individuals who undergo a certain experience develop relational unity. Pragmatism research philosophy believes that experience is equivocal, plural, and ongoing.

Experience cannot be duplicated, nature and self-experience form part of a lived experience where there is no privilege for spectators, and everyone forms part of existing experience. Scharmer (2009) reveals that in recent years research has produced results that nobody wants due to the destruction of communities, terrorism, hunger, poverty, and violence. The current times require conscious decisions and strategic leadership to meet challenges in a more strategic, intentional, and conscious way (Scharmer, 2009). He further highlighted that experience cannot be duplicated to predict the future anymore due to artificial intelligence (AI) and high-tech innovation. The pragmatism philosophy (theory of experience) explained above

agrees with Theory U used by the researcher in this study. This philosophy states that academic speculations must not only use past experience to formulate present experience, but must also consider innovation qualities in shaping how people can live their lives in the future. The philosophy helps to justify and refer research questions to the future. Rorty (1984) adapted from Carlsen (2016) observed that a better human future notion is substituted by reality, nature, and reason.

Pragmatist researchers bring theory back to the living experience. Experience consists of and is inclusive of knowledge, body, action, emotion, and thinking people must be able to reflect upon. According to Sharma *et al*. (2018), pragmatism practice and theory of education must give real-life experience. They further argued the real-life experience must be supported at least by one form of pragmatism.

1. ***Humanistic pragmatism –*** mostly used in social science, science, philosophy, and religion. Humans do all thinking and everything in nature to fulfil human satisfaction.
2. ***Experimental pragmatism*** – the basis of science is the experimental method, the known truth must be practical, and no truth is final. Problems encountered by humans can be solved experimentally.
3. ***Nominalistic pragmatism*** – this element of pragmatism believes that experiment results are concrete and concise.
4. ***Biological pragmatism*** – there is a relationship between man and environment. Social skills are well developed through education which then allows individuals to understand the environment and prepare for future living.

The principles of pragmatism philosophy reveal that pragmatists are pluralist researchers who are of the view that individuals investigate aims and truth based on their life experience. Therefore, the reality is not one-sided but has many sides. Pragmatism research philosophy see the world evolving constantly, truth in the making and the world as a process. These reasons emphasise change in every aspect of research to test reality and truth. Pragmatism allows continuous integration and reconstructing of education to produce well thought solutions to respond to new situations.

This philosophy deals with problems in a reasonable way that better fit existing conditions rather than using fixed ideas, rules, or theories. It is an educational philosophy that emphasises that teaching must be practical as it should educate students with skills they can use in real-life

(Rai & Lama, 2020). The principles of pragmatism emphasise that the teaching and learning process must be effective.

Each belief has a unique assumption based on different colleges/ disciplines in natural sciences, social sciences, applied sciences, humanities, and the domain of organisational practice (Saunders, 2009). Epistemology assumption is concerned with what constitutes acceptable, legitimate, and valid knowledge and how the knowledge is communicated to others (Saunders, 2007).

The study focuses on the two big higher education institutions in the province of KwaZulu-Natal, the University of KwaZulu-Natal and the University of Zululand. The study focuses on postgraduate students and academic staff. Looking at the target population and sample size, the researcher deemed the pragmatism philosophy to be best suited for the study because this research constitutes quantitate and qualitative data. The interviews were used to get in-depth information from academic staff, participants were not influenced, and the researcher was professional in the entire process.

The study collected data from participants (postgraduate students and staff) at the University of KwaZulu-Natal and University of Zululand campuses. The data collection took place on five campuses at the University of KwaZulu-Natal and two campuses at the University of Zululand. The aim of the research was to investigate whether expanding entrepreneurship education could help boost students' innovation. Theory U by Otto Scharmer (2009) was used as the theoretical framework for the study since it sought to search for future possibilities. The study used a pragmatism research philosophy since the philosophy combined both positivism and interpretivism and allowed both qualitative and quantitative data collection. The study used mixed method approach to provide a comprehensive analysis of the collected data. Quantitative data were collected using a questionnaire in the form of an online survey and analysed using SPSS version 24. Qualitative data were collected using interviews in the form of Zoom or Microsoft teams online and analysed using the NVivo thematic programme. The table below summarises research philosophies.

Table 4.1: The research philosophy summary

A comparison of beliefs associated with positivism research			
Ontology	Axiology	Epistemology	Typical methods
• Independent • Real • External	• Value-free research	• Measurable and observable facts • Scientific method	
• Universalism/ one-true reality	• Independent and neutral of what is researched • Objective research	• Law supported generalisation	• Large samples, highly structured, and deductive • Quantitative analysis method
• Granular things		• Numbers	
• Ordered	• Researchers remain objective	• Researchers use prediction and casual explanation as contributions	
A comparison of beliefs associated with realism research philosophy			
• Layered or stratified	• Value-laden research	• Relativism • epistemology	• In-depth and retroductive • Analysis of emerging agency and pre-existing structures • Range of data types and methods to fit subject matter
• Independent • External	• Researcher is biased	• Knowledge is transient and situated	

	because of world views upbringing and cultural experience		
• Objective structures	• Researchers minimise errors and bias	• Facts are socially constructed	
• Casual mechanism	• Research is objective	• Using casual explanation as the contribution	

A comparison of interpretivism and positivism philosophies.

Metatheoretical assumptions	• **Interpretivism**	• **Positivism**
• Ontology	• Reality and researcher are inseparable	Reality and researcher are separate
• Epistemology	• World knowledge is constituted through individual lived experience	Objective truth exists beyond the human mind
• Method	• Phenomenology • Hermeneutics	• Content analysis Statistics
• Research object	• Interpreted using the meaning of researchers' lived experience	Consists of research qualities that are independent of researcher's point of view
• Theory of truth	• Research interpretation matches lived experience • Truth is intentionally fulfilled.	• Mapping between reality and research statement • Corresponds to the theory of truth
• Reliability	• Research addresses and recognises the	• Results can be reproduced • Replicability

	implications of subjectivity • Interpretive awareness	
• Validity	• Defensive approach knowledge claim	• Data measures reality

A comparison of beliefs associated with pragmatism research philosophy

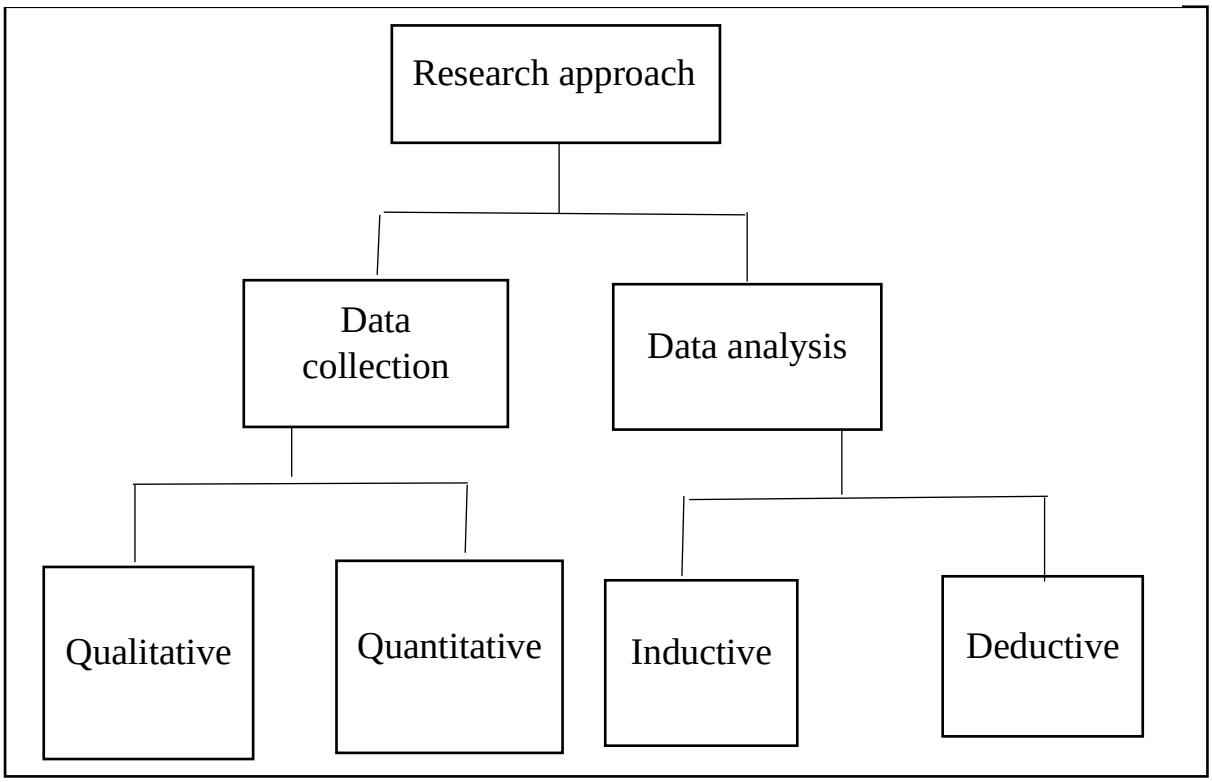
• **Ontology**	• **Axiology**	• **Epistemology**	• **Typical methods**
• Reality is the consequence of ideas • Complex • Rich • Flux of experiences, processes, and practice.	• Research is sustained and initiated by the researcher's doubts and beliefs • Researcher is reflexive • Value-driven research	• Knowledge and theories enable successful action. • The meaning is practical knowledge in a specific context. • Mainly focuses on practices, problems, and relevance • Provides informed future practice as a contribution and solves problems	• Guided by research problem and research questions • Variety of methods: - Qualitative - Quantitative - Action research - Mixed method - Multiple research • Emphasises practical outcomes and solutions

Source: Adapted from Dudovskiy (2016)

4.4 RESEARCH APPROACHES

Research approaches are research procedures that explain or provide detailed steps from research plan, data collection, data analysis, and interpretations. To reach a decision on choosing the appropriate approach, a research design and research methods must be understood (Crowe et al., 2011). The research approach is the interconnection of design, philosophical worldview, and research methods where broad assumptions are narrowed down to a detailed scope (Creswell, 2014). The research approach has three components – research design, philosophical worldview, and methods of research. The research design consists of data collection, measurements, analysis, interpretation of data, and drawing of conclusion (Saunders, 2009). Philosophical worldview rooted in epistemology, constitutes of valid, legitimate, and acceptable paradigm of research approach. Methods of research provide guidelines/ steps to obtain detailed information from the sample (Saunders, 2009). The nature of a problem, the researcher's experience, and the participants in the study are the key values that guide research approach selection. The research approach primarily has two categories: (1). Data collection, (2). Reasoning or data analysis.

Figure 4.2: The research approach schematic diagram



Source: Adapted from Chetty (2016)

This phenomenon provides guiding steps on how the research is conducted, whether it is a deductive or inductive approach. The research approach gives clear steps on how research is conducted and tests the validity of assumptions. A researcher must distinguish if the research is a quantitative, qualitative, or mixed method (Crowe *et al*., 2011). The quantitative research method investigates objective theories by testing relationships in variables, which can be measured and analysed using statistical instruments (Chetty, 2016). The qualitative research method explores the understanding of social problems through groups or individuals. Data collection is through participants' settings or focus group settings. Mixed method research involves collecting qualitative and quantitative data. This approach allows two forms of data to be integrated using theoretical frameworks and philosophical assumptions.

The advantage of the mixed method is that it provides a complete understanding relating to the research problem (Onwuegbuzie & Leech, 2006). The approach serves as a strategic bridge between research strategy, research questions, and execution of research. A combination of methods yields a complete analysis, thus the mixed method uses inductive and deductive approaches simultaneously (Johnson & Onwuegbuzie, 2004).

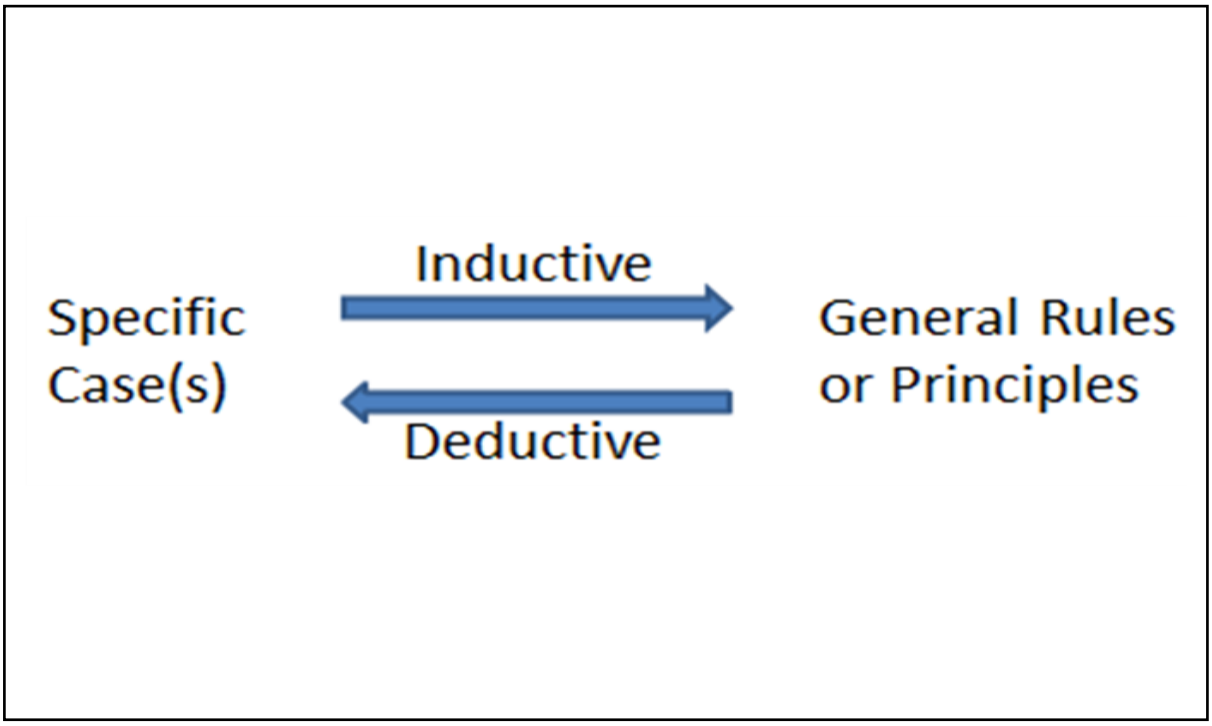
4.4.1 Inductive approach

An inductive approach is used to discover and follow patterns, this approach uses research questions to get to the area of interest, and data collection is qualitative. The inductive approach focuses on condensed raw data, creating new theories, and providing the link between raw data and objectives (Thomas, 2003). The inductive approach is used to:

1. Establish the link between findings and the research project.
2. Convert raw data into a logical summary.
3. Create a process with evidence that it started from raw data. The final step is developing a theory based on processes revealed using raw data (Jebreen, 2012).

The inductive approach known as the bottom-up approach utilises secondary data to derive themes, concepts, and models (Goddard & Melville, 2004). They further explained that researchers begin with observations, follow patterns and the final step is generating theory. This approach does not test the hypothesis, it is a data-driven approach of understanding the meaning and examining the effect of events, experiences, and reality within society (Chetty, 2016).

Figure 4.3: The inductive/ deductive research approach schematic diagram



Drawing from Wilson (2010)

4.4.2 Deductive approach

The deductive approach is mainly involved in testing hypotheses and theories. The deductive approach is used to enable research reasoning from general speculations to specific and reliable knowledge (Dudovskiy, 2016). The generalisations lead to theoretical framework development with research questions which are tested to get a specific conclusion. A researcher embarks on research that starts with common knowledge which is general information to the population and ends with thoroughly investigated knowledge. Past patterns tested or measured against observations are derived from a theory and can be explained by using a hypothesis (Wilson, 2014). The approach starts by exploring theories, developing a hypothesis or theoretical framework, and finalise by drawing a specific conclusion based on logical premises (Soiferman, 2010).

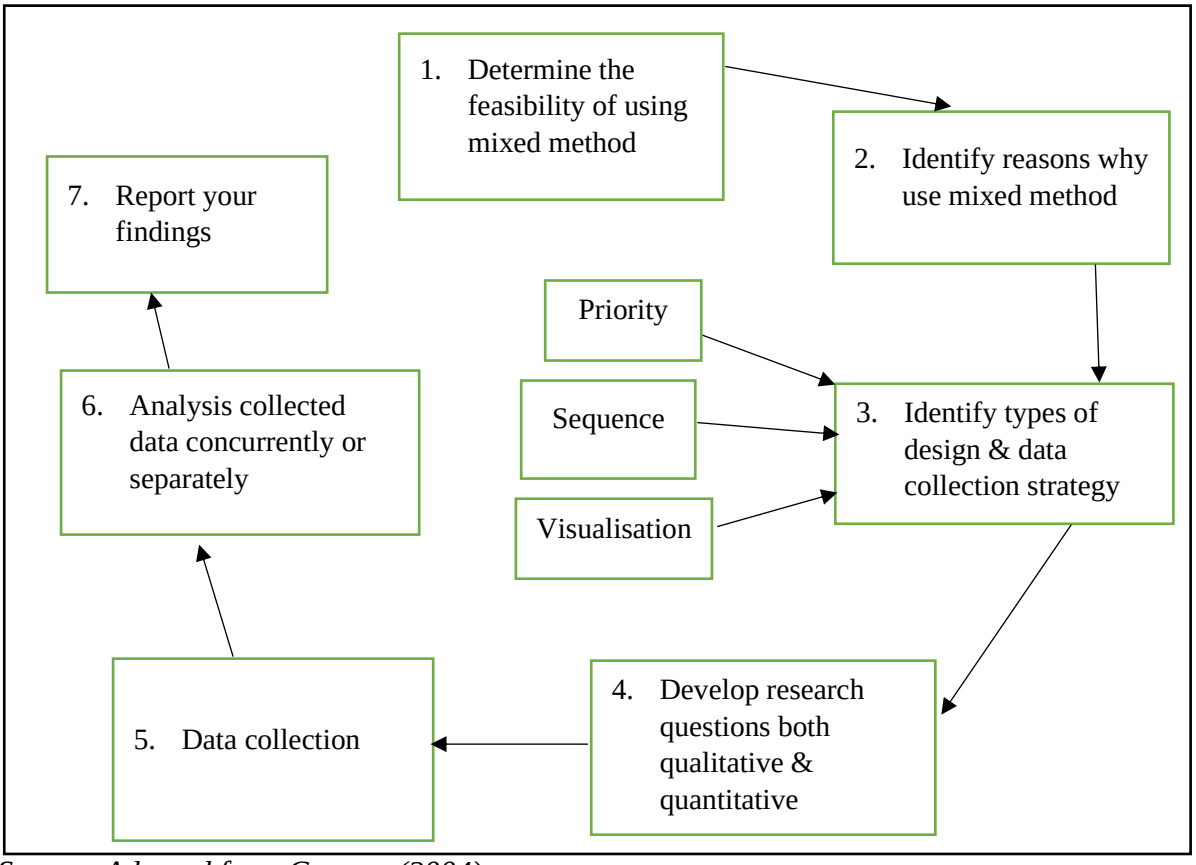
The reference point is well established and consists of existing knowledge, with aims and theory to build on utilising data obtained from research. The deductive approach builds on something that already exists depending on a formal logic. Arguments that are based on rules, laws, or accepted principles are expressed deductively and can be measured using scientific principles

for reliability and validity (Soiferman, 2010). The deductive (quantitative) approach uses inferential statistics or descriptive statistics to understand relationships among variables. The advantages of using the deductive approach are: (i) It is easy to describe relationships between variables and concepts, (ii) Easy to measure concepts, and (iii) easy to generalise using research findings but to a certain extent (Dudovskiy, 2016).

4.4.3 Mixed approach

Sale *et al*. (2002) argued that a combination of approaches is beneficial to researchers to better understand the world we live in as both approaches give different perspectives to study phenomena while sharing a common goal to improve and understand societal conditions. They further emphasised that the approaches share a common goal in the body of knowledge of disseminating information and knowledge for practical use (Sale *et al*., 2002). These approaches allow a combination of theories triangulation, cross-validation, or utilisation of different data to gain more understanding of the phenomenon. Onwuegbuzie and Leech (2006) agreed with Sale *et al*. (2002) by stating that the mixed method allows maximum participants and larger sample results in valid and reliable research findings. The mixed method uses two instruments, namely: interviews and questionnaires, to maximise data collection from participants and allow maximum data interpretation from the researcher (Onwuegbuzie & Leech, 2006).

Figure 4.4: Guiding steps on conducting a study using mixed method



Source: Adapted from Cannon (2004)

The Figure 4.4 above represents seven guiding steps that must be taken if a researcher decides to take a mixed method approach. The mixed method is a combination of qualitative and quantitative methods. It is best preferred since the approach produces maximum response from participants. The researcher gets in-depth information using the qualitative data-collecting strategy while getting numerical data using the quantitative method. This research was guided by figure 4.4, a researcher was investigating whether expanding entrepreneurship education could assist boost students innovation. The was aiming to get rich information that will help support recommendations to the institutions. Pragmatism philosophy was used because it allow in-depth data and both quantitative and qualitative data. Postgraduate students were chosen to participate in the study because they have junior degrees, some of them have searched for employment, therefore they can bring positive contribute from previous experience. Senior academic staff were requested to participate because they can compare changes over the years from couple of years back to date. This could give them an opportunity to comment on what need to be done for institutions to produce independent and innovative graduates. The figure above reveal steps guiding the research from step 1, “feasibility of using mixed method” to

final step 7, “reporting the findings”. Table 4.2 below compares qualitative, quantitative, and mixed method research approaches.

Table 4.2: A comparison between three research approaches

Tends to	**Quantitative**	**Qualitative**	**Mixed method**
Philosophical assumption	Post-positivist knowledge claim	Transformative knowledge claim	Pragmatic knowledge claim
Strategies of inquiry	Experiments and surveys	Grounded theory Case study Ethnography Phenomenology Narrative	Concurrent Transformative Sequential
Methods	Numeric data Predetermined approachesClosed-ended questions	Open-ended questions Text Image data Emerging approaches	Uses both open and closed-ended questions Uses both qualitative and quantitative methods Uses both emerging and predetermined approaches

Source: Adapted from Creswell (2013)

The inductive research approach and its association with qualitative data collection were discussed above. The researcher further discussed the advantages of using the inductive approach, which is used mostly in qualitative research where findings are used to form a theory. The interviews section was part of qualitative data where in-depth information was collected from academic staff. The deductive approach was discussed, and the advantages and its association with quantitative data collection. Quantitative data were collected from postgraduate students using a questionnaire. The aim was to investigate the contribution of the current curriculum if it assists with relevant skills required by the world of the fourth industrial revolution dominated by artificial intelligence. Both approaches reveal each advantage, disadvantage, and contribution towards conducting research. Using mixed method was

beneficial to the researcher to get more information from all the participants on the researched phenomenon.

4.5 RESEARCH STRATEGIES

The research strategy is a consistent and systematic method of data collection with the aim of using data to report findings (De Vaus, 2013). It clearly explains the procedures used for data collection to the readers and other researchers (Visser *et al.*, 2000). A research strategy provides step by step guide on researchers' thoughts and direction, it reveals planned strategies used to conduct the study systematically and yield detailed results. The overall research strategy provides support to researchers in structuring, creating and presenting gathered results so that other researchers may review or determine if the work meets the standards of academic research (Johannesson & Perjons, 2021). The strategy looks at the holistic plan for the research study whereas the research method focuses on data collection and analysis. A researcher needs to choose a research strategy prior to embarking on a research journey, the questions that must be addressed for appropriate strategy are:

- Does the strategy suit the research questions?
- Is the strategy feasible, and are there enough resources to complete the research project?
- Is the strategy ethical? The strategy must not affect the environment, people, or animals negatively.

The research strategy must be suitable and feasible for its purpose from a practical standpoint. In social sciences research, the requirement is that participants must remain anonymous, they can withdraw anytime without a penalty, and must understand their rights (Saunders *et al*., 2015). The research onion Figure 4.1 consists of seven research strategies, namely: experiment, survey, case study, grounded theory, ethnography, action research, and archival research (Saunders, 2009).

4.5.1 Experimental research strategy

Experimental research investigates cause-versus-effect relationships. It disproves or proves the observed outcome. The phenomenon is expressed using independent and dependent variables dominantly in natural science studies (Cash *et al*., 2016). The experimental research design provides insight into how experiments must be utilised to build and contribute to scientific

knowledge significantly. Skidmore (2008) mentioned that in an experiment, a portion of variables is manipulated which affects other variables that are observed. She further observed that experiments focus on independent variables to predict dependent variables' outcomes. Other variables are controlled, distributed, or eliminated in a way that results reflecting on dependent variables can be justified. Experimental research's purpose is to prove that each factor has effect on another, starting from the natural situation to experimental form where empirical research is carried out and quantitative data are obtained (Kandel & Campus, 2020). Johannesson and Perjons (2021) highlighted that the disadvantages and advantages of experiments can be explained in terms of external and internal validity. External validity is the generalisation of experiment results, a researcher may expect the same results in situations and occasions. Internal validity observes changes in dependent variables and observes if the changes are caused by changes in independent variables (Ross & Morrison, 2013). The experimental research strategy was not used in this study.

4.5.2 Survey research strategy

A survey research strategy is a form of information collection from a sample through response to research questions. Survey research allows different methods to collect data, recruit participants, and use different methods of instrumentation (Check & Schutt, 2011). In survey research, a quantitative approach can be employed (using a questionnaire) and a qualitative approach (interviews or any form of open-ended questions). The advantage of survey research is that it allows the use of mixed methods (qualitative and quantitative) in one study to get in-depth information from participants (Ponto, 2015). Another advantage of survey research is that it allows data collection on a large sample, the primary purpose is to use information collected to better understand the population and make research-based generalisations.

Glasow (2005, p1) observed that survey research was designed to solve problems, answer questions, set goals, describe what exists, and analyse trends. She further stated that, “a research survey is simply a tool to collect data from large group”. Survey research requires minimal money investment to administer, develop, and supply estimates for the population (Fowler, 2013). The disadvantage is that biased information might be shared during data collection by participants to confound results or present inappropriate behaviour (Jones *et al.*, 2013). The survey strategy consists of two steps; the first step is the development of a sampling plan and the second step is revealing procedures used to estimate samples from the target population

(Ponto, 2015). In this study, a survey research strategy was employed since it allows the usage of mixed methods.

4.5.3 Case study research strategy

A case study research strategy is a method of investigating a specific subject or phenomenon by conducting an in-depth analysis of a real-life event or situation (Harling, 2012). This type of research typically involves a detailed examination of a single instance or event, such as a person, group, organisation, or community. It is often used to explore complex social, psychological, or behavioural phenomena (Harling, 2012). Case study research is often used in fields such as sociology, psychology, business, and education. The case study strategy can involve a variety of data collection methods such as interviews, observations, and document analysis (Swanborn, 2010). The main goal of the case study research strategy is to understand the subject matter in its natural setting and to gain insights that can be used in other similar situations.

A case study research is used when a researcher wants to understand a complex issue and if it has not been extensively studied before. The researcher may use theoretical frameworks and conceptual models to guide the analysis (Johannesson & Perjons, 2021). The advantage of a case study research is that it allows a researcher to gain a rich and detailed understanding of the subject being studied (Johannesson & Perjons, 2021). The disadvantage of the strategy is that it focuses on a specific case or event which makes it difficult to generalise findings (Yin, 2012). The case study research strategy was not used in the study.

4.5.4 Grounded theory research strategy

Grounded theory is a research strategy that involves the development of a theory that emerges from data collected through qualitative methods such as observations, interviews and document analysis (Khan, 2014). The theory is grounded in the data meaning it is derived directly from the data and is not imposed on the data. The goal of grounded theory is to generate a theory that explains patterns or connections among the data and can be used to make predictions about future observations (Calman, 2006). The research process involves collecting, analysing, and iteratively refining emerging theories through additional data collection and analysis. The grounded theory research strategy was not used in the study.

4.5.5 Ethnography research strategy

Ethnography is a research strategy used in social science particularly anthropology that involves the study of people and culture through the examination of everyday experiences and practices (Sharma & Sarka, 2019). It involves conducting fieldwork such as participating in and observing activities of certain groups or communities. The ethnography research strategy uses qualitative data collection methods such as participation observations and interviews to understand the cultural norms, beliefs, and values of the group being studied (Sharma & Sarka, 2019). Ethnography is often used to study small, specific groups or communities, and its goal is to provide a detailed holistic understanding of the group or culture being studied (Naidoo, 2012). Ethnography research allows a researcher to collect other forms of data such as photographs, videos, and audio recordings (Naidoo, 2012). The research strategy is subjective because it allows a researcher to use their own perspective and experiences to shape their understanding of the studied phenomenon. Ethnography research strategy is used in the field of anthropology, sociology, education, and marketing research to understand complex social phenomena and to gain into the lived experiences of people or communities (Eriksson & Kovalainen, 2008).

The advantage of using this strategy is that it provides a holistic understanding, offers rich detailed data, allows the study to focus on a specific group, provides insider information, is flexible, and can be used in multiple fields (Johannesson & Perjons, 2021). The ethnography research strategy was not used in this study.

4.5.6 Action research strategy

Action research is a strategy for investigating a problem in a particular context such as a school or organisation by taking action to solve the problem and then reflecting on the results. The process involves planning, taking action, observing, reflecting, modifying the plan, and taking further action if required (Burns, 2015). This research strategy is often used in educational settings to improve teaching and learning, it can be applied to other fields such as businesses, healthcare, and community development (Johannesson & Perjons, 2021). Action research is usually used by practitioners to improve their practice, it requires active participation from researchers and individuals or units experiencing the problem. This usually ensures that the research is relevant to the needs of society and findings are accepted and implemented. The

action research strategy involves four steps: planning, acting, observing, and reflecting and modifying (Burns, 2015). The action research strategy was not used in the study.

4.5.7 Archival research strategy

Archival research strategy refers to the methods and techniques used by researchers to locate, access and analyse primary source materials that are stored in archives (Ventresca, 2001). The primary sources that are stored in archives can be historical documents, photographs, letters, and other records (Pearce-Moses & Baty, 2005). Archival research often involves identifying relevant collections and creating research plans using various tools and methods, to analyse and interpret materials. The strategy includes using finding aids, identifying key individuals or organisations, utilising online resources, and consulting archivists and other experts. Archival research strategies are used to gain a deeper understanding of historical events or cultures (Roche, 2005).

The archival research can be used to:

- Collect original and unique information that cannot be found in secondary sources.
- Understand the perspective, context, and biases of primary sources.
- To validate and verify historical facts and events.
- Add complexity, depth, and nuance to historical understanding.
- Understand the perspectives of individuals and groups who were not traditionally included in history.

The advantage of the archival research strategy allows a thorough and accurate understanding of historical events and figures which can be beneficial to different fields such as history, sociology, and anthropology (Roche, 2005). The study focuses on resolving the current problem facing the national job markets, therefore, the archival research strategy was not used in this study.

Looking at the sample size and the type of data required, the researcher used online survey research in the form of questionnaires to collect data from participants (postgraduate students) and structured interview questions were designed for academic staff. The survey research strategy was employed to probe the problem, and a descriptive analysis was made to provide clear discussions or arguments.

4.6 TIME HORIZON

The framework investigates the timeline of the research project depending on the methodology chosen by the researcher. The time horizon represents different categories of whether data collection will happen once, twice, or repeatedly (Saunders *et al*., 2009). The time horizon is the time frame of the research, a period it takes to investigate an area of interest. The research objectives and type of research have an impact on the chosen time horizon for the study. The time horizons explain how many points in time a researcher is planning to gather data. There are two types of research horizons, longitudinal research and cross-sectional.

4.6.1 Longitudinal time horizon

The longitudinal time horizon uses different intervals or times to collect data. Longitudinal research is used to observe behaviour, attitude, and process and examine all changes over some time (Saunders *et al.,* 2012). The longitudinal research uses time series data, it is not restricted, samples are tested in different time intervals and new samples are prohibited to avoid inaccurate readings or results (Caruana *et al*., 2015). The research can be extended to a period of several years or decades, this allows a researcher to capture changes and patterns that may occur in the variables being studied and how they relate to one another. The advantages of longitudinal research include:

- Increased understanding of causality can help to establish cause-and-effect relationships between variables.
- Improve the accuracy of measurements by allowing the researcher to account for individual differences and changes that may occur over time.
- Increase statistical power by collecting multiple observations over time (Thomas, 2022).

However, the disadvantages of longitudinal research are time-consuming, expensive and participants may drop out of the study which can lead to biased results. The researcher did not use longitudinal research in the study.

4.6.2 Cross-sectional time horizon

Cross-sectional time horizon refers to a type of study design mostly used in research where data is collected and analysed from individuals or entities at a specific point in time (Levin, 2006). Cross-sectional time horizon also known as a snapshot is used to understand the characteristics, behaviour, or performance of a particular group at a given moment. The data collected using a

cross-sectional time horizon is used once-off to investigate a specific problem rather than over a period. This time horizon is used to analyse differences among groups of people, companies, or entities. The data collected can be used to compare variables such as income, age, industry, or location, among others (Levin, 2006). A cross-sectional time horizon provides a snapshot of characteristics at a specific point in time, it is useful for identifying trends or patterns within a group (Bryman, 2007). A cross-sectional horizon was employed in this study because the researcher was given a period of twelve months to collect data. The institutions issued a gatekeeper's letter and ethical clearance stating that the researcher was only allowed to collect data before the expiry date of ethical clearance. The researcher collected data once and analysed it to investigate challenges faced by participants at once. The data collection process happened once to avoid getting inconsistent findings from both postgraduate students and academic staff at the University of KwaZulu-Natal and the University of Zululand.

4.7 DATA COLLECTION METHOD

The data collection method is a technique used by researchers to get relevant information from participants, the collected data can be analysed, interpreted, and discussed to provide logical feedback on the researched phenomenon (Gerber-Nel *et al*., 2005). Data collection includes the process of collecting, measuring, and analysing variables of interest, collected data enables a researcher to fulfil research objectives (Kabir, 2016). The concept of data collection is employed to capture quality evidence that can be translated into credible answers (Kabir, 2006). Bar-llan (2001) observed that the quality, reliability, and validity of the study depend on the tools used to collect data which are not controlled by the researcher. A researcher needs to identify a study site for research where participants are located.

4.7.1 Study site

A study site is defined as the physical location or a place where the study will be carried out to gather relevant information (Klenke, 2016). In this research, the study site is in KwaZulu-Natal South Africa. The University of KwaZulu-Natal has campuses situated in Durban and Midlands in KwaZulu Natal Province. The study site is the University of KwaZulu-Natal's five campuses (Medical School, Howard College, Westville Campus, Edgewood Campus, and Scottsville Campus). The University of Zululand with two campuses is situated in the north of KwaZulu Natal Province. KwaDlangezwa Campus is located in Empangeni and the Richards Bay Campus is in Richards Bay town. After identifying the study site, a target population must be

identified. The research focused on postgraduate students and academic staff from universities mentioned above.

4.7.2 Target population

According to Herbert (2005), a target population is a group of people or units with specific characteristics that the researcher is interested in conducting a study on, the number of registered postgraduate students, academic staff at the University of KwaZulu-Natal and University of Zululand were the target population. At the time of the research, the University of KwaZulu-Natal's target population was 10 627 postgraduate students and 1331 academic staff, and the University of Zululand's target population was 3 604 postgraduate students and 277 academic staff, this was the total population for all campuses (UKZN, 2021; UNIZULU, 2021).

Table 4.3: Population size for University of KwaZulu-Natal and University of Zululand.

University	**Population size postgraduate students**	**Population size academic staff**
University of KwaZulu-Natal	10 627	1331
University of Zululand	3 604	277
Total	**14 231**	**1608**

Researcher's own work (2023)

The survey research strategy was employed to collect data in the form of interviews and questionnaires.

4.7.3 Sampling

Sampling is taking a certain portion of the target population and using it to conduct analysis (Herbert, 2005). It is a statistical method of selecting a subset of individuals from a larger population to represent and make inferences about the entire group. The goal of sampling is to select a representative sample that accurately reflects the characteristics of the population. The type of sampling includes simple random sampling, stratified sampling, cluster sampling, systematic sampling, and convenience sampling. Simple random sampling says every unit or individual of the population has an equal and independent chance of being selected. In stratified sampling, the population is divided into subgroups (strata) based on identified characteristics, a sample is selected from the stratum. In cluster sampling, the population is divided into groups (clusters), and a sample is selected from the cluster. In systematic sampling, a regular intervals

selection is used whereas in convenient sampling, units or individuals are selected due to easy access.

A sample size is a small portion taken from the target population to represent the entire population (Yin, 2009). A sample size is the number of units that are carefully chosen to take part in the study. The University of KwaZulu-Natal survey had five units, within the institution, there are students from Agriculture, Engineering and Science, Health Sciences, Humanities and Law and Management Studies plus academic staff members. The University of Zululand survey had five units, academic staff members, and students from Arts, Commerce, Administration and Law, Education, Science, Agriculture and Engineering. Students were divided into subgroups; the subgroups were based on the qualifications they were currently registered for in the institutions. In the subgroups, students were selected randomly to participate in the study. A researcher used survey monkey calculator to calculate for sample size, the calculator used 95% confidence level, 5% margin of error to obtain students sample size for each institution. Using postgraduate total population of 10 627, the university of KwaZulu-Natal sample size was 371. The University of Zululand population was 3 604 and sample size of 348.

Table 4.4: Academic staff and registered postgraduate students by College/ Faculty

Institution	**Student population size**	**Student sample size**	**Staff population size**	**Staff sample size**
UKZN	10 627	371	1331	4
UNIZULU	3 604	348	277	4
TOTAL	14 231	719	1608	8

The sample size was calculated using survey monkey sample size calculator.

The sampling method consists of two sampling types: non-probability sampling and probability sampling.

4.7.3.1 Non-probability sampling

Non-probability sampling is a method of sampling where the solution of the sample is not based on random selection but on the judgement of the researcher (Brick, 2015). Non-probability sampling methods are commonly used when it is difficult or impractical to use probability sampling methods. Examples of non-probability sampling methods are convenience sampling, snowball sampling, quota sampling, and purposive sampling.

Convenience sampling involves selecting a sample based on what is convenient and accessible (Etikan, 2016). Snowball sampling involves selecting participants who can help the researcher get other participants. Researchers get individuals who can refer others to take part in the study (Dragon & Isaic-Maniu, 2013). Quota sampling involves selecting a sample that reflects the characteristics of the population, a researcher may select participants based on age, gender, or ethnicity to ensure the sample represents the population. Purposive sampling involves selecting a sample based on a specific purpose, and participants are chosen based on their level of expertise or experience in a particular area (Etikan, 2016). The study used quota sampling since the colleges/faculties were divided into four parts, this was a non-probability sampling. For qualitative research, quota sampling was utilised where senior staff members in their department with management experience were requested to participate. The academic staff who participated in the study were either professors, academic leaders, departmental heads, or senior lecturers. They were selected based on a high level of experience in their area of expertise because a researcher was aiming to get more information based on experience and the number of years spent in academia.

4.7.3.2 Probability sampling

Probability sampling is a sampling technique in statistics where each member of a population has a known and equal chance of being selected for inclusion in a sample (Showkat & Parveen, 2017). The technique is used when the researcher intends to make inferences about investigated population (Acharya *et al*., 2013). The probability sampling method gives assurance to the researcher that each segment of the population is represented in the sample by using a random selection process to choose sample components. This allows a member of the population to stand an equal opportunity of being selected (Adwok, 2015). Prior to selecting a probability sample, the sampling frame must be chosen, and the sample frame constitutes those individuals or units who have a chance to be selected when using the sample selection procedure (Elder, 2009).

This means that the selection of participants is not based on convenience or judgment but is determined by the laws of probability. The common methods of probability sampling include simple random sampling, stratified random sampling, systematic sampling, and cluster sampling. In simple random sampling, each member of the population is given an equal chance of being selected through a random process, such as using a random number generator (Adwok, 2015). In stratified random sampling, the population is divided into subgroups called strata, and

then a random sample is selected from each stratum. This technique reduces sampling error since a relevant portion representing a specific population is ensured (Elder, 2009).

Systematic sampling involves selecting members of a population at regular intervals, such as every tenth person using the n^{th} value of the population. The population is arranged in a specific order, the value n^{th} = represents the population and divide it by sample size (Etikan & Bala, 2017). In cluster sampling, the population is divided into clusters, and a random sample of clusters is selected. The total members of the selected clusters are included in the sample.

Part of this research used a quantitative data-collecting method, however, the students were divided into subgroups called clusters, and the quota sampling method was employed. The University of KwaZulu-Natal as cluster one had four colleges: the Colleges of Agriculture, Engineering and Science, College of Law and Management Studies, College of Health Science, and College of Humanities. The University of Zululand as cluster two had four subgroups the Faculty of Commerce, Administration and Law, Faculty of Science, Agriculture and Engineering, Faculty of Education, and Faculty of Arts. The University of KwaZulu-Natal students were randomly selected from cluster one (postgraduates students from College of Agriculture, Engineering and Science, postgraduate students from College of Health Sciences, postgraduate students from College of Humanities, postgraduate students from College of Law and Management Studies), all four colleges were fairly represented. The University of Zululand students were randomly selected from cluster two (postgraduate students from Faculty of Art, postgraduate students from Faculty of Commerce, Administration and Law, postgraduate students from Faculty of Education, postgraduate students from Faculty of Science, Agriculture and Engineering), and all four faculties were fairly represented. Quota sampling was advantageous in this research since students were able to respond to questions based on the experience they had from their college/ Faculty. The advantages of using quota sampling in this research are that the method was easy to use, and the method represented the population fairly and was suitable for analysis (Kothari, 2004).

4.7.3.3 Observations

The observation data collection method refers to a research technique where a researcher reads and documents behaviours, actions, and characteristics of individuals or groups being studied. The observation method is used in the fields of psychology, sociology, education, and anthropology (Kawulich, 2012). There are different ways to use when collecting data using observation methods such as naturalistic observation, structured observation, participatory

observation, non-participant observation, direct observation and indirect observation (Kawulich, 2012; Ciesielska *et al*., 2018).

The naturalistic observation method is used to observe groups or individuals in their natural environment without interfering with their behaviour. The structured observation method is used to observe individuals or groups in a controlled setting where specific behaviours and actions are observed and recorded in a standardised manner. Participatory observation is when the researcher becomes part of the group being studied and actively participates in their activities while observing and recording their behaviour. Non-participant observation observes groups or individuals from a distance. Direct observation is when a researcher directly observes the behaviour and actions of individuals or groups. In indirect observation, the researcher observes the consequences of behaviour or actions rather than the behaviour itself (Ciesielska *et al*., 2018). In the observation research method, a researcher must maintain an objective perspective, avoid bias, and take detailed information throughout the observation process. The researcher did not use the observation method in the research study because academic staff participants were required to share information based on experience which require unbiased researcher collect reliable findings. Students responded using questionnaire, therefore observation method was not possible to use.

4.7.4 Secondary data

Secondary data collection involves gathering information from existing sources that have already been collected or published (Kabir, 2016). Collecting secondary data is less expensive to obtain and utilise compared to primary data since the information is captured and stored for future researchers to have access to it for further research (Martins *et al*., 2018). The secondary data is a viable option and provides an advantage when a researcher has limited time and resources for specific research. Secondary data allows the researcher to follow steps and principles used by the primary researcher since the study utilises primary data (Johnston, 2014). Using literature in research is part of utilising secondary data, and the secondary data can be collected using literature review, public records, online databases, company reports, social media, surveys, books, research articles, statistical data, and biographies (Kabir, 2016). The secondary data were used to support the needs of the study, identify gap of the study, get more knowledge on similar studies conducted in other countries, and get in-depth knowledge about entrepreneurship education. However, the secondary data collection method was not used in

this study as a data collecting method since the aim was to get primary data from postgraduate students and academic staff from University of KwaZulu-Natal and University of Zululand.

4.7.5 Interviews

Interviews are a common method of data collection in research studies. It is a conversation between a researcher and participant, and it involves engaging participants by asking questions and interchanging views on a researched phenomenon (Alshenqeeti, 2014). Abawi (2017) said data should be collected in the form of recording, listening to individuals, or filming responses. Several types of interviews can be used including structured interviews, semi-structured interviews, in-depth interviews, and focused group interviews.

In a structured interview, the researcher asks a set of predetermined questions to all participants in the same order, and the questions are usually closed-ended. However, a participant may be requested to provide more information if the answer is probing. In a semi-structured interview, a researcher has a set of questions, but the participant is allowed to respond in their own words and provide additional information if there is more in-depth information to share concerning studied phenomenon. In a semi-structured interview, a researcher can ask follow-up questions or modify questions to better get clarity on the participants' responses. In-depth interviews are less formal, the method is used to collect complex sources of information that are opinion-based. Focus group discussion involves structured questions whose aim is to stimulate engagement on a specific topic. The group setting allows members to be open and the interaction enriches the quantity and quality of information required. The advantage of using interviews is that participants are not limited to one response, they are free to respond to questions, and can suggest other ways to improve the study which is not covered by quantitative questions. The researcher utilised interviews as a data collection tool, the interview questions were semi-structured to allow participants to provide detailed information on the studied phenomenon.

4.7.6 Questionnaires

A questionnaire is a data-collecting instrument that is used in various fields to collect data. It consists of a set of questions that are designed to collect information about a specific topic (Kabir, 2016). The advantage of a questionnaire is that it provides privacy to participants, is cheaper to use, and consists of standardised answers which makes it easy to compile data. Questionnaires are used in quantitative research to collect data from a large sample size, it may

reflect accurate views of participants (Roopa & Rani, 2012). The questionnaire instrument allows quantitative data to be consistent, standardised, and coherent, the instrument defines the purpose of objectives of the study (Roopa & Rani, 2012).

In a questionnaire, participants' identities are protected, confidential, and voluntary participation is emphasised (McLeod, 2018). The questionnaire method is used in various fields such as social science, market research, and psychology. The questions in a questionnaire may be open-ended where participants can answer in their own words or closed-ended questions where participants are given options to choose from (McLeod, 2018). Questionnaires can be administered in person, by email, or online, and they can be used to collect a wide range of data including demographic information, attitudes, behaviours, and experiences (Mbambo, 2005). The data collected through questionnaires can answer research questions, identify trends, and make informed decisions. The questionnaire data collection instrument was used in the study as a data collection method. Utilising a questionnaire to get information from students was appropriate to investigate if it is possible to expand entrepreneurship education to boost students' innovation by evaluating the curriculum and suggesting adding entrepreneurship education to other qualifications in tertiary institutions. The questionnaire consists of two sections. Section A was a biographical data looking at gender, age, year of study, and nationality. Section B comprised research questions such as the existing education in terms of innovation, knowledge contribution to business development and innovation ideas, attitude towards innovation and entrepreneurship education, and the impact of entrepreneurship education on students' innovation.

A mixed method technique using online questionnaires and interviews was employed to collect data. A Likert scale form questionnaire was designed. The Likert scale had a scale ranging from 1 to 5 where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 4 = strongly agree. Semi-structured interview questions aiming to address objectives were prepared to get in-depth information from participants. The advantage of using a questionnaire is that it is quick and easy to collect data, is practical, covers anonymity, is reliable, covers all aspects of a topic, and is accurate. The disadvantage is that participants might be dishonest, and closed questions may limit people's views and participants might skip questions (Iqbal *et al.*, 2012).

A pilot study of five questionnaires was shared with postgraduate students and staff from different colleges to check how long it would take to answer all questions, check if questions were easy to understand and if questions covered all content, and modify errors. Initially a

researcher estimated the time to complete the questionnaire is 15 minutes, however after pilot study it was discovered that 20 minutes was sufficient to answer the questionnaire. Few changes were made to accommodate feedback provided by participants during pilot study. A total of 714 postgraduate students and eight staff members responded to the survey which constituted to 99% response rate combined from both academic staff and postgraduate students.

4.8 DATA ANALYSIS

Data analysis is an important component of the larger field of data science, which encompasses a range of activities related to acquiring, processing, and understanding data (Brodie, 2019). Data analysis is the process of systematically examining and interpreting data to extract meaningful insights and knowledge. It involves collecting, cleaning, processing, and modelling data using a variety of techniques including statistical analysis, machine learning, and data visualisation (Richmond, 2006). The main goal of data analysis is to gain a deeper understanding of the data and to use this understanding to inform decision-making, improve processes, and identify patterns and trends that may not be immediately apparent. This can be done in a wide range of fields, including business, finance, healthcare, and social sciences (Kawulich, 2004). Other common techniques used in data analysis include data cleaning and pre-processing, exploratory data analysis (EDA), regression analysis, hypothesis testing, clustering, and predictive modelling (Kawulich, 2004). The choice of technique depends on the data and questions being asked. Data analysis used in this study consists of descriptive statistics, inferential statistics conducted using SPSS version 24, and NVivo thematic method.

4.8.1 Descriptive statistics analysis

Descriptive statistics is a branch of statistics that deals with summarising and describing the main characteristics of a dataset (Rashid, 2021). Descriptive statistics can be divided into two main categories: measures of central tendency and measures of variability. It is used to provide a clear and concise summary of the data and describe properties of central tendency such as mean, median, and mode which can help in understanding the overall patterns and trends within the data. Descriptive statistics can be used to navigate measures of variability or dispersion such as standard deviation, range, variance, and quartile deviation (Rashid, 2021). The mean value is the sum of all values in a dataset divided by the total number of values, therefore mean value presents the data value average (Miller, 2013). Variance measures how data is spread out from the mean value. Standard deviation is used to describe the spread of data set around the mean value, the deviation of values between a single observation and mean value (Jaggi, 2003).

The table 4.5 below provide steps of descriptive data representation format for University of KwaZulu-Natal and University of Zululand.

Table 4.5: Data representation format for University of KwaZulu-Natal and University of Zululand.

Steps followed	**Process followed in chronological order**
Step 1	State the objective.
Step 2	Design a table with questions addressing the objective.
Step 3	The table include the total sample, mean average and standard deviation.
Step 4	Discuss research findings.
Step 5	Linking research findings with literature and theory.
Step 6	The graph representing findings summary with respect to each objective.

Researcher's own work (2023).

4.8.2 Inferential statistics analysis

Inferential statistics analysis can be used in a variety of settings, including scientific research, business, and social sciences, to make predictions and draw conclusions about populations based on samples (Rashid, 2021). Inferential statistics can generalise information from a sample to a population using results and analysis obtained from the study. The method can use probability theory to determine the properties of the population using the properties of the sample. The inferential statistics method can predict, compare, and test relationships among variables (Sutanapong & Louangrath, 2015). Examples of inferential statistics are t-test, ANOVA, and regression analysis.

T-test is a statistical test used to determine if there is a significant difference between the means of two groups or samples (Tu, 2007). The t-test is based on the t-distribution, which is a probability distribution that is used when the population variance is unknown. T-test (using one sample) tests if there is a significant difference from scalar values. A T-test (using two samples) is used to compare the mean values of two independent groups (Freeman & Julious, 2010). Analysis of variance (ANOVA) is a statistical method used to test whether the means of three or more groups are equal. It compares the variance between groups to the variance within

groups to determine if there is a significant difference between the means of the groups (Walde, 2015).

Regression analysis is a method used to model the relationship between a dependent variable and one or more independent variables. The regression analysis method can determine how much one variable is affected by changes in another variable. Regression analysis can be used to make predictions, identify relationships between variables, and determine the strength of the relationship between the variables.

4.8.3 NVivo method analysis

NVivo is a software program used for qualitative data analysis, particularly for managing and analysing non-numerical data, such as text, audio, and video. NVivo is a helpful and reliable tool for organising, sorting, and analysing data (Dhakal, 2022). NVivo improves the quality of analysis by offering features and tools to structure and organise collected information (Dhakal, 2022). She further observed that a significant step of analysis in qualitative research is to start with dataset coding and creating sections based on categories. This method allows a researcher to code important information by tagging it using a node. The advantage of using the NVivo tool is that it permits users to see data from a global view in a detailed manner that may be hard to access when using a different analysing tool (Elster, 2020).

The NVivo analysis is commonly used in research fields such as social sciences, healthcare, and market research. It allows users to import and organise their data, such as transcripts of interviews, survey responses, or field notes, into a structured format (Nowell *et al*., 2017). It provides a range of tools for coding, categorising, and analysing the data. The NVivo analysing method can provide insightful analysis that can help respond to research questions (Judger, 2016).

A total of 719 questionnaires was sent out to students via links however only 714 postgraduate students participated. Exactly 371 questionnaires were sent to the University of KwaZulu-Natal postgraduate students but only 368 postgraduate students responded and 348 questionnaire were sent to the University of Zululand students and 346 postgraduate students responded. The interviews were conducted to get more information from academic staff, four academic staff representing the University of Zululand were interviewed and another four academic staff representing the University of KwaZulu-Natal were interviewed. The sample was taken from

two universities, aiming for part of the academic staff to participate and postgraduate students from all colleges/ faculties.

The demographic description focused on age, gender, level of study, race, and college/ faculty a student registered in. Age was divided into five groups: 1 = 20 – 24, 2 = 25 – 29, 3 = 30 – 34, 4 = 35 – 39, 5 = 40 and above. Gender: 1 = Male, 2 = Female. Level of study: 1 = 4th year/ PGDip/ Honours, 2 = Masters, 3 = PhD. Race: 1 = Black, 2 = Coloured, 3 = Indian, 4 = White. College/ faculties: this section was structured in a different way to distinguish the college/ faculty model for each university.

Descriptive statistics were used to reveal common characteristics between the sample and the original population. In the analysis, standard deviation and mean differences were shown. A Likert scale was used to analyse the factors. The Statistical Package for the Social Sciences (SPSS) was used for quantitative data analysis and descriptive statistics to describe common characteristics in the sample including standard deviation, mean score, and variance. Qualitative data were recorded from participants during interviews, and later transcribed. Analysis was conducted using the NVivo programme.

4.9 RELIABILITY

Reliability focuses on the consistency, stability, and dependability of measuring data adopted from the study (Heale & Twycross, 2015). Reliability depends on the extent of repeatable measurements on different occasions under a different setup or condition (Edwin, 2019). He further emphasised that measurements that are done over a variety of conditions but produce stable measurements reflect reliability. Several factors can influence the reliability of a study, including the research design, sample size, data collection methods, statistical analysis, and potential sources of bias (Saunders *et al*., 2009). Assessing the reliability of a study involves evaluating its ability to produce consistent and accurate results.

Drost (2011) reveals that reliability from research can only be affected by two errors: systematic error and random error. Systematic error, known as systematic bias, refers to a type of error that consistently affects the results of a study or experiment in a particular direction (Barlow, 2002). Systematic errors are caused by a flaw or problem in the study design or measurement instruments. Systematic errors can arise from various sources, such as instrumentation, sampling bias, selection bias, measurement bias, and experiment design (Barlow, 2002).

A random error is an unpredictable variation in a measurement or observation that occurs due to chance factors, such as variations in measurement instruments, environmental conditions, or human error (Grellety & Golden, 2016). Random errors are caused by chance and can vary in magnitude and direction. Errors can occur in any measurement, and they can affect both the accuracy and precision of the result.

The researcher used Cronbach's Alpha Coefficient to measure the reliability of each construct. The correlation coefficient will be used to test the reliability of the survey and to ensure consistency in results.

4.10 VALIDITY

Validity is the degree to which a measurement tool, such as a survey, questionnaire, or test, accurately measures what it is intended to measure. In research, validity is an important aspect of ensuring that the results obtained are reliable and accurate (Babbie & Mouton, 2002). Validity in research refers to the degree to which a study measures what it claims to measure. In this research, the survey research using questionnaires and interviews was used since it was accepted to have no risk as a data collecting method. Interviews allowed academic staff to share their views whereas questionnaires consisting of closed-ended questions were shared with students to get their opinion or personal feelings on the studied phenomenon. The input and professional advice were requested from a statistician to check if the questions measured content validity.

The pilot study was conducted with both academic staff and postgraduate students to minimise errors in the questions. The feedback received from the participants was used to correct errors in the questionnaire and interview schedule. The participants who took part in the pilot study did not participate in data collection. The postgraduate students were asked to respond to questions alone and independently without being interrupted or assisted by other students to avoid bias. The participants were allowed one chance to respond to the questionnaire via a link, and the link only allowed one response per participant to ensure reliability, validity and avoid bias in the research. Validity is a fundamental aspect of research; it ensures that the findings and conclusions of the study are accurate and reliable.

4.11 LIMITATIONS OF THE STUDY

The research study focuses on the University of KwaZulu-Natal and University of Zululand students and academic staff only. The constraints were caused by difficulties experienced by the researcher when applying for ethical clearance to other institutions. The study may have yielded different results if more universities were part of the study, and if the universities of technology and technical vocational education and training were included in the study. Due to limited resources and funding, the researcher had no choice but to focus on two universities situated in KwaZulu Natal Province. Due to a delay in response when applying for gatekeeper letters to other institutions, the researcher decided to use only two universities. The COVID-19 pandemic happened in 2020 and changed operations in other institutions. It was difficult to get permits to access other institutions. Shortage of funds limited the researcher from traveling physically to other institutions to request permission and emails and other means of communication were not responded to. Therefore, the results could have been different if other students from different institutions were invited or included in the study.

4.12 ETHICAL CONSIDERATIONS

The gatekeeper's letter was obtained from the Office of the Registrar at the University of KwaZulu-Natal. Prior to obtaining the ethical approval, the gatekeepers' letter from the University of KwaZulu-Natal and the University of Zululand was requested by sending an application for approval to the office of the Registrar to the institutions. The ethical approval for this research was obtained after getting approval from the University of KwaZulu-Natal and the University of Zululand Ethics Committee. The ethical clearance was approved, and the protocol reference number is **HSSREC/ 00004152/ 2022**. During data collection, the researcher emphasised the importance of privacy, the safety of identity, and rights and informed participants that participation was voluntary, and no money may be expected from participating in the study.

The informed consent form was given to every academic staff who was participating. Informed consent was attached on the front page of the questionnaire to allow students to read it through before participating in the study. This was emphasised to make sure their human dignity was always maintained and to allow participants to get adequate information before participating in the study. The rights of participants were explained to them prior to the interview and they were asked to sign the informed consent forms.

4.13 CHAPTER SUMMARY

The research was motivated by the escalating unemployment rate, graduate unemployment, the potential for innovation development, and entrepreneurship education curriculum development in the South African higher education sphere. The aim was to investigate if entrepreneurship education could produce motivated business owners who can have significant contributions to job creation, economic development, and society, nationally and even globally. The researcher identified a gap to investigate if expanding entrepreneurship education to boost students' innovation in South African universities could assist in bridging the gap among university curriculum, innovation, job market, and the world of the fourth industrial revolution (4IR). Several researchers (Wong *et al*. 2007; Etzkowitz & Zhou, 2007; Fatoki & Chindoga, 2011; and Sahut & Peris-Ortiz, 2014) believe that entrepreneurship education could have a major contribution to innovation.

The chapter aimed to outline procedures used in this research such as philosophy, research design and techniques. The research used pragmatism research philosophy since it allow a researcher to get in-depth information from participants, the combination of interpretivism and positivism and allow quantitative and qualitative data collection. Since the research require both qualitative and quantitative data, the mixed method approach was beneficial for this research. Expanding entrepreneurship education could assist students from other colleges/ faculties to use skills obtained from their qualifications plus entrepreneurship education to start small businesses. Entrepreneurship education could spark creativity among students and that can lead to innovative ideas and new business ventures. Cross-section time horizon was used to guide data collection at a specific point in time and the data was used once-off to investigate a researched phenomenon.

The study used a mixed method design in the form of interviews (for academic staff) and questionnaire survey (for students). The mixed methods strategy reduces possible false information and errors, a survey research strategy was used since it allow large sample of data. This is achieved by getting different forms of data from participants which complement each other by sharing information that represents the population's point of view. The study site is in KwaZulu Natal, South Africa, University of KwaZulu-Natal and University of Zululand, the large population was postgraduate students and academic staff. A total sample size of 714 students responded to questions which amounts to a 99% response rate. A total of 368 students were from the University of KwaZulu-Natal, and 346 students were from the University of

Zululand. Eight academic staff participated in the research, which amounted to a 100% response rate for interviews. Academic staff were interviewed to share personal experiences about the curriculum they teach currently. Quota sampling was used to get senior academic to participate from different respective departments. Quota sampling was used for quantitative data since students were divided into colleges/ faculties they registered with.

Data were captured during data collection and analysed after completing data collection. Quantitative data was collected using questionnaires and analysed using SPSS version 24 and qualitative data was collected using interviews and analysed using the NVivo analysis method. The researcher ensured that ethical principles, honesty, and professionalism were adhered to by appealing to participants to answer questions independently to ensure validity.

Chapter 5 presents the results obtained during the data collection period.

CHAPTER 5

QUANTITATIVE DATA ANALYSIS AND DISCUSSIONS

5.1 INTRODUCTION

The previous chapter discussed the methodology employed in the study from the early stages of research until the data collection stage. This chapter focuses on research findings responding to the research objectives of the study. Data analysis responding to each objective is displayed and followed by a detailed discussion to elaborate findings. The research findings are divided into two sections, namely, Chapter 5 which presents quantitative data collected using a questionnaire as a data collecting instrument, and Chapter 6 which presents qualitative data collected using interviews as a data collecting instrument.

In Chapter 5, there are two parts; Part 1 presents demographic information, and Part 2 presents descriptive data followed by critical discussions of findings. Chapter 6 is the interview data section with eight academic staff participants. The responses were captured and coded; participants were coded from Participant 1 to Participant 8.

5.2 RESEARCH OBJECTIVES

The main objective of the research was to investigate if expanding entrepreneurship education could assist in boosting students' innovation in South African universities. The research was conducted by designing questions that could be directly linked with the objectives of the study. The target population was postgraduate students and academic staff from the University of KwaZulu-Natal and the University of Zululand. The universities were chosen because they were both in KwaZulu Natal Province. It was easy for the researcher to reach the location, to collect data, and limited funds were a factor. Postgraduate students were the best candidates to participate in the study because they got first degrees, have been exposed to job hunting, understand curriculum implications, and were deemed capable of providing constructive feedback on the topic.

Davey *et al.* (2011) argued that entrepreneurship education develops goal-driven entrepreneurs, therefore, entrepreneurship education may give students alternative career options. The Department of Higher Education and Training is encouraging universities to promote student entrepreneurship and students must develop innovative businesses (DHET, 2020). The research

findings obtained could give South African Universities a clear picture of how students think about the proposal of adding entrepreneurship education to other qualifications to expand career options since business can become a permanent career choice. Findings could further suggest curriculum development that could integrate innovation, entrepreneurship education, and Information Technology (IT) to produce creative and innovative future business leaders. Findings could support the Department of Higher Education and Training initiative that speaks to student entrepreneurship development in South African universities (Chimucheka, 2014). Providing the entire university community with entrepreneurship education will speed up the process of getting students interested in entrepreneurship as a permanent career choice and the Department of Higher Education and Training vision will be achieved.

Findings could pursue other faculties/colleges to evaluate curriculum and introduce entrepreneurship education to other qualifications. The initiative could give South African universities an opportunity to teach entrepreneurship to all undergraduate qualifications, organise workshops, seminars, and programmes that enhance and emphasise practical work towards innovative venture creation. Research findings could suggest adding entrepreneurship education to other qualifications to create awareness about the state of the economy around the world and the significance of entrepreneurship towards changing the state of the economy. Entrepreneurship education may help students to think entrepreneurially using skills and the knowledge they obtained from their curriculum. Adding entrepreneurship education could be an advantage in increasing the number of majors in a qualification; this is an added advantage to institutions because students will have a variety of skills. The promotion of entrepreneurship in higher education is in the Department of Higher Education and Training public policy, therefore, findings could assist in strengthening the policy.

To fulfil the main objective, the investigated objectives were to:

1. Determine if the existing education equips students with innovation skills across the institution.
2. Determine if knowledge acquired from qualification exposes students to innovative ideas.
3. Investigate the assumptions/ views the students have towards innovative entrepreneurship.
4. Determine the attitude students have towards innovation and entrepreneurship education.
5. Determine if entrepreneurship education knowledge can help boost innovation among students.

5.3 RESEARCH FINDINGS AND DISCUSSIONS

All the research findings below reflect information collected from participants (postgraduate students) from the University of KwaZulu-Natal and the University of Zululand who took part in the research.

5.3.1 Demographic data

This section focuses on the demographic description of participants including age, gender, college/ faculty, level of study and race. The demographic data were only collected from postgraduate students using a questionnaire. The descriptions were utilised to make comparisons if there is significant influence made by age, gender, or race.

5.3.1.1 Participants gender

Table 6 below shows that 51% of females and 49% of males participated. According to Stats SA (2021), South Africa is a country with more females than males. The number of females who participated was almost equal to the number of males, therefore, postgraduate students from the University of Zululand were fairly represented in terms of gender. The University of KwaZulu-Natal got 55% of females and 45% of males participating. The 10% difference is the evidence supporting Stats SA's statement which shows that South Africa is a female-dominated country, and it shows that females were more willing to participate, or it could be the institution got more female postgraduates than males.

Table 5.1: Gender of Participants

University of KwaZulu-Natal		
Gender	**Number of participants (postgraduate students)**	**Percentage %**
Female	206	56%
Male	162	44%
Total	368	100%
University of Zululand		
Female	177	51%
Male	169	49%
Total	346	100%

Researcher's own work (2023).

5.3.1.2 Participants age

This section looks at the age of participants. The categories were divided into five groups to allow comparison of decision-making versus age group. This was to check if age has a significant impact on decision-making. Table 5.2 below for University of KwaZulu-Natal shows that 67.7% were postgraduate students between 20 and 24 years; 21.5% were postgraduate students between 25 and 29 years, 7.6% were between 30 and 34 years, 2.2% were between ages of 35 and 40 years and 1.0% were 41 years and above postgraduate students. For University of Zululand, it shows that 66.5% were postgraduate students between the ages of 20 and 24 years, 28.0% were postgraduate students between 25 and 29 years, 4.3% were between 30 and 34 years, 1,2% were between the ages of 35 and 40 years and no one responded at the age of 41 and above.

Table 5.2: Participants' age

Age (yrs)- UKZN	**Students participated**	**Percentage %**	**Cumulative%**
20 – 24	249	67.7%	67.7
25 – 29	79	21.5%	89.2
30 – 34	28	7.6%	96.8
35 – 40	8	2.2%	99
41 and above	4	1.0%	100
Total	368	100%	
Age (yrs) - UNIZULU			
20 – 24	230	66.5%	66.5
25 – 29	97	28%	94.5
30 – 34	15	4.3%	98.8
35 – 40	4	1.2%	100
41 and above	0	0%	

Researcher's own work (2023)

5.3.1.3 Participants race

The participants were divided into four groups, and this was done to allow the researcher to compare decision-making against the race of participants. Race could have a significant impact on decision making, perceived social norms where students grow up, and beliefs of an ethnic

group could shape how students behave towards the researched phenomenon. Table 5.3 below shows that the University of KwaZulu-Natal had 97.8% black postgraduate students who participated in the study, 0.3% represented coloured postgraduate students, 1.4% were Indian postgraduate students and 0.5% represented white postgraduate students. The University of KwaZulu-Natal is an institution dominated by black students in general, therefore, getting data dominated by black students was expected.

At the University of Zululand, 99.1% of participants were black students as the university is in the deep rural area North of KwaZulu-Natal. The coloured population constituted 0.3% of participants, 0.3% represented Indians who participated in the study and 0.3% were white postgraduates who participated in the study. Coloureds, Indians, and whites had an equal number of participants. Hence, findings reveal blacks as the majority of participants.

Table 5.3: Participants race

Race UKZN	**Students participated**	**Percentage%**	**Valid %**	**Cumulative %**
Black	360	97.8%	97.8	97.8
Coloured	1	0.3%	0.3	98.1
Indian	5	1.4%	1.4	99.5
White	2	0.5%	0.5	100
Total	**368**	**100%**	**100**	
Race UNIZULU				
	Students participated	**Percentage**	**Valid %**	**Cumulative %**
Black	343	99.1%	99.1	99.1
Coloured	1	0.3%	0.3	99.4
Indian	1	0.3%	0.3	99.7
White	1	0.3%	0.3	100
Total	**346**	**100**	**100**	

Researcher's own work (2023)

5.3.1.4 Participants College/Faculty

The participants were divided according to the number of colleges or faculties depending on the institution. The University of KwaZulu-Natal has four Colleges: College of Agriculture, Engineering and Science (CAES), College of Health Sciences (CHS), College of Humanities (CH) and College of Law and Management Studies (CLMS). On the other hand, the University of Zululand has four faculties: the Faculty of Arts (FA), Faculty of Commerce, Administration and Law (FCAL), Faculty of Education (FE) and Faculty of Science, Agriculture and Engineering (FSAE). The participants were divided into sub-groups called strata to understand their backgrounds and areas of expertise.

Table 5.4: Participants College/ Faculty

College UKZN	**Number of student participants**	**Percentage %**	**Cumulative %**
CAES	93	25.3%	25.3
CHS	88	23.9%	49.2
CH	87	23.6%	72.8
CLMS	100	27.2%	100
Total	**368**	**100%**	
Faculty UNIZULU	**Number of student participants**	**Percentage %**	**Cumulative %**
FA	87	25.1%	25.1
FCAL	89	25.7%	50.8
FE	89	25.7%	76.5
FSAE	81	23.4%	100
Total	**346**	**100%**	

Researcher's own work (2023)

5.3.1.5 Participants' level of study

The participants were separated according to level of study, Level 1: 4th year, Postgraduate diplomas and Honours, Level 2: Masters, Level 3: PhD. The system was used for both institutions, the University of KwaZulu-Natal and the University of Zululand. The table below shows the distribution per level.

Table 5.5: Participants' level of study

Level of study UKZN	**Number of student participants**	**Percentage %**	**Cumulative %**
4TH year/PG Dip/ Honours	254	69.0%	69.0
Masters	73	19.8%	88.8
PhD	41	11.2%	100
Total	**368**	**100%**	
Level of study UNIZULU	**Number of student participants**	**Percentage %**	**Cumulative %**
4TH year/PG Dip/ Honours	317	91.6%	91,6
Masters	26	7.5%	99.2
PhD	3	0.88%	100
Total	**346**	**100%**	

Researcher's own work (2023)

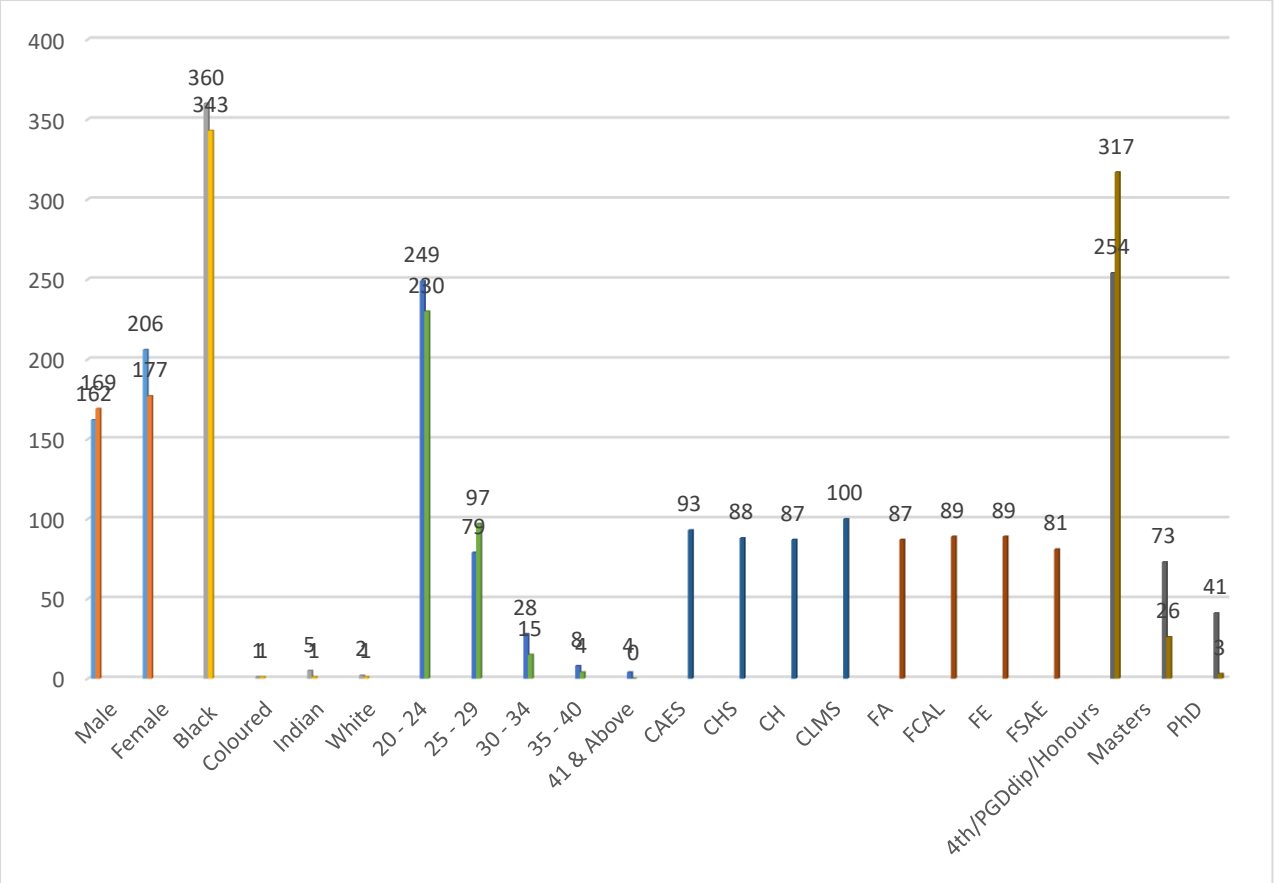
The demographic data were presented in the tables above reflecting the number of postgraduate students who participated in the research. Demographic data reflected gender, race, age, college/faculty and level of study. From the data, it was revealed that females were more than males. In terms of race, black students were more than other races, this is because both universities are in KwaZulu-Natal Province where black people dominate society. In the age group of 20 – 24, postgraduates were more involved, more than 66% participated in this study. That age group dominates the universities; hence many students were between the ages of 20 and 24.

The number of postgraduate students per college/faculty was evenly distributed, however, numbers were not equal across colleges because random sampling was used resulting in all students having an equal chance of being chosen to participate in the study. The research was dominated by students from 4th year/PGDip/Honours. This group of postgraduate students was easy to get hold of since they had group assessments and other activities that kept them together.

The Master's and PhD students have individual projects and as such, do not necessarily have things that push them to regular communication with other students.

Figure 5.1 below reflects the demographical summary of gender, race, and age of postgraduate participants from the University of KwaZulu-Natal and the University of Zululand.

Figure 5.1: The demographic findings summary for UKZN and UNIZULU



5.3.2 Descriptive data analysis

Descriptive data analysis is a statistical method that involves analysing, summarising, and presenting data to gain insights and information about the patterns, characteristics, and behaviour of the studied phenomenon. This is done to understand common traits between the parent population and the researched sample (Jaggi, 2003). Furthermore, it is done to understand and describe data sets to identify relationships, trends, and other notable features within the data set. The collected data can be analysed statistically and presented in the form of tables or graphs (Jaggi, 2003). Descriptive data analysis aims to provide an accurate and

comprehensive view of the data to allow the researcher to make a research-supported decision based on the information gained from the analysis.

After analysing data, tables were used to show standard deviations and different mean values obtained to answer research objectives. The five objectives were aimed to determine if expanding entrepreneurship education knowledge can help boost innovation among students. All the objectives were linked with Theory U which says, "leading from the future as it emerges", the theory was created by Otto Scharmer (2009). Theory U consists of five components (Co-initiating, Co-sensing, Co-presencing, Co-creating, and Co-evolving) each component is linked with the objective of the study.

The link between objectives and theory

Objective 1: To determine if the existing education equips students with innovation skills across the institution.

Component 1: Focuses on teaching individuals or groups to understand where they are currently.

Objective 2: To determine if knowledge acquired from qualification exposes students to innovative ideas.

Component 2: It is called a period of observing and discovering potential . Aimed to investigate if current qualifications stimulate innovation.

Objective 3: To investigate the assumptions/views the students have towards innovative entrepreneurship.

Component 3: Period of letting go of old habits, connecting to source, and reflecting on personal mission and commitment.

Objective 4: To determine the attitude students have towards innovation and entrepreneurship education.

Component 4: Putting theory into practice and connecting to vision. Build a positive attitude towards innovation for future businesses.

Objective 5: To determine if entrepreneurship education knowledge can help boost innovation among students.

Component 5: Facilitate and operate the process. Utilise acquired education to boost innovation and produce more businesses.

The Likert scale measurement was used to measure the response factors of the participants. The scale was between 1 – 5, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree, the scale tested for validity and reliability, and the results presentation protocol were adapted from Iqbal *et al.*, (2012). The objectives were coded as (RO – for Research Objective).

5.3.2.1 Objective 1: To determine if the existing education equips students with innovation skills across the institution

Table 5.6: The existing education in terms of innovation

Questions (University of KwaZulu-Natal)	**Total sample (s)**	**Mean ($\bar{x}$) Ave=3.29**	**Standard deviation (σ)**
1. I am aware of the university entrepreneurship education.	368	2.97	1.192
2. The skills I receive from the university education encourage me to be innovative.	368	3.34	1.133
3. My courses will equip me with the skills to get a job or start an innovative business.	368	3.55	1.205
4. My courses offer skills that allow me to upgrade existing businesses to new business models.	368	3.19	1.271
5. I find the knowledge in the curriculum sufficient.	368	3.38	1.185

Researcher's own work (2023)

In Table 5.6 (UKZN), with questions focusing on testing if students understand the current curriculum, the participants responded negatively to the statement "I am aware of the university entrepreneurship education". Findings reveal that 38.5% disagreed with the statement, 23.4% were neutral and 38% agreed. The statement had a 2.97 mean average and a 1.192 standard deviation. The results were almost distributed across the scale, compared with other statements, participants disagreed with this statement. Investigating the existing curriculum, all results were significant, and most participants understood their curriculum but were unaware of entrepreneurship education.

The findings agreed with Theory U component 1, which says “listen to what emerges, establish common intent, pay attention to others and to what life calls you to execute”. Students are not aware of entrepreneurship education because a majority of them are not exposed to it in their curriculum, however, the university and the Department of Higher Education and Training started promoting student entrepreneurship in 2017. These findings supports research by Kühl (2020) when he discussed that theory U by Otto Scharmer seeks to control the change in the society and individuals, the organisations or individuals that goes against it are labelled as individuals that resist change. Theory U component 1 asks students to listen to what emerges and pay attention to others which encourages students to learn things outside of the curriculum.

With statement number 2, “skills I receive from the university education encourage me to be innovative”, 49.5% agreed, 28.8% were neutral and 21.8% disagreed. The neutral response means students are not sure whether their curriculum encourages innovation or not, 21.8% disagreed that curriculum encourages innovation. The statement has a mean of 3.34 and a standard deviation of 1.133, the responses suggest that the curriculum given to students must be revisited, and adjusted in such a way that the old syllabus is replaced with a new curriculum that supports creative thinking and innovation. With Statement number 3, “my courses will equip me with skills to get a job or start an innovative business”, a mean average of 3.55 a standard deviation of 1.205 were attained., Notably the mean average of 3.55 was higher than that of other statements. More than 58.7% agreed with the statement, 22.6% were neutral and 18.8% disagreed. This means students believe that after completing their qualifications they will get jobs.

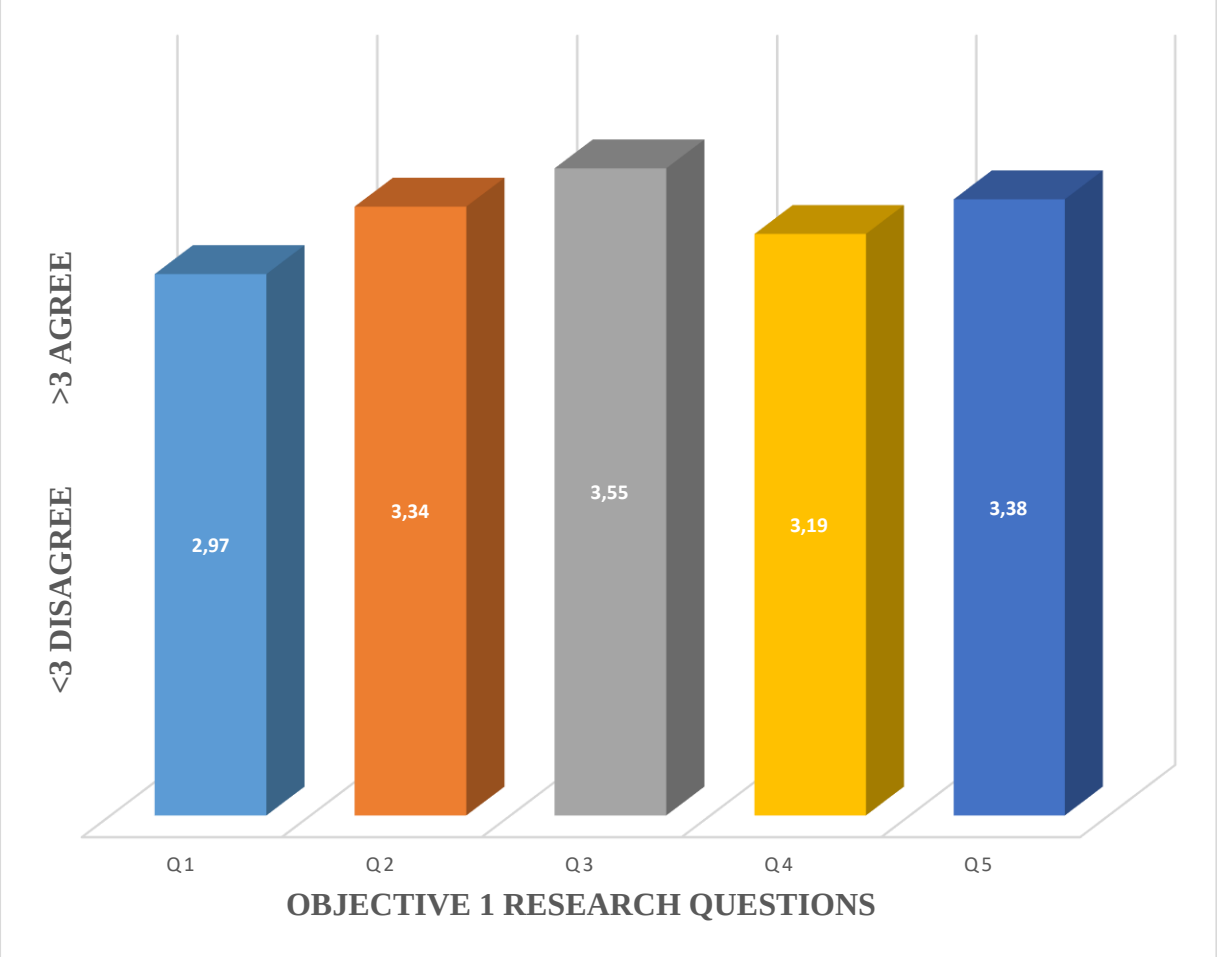
Statement 4 “my courses offer skills that allow me to upgrade existing business to new business model”, yielded the following: a total of 44.3% of students agreed with the statement, 30.2% disagreed, 25.5% were neutral responses, and a large number of students were neutral or in disagreement with the statement. This means skills offered by the curriculum allow students to be job seekers not job creators. A study by Sridevi (2021) mentions that entrepreneurship allows students to become job creators when they start innovative businesses and job opportunities are created. Adding entrepreneurship education across all colleges/ faculties might help change the mindset of students to become business owners.

Statement 5, “I find the knowledge in the curriculum sufficient”, Yielded the following: a mean average of 3.38 and a standard deviation of 1.185. The majority of students (51.4%) agreed with the statement, 25.3% were neutral, and 23.4% disagreed with the statement. Just above

50% of students believe the curriculum is sufficient whereas a significant portion of students chose to be neutral, and others disagreed with the statement. Since postgraduate students were the target population, some students may have used their qualifications to look for employment and did not get positive responses from companies. This could be a reason why they disagreed with the statement, hoping that advancing their career or adding other majors may help give them alternative career options.

The graph below, in Figure 5.2, shows a summary of findings on the University of KwaZulu-Natal's Objective 1:

Figure 5.2: The existing education in terms of innovation findings summary UKZN



All the statements on Research Objective 1: *to determine if the existing education equips students with innovation skills across the institution* were significant agreement except for Statement 1, meaning that students are not aware of UKZN inQubate and its programmes. This

means the university must do ground work to promote entrepreneurship to students. Statement 1 is, “I am aware of the university entrepreneurship education”. Objective 1 was achieved.

Table 5.7: The existing education in terms of innovation

Questions (University of Zululand)	**Total sample (s)**	**Mean ($\bar{x}$) Ave=3.60**	**Standard deviation (σ)**
1. I am aware of the university entrepreneurship education.	346	3.41	1.196
2. The skills I receive from the university education encourage me to be innovative.	346	3.78	1.207
3. My courses will equip me with the skills to get a job or start an innovative business.	346	3.80	1.272
4. My courses offer skills that allow me to upgrade existing businesses to new business models.	346	3.46	1.334
5. I find the knowledge in the curriculum sufficient.	346	3.53	1.209

Researcher’s own work (2023)

Table 5.7 (UNIZULU) with questions focusing on testing if students understand the current curriculum, the participants responded positively to the statement “I am aware of the university entrepreneurship education”. Findings reveal that 58.1% agreed with the statement, 22.8% disagreed and 19.1% were neutral. The findings were different from the results obtained from the University of KwaZulu-Natal. The University of Zululand research space promotes entrepreneurship education and innovation regularly and their university homepage suggests training and development programs and DHET-accredited journals to read for more information. The statement had a 3.41 mean average and 1.196 standard deviation meaning that responses from students were not much deviated from one another.

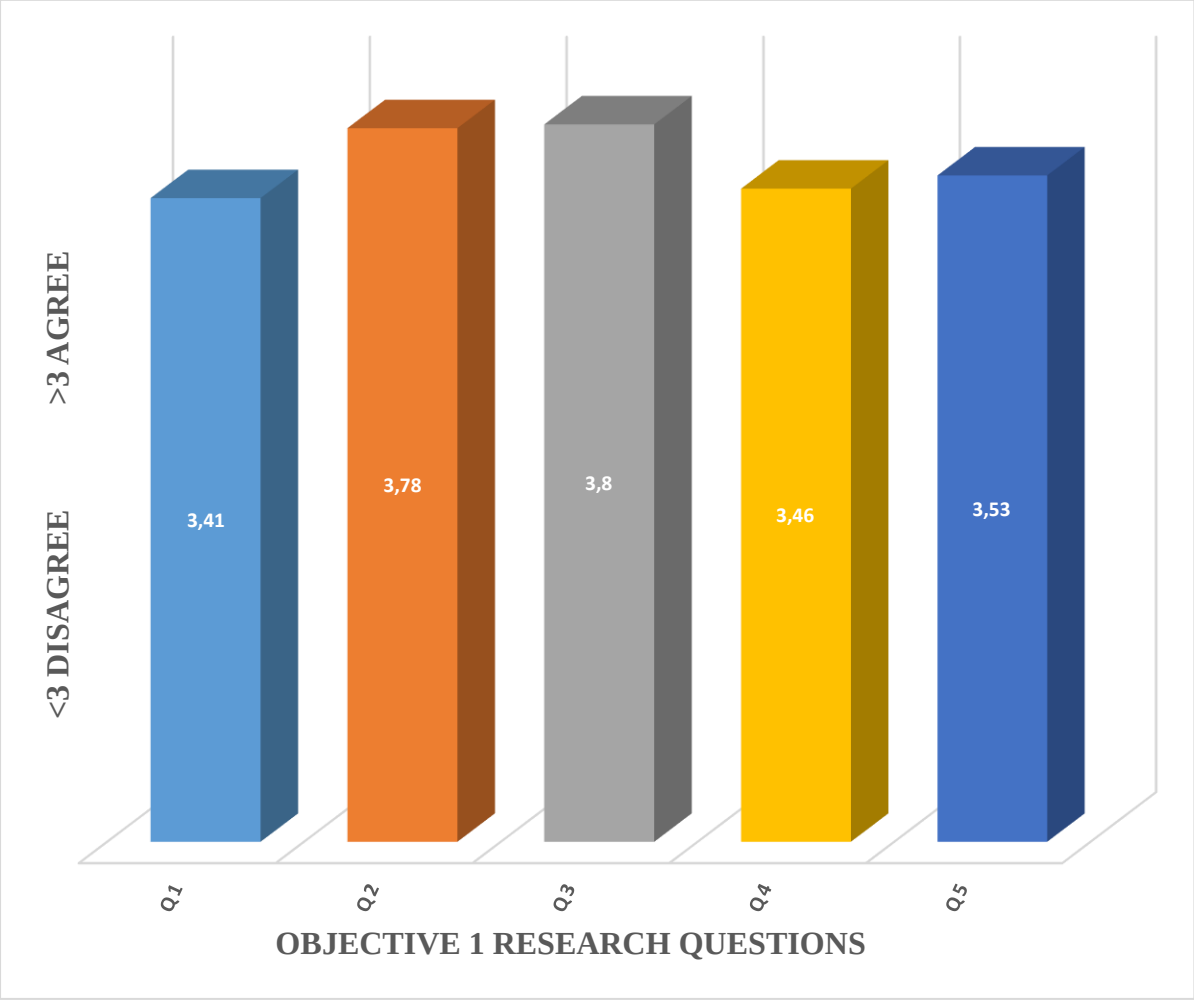
Statement 3, “My courses will equip me with skills to get a job or start innovative business”, yielded the following responses. A total of 73.1% agreed with a statement, 17.3% disagreed and 9.5% were neutral. More than 73% of students were confident that the curriculum offered to them would equip them to get employment or they could utilise skills to open innovative businesses. The statement has a mean of 3.80 and a standard deviation of 1.272. In all

statements in Objective 1, students from the University of Zululand had more positive responses compared to the University of KwaZulu-Natal students.

The results obtained agree with the study conducted by Bauman and Lucy (2021) share the same sentiment with Steenekamp *et al.* (2011) when they mentioned that education is a significant tool to use to promote and influence students about entrepreneurship careers. Dana *et al*. (2021) examined the role of entrepreneurship education in motivating individuals on establishing businesses that are important in economic growth.

However, Statement 1 in both universities had a low percentage and mean average when it was compared with other statements. This implies that more work needs to be done, students must get entrepreneurship education to raise awareness across institutions. Figure 5.3 below shows summary findings on the University of Zululand Objective 1.

Figure 5.3: The existing education in terms of innovation findings summary UNIZULU



The statements on Objective 1 yielded a significant agreement. Statement 3, "My courses will equip me with skills to get a job or start an innovative business", had a highly positive response from students, which means students believe that they will get jobs after completing their studies. The objective was achieved.

5.3.2.2 Objective 2: To determine if knowledge acquired from qualification exposes students to innovative ideas

Table 5.8: Knowledge contribution to business development and innovative ideas

Questions (University of KwaZulu-Natal)	**Total sample (s)**	**Mean ($\bar{x}$) Ave=3.38**	**Standard deviation (σ)**
1. My university provides services like extra classes, seminars and workshops to support innovation.	368	3.54	1.176
2. My university has an innovation centre.	368	3.25	1.051
3. My university supports new innovative businesses.	368	3.38	1.010
4. My lecturers are innovative.	368	3.29	1.135
5. My lecturers are always available to help me with innovation.	368	3.14	1.111
6. In my curriculum, innovation is emphasised all the time.	368	3.05	1.243
7. To gain more innovation knowledge is essential for my career.	368	3.99	1.109

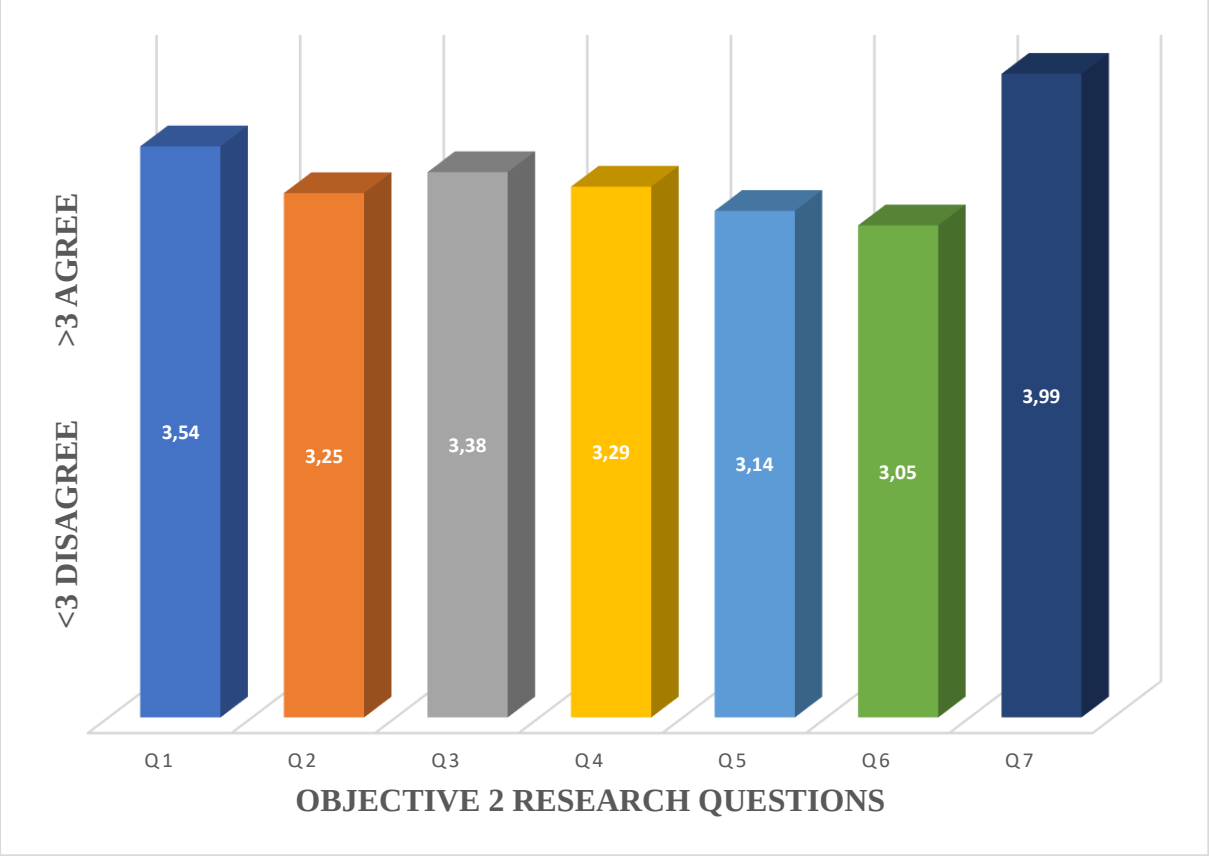
Researcher's own work (2023)

Objective 2 aimed to determine if knowledge received from qualification exposes students to innovation. All statements were in significant agreement, students responded positively to the questions agreeing that the curriculum expose them to innovation. However, Statement 6, "In my curriculum innovation is emphasised all the time", yielded less positive responses. Only 38.6% of students agreed, 33.5% disagreed and 28% were neutral. The mean average for the statement is 3.05 and 1.243 standard deviation, this means students had different views or opinions regarding the statement. The difference is 5.1% between students who agreed with the

statement and those against it. The 28% neutral responses further support that students are not sure whether the current curriculum supports innovation or not.

Statement 7, “To gain more innovation knowledge is essential for my career,” yielded the following results. A total of 76.6% of students agreed, meaning that students require more education to help them with creative thinking to boost innovation. Steenekamp *et al*. (2011) mentioned that there is a direct significant relationship between education and entrepreneurial performance. Kanaan-Jebna *et al*. (2022) discussed the impact of entrepreneurial competencies and entrepreneurship education in firm performance, their research reveal that entrepreneurship education is behind every successful business strategy. They further state that entrepreneurship education can be used to overcome uncertainties in a business environment and it can influence competency which can lead to better performance. Soomro *et al*. (2021) discussed that entrepreneurship education is essential to build a positive entrepreneurial attitude and capture the target market. The high percentage reflects that the majority of students see a need to add innovative entrepreneurship education to their curriculum.

Figure 5.4: Knowledge contribution to business development and innovative ideas summary UKZN



The mean average is above 3 in all the statements, reflecting that students agree with the statements, therefore, there is significant agreement that knowledge acquired from qualification exposes students to innovative ideas. Objective 2 was attained.

Table 5.9: Knowledge contribution to business development and innovative ideas

Questions (University of Zululand)	**Total sample (s)**	**Mean ($\bar{x}$) Ave=3.39**	**Standard deviation (σ)**
1. My university provides services like extra classes, seminars and workshops to support innovation.	346	3.52	1.244
2. My university has an innovation centre.	346	3.10	1.216
3. My university supports new innovative businesses.	346	3.21	1.207
4. My lecturers are innovative.	346	3.49	1.226
5. My lecturers are always available to help me with innovation.	346	3.45	1.285
6. In my curriculum innovation is emphasised all the time.	346	3.16	1.248
7. To gain more innovation knowledge is essential for my career.	346	3.79	1.258

Researcher's own work (2023)

Table 5.9 above reveals results obtained for Objective 2 at the University of Zululand. The objective aim was to determine if knowledge acquired from qualifications exposes students to innovative ideas. Seven questions were developed to answer the objective. Statement 2 had a low positive response compared to other statements. The statement says, "My university has an innovation centre". A total of 43.6% of students agreed with the statement, 30.1% disagreed and 26.3% were neutral. This shows that many students do not have an idea of an innovation centre in their institution. These results suggest that the institution needs to work harder to make students aware that the platform could stimulate entrepreneurial interest among students. Entrepreneurial interest can influence behaviour and attitude towards the phenomenon. Personal attitudes and social norms play a significant role in entrepreneurial intention (Iqbal *et al.*, 2012).

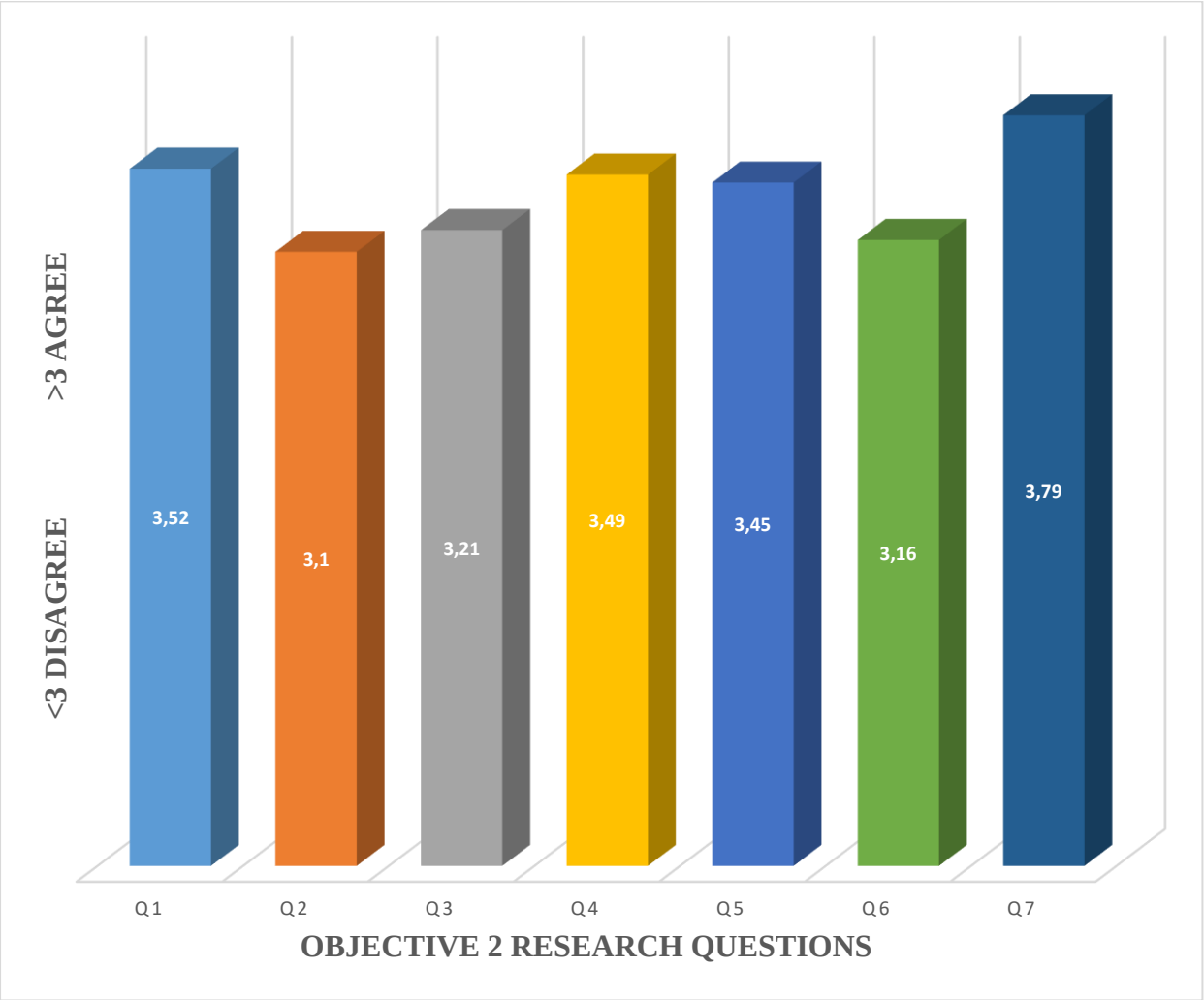
The research findings by Barba-Sánchez *et al*. (2022) highlight that institutions must aim at promoting triple bottom line (environmental, economic and social) to successfully initiate curriculum that enhance entrepreneurial spirit among university students. The findings by Barba-Sánchez *et al*. (2022); Iqbal *et al*. (2012) are in supports of the findings obtained in this research. The statement had a mean average of 3.10 and a standard deviation of 1.216.

Statement 5, "In my curriculum innovation is emphasised all the time", had a mean average of 3.16 and a standard deviation of 1.248. The responses had 47.9% of students that agreed with the statement, 31% disagreed and 21.1% students were neutral. More than 52% of students did not support the statement. This is evidence that the curriculum offered must be revisited. The statement challenges academic leaders, departmental heads, senior lecturers and curriculum developers to remove old content and replace it with new content that speaks about innovation development. The statement had a 3.16 mean average, meaning that the majority of responses were leaning towards the left supporting the neutral and disagreeing side.

Statement 7, "To gain more innovation knowledge is essential for my career", yielded the following results. About 70.8% of students agreed with the statement, 16.4% disagreed and 12.7% were neutral. The majority of the students believed that innovation was key in the century of the Fourth Industrial Revolution (4IR). The results support the literature by Henrekson and Sanandaji (2011). Technology improvement restructures all the components of economic activities by causing disruption on existing activities while in some cases complement and improve activities (Ciarli *et al.*, 2021). Hu (2021) discussed the significance of knowledge spillover on speeding up technological innovations. He emphasized the significance of innovation in fast growing the economy of Brazil, Russia, India, China and South Africa (BRICS) countries as they have significant market potential. The members of BRICS countries are more willing and eager to make contribution and progress in technological innovation (Hu, 2021).

High-tech industries need innovation, and Small Medium and Micro Enterprises need updated innovation to survive the fast-changing world of technology (Baumol & Storm, 2007). The statement had a mean average of 3.79 and a standard deviation of 1.258, meaning that the results were positive and skewed to the right. The students agreed that getting more innovation knowledge is essential.

Figure 5.5: Knowledge contribution to business development and innovative ideas summary UNIZULU



The mean average is above 3 in all the statements, reflecting that students agree with the statements. Therefore, there is significant agreement that knowledge acquired from qualification exposes students to innovative ideas. However, Statements 2 and 6 had low positive responses meaning that students were not aware if the institution has an innovation centre and they disagreed that innovation is emphasised all the time in their curriculum. This objective of the research was attained.

5.3.2.3 Objective 3: To investigate the assumptions/ views the students have towards innovative entrepreneurship

Table 5.10: Assumptions on innovative entrepreneurship

Questions (University of KwaZulu-Natal)	**Total sample (s)**	**Mean ($\bar{x}$) Ave=3.36**	**Standard deviation (σ)**
1. I am aware that the university has collaborated with various stakeholders to teach me the fundamentals of venture creation.	368	3.02	1.231
2. I am aware that my degree encourages innovation and creative thinking.	368	3.87	1.182
3. The current curriculum offered by the institution allows all students to be innovative and business-minded.	368	2.83	1.148
4. My university has enough infrastructure to support innovation and entrepreneurship education.	368	3.15	1.147
5. The knowledge I receive from my qualification addresses key national challenges.	368	3.70	1.198
6. I can use the knowledge I received from my qualification to start a modernised venture.	368	3.56	1.147

Researcher's own work (2023)

Table 5.10 above represents results obtained from the University of KwaZulu-Natal for Objective 3. Five statements significantly agreed with the objective and Statement 3 significantly disagreed with the objective.

Statement 3, "The current curriculum offered by the institution allows all students to be innovative and business-minded", yielded the following results. Only 28.8% of students agreed with the statement, 39.4% disagreed and 31.8% of students were neutral. The results reveal that the majority of students disagreed that the curriculum offered by the institution allows all students to be innovative and business-minded. Students from the College of Law and Management Studies are the only groups getting entrepreneurship education and business-

related modules. Students from the College of Agriculture, Engineering and Science, College of Humanities and College of Health Sciences are receiving skills specific to their area of expertise, and not business education. The results support Theory U, Component 3, "Period of letting go of old habit, connect to source, reflect on personal mission and commitment". Co-presencing is a turning point where everyone should think of designing a creative response to solve current challenges and adapt to future possibilities (Scharmer, 2009).

The study could help the institution to look beyond past patterns and focus on future strategies that may unleash the potential of students. To stimulate a business mindset, entrepreneurship education, and innovative entrepreneurship must be expanded to other qualifications to help develop creative thinking. The statement had a 2.83 mean and a 1.148 standard deviation. The results were skewed to the left showing that the majority of students were not in agreement with the statement.

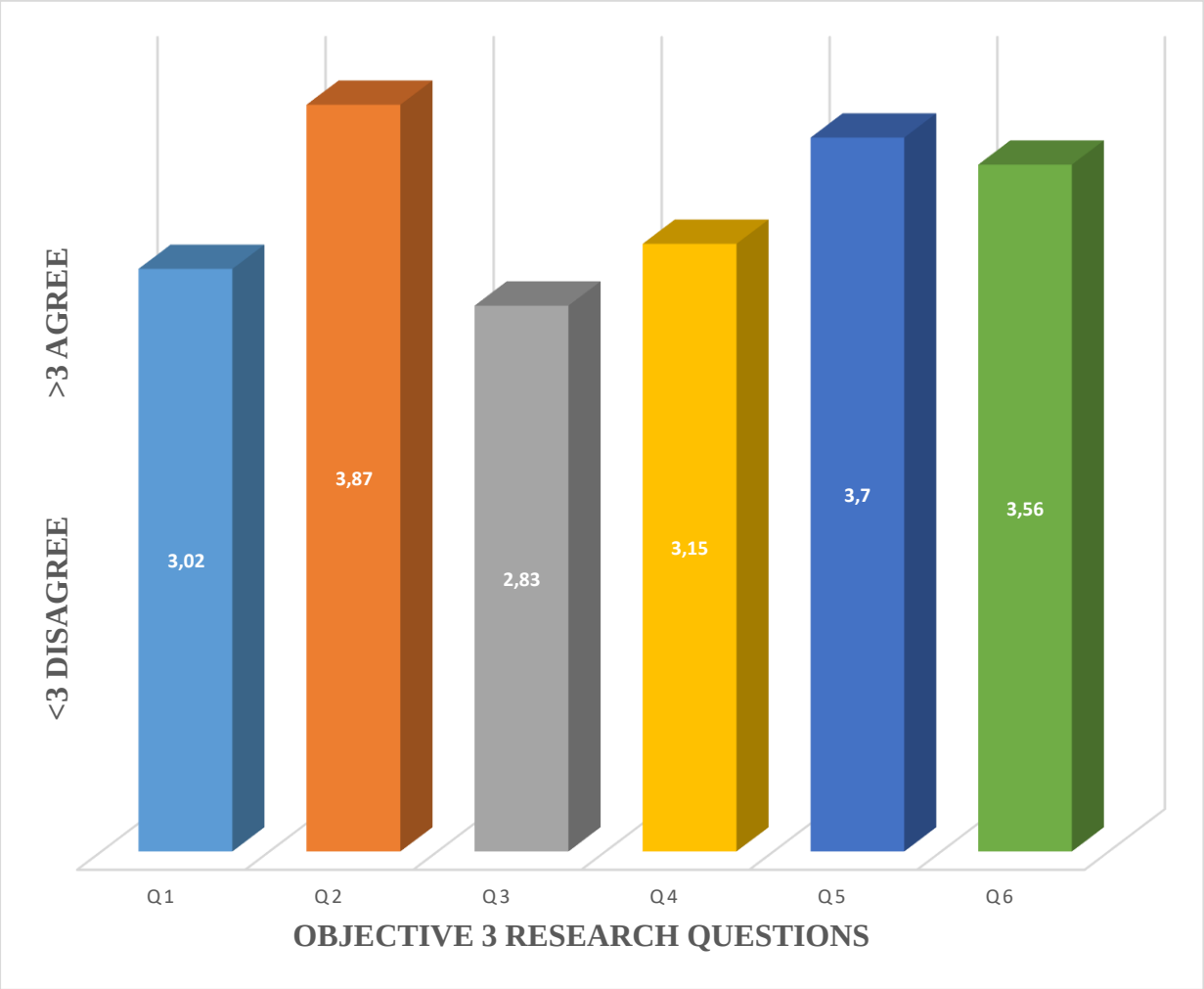
Statement 4, "My university has enough infrastructure to support innovation and entrepreneurship education", yielded the following results. A total of 36.9% of students agreed with the statement, 35.9% were neutral and 27.2% disagreed. Combining the number of neutral students and those who disagreed gives a total of 63.1%. This means that more than 63% of students were either neutral or disagreed with the statement. The result could reflect that students were not aware of the innovation centre in the institution or the University of KwaZulu-Natal inQubate. The University of KwaZulu-Natal inQubate is the office that promotes entrepreneurship among students (UKZN, 2023). The office collaborated with Entrepreneurship Development Higher Education (EDHE) to provide students with a platform to present business ideas and stand a chance to win funding for innovative business ideas (UKZN, 2023). The statement had a mean value of 3.15 and a standard deviation of 1.147 revealing that results were close to the mean. The results suggest that more work needs to be done to raise awareness and entrepreneurship education needs to be introduced.

Statement 2, "I am aware that my degree encourages innovation and creative thinking", yielded the following results. A total of 70.9% of students agreed with the statement, 15.2% were neutral and 13.9% disagreed. The statement had a mean average of 3.87 and a standard deviation of 1.182. The objective aim was to investigate assumptions/views students have towards innovative entrepreneurship. The assumptions were positive, students believe that their curriculum encourages innovation and creative thinking. This could be a huge benefit when adding entrepreneurship education because students may combine education with creative

thinking to start innovative businesses. The benefit of innovative businesses could contribute to high-tech industries, create job opportunities, and design/introduce new products or services to the market (Wong *et al*., 2007). Creative thinking goes with a positive attitude and can enhance certain behaviours. The results support literature by Kunene (2009), Stokes *et al*. (2010), Ajzen (2011), and Neeraj and Sangeeta (2021).

The study could help close the gap of unemployment and suggest curriculum revisits to other qualifications. This can benefit students in getting an up-to-date curriculum that could easily answer demanding job scarcity. A study by Neeraj and Sangeeta (2021) mentioned that innovative entrepreneurship is needed to promote digital innovation businesses which can improve welfare and lower unemployment.

Figure 5.6: Assumptions on innovative entrepreneurship summary UKZN



Five statements had a mean average above 3 which means that the response from students allowed statements to be in significant agreement with the objectives. Statement 3 significantly

disagreed with the objective; the disagreement was on the current curriculum offered to students. Students believe that not all of them receive a curriculum that equips them to be business-minded and innovative. The study's main objective suggests that entrepreneurship education must be expanded to other qualifications to boost students with skills to start innovative businesses. The results show that students agree that adding entrepreneurship could be beneficial to them.

Table 5.11: Assumptions on innovative entrepreneurship

Questions (University of Zululand)	**Total sample (s)**	**Mean ($\bar{x}$) Ave=3.47**	**Standard deviation (σ)**
1. I am aware that the university has collaborated with various stakeholders to teach me the fundamentals of venture creation.	346	3.51	1.226
2. I am aware that my degree encourages innovation and creative thinking.	346	3.97	1.256
3. The current curriculum offered by the institution allows all students to be innovative and business-minded.	346	3.14	1.253
4. My university has enough infrastructure to support innovation and entrepreneurship education.	346	2.94	1.279
5. The knowledge I receive from my qualifications addresses key national challenges.	346	3.61	1.271
6. I can use the knowledge I received from my qualification to start a modernised venture.	346	3.66	1.248

Researcher's own work (2023)

Table 5.11 above represents Objective 3's findings obtained from the University of Zululand. The results are in significant agreement with the objective, except for Statement 4 with less percentage supporting the statement. Statement 2, "I am aware that my degree encourages innovation and creative thinking", yielded the following results. A total of 77.8% of students agreed with the statement, 15.7% disagreed and 7.5% were neutral. Even the University of

KwaZulu-Natal got the highest percentage on this statement. This proves that students believe that their qualification encourages innovation and creative thinking. Introducing entrepreneurship could motivate students to use innovation and creative thinking to start new businesses.

These results agree with Baumol and Storm (2007) when they said, “Innovation helps entrepreneurs to upgrade or produce something new to the market”. Feldman (2004) observed that innovation can introduce, commercialise or improve products. Arnkil *et al*. (2010) highlighted that innovation plays a vital role in the quadruple helix model where universities-firms-civil society-government cooperates to produce scarce skills. Kolehmainen *et al*. (2016) emphasised that institutions must apply the quadruple helix model to improve innovation and the economy. The results had a mean of 3.97 and a standard deviation of 1.256 , findings were skewed to the right (positive) meaning more students agreed with the statement.

Statement 3, “The current curriculum offered by the institution allows all students to be innovative and business minded”, yielded the following results. Exactly 44.8% of students agreed with the statement, 31.2% disagreed and 24% were neutral. The statement had a positive response, however, students who agreed with the statement were less than 50%. This shows that disagreeing and neutral students were more that agreeing students. Students from the University of KwaZulu-Natal also had a negative response to this statement, proving that the current curriculum offered by the institutions needs to be revisited and amended to best fit the current environment. The findings support Theory U, Component 3, “Period of letting go of old habits and getting a sense of purpose”. This could mean that curriculum no longer addresses the status quo and might need changes to better address the challenges of the current century. The statement had a mean average of 3.14 and a standard deviation of 1.253.

Statement 4, “My university has enough infrastructure to support innovation and entrepreneurship education”, yielded the following results. A total of 36.9% of students agreed, 39% disagreed and 21.4% were neutral. A total of 60.4% consists of students who did not agree and neutral responses. This means students do not know about the infrastructure or the platform is not sufficiently revealed to students. The mean average was 2.94% and and the standard deviation was 1.279. The results were skewed to the left meaning students disagreed that the institution has enough infrastructure to support innovation.

Entrepreneurship education has not gained popularity in institutions. The Department of Higher Education and Training (DHET) together with institutions need to do more to get students involved. The results support the literature by Van der Westhuizen (2017) which emphasises that, "Each university must have a shifting hope activating potential entrepreneurship (SHAPE) programme to teach students skills development, entrepreneurship career and introduce workshops on entrepreneurship development".

Radipere (2012) observed that entrepreneurship programmes in South Africa do not yield the best outcome due to the old traditional way of teaching. The results reflect that entrepreneurship education is needed to allow students to take entrepreneurship as a career.

Figure 5.7: Assumptions on innovative entrepreneurship summary UNIZULU

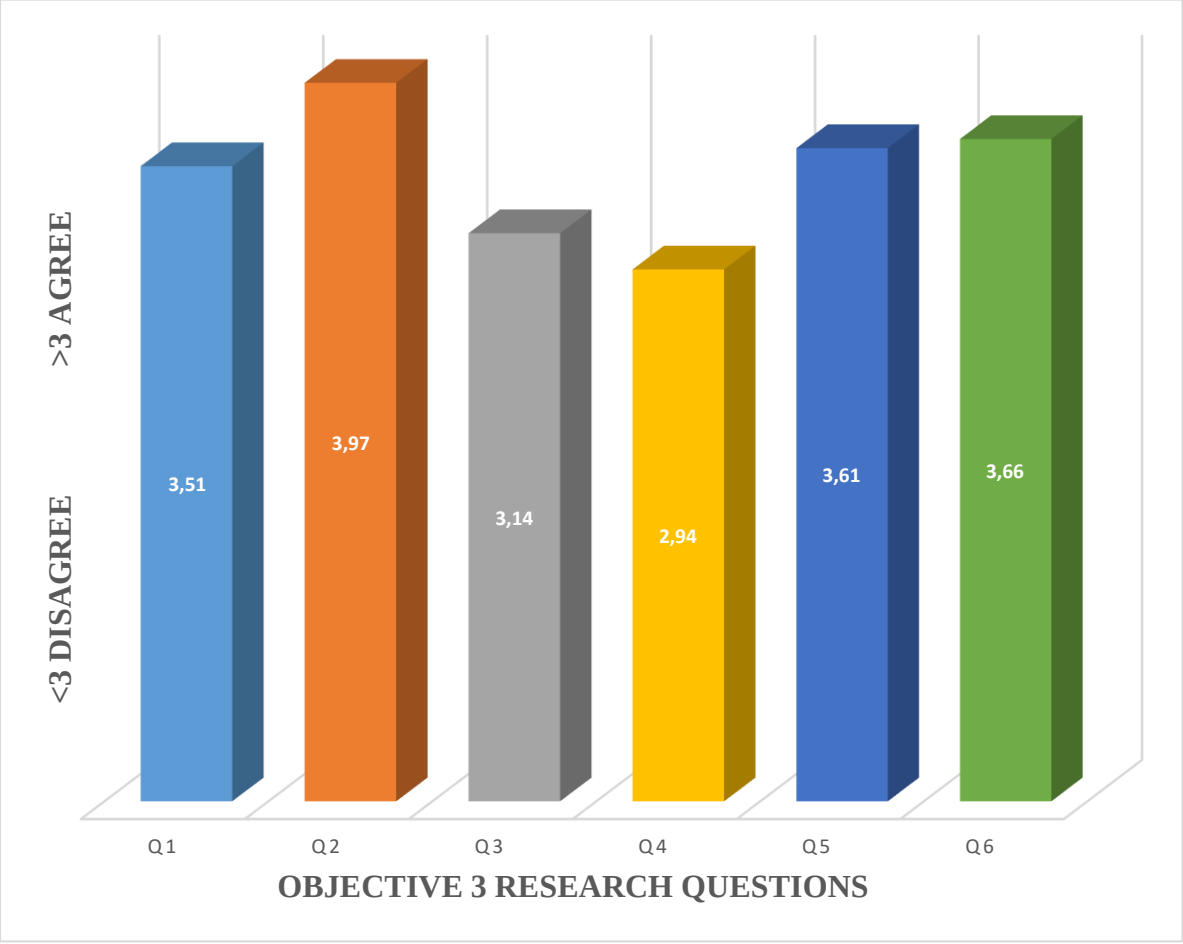


Figure 5.7 above summarises the results for the University of Zululand, Objective 3. All statements were in significant agreement except for Statement 4. Awareness through education is needed from the university.

This could help trigger students to have a vested interest in innovative entrepreneurship. Businesses may be created using skills from education combined with business education.

5.3.2.4 Objective 4: To determine the attitude students have towards innovation and entrepreneurship education

Attitude is a perception to perform a behaviour. It guides what is favourable or unfavourable to an individual.

Table 5.12: The attitude towards innovation and entrepreneurship education

Questions (University of KwaZulu-Natal)	**Total sample (s)**	**Mean ($\bar{x}$) Ave=3.34**	**Standard deviation (σ)**
1. My degree will give me a competitive advantage in the job market.	368	3.62	1.120
2. My degree does not allow me to compete globally with students from international universities.	368	2.35	1.163
3. I have role models who are business owners to look up to if ever I need inspiration.	368	3.54	1.276
4. Given resources, I would start an innovative business.	368	3.94	1.117
5. I can take entrepreneurship as a career.	368	4.00	1.099
6. I am not interested in being an entrepreneur.	368	1.93	1.176
7. I am interested in innovative entrepreneurship.	368	4.03	1.125

Researcher's own work (2023)

Table 5.12 reflects the University of KwaZulu-Natal's Objective 4 results. The objective has seven statements, and five statements have a significant agreement with the objective, and two statements have a significant disagreement with the statement but portray a positive response. Statement 2, "My degree does not allow me to compete globally with students from international universities", yielded the following responses. A total of 16.8% of students agreed with the statement, 62% disagreed and 21.2% were neutral. A total of 62% disagreed with the statement revealing a positive attitude among students. Findings show that students have good attitudes and mindsets, and adding innovative entrepreneurship education may assist students

to reach their full potential. Karali (2013) said attitude predicts the likelihood for an individual to become an entrepreneur. Soomro *et al*. (2020) observed that entrepreneurship education influences individual attitudes and may stimulate positive entrepreneurial intentions. If students believe their qualifications equip them with skills to compete internationally, this means that students with business education may create innovative businesses that can compete globally. The results had a mean average of 2.35 and a 1.163 standard deviation, meaning that findings are skewed to the left revealing that students are against the statement that their qualification does not allow them to compete globally.

Statement 5, "I can take entrepreneurship as a career", yielded the following responses. A total of 76.1% of students agreed with the statement, 13.6% were neutral and 10.4% disagreed. The results emphasise that given an opportunity and business education students will take entrepreneurship as a career option. The findings reveal that students have a positive attitude toward entrepreneurship. A good attitude contributes to a positive entrepreneurial orientation. The results agree with the findings obtained by Karali (2013), who mentioned that entrepreneurial attitude measures an individual's ability to become an entrepreneur. Attitude predicts the power of the likelihood of a phenomenon to happen, and boosts self-esteem. Zollo *et al.* (2017) revealed that the university environment plays a significant role in developing entrepreneurial intention among students. Attitude can build a strong mentality towards sustainability; a sustainable business can create more sustainable job opportunities. The statement had a mean of 4.0 and 1.099 standard deviation. The results were skewed to the right, meaning the majority of students support the statement and they feel strongly about it.

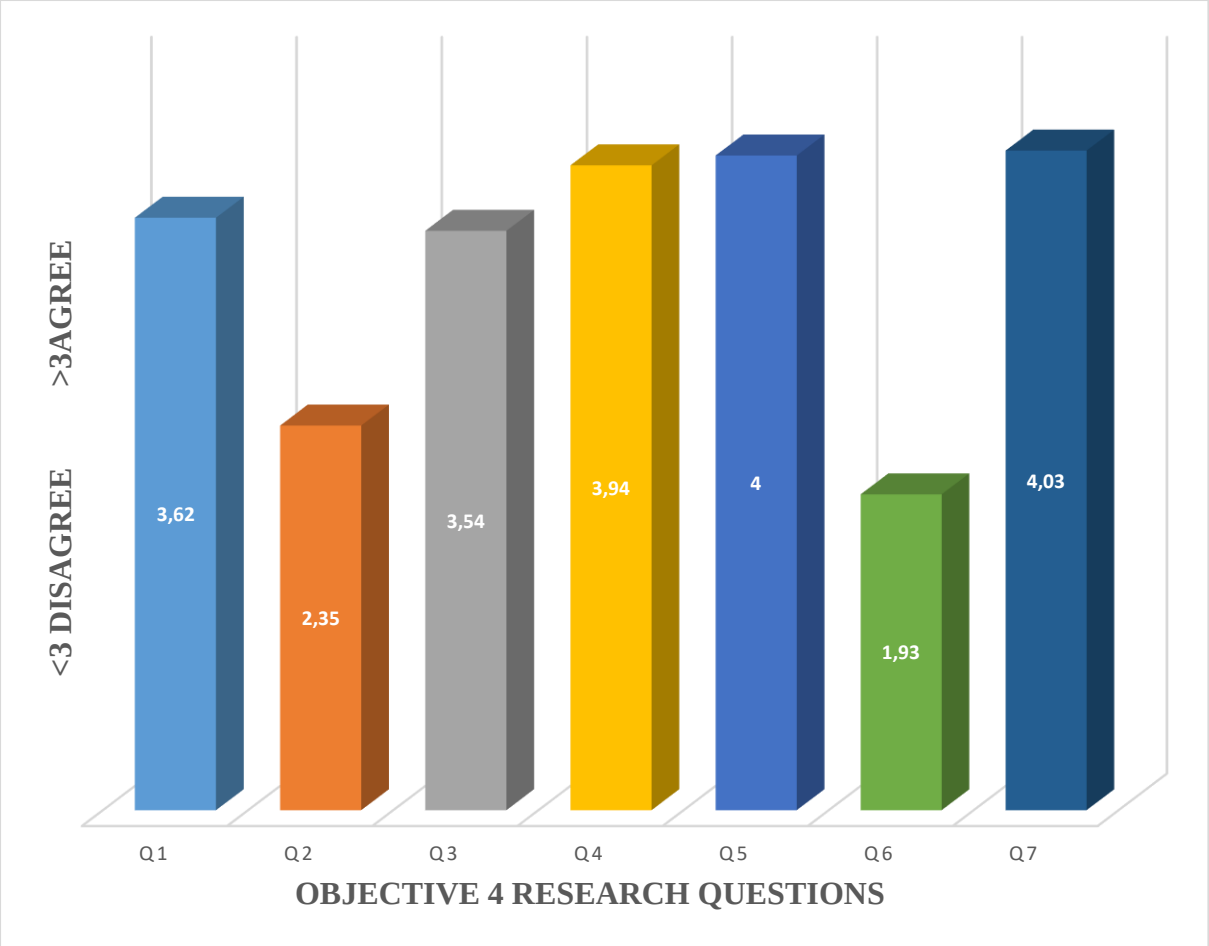
Statement 6, "I am not interested in being an entrepreneur", yielded the following results. A total of 76.7% of students indicated that they wanted to be entrepreneurs, 11.1% were not sure what they wanted to be and 13.1% agreed that they did not want to be entrepreneurs. This was a negative statement because it suggested that students are not interested in owning businesses, and notably they disagreed. The statement had a mean average of 1.93 and a 1.176 standard deviation, showing results skewed to the left opposing the negative statement.

Statement 7, "I am interested in innovative entrepreneurship", yielded the following results. Exactly 75.3% agreed, 14.4% were neutral responses and 10.3% disagreed. The majority of students wanted to engage in innovative entrepreneurship. This study may help achieve the goal by suggesting adding entrepreneurship education across all colleges/faculties. Combining

business education and various qualifications will help develop innovative ideas that can be real businesses.

This could be linked with Theory U Component 4, "Co-creating – connecting vision and intention by putting theory into practice". This is a point where education knowledge is used to establish innovative ventures (Scharmer, 2009). Ondimu (2013) argued that introducing an entrepreneurial culture will be beneficial to South African citizens.

Figure 5.8: The attitude towards innovation and entrepreneurship education summary UKZN



The result summary shows the consistency in the results above. Statements 1, 3, 4, 5, and 7 had a mean average above 3 proving that statements significantly agreed with the objective.

Statement 2, "My degree does not allow me to compete globally with students from international universities" and Statement 6 "I am not interested in being an entrepreneur" were

both negative, but students responded against them, indicating that students have a positive attitude toward innovation and entrepreneurship education.

Table 5.13: The attitude towards innovation and entrepreneurship education

Questions (University of Zululand)	**Total sample (s)**	**Mean ($\bar{x}$) Ave=3.31**	**Standard deviation (σ)**
1. My degree will give me a competitive advantage in the job market.	346	3.60	1.224
2. My degree does not allow me to compete globally with students from international universities.	346	2.41	1.262
3. I have role models who are business owners to look up to if ever I need inspiration.	346	3.59	1.340
4. Given resources, I would start an innovative business.	346	3.80	1.232
5. I can take entrepreneurship as a career.	346	3.84	1.213
6. I am not interested in being an entrepreneur.	346	2.06	1.298
7. I am interested in innovative entrepreneurship.	346	3.84	1.284

Researcher's own work (2023)

Table 5.13 above presents findings obtained from the University of Zululand's postgraduate students. The objective was to investigate attitudes toward innovation and entrepreneurship education. The objective had seven statements, and Statements 1, 3, 4, 5, and 7 significantly agreed with the objective. Statement 2, "My degree does not allow me to compete globally with students from international universities", was a negative statement, however, the students responded positively to it. A total of 23.9% of students agreed, 16.2% were neutral students and 59.9% disagreed. Since it was a negative statement, only 23.9% were supporting saying their qualification does not allow them to compete internationally. More than 59% strongly believe their qualification can put them on a global market and be competitive.

A positive attitude portrayed by students reveals a positive mindset. Students from the University of KwaZulu-Natal share the same sentiments as the University of Zululand students. Ajzen (1991) observed that a person with a positive attitude has a high chance of starting a

business. Barba-Sánchez *et al.* (2022) believe that constructs of theory of planned behaviour (personal attitude, social norms and perceived behavioural control) are among influential constructs to evaluate intention towards a behaviour. Favourable conditions develop strong interest and attitude and they become more likely to be performed (Ajzen, 1991). Zian *et al*. (2010) highlighted that personal character has a significant influence on decision-making. The statement had a mean average of 2.41 and a 1.262 standard deviation, showing skewness to the left where students disagreed with the statement.

Statement 5, "I can take entrepreneurship as a career", yielded the following results. Exactly 74% of students agreed, 11% were neutral and 15% disagreed. The majority of students want to have businesses, and to help them realise their dream business education must be taught in their curriculum to better equip them with skills to run businesses successfully. This statement was above 70% from the University of KwaZulu-Natal and the University of Zululand. The good attitude portrayed by students must be supported. The initiative by the universities across South Africa and the Department of Higher Education and Training to promote entrepreneurship could be a great help since it gives mentorship, guidance and good pointers to develop lucrative businesses. A lucrative business must meet societal needs, and provide solutions to long-existing problems. Most importantly, a positive attitude can make it easy for entrepreneurs to understand the daily operations of a business for better management. The statement had a mean average of 3.84 and a standard deviation of 1.213.

Statement 7, "I am interested in innovative entrepreneurship", yielded the following results. Students showed interest in innovative entrepreneurship, and institutions must develop more innovation centres, and conduct seminars, workshops, and competitions to promote collaborations that can lead to innovation. Interested students constituted 70.2%, about 14.2% were neutral and 15.6% was the group that was not interested in innovative entrepreneurship. The 14.2% could be interested if they see a significant impact of innovation and how it improves people's living conditions. Tohidi and Jabbari (2012) emphasised that innovation improves service delivery. Nissan *et al*. (2012) emphasised that innovative businesses are the key factors to economic development and improve societal welfare. The literature by Nissan *et al*. (2012) agrees with the research findings obtained from this study. The findings had a mean average of 3.84 and a standard deviation of 1.284. There was a significant agreement between objectives and statements, therefore students had a positive attitude towards innovation and entrepreneurship education.

Figure 5.9: The attitude towards innovation and entrepreneurship education summary UNIZULU

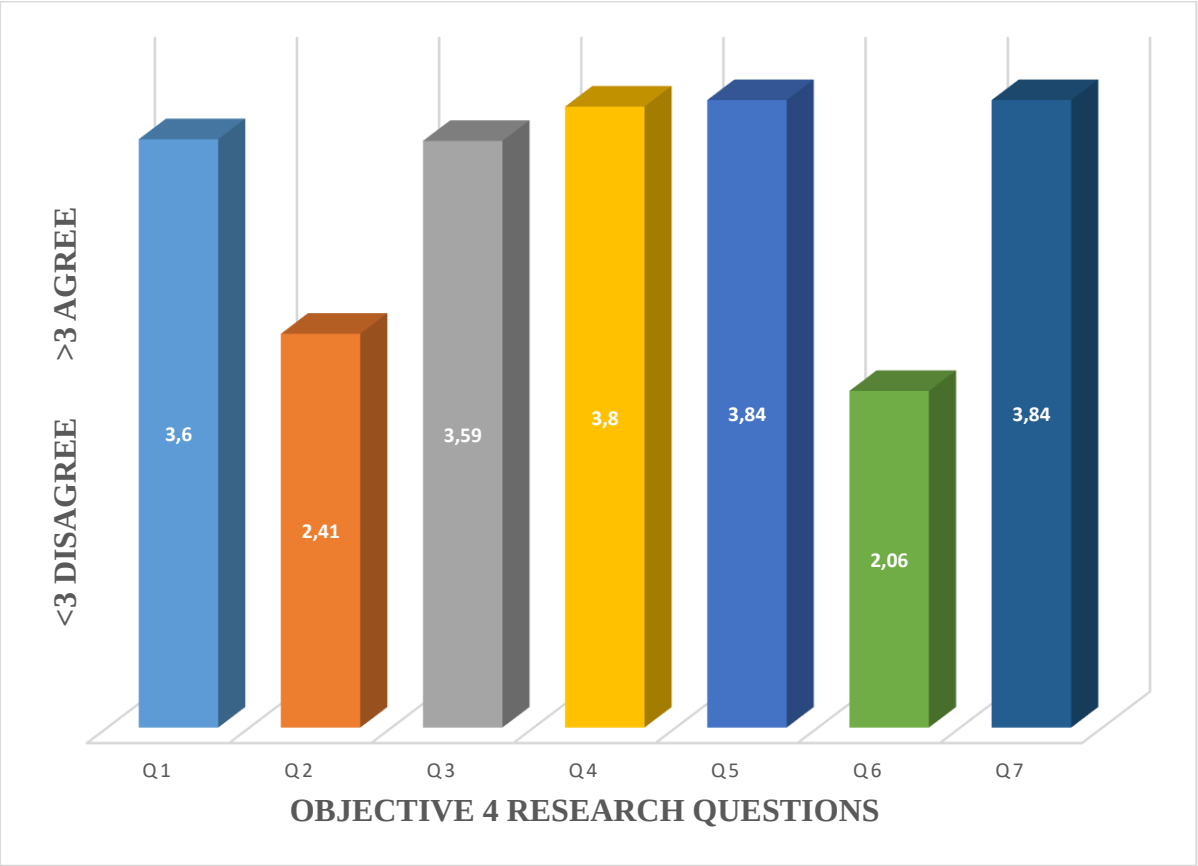


Figure 5.9 above shows the mean average of responses obtained from the University of Zululand's Objective 4. Students showed interest in innovative and entrepreneurship education.

5.3.2.5 Objective 5: To determine if entrepreneurship education can help boost innovation among students

Table 5.14: The impact of entrepreneurship education on students' innovation

Questions (University of KwaZulu-Natal)	**Total sample (s)**	**Mean ($\bar{x}$) Ave=3.71**	**Standard deviation (σ)**
1. My degree is structured in a way that allows me to be versatile in industry and venture start-ups.	368	3.31	1.205
2. The relationship the university has with other sectors and stakeholders creates opportunities for me.	368	3.18	1.151
3. The Fourth Industrial Revolution world requires education to contribute to technological innovation advancement.	368	4.16	0.962
4. What I have learned is not sufficient to trigger innovation.	368	2.87	1.187
5. University course content needs to improve for me to be innovative.	368	3.79	1.067
6. University entrepreneurship education needs to improve for me to be innovative.	368	3.86	1.053
7. University-society-industry need to collaborate and develop research and development centres.	368	4.15	0.9417
8. Adding entrepreneurship education to my curriculum will help stimulate an entrepreneurial mindset.	368	4.34	0.9079

Researcher's own work (2023)

Objective 5 aimed to determine if entrepreneurship education can help boost innovation among students. The Table 19 reflects eight statements that were designed to answer Objective 5. Seven statements had a mean average above 3 meaning that statements significantly agreed with the objective.

Statement 1, “My degree is structured in a way that allows me to be versatile in industry and venture start-ups”, yielded the following responses in which students used their current curriculum as a reference. A total of 49.4% agreed with the statement, 25.3% were neutral and 25.3% disagreed. More than 25% were not sure about their capability to adapt easily to different situations. In the problem statement on *page 3*, it was mentioned that students from the Faculty/ College Law and Management Studies are the only students given the opportunity to learn entrepreneurship and other business-related modules. This gives them an advantage since they can use their qualification to look for jobs or utilise skills to start a business.

The results support Theory U, Component 5, “Co-evolving – a period to clarify, consolidate, facilitate and operate the process from the whole”. This is a period where skills obtained can be used to benefit individuals or the organisation (Scharmer, 2009). Students from other faculties/ colleges are forced to become job seekers due to the structured curriculum that does not grant an alternative career option to fall back on if the first plan fails or when the student is no longer interested in working for someone. The other 25% disagreed with the idea that their degree allowed them to be versatile. The statement had a mean average of 3.31 and a 1.205 standard deviation. Neutral students and those who disagreed were more than 50% suggesting that curriculum developers, academic leaders, departmental heads and senior lecturers have a task to revise curriculum content. The curriculum must promote creative thinking, and allow students to be versatile.

Statement 2, “The relationship the university has with other sectors and stakeholders creates opportunities for me”, yielded the following results. A total of 37.8% agreed with the statement, 38% were neutral and 24.2% disagreed. A minority of students supported the statement whereas the majority of students were neutral. The neutral response could mean that students are not aware of the relationship between the institution, industries, government, or civil society. The quadruple helix actor of innovation emphasises the significance of collaboration amongst these actors, the advantages it brings to students and external society. Arnkil *et al*. (2010) highlighted that the quadruple helix is an innovation model where universities-firms-civil society cooperate to produce scarce skills and innovation. Kolehmainen *et al*. (2016) emphasised that the quadruple helix plays an important role in allowing stakeholders to understand their role in the success or failure of the entrepreneurial university. Leydesdorff and Meyer (2006) highlighted that each stakeholder must have a positive contribution toward innovation, venture creation, job creation, and local economic development. The results suggest that more work needs to be

done by the institution, government, industries, and civil society to produce innovative graduates.

Statement 3, “The Fourth Industrial Revolution (4IR) world requires education to contribute to technological innovation advancement”. A total of 79.9% of students agreed with the statement, 15.8% were neutral and 4.3% disagreed. Student participants agreed that education must be up to date to meet current needs and allow students to understand current trends and be able to use technology to their advantage. The result supports literature by Smith and Woodworth (2012) when they said, “Entrepreneurship and innovation must converge to strengthen the economy”. Ramaphosa (2020) discussed that introducing entrepreneurship to students may improve innovation, revive the economy, and reduce unemployment. The statement had a mean average of 4.16 and 0.962 standard deviation. The findings are skewed more to the right signalling positive feedback from students. Technology plays a big part in the economy; manual labour is replaced by machines and robots leading to fewer jobs in the job market. Students need to focus on innovation and innovative entrepreneurship to counteract the current dilemma and create opportunities for society.

Statement 5, “University course content needs to improve for me to be innovative” suggests that the content is outdated needs improvement. A total of 65.5% of students agreed, 24.2% were neutral and 10.3% disagreed. The majority of students indicated that what is taught through the curriculum is not sufficient knowledge to help them boost innovation. Adjusting the curriculum by removing outdated modules and replacing them with innovative entrepreneurship could help students think entrepreneurially. Improving course content might trigger entrepreneurial intent among students. Chimucheka (2014) argues that low total entrepreneurial activity (TEA) is a risk to the economy, therefore government, universities, and well-established ventures must help Small, Medium and Micro Enterprises (SMMEs) to change total entrepreneurial activity in South Africa. Stokes *et al*. (2010) believe that entrepreneurship education can be used to develop skills through learning. The statement has a mean average of 3.79 and a 1.067 standard deviation.

Statement 7, “University-society-industry need to collaborate and develop research and development centres” suggests that collaboration may help each stakeholder to contribute towards building new frontiers. Industries may encounter problems, and the university's responsibility is to research the problem, get findings and transfer them to the industry where the theory is put into practice. A total of 82.3% of students agreed with the statement, 12.5%

were neutral and 5.2% disagreed. The findings support Figure 3 *the entrepreneurship education role in the industry* on page 21.

Etzkowitz and Zhou (2007) observed that the entrepreneurial mode collaborates with entrepreneurial attitude, and vision and bridges a gap between university and industry. The collaboration could help students find mentors, sponsors, and a chance for networking in the process. The statement was supported by positive results with a mean average of 4.15 and a standard deviation of 0.9417.

Statement 8, "Adding entrepreneurship education in my curriculum will help me stimulate entrepreneurial mindset" yielded high positive results compared to all the statements. Students indicated that they wanted entrepreneurship education to be added to their curriculum, 88.1% of students agreed with the statement, 7.9% of students were neutral and 4.1% disagreed. The high percentage calls for urgent attention. If students believe entrepreneurship education could be the key to the future, they must be granted education to better prepare for the future. Barba-Sánchez *et al.* (2022) emphasized that entrepreneurship curriculum must be adjusted to focus on cross disciplinary training to provide education such as sustainability in business and environmental management. Ajzen (1991) observed that entrepreneurship education fuels readiness and opportunity to search. Elmuti *et al.* (2012) discussed the link between entrepreneurial training, entrepreneurial education, social competence, and venture effectiveness.

Objective 4 was to examine students' attitudes towards innovation and entrepreneurship education. The results showed that students had positive attitudes, therefore, adding entrepreneurship education could benefit students in their curriculum to stimulate entrepreneurial intent. The research aim was to expand entrepreneurship education to all the colleges/ faculties to boost students' innovation across South African universities. More than 88% of students agreed with the statement that business education must be introduced to their curriculum.

Figure 5.10: The impact of entrepreneurship education on students' innovation summary UKZN

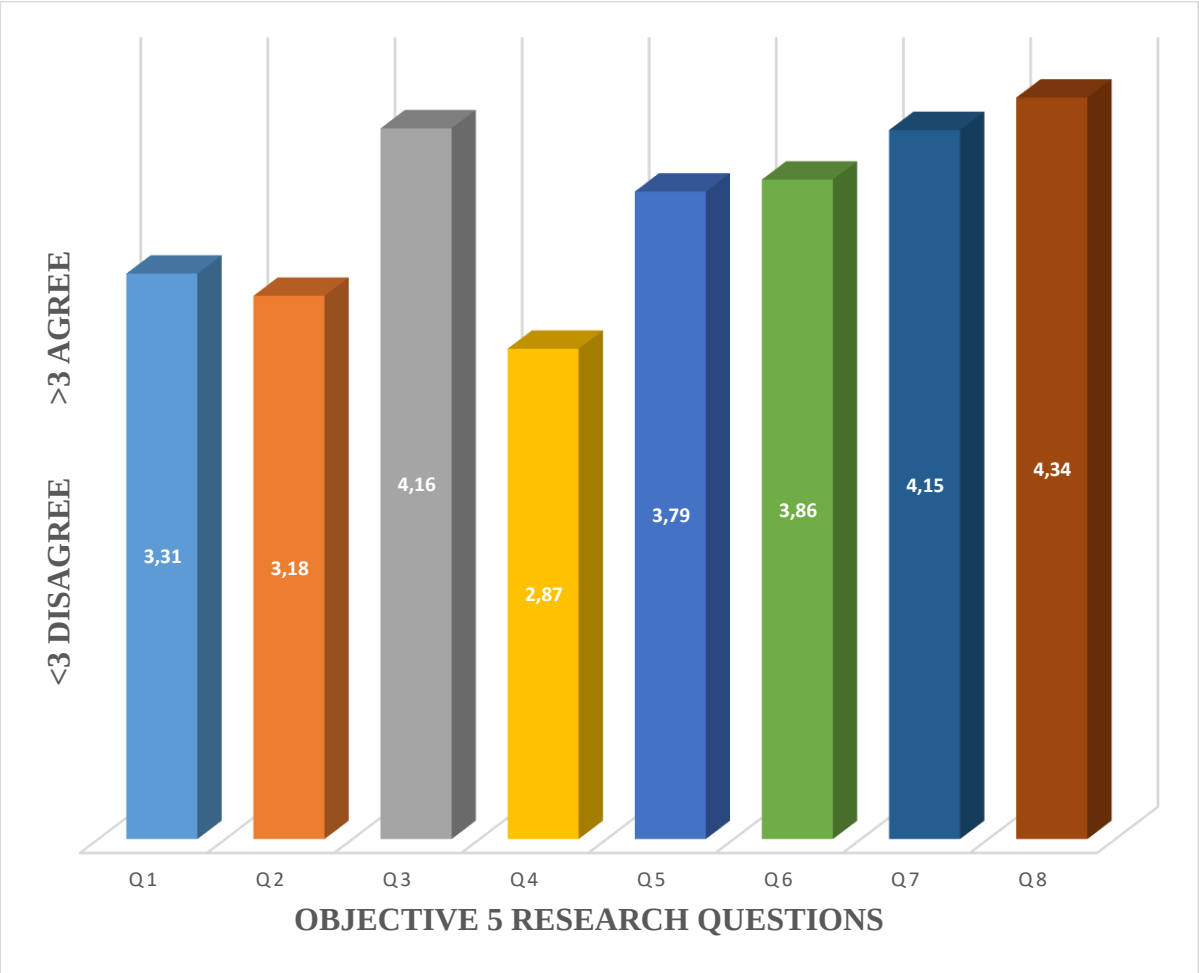


Figure 5.10 above presents the University of KwaZulu-Natal's Objective 5, and the statements are in significant agreement with the objective.

Table 5.15: The impact of entrepreneurship education on students' innovation

Questions (University of Zululand)	**Total sample (s)**	**Mean ($\bar{x}$) Ave=3.57**	**Standard deviation (σ)**
1. My degree is structured in a way that allows me to be versatile in industry and venture start-ups.	346	3.51	1.243
2. The relationship the university has with other sectors and stakeholders creates opportunities for me.	346	3.24	1.243
3. The Fourth Industrial Revolution (4IR) world requires education to contribute to technological innovation advancement.	346	3.93	1.180
4. What I have learned is not sufficient to trigger innovation.	346	2.90	1.287
5. University course content needs to improve for me to be innovative.	346	3.52	1.242
6. University entrepreneurship education needs to improve for me to be innovative.	346	3.61	1.209
7. University-society-industry need to collaborate and develop research and development centres.	346	3.84	1.147
8. Adding entrepreneurship education to my curriculum will help stimulate an entrepreneurial mindset.	346	4.04	1.189

Researcher's own work (2023)

The results discussed below are taken from Table 20 representing University of Zululand postgraduate students. Statement 2, "The relationship the university has with other sectors and stakeholders creates opportunities for me", yielded divergent views. A total of 48% of students agreed, 24.3% were neutral and 27.7% disagreed. Less than 50% of students were in support of the statement. The 24.3% neutral students could be those who do not know that the university has a relationship with other stakeholders, or they know the relationship, but it does not have an impact on students' career development. The disagreement part with 27.7% strictly denies that relationships with other sectors create opportunities for students. The findings indicate that

the institution must develop working relationships and alliances with outside stakeholders and companies for the betterment of students. The findings had a 3.24 mean average and a 1.243 standard deviation. The university can strengthen the relationship with companies by suggesting high-performing graduates to join their teams and offer research development to improve services.

Statement 3, "The Fourth Industrial Revolution (4IR) world requires education to contribute to technological innovation advancement", yielded the following results. A total of 75.8% of students agreed with the statement, 10.7% were neutral and 13.6% disagreed. Education plays a significant role in career development. The Fourth Industrial Revolution (4IR) introduced drastic changes in the industry, resulting in automotive labour gaining popularity. Moses *et al*. (2012) emphasised that businesses must adapt to technology to respond to needs of the society. Fatoki and Chindoga (2011) support that youth entrepreneurship must be promoted to exist in digital market where more activities take place. Wong *et al.* (2007) observed that entrepreneurship education can introduce innovative initiatives that would blend with technology commercialisation. The results had a mean average of 3.93 and a standard deviation of 1.180.

Statement 4, "What I have learned is not sufficient to trigger innovation", yielded divergent views. A total of 38.5% of students agreed that what they had learned was not sufficient. Lecturers must attend to the concern by introducing more innovative ways to teach, using practical examples to raise awareness among students, and using interactive methods of teaching. Sahut and According to Peris-Ortiz (2014), introducing entrepreneurship education could trigger innovation as the two (entrepreneurship education and innovation) must go hand in hand. A total of 19.7% were neutral. This may indicate that students do not understand module objectives, or learning outcomes or they are not interested in active learning. Giving practical examples, allowing discussions on the topic, and giving spot tests will push students to learn regularly. A total of 41.9% of students disagreed with this negative statement, , which is a positive sign. Students believed that what they had learned could trigger innovation, however, relevant content should be provided to better equip them with skills. The statement had a mean average of 2.90 and 1.287 standard deviation. Results were skewed to the left showing that students were against the statement.

Statement 6, "University entrepreneurship education needs to improve for me to be innovative", yielded the following results. The majority of the students agreed with the statement, 63.9% responded that entrepreneurship education must improve to support innovation. Results reflect that the population agreed that there is a need to improve the existing curriculum to produce innovative graduates. The neutral students were 17.6% and 18.2% disagreed. In Objective 1, the questions were looking at the existing curriculum, and Statement 1 asked if students were aware of entrepreneurship education. Only 38% agreed, more than 61% were against the statement. Objective 1 students revealed that they were not aware of entrepreneurship education. In Objective 6, students supported what they raised in Objective 1 by emphasising that entrepreneurship must be improved to support innovation. Improving education may improve a number of innovative ventures and yield graduates with diverse skills.

The entrepreneurship education concept was adopted and supported by the Department of Higher Education and Training and all universities in South Africa, however, more needs to be done. The programs facilitated by the Department of Higher Education and Training must get colleges/ faculties involved, and must be compulsory for academics to take part. The information received by academics must be shared in class with students to raise awareness. This could assist the teaching and learning approaches to be proactive. The results had a mean average of 3.61 and 1.209 standard deviation.

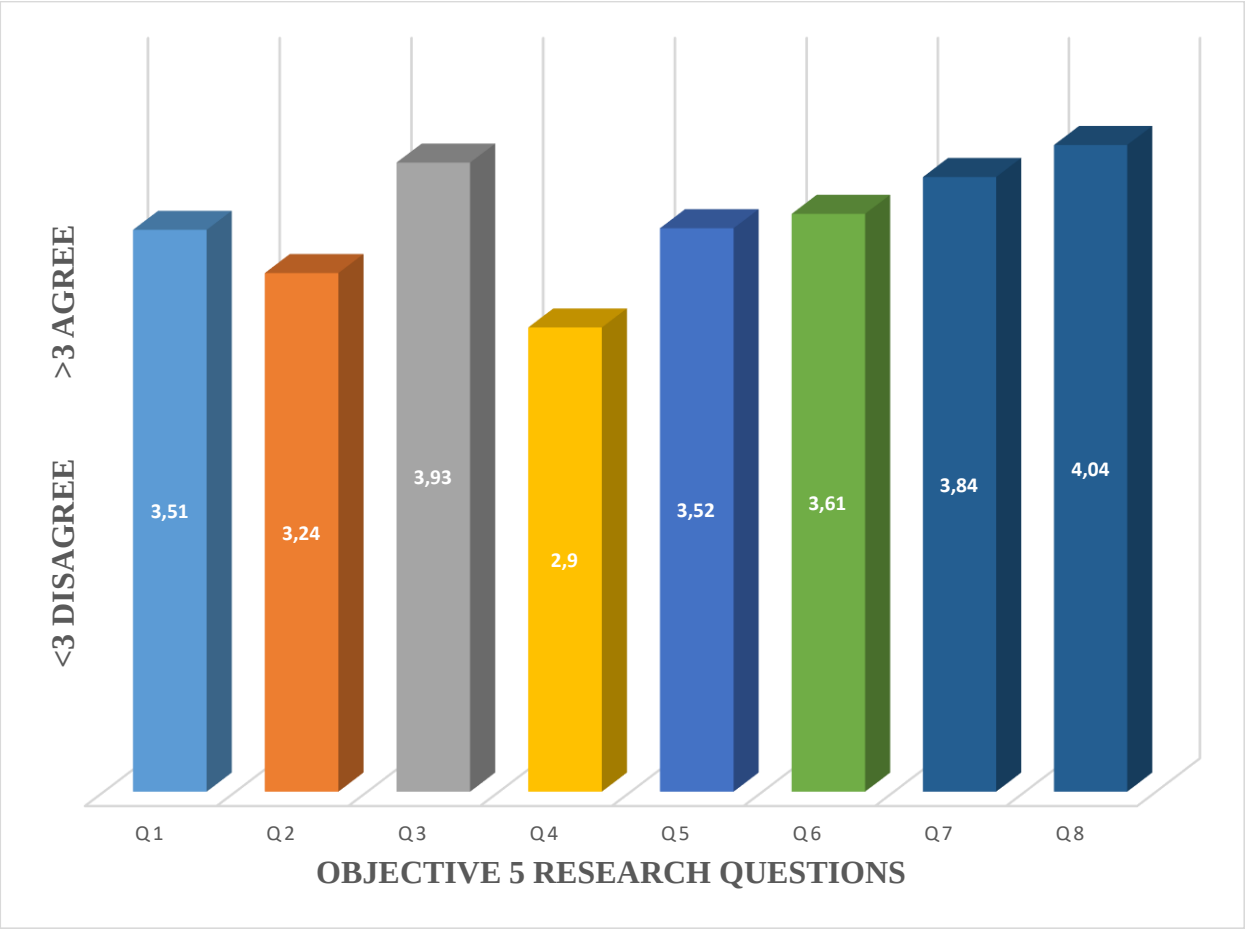
Statement 7, "University-society-industry need to collaborate and develop research and develop centres" suggested that collaboration makes things easy since each stakeholder can make a significant contribution toward the course of developing a noble society. The majority of the students (74.2%) supported the statement as they believe that collaboration between industry, university, government, and society may accomplish more when working together. Afonso *et al*. (2012) observed that using the quadruple helix confirms an increase in production, high growth, and productive developments in government expenditure. Leydesdorff (2012) highlighted that the quadruple helix can be used for policy guidance, knowledge transfer, network development, and start-up development. There is still room for improvement if the institutions can adopt the quadruple helix actors for affiliation and to speed up progress. Only 13% of students were neutral and 12.7% disagreed. The portion of students that disagreed with the statement could be students who are not aware of the collaboration or those who do not understand how they are going to benefit from the process. The statement had a mean average of 3.84 and a 1.147 standard deviation. The statement significantly agreed with the objective. The collaboration could have more advantages since the population will have a common goal

to achieve as a nation. Universities can use research facilities to improve the existing standards of living, civil society can pledge time and resources while industries can utilise high-tech resources for production efficiency. Students can get mentorship and opportunities to learn through internships or in-service training from companies.

Statement 8, "Adding entrepreneurship education in my curriculum will help stimulate entrepreneurial mindset", yielded positive responses. Students from the University of Zululand concurred with University of KwaZulu-Natal students on this statement. A total of 78.4% of students were confident that adding entrepreneurship education to the curriculum would help them stimulate an entrepreneurial mindset. The research aimed to expand entrepreneurship education to boost students' innovation in South African universities. Looking at the research objectives, the students supported the research. This study could help institutions to utilise feedback obtained from students to repurpose and restructure course content to align it with the 21st-century demands. Entrepreneurship education can teach students to be versatile since it can become a career choice that can contribute to economic growth, and reduce unemployment and corruption in the country. The creation of new businesses can help people get employment which then reduces the burden on the government since there will be fewer people depending on social grants (Patel *et al*., 2023).

A study by Patel *et al*. (2023) highlighted that from early 2020 during COVID-19 pandemic to date, the majority of household breadwinners in South Africa have been grant beneficiaries. The grant holder beneficiaries include older people, people with disabilities, and children. Students from disadvantaged backgrounds, particularly in the rural parts of KwaZulu Natal, are motivated by unfavourable conditions to change their lives. The study by Patel *et al*. (2023) further revealed that some people are doing over and above to improve their families' wellbeing and desire to be independent. The statement had a highly positive response reflecting how desperately students want entrepreneurship education in their curriculum. Only 13% of students disagreed and 8.7% were neutral. The mean average was 4.04 and the standard deviation was 1.189. The findings were skewed to the right centred around one point meaning the majority of students share the same sentiments concerning entrepreneurship education.

Figure 5.11: The impact of entrepreneurship education on students' innovation summary UNIZULU



Adding entrepreneurship education across all faculties/ colleges can make students think out of the box, trigger creativity, and open a platform for more innovative entrepreneurship. Young innovative minds can create a better future for the nation. Youth require education and in-depth training in innovative entrepreneurship to be motivated (Jesselyn Co & Mitchell, 2006). New ventures could benefit universities, society, and industry, and the impact could expand globally. Gibb *et al*. (2012) mentioned that students may develop positive attitudes and generate innovative businesses when using entrepreneurship education knowledge. Attitude influences decision making, an individual ends up thinking more about a new venture which leads to entrepreneurial intention (Drnovšek *et al*., 2010). The findings support and correspond with Theory U employed in this study. There was significant agreement between Objective 5 and the statements; therefore, Objective 5 was achieved. The results obtained from the University of Zululand postgraduate students agreed with the findings by Iqbal *et al*. (2012).

5.4 REGRESSION ANALYSIS ON ENTREPRENEURSHIP EDUCATION

Regression analysis is a statistical method used to analyse relationships between dependent variables and one or more independent variables (Seber & Lee, 2012). It measures data description, parameter estimation, and the relationship between variables (Montgomery *et al*., 2012). Regression analysis is used in different fields to analyse relationships, make predictions, and make informed decisions. The types of regression analysis are predictive modelling, hypothesis testing, causal inference, and trend analysis.

- **Predictive modelling** is used to build models that can predict future values of dependent variables using independent variables (Sarstedt *et al*., 2019).
- **Hypothesis testing** is used to test hypotheses about the relationship between variables. It can be used to determine the statistical significance relationship between independent and dependent variables, and it can be used to quantify relationships between variables (Stone *et al.*, 2010).
- **Causal inference** is usually employed to investigate causal relationships between variables. It helps to identify if the independent variable has a direct effect on the dependent variable.
- **Trend analysis** is used to analyse trends in data over a period. It is used to identify changes, patterns, and forecasting between variables (Sarstedt *et al*., 2019).

Regression analysis was used to measure the relationship between independent and dependent variables. Theory U which was used in the study propounds that five components must have a relationship to better yield favourable results toward a better future as it emerges. Regression analysis was employed to analyse and check the positive relationship between independent variables (Objectives 1, 2, 3, & 4) against dependent variables (Objective 5). The findings are tabulated below in Table 21.

Table 5.16: Regression of entrepreneurship education and its antecedents UKZN

Objectives	**Beta (B)**	**Sign**
RO1 – To determine if existing education equips students with innovation skills.	0.797	0.00
RO2 – To determine if knowledge acquired exposes students to innovation.	0.397	0.00
RO3 – To investigate assumptions/views towards innovative entrepreneurship.	0.534	0.00
RO4 – To determine students' attitudes towards innovation.	0.568	0.00

Dependent variable: Entrepreneurship Education, adjusted $R^2 = 0.652$, $F = 685.565$, $P < 0.005$

Table 5.16 above shows Beta values for all research objectives from the University of KwaZulu-Natal. The Beta for Objective 1 is 0.797, Objective 2 is 0.397, Objective 3 is 0.534, and Objective 4 is 0.568. It can be concluded using Beta values that Objective 1, "To determine if existing education equips students with innovation skills across the institution" is a stronger predictor. Findings show that the statement from Objective 1 reflects a 79.7% variation with regard to entrepreneurship education. This means education have significant impact on innovation, therefore giving quality updated education will result in students with high capabilities of innovation and creativity. Education plays a vital role in developing innovative entrepreneurs.

Entrepreneurship education and Innovation as dependent variables have a relationship with independent variables (RO1, RO2, RO3 and RO4). Objective 1 was to investigate if the current curriculum equips students with skills to keep up with the fast-changing world of technology. Students were certain that the current curriculum needs to be revised and entrepreneurship education should be added to better equip them with relevant skills. Below is the Beta table for the University of Zululand. The results obtained from this study support Stone *et al*. (2010), Sahut and Peris-Ortiz (2014), and Elmuti (2012).

Table 5.17: Regression of entrepreneurship education and its antecedents UNIZULU

Objectives	**Beta (B)**	**Sign.**
RO1 – To determine if existing education equips students with innovation skills.	0.800	0.00
RO2 – To determine if knowledge acquired exposes students to innovation.	0.667	0.00
RO3 – To investigate assumptions/views towards innovative entrepreneurship.	0.555	0.00
RO4 – To determine students' attitudes towards innovation.	0.522	0.00

Dependent variable: Entrepreneurship Education, adjusted $R^2 = 0.736$, $F = 957.411$, $P < 0.005$

Regression analysis from Table 5.17 above reflects Beta readings for all the objectives for the University of Zululand. The Beta for Objective 1 is 0.800, Objective 2 is 0.667, Objective 3 is 0.555, and Objective 4 is 0.522. From Beta readings above, it can be concluded that Objective 1, "To determine if existing education equips students with innovation skills across the institution", is a stronger predictor of entrepreneurship education. The Beta readings from the University of Zululand had higher readings in Objective 1, and the University of KwaZulu-Natal also had a high Beta value in Objective 1.

The findings reveal that revisiting, revising, or restructuring the curriculum can bring significant change to students. Students believe that current education does not equip them fully with relevant skills. Therefore, expanding entrepreneurship education could be beneficial to the student population in South African universities. The results from this study support the findings by Iqbal *et al.* (2012) and Lacho (2010). Beta values reflect relationship between dependent and independent variables, high Beta value reflects strong relationship between measured variables, therefore independent variable with high Beta can be used to estimate dependent variable.

5.5 VARIABLES CORRELATION ANALYSIS

Correlation analysis is a statistical method that measures the strength of the relationship between two or more variables (Zaid, 2015). The analysis is used to determine whether variables are related and to what extent. The correlation coefficient is the result obtained from correlation analysis, the correlation is at 0.01 level (2-tailed) significant. The results with +1

reflect a positive correlation coefficient where variables move in the same direction (Gogtay *et al.*, 2017).

A correlation coefficient of -1 indicates a perfect negative correlation where variables move in opposite directions (Gogtay *et al*., 2017). A correlation of 0 indicates no correlation between variables. The correlation coefficient between $0.4 \leq r \leq 0.59$ is a moderate correlation, $0.6 \leq r \leq 0.79$ is a high correlation and $0.8 \leq r \leq 1.0$ is a very high correlation (Zaid, 2015). The correlation between $0 \leq r \leq 0.19$ suggests no association, and $0.20 \leq r \leq 0.39$ suggests a weak correlation (Syauqy *et al*., 2018). The tables below show the correlation between variables adapted from the University of KwaZulu-Natal and the University of Zululand findings.

Table 5.18: Correlation between variables University of KwaZulu-Natal

Correlation	**Research objective 1**	**Research objective 2**	**Research objective 3**	**Research objective 4**	**Research objective 5**
Research objective 1	0.200	0.621	0.756	0.356	1
Research objective 2	0.621			1	
Research objective 3	0.756		1		
Research objective 4	0.356	1			
Research objective 5	1				

**Correlation at the 0.01 level (2-tailed) is significant.

The results reflect a high correlation between Objective 5 “To determine if entrepreneurship education knowledge can help boost innovation skills among students” and Objective 2 “To determine if knowledge acquired from qualification exposes students to innovative ideas”. The correlation coefficient is $r = 0.621$, $p < 0.005$, meaning that responses in Objective 5 have similar support to Objective 2 responses from students. Objective 5 was to examine if adding entrepreneurship education knowledge can help boost innovation among students. The majority of students agreed that the curriculum needs to be modified and restructured to better address current issues facing the country.

Correlation is high between Objective 5 and Objective 3 “To investigate assumptions/views students have towards innovative entrepreneurship”. Objective 3 was to examine assumptions, views, and knowledge students have towards innovation entrepreneurship. The correlation coefficient is $r = 0.756$, $p < 0.005$. The students had great views and assumptions towards innovative entrepreneurship; however, students emphasised that current education has outdated content that needs to be replaced.

The correlation between Objective 5 and Objective 4 “To determine the attitude students have towards innovation and entrepreneurship education” is a weak correlation. The correlation coefficient is $r = 0.356$, $p < 0.005$ because students believe that the current curriculum must be replaced with a new innovative curriculum to better give them skills to participate in the fast-changing world of the Fourth Industrial Revolution (4IR). If a student’s attitude is negative, the chances of that student’s participation in innovation and entrepreneurship will be less. The results support the findings by Iqbal *et al*. (2012) when they emphasised that attitude is a significant factor in decision making and dependent variables. A positive weak correlation exists between Objectives 1 and 4.

Correlations between Objective 5 and Objective 1 “To determine if existing education equips students with innovation skills across the institution” reflect a weak correlation. This is caused by the type of education that is offered to students currently whereas Objective 5 suggests adding entrepreneurship education across the institution, which is different from what is offered by the current curriculum. The entrepreneurship education curriculum is currently offered to students from the College of Law and Management Studies. Students from other disciplines only receive modules from their area of expertise which does not include entrepreneurship.

Table 5.19: Correlation between variables University of Zululand

Correlation	**Research objective 1**	**Research objective 2**	**Research objective 3**	**Research objective 4**	**Research objective 5**
Research objective 1	0.593	0.744	0.858	0.655	1
Research objective 2	0.744			1	
Research objective 3	0.858		1		

Research objective 4	0.655	1			
Research objective 5	1				

**Correlation at the 0.01 level (2-tailed) is significant.

The University of Zululand results have a positive correlation. A moderate correlation exists between Objectives 1 and 5 because of the concern students raised about the existing curriculum.

Objective 1 was to examine if the existing curriculum needs changes to respond to the Fourth Industrial Revolution and the fast-changing world of technology. Objective 5 suggests adding entrepreneurship education to the existing curriculum. The correlation coefficient is $r = 0.593$, $p < 0.005$. There is a high correlation between Objectives 2 and 5 and the the correlation coefficient is $r = 0.744$, $p < 0.005$, meaning that students agreed that their qualifications expose them to innovation; however, they lack innovative entrepreneurship on their acquired skills.

A good attitude can result in an individual taking on tasks and performing well. A high correlation exists between Objectives 4 and 5, meaning students want to own their businesses after graduation or in the future. The results agree with Iqbal *et al*. (2012) and Fayolle *et al.* (2006). The positive attitude is motivated by the high level of unemployment, crime rate, and poverty facing South Africa and the African continent holistically. The pressure and responsibility to give back, and support back home drive the ambitions of students. The correlation coefficient is $r = 0.655$, $p < 0.005$.

5.6 GENDER AND AGE INFLUENCE ON DECISION MAKING

The results under demographic data focused on the gender and age of participants. This section investigates if gender and age had a significant influence on decision-making when participating in this research. Table 25 shows that gender had a significant role in influencing the decision to expand entrepreneurship education to boost students' innovation in South African universities. The table below portrays the number of females versus the number of males who participated in the study. The results will reflect how each gender responded to each objective. The research was dominated by female students from the University of KwaZulu-Natal and the University of Zululand. The large percentage of females is a true reflection of

postgraduate students registered in these institutions. The participants were postgraduate students listed in the table below.

Table 5.20: Gender comparison for each objective University of KwaZulu-Natal

Objectives		**N**	**Mean (M) average**	**Standard deviation (SD)**
Research objective 1	Female	206	3.317	0.866
	Male	162	3.251	0.926
	Total	368	3.288	0.892
Research objective 2	Female	206	3.422	0.773
	Male	162	3.320	0.865
	Total	368	3.377	0.815
Research objective 3	Female	206	3.392	0.792
	Male	162	3.308	0.822
	Total	368	3.355	0.805
Research objective 4	Female	206	3.511	0.697
	Male	162	3.671	0.761
	Total	368	3.582	0.729
Research objective 5	Female	206	3.661	0.557
	Male	162	3.766	0.722
	Total	368	3.707	0.636

ANOVA

The results from Table 5.20 above indicate that Objective 1 has more females (M = 3.317) believing that existing education does not adequately equip students with innovation skills across the institution than males (M = 3.251), F (1.366) = 0.494, $p < 0.005$. Looking at Objectives 4 and 5, the results show that more males have a positive attitude towards innovation and entrepreneurship education. Objective 4's mean for males was 3.671, F (1.366) = 4.378, $p < 0.005$. Objective 5 was to investigate if entrepreneurship education knowledge can help boost innovation among students, and more males agreed (M = 3.766), F (1.366) = 2.499, $p < 0.005$. Students believe that adding entrepreneurship education can help boost innovation across the qualifications and in the institution at large. Even though the majority of females (206) participated, the results reveal strong responses from male postgraduate students. This could mean female postgraduate students were not sure of what they wanted at that moment. The

results reflect the confidence that students are determined to create ventures after receiving a business education.

Table 5.21: Gender comparison for each objective University of Zululand

Objectives		**N**	**Mean (M) average**	**Standard deviation**
Research objective 1	Female	175	3.649	0.933
	Male	171	3.545	1.113
	Total	346	3.598	1.026
Research objective 2	Female	175	3.481	0.921
	Male	171	3.292	1.069
	Total	346	3.387	1.000
Research objective 3	Female	175	3.557	0.876
	Male	171	3.386	1.028
	Total	346	3.473	0.957
Research objective 4	Female	175	3.370	0.757
	Male	171	3.238	0.873
	Total	346	3.305	0.818
Research objective 5	Female	175	3.622	0.826
	Male	171	3.524	1.024
	Total	346	3.574	0.929

ANOVA

At the University of Zululand, female postgraduate students dominated and showed strong support for the notion that suggests curriculum restructuring in Objective 1. The majority of females ($M = 3.649$), $F(1.344) = 0.890$, $p < 0.005$ were indicated that the existing curriculum needs a few changes to equip students with relevant skills. Objective 2, "To determine if knowledge acquired from qualifications exposes students to innovative ideas", yielded the following results. Female students agreed that it does to a certain point whereas male students' responses were not consistent, some males disagreed, and others agreed. The mean was 3.292, $F(1.344) = 3.119$, $p < 0.005$ had a positive attitude and were interested in business start-ups. Objective 5 results reveal that both females ($M = 3.622$), $F(1.344) = 0.963$, $p < 0.005$ and males ($M = 3.524$), $F(1.344) = 0.963$, $p < 0.005$ want entrepreneurship education to be part of their curriculum. The students show more confidence, and dedication in starting and maintaining businesses.

5.7 STUDENTS RESPONSE TO RESEARCH OBJECTIVES

The study aimed to achieve five research objectives. The objectives summary will reveal whether the study's aim was achieved or not. Table 27 below consists of objectives, statements, and summary of results. The objectives underpinning the study were achieved.

Table 5.22: The objectives achievement summary for University of KwaZulu-Natal

	Objectives	**Statement**	**Results (**Mean (M) , Standard Deviation (SD) & comment**)**
1	To determine if existing education equips students with innovation skills across the institution.	1. I am aware of the university entrepreneurship education	M = 2.97, SD = 1.192 Significant disagreement
		2. The skills I receive from the university education encourage me to be innovative.	M = 3.34, SD = 1.133, Significant agreement
		3. My courses will equip me with the skills to get a job or start an innovative business.	M = 3.55, SD = 1.205 Significant agreement
		4. My courses offer skills that allow me to upgrade existing businesses to new business models.	M = 3.19, SD = 1.271 Significant agreement
		5. I find the knowledge in the curriculum sufficient.	M= 3.38, SD = 1.185 Significant agreement
2	To determine if knowledge acquired from qualification exposes students to innovative ideas.	1. My university provides services like extra classes, seminars, and workshops to support innovation.	M = 3.54, SD = 1.176 Significant agreement
		2. My university has an innovation centre.	M = 3.25, SD = 1.05 Significant agreement
		3. My university supports new innovative businesses.	M = 3.38, SD = 1.010 Significant agreement
		4. My lecturers are innovative.	M = 3.29, SD = 1.135 Significant agreement
		5. My lecturers are always available to help me with innovation.	M = 3.14, SD = 1.111 Significant agreement

		6. In my curriculum, innovation is emphasised all the time.	M = 3.05, SD = 1.243 Significant agreement
		7. To gain more innovation knowledge is essential for my career.	M = 3.99, SD = 1.1099 Significant agreement
3	To investigate the assumptions/views students have towards innovative entrepreneurship.	1. I am aware that the university has collaborated with various stakeholders to teach me the fundamentals of venture creation.	M = 3.02, SD = 1.231 Significant agreement
		2. I am aware that my degree encourages innovation and creative thinking.	M = 3.87, SD = 1.182 Significant agreement
		3. The current curriculum offered by the institution allows all students to be innovative and business-minded.	M = 2.83, SD = 1.148 Significant disagreement
		4. My university has enough infrastructure to support innovation and entrepreneurship education.	M = 3.15, SD = 1.147 Significant agreement
		5. The knowledge I receive from my qualifications addresses key national challenges.	M = 3.70, SD = 1.198 Significant agreement
		6. I can use the knowledge I received from my qualification to start a modernised venture.	M = 3.56, SD = 1.147 Significant agreement
4	To determine the attitude students, have towards innovation and entrepreneurship education.	1. My degree will give me a competitive advantage in the job market.	M = 3.62, SD = 1.120 Significant agreement
		2. My degree does not allow me to compete globally with students from international universities.	M = 2.35, SD = 1.163 Significant disagreement
		3. I have role models who are business owners to look up to if ever I need inspiration.	M = 3.54, SD = 1.276 Significant agreement
		4. Given resources, I would start an innovative business.	M = 3.94, SD = 1.117 Significant agreement

		5. I can take entrepreneurship as a career.	M = 4.00, SD = 1.099 Significant agreement
		6. I am not interested in being an entrepreneur.	M = 1.93, SD = 1.176 Significant disagreement
		7. I am interested in innovative entrepreneurship.	M = 4.03, SD = 1.125 Significant agreement

Researcher's own work (2023)

Table 5.23: The objectives achievement summary for University of Zululand

	Objectives	**Statement**	**Results (**Mean (M), standard deviation (SD) & comment**)**
1	To determine if existing education equips students with innovation skills across the institution.	1. I am aware of the university entrepreneurship education.	M = 3.41, SD = 1.196 Significant agreement
		2. The skills I receive from the university education encourage me to be innovative.	M = 3.78, SD = 1.207 Significant agreement
		3. My courses will equip me with the skills to get a job or start an innovative business.	M = 3.80, SD = 1.272 Significant agreement
		4. My courses offer skills that allow me to upgrade existing businesses to new business models.	M = 3.46, SD = 1.334 Significant agreement
		5. I find the knowledge in the curriculum sufficient.	M= 3.53, SD = 1.209 Significant agreement
2	To determine if knowledge acquired from qualification exposes students to innovative ideas.	1. My university provides services like extra classes, seminars, and workshops to support innovation.	M = 3.52, SD = 1.244 Significant agreement
		2. My university has an innovation centre.	M = 3.10, SD = 1.216 Significant agreement
		3. My university supports new innovative businesses.	M = 3.21, SD = 1.207 Significant agreement
		4. My lecturers are innovative.	M = 3.49, SD = 1.226

			Significant agreement
		5. My lecturers are always available to help me with innovation.	M = 3.45, SD = 1.285 Significant agreement
		6. In my curriculum, innovation is emphasised all the time.	M = 3.16, SD = 1.248 Significant agreement
		7. To gain more innovation knowledge is essential for my career.	M = 3.79, SD = 1.258 Significant agreement
3	To investigate the assumptions/views students have towards innovative entrepreneurship.	1. I am aware that the university has collaborated with various stakeholders to teach me the fundamentals of venture creation.	M = 3.51, SD = 1.226 Significant agreement
		2. I am aware that my degree encourages innovation and creative thinking.	M = 3.97, SD = 1.256 Significant agreement
		3. The current curriculum offered by the institution allows all students to be innovative and business-minded.	M = 2.83, SD = 1.148 Significant disagreement
		4. My university has enough infrastructure to support innovation and entrepreneurship education.	M = 2.94, SD = 1.279 Significant disagreement
		5. The knowledge I receive from my qualifications addresses key national challenges.	M = 3.61, SD = 1.271 Significant agreement
		6. I can use the knowledge I received from my qualifications to start a modernised venture.	M = 3.66, SD = 1.248 Significant agreement
4	To determine the attitude students have towards innovation and entrepreneurship education.	1. My degree will give me a competitive advantage in the job market.	M = 3.60, SD = 1.224 Significant agreement
		2. My degree does not allow me to compete globally with students from international universities.	M = 2.41, SD = 1.262 Significant disagreement

		3. I have role models who are business owners to look up to if ever I need inspiration.	M = 3.59, SD = 1.340 Significant agreement
		4. Given resources, I would start an innovative business.	M = 3.80, SD = 1.232 Significant agreement
		5. I can take entrepreneurship as a career.	M = 3.84, SD = 1.213 Significant agreement
		6. I am not interested in being an entrepreneur.	M = 2.06, SD = 1.298 Significant disagreement
		7. I am interested in innovative entrepreneurship.	M = 3.84, SD = 1.284 Significant agreement

Researcher's own work (2023)

5.8 STUDENTS RESPONSE TO RESEARCH QUESTIONS

This section aims to respond to all five research questions. The research questions of this study are:

1. Does the existing education equip students with innovation skills across the institution?
2. To what extent do qualifications offered in the institution expose students to innovative ideas?
3. What are the assumptions/views that the students have towards innovative entrepreneurship?
4. What are the attitudes students have towards innovation and entrepreneurship education?
5. Can entrepreneurship education knowledge help to boost innovation among students?

The research managed to achieve all research questions.

Table 5.24: Students' responses to research questions (UKZN and UNIZULU)

Research questions		**Outcome**
1	Does the existing education equip students with innovation skills across the institution?	• The majority of students were not aware of entrepreneurship education. • Students agreed that using their curriculum they will find employment after graduating. • Students believe that the existing curriculum needs to be revised and updated to equip them with relevant skills. • Findings support Theory U employed in the study, "Look beyond past patterns and develop strategies for desired future and new possibilities". • The findings significantly agree with Steenekamp *et al*. (2011). • The overall UKZN mean average was 3.29 and 1.197 standard deviation. • The overall UNIZULU mean average was 3.60 and 1.244 standard deviation.
2	To what extent do qualifications offered in the institution expose students to innovative ideas?	• Students believe that education exposes them to innovation. • The majority of students disagreed that innovation is emphasised in their qualifications. • Students believe that innovation is essential to their careers as it can help them create ventures. • Students may need entrepreneurship education to help with creative thinking. • This research supports the study by Steenekamp *et al*. (2011) when they stress that there is a direct relationship between education and innovative entrepreneurship. • Soomro *et al*. (2021) highlighted that entrepreneurship education is essential to expose students to creativity. • The positive mean average for UKZN was 3.38 with a 1.119 standard deviation.

		• The positive mean average for UNIZULU was 3.39 with a 1.241 standard deviation.
3	What are the assumptions/views the students have towards innovative entrepreneurship?	• Students denied that the current curriculum allows all students to be innovative. • They believe that only students from the College of Law and Management Studies from the University of KwaZulu-Natal have the privilege because those students get a business education from their qualifications. • Students from the University of Zululand concur with the University of KwaZulu-Natal students on the curriculum issue. • Baumol and Storm (2007) accentuate that innovation helps entrepreneurs to produce and upgrade something new to the market. • Kolehmainen *et al.* (2016) stress that institutions must use entrepreneurship education to improve innovation and the economy. • Students think that universities need to improve infrastructure to support innovation. • Students had positive assumptions/views about entrepreneurship education. • The UKZN findings had a mean of 3.36 and a standard deviation of 1.176. • The UNIZULU findings had a mean of 3.47 and a standard deviation of 1.256.
4	What are the attitudes students have towards innovation and entrepreneurship education?	• Students have a positive attitude towards entrepreneurship education and innovation. • Students are interested in starting innovative ventures and the majority of them are willing to take entrepreneurship as a career.

		• Fayolle *et al*. (2006) assert that entrepreneurship education, workshops, and seminars have a significant positive impact on students' attitude. • Karali (2013) confirms that attitude reflects the likelihood for an individual to become an entrepreneur. • Soomro *et al*. (2020) concur with Karali (2013) that entrepreneurship education influences attitudes and stimulates positive entrepreneurial intentions. • The UKZN mean average was 3.34 and the standard deviation was 1.154. • The UNIZULU mean average was 3.31 and the standard deviation was 1.265. • Findings correspond with Theory U Component 4, "Connecting vision and intention by putting theory into practice". This is where entrepreneurship education is used to establish new ventures. • Baker *et al.* (2007) believed that a positive attitude has a significant impact on behaviour and intention. • According to Farah and Newman (2010), attitudes are a stronger predictor of intention.
5	Can entrepreneurship education knowledge help to boost innovation among students?	• Students are eager to receive entrepreneurship education through their curriculum. • Chimucheka (2014) emphasises that entrepreneurship education could increase total entrepreneurial activity and reduce risk to the economy. • Stokes *et al.* (2010) emphasised that entrepreneurship education can be used to develop skills through learning. • Students believe that collaboration among university, civil society, government, and industry could bring developments that could change life for the better. • Arnkil *et al.* (2010) believe that the quadruple helix actors must join forces to produce scarce skills and innovation.

		• The majority of students mentioned that education in the higher education sector needs to change to improve innovation and creative thinking. • Findings relate to Theory U, Component 5, "A period to clarify, consolidate, facilitate and operate the process from a whole". • Iqbal *et al*. (2012) highlight that a positive mean average means that there is a great influence encouraging students to think about starting a business right after graduation. • The positive result means that students have good intentions toward venture start-ups, the findings concur with results obtained by Baker *et al.* (2007). • Zian *et al*. (2010) highlighted that individual character has a dominant influence on decision-making. • The UKZN average mean was 3.71 and the standard deviation was 1.059. • The UNIZULU average mean was 3.57 and 1.218 standard deviation. • Students want to make entrepreneurship a career choice. • Fayolle *et al*. (2006) stress that entrepreneurship programs have a powerful impact on students' entrepreneurial intent.

Researcher's own work (2023)

5.9 CHAPTER SUMMARY

The research aimed to expand entrepreneurship education to boost students' innovation in South African universities. The results obtained from the study support findings discussed in the literature review (Chapter 2) and results section in Chapter 5 by Fayolle *et al*. (2006), Scharmer (2009), Zian *et al*. (2010), Arnkil *et al*. (2010), Iqbal *et al*. (2012) and Chimucheka (2014). The study had five objectives which were linked to Theory U's five components. The findings reported that students need the curriculum to be revised and entrepreneurship education to be expanded across the institution to equip students with a business mindset and innovation skills. Students showed a positive attitude towards entrepreneurship education, a total of more than 88% reflects that the highest percentage comprised students supporting the idea of entrepreneurship education being added to all qualifications.

Students urged institutions to use the quadruple helix actors to speed up the development process. Collaboration of universities, governments, industries, and civil society could allow each stakeholder to contribute significantly towards building a better economy. Using entrepreneurship education may stimulate innovation where new businesses are developed and job opportunities increase. Findings revealed that outdated education contributes to unemployment and hinders more students from starting businesses. The results support findings by Iqbal *et al*. (2012). The institution must invest in innovation centres, research and development, collaborations with international institutions, and use innovative ways of teaching to keep students interested. Fayolle *et al.* (2006) highlighted that teaching must use case studies and practical scenarios to stimulate student interest in learning.

The findings were significant because they reveal that students indeed need entrepreneurship education across all qualifications in higher education institutions. The findings challenge decision makers such as heads of departments (HODs), academic leaders, senior lecturers, and curriculum developers to remove outdated content in the curriculum and replace it with innovative content. The findings could convince colleges/faculties to redesign each degree to meet current models and expectations. A study by Fields and Kunene (2017) mentioned that entrepreneurship education is still in its infancy stage, therefore, active entrepreneurship education must be promoted to produce productive entrepreneurs. The findings are significant because they support the Department of Higher Education and Training (DHET), and Entrepreneurship Development in Higher Education (EDHE) strategy to develop entrepreneurship country-wide.

CHAPTER 6

QUALITATIVE DATA ANALYSIS AND DISCUSSIONS

6.1 INTRODUCTION

As discussed in Chapter 4, qualitative data analysis is a process of examining and interpreting non-numerical data such as text, audio recordings, videos, and images (Belotto, 2018). Therefore, the process involves systematic and rigorous methods to identify patterns, themes, and relationships within data (Flick, 2013).

The previous chapter analysed and discussed quantitative data collected from postgraduate students at the University of KwaZulu-Natal and the University of Zululand. This chapter focuses on the second part of data which is qualitative research findings obtained from academic staff at the University of KwaZulu-Natal and the University of Zululand. Data findings respond to questions that were developed to answer the objectives of the research. Chapter 6 involves the data collected from interviews with academic staff. The responses were captured and coded; participants were coded as (Participants 1 to 8).

6.2 THEMES AND CATEGORISATION

Table 6.1: Themes representing qualitative data responses from University of KwaZulu-Natal and University of Zululand participants

Number	Themes and categories	Codes
1	Existing curriculum and needed changes	Current, curriculum, changes
2	Innovation and entrepreneurship education	Unemployment, education, innovation, entrepreneurs
3	Creating businesses and satisfaction	Businesses, start-up, development, career
4	Expanding entrepreneurship education	Expand, Across, College/Faculty

Researcher's own work (2023)

The themes were used to easily identify or extract key information from participants regarding the current curriculum and recommendations posed by the research. Themes are essential for interpreting data collected during research. Themes serve the purpose of data organisation, data

analysis, theory development, reporting, dissemination, validity, and reliability. In qualitative research, themes are used to make sense of complex qualitative data, identify patterns and relationships and communicate their findings effectively.

6.3 DATA PRESENTATION

The data were collected using interviews as a data collecting instrument. In total, eight academic staff members were interviewed, four academic staff members from the University of KwaZulu-Natal (one per college), and four staff members from the University of Zululand (one per faculty). The aim was to get in-depth knowledge or information on curriculum content from academic staff. The academic staff members were notified that interviews were made to collect data for academic purposes. The researcher also explained the purpose of the study, and the contribution it could make to higher education institutions and the country at large. Staff members were sent consent forms to read and sign before starting with the interviews. The purpose of the interviews was to get information from the academic staff if they saw the current curriculum benefitting the institution or if there was a need to restructure the existing curriculum. The responses below were information recorded from academic staff from the University of KwaZulu-Natal and the University of Zululand.

6.3.1 Existing curriculum and needed changes

The interviewer introduced the purpose of the research, read the consent form to the participants and asked the participant whether he/ she agree to proceed with the interview. The interviewer started the interview, he asked about the existing curriculum and needed changes to better equip students with relevant skills.

An experienced academic who is an academic leader (AL) argues that there is a need for some changes.

He started by saying

"*I think there are major changes that need to be done and it is long overdue"* (**Participant 1**).

Another participant feels that changes must start at the high school level.

He argues that,

"*In my view, this problem you are trying to solve in your research is a problem that should also be tackled at the high school level where each combination of subjects students are encouraged to take business-related studies*" (**Participant 2**).

On the issue of existing curriculum and suggested changes, a senior lecturer emphasised that,

"*What needs to be done now is to restructure the curriculum of the university to accommodate the shortage of skills in the country. It could be changing science degrees to introduce entrepreneurship education, and also in chemistry in the water sector there is a serious shortage of analytical chemistry skills. We can adapt curriculum to accommodate what is needed but we cannot change curriculum as a whole because we cannot change science that will affect the future generations core and science fundamentals, but we can introduce few curriculum changes to accommodate a few modules"* (**Participant 4**).

Another senior academic staff with experience in health science commented and stressed that,

"*What the current curriculum does is concentrate on the science, we teach students science, we equip them and they are able to adapt everywhere, but what the curriculum doesn't do is that it doesn't prepare them to start their own businesses, and what it also doesn't do is that it doesn't equip them with know-how if they have good ideas how do they take them from idea stage right to product development. So definitely there is a need for curriculum change*" (**Participant 6**).

One of the academics believes that the curriculum does not address students' needs because what is taught in class is not in line with what is needed by the country.

She said,

"*Yes, it does. I think this speaks to issues around employment and it speaks to how our qualifications especially in humanities are based on the Western paradigm that does not consider the context of the students" (***Participant 8**).

She further said,

"*So, we have an issue of qualifications that are not based within context, then students can't practise what they are taught and therefore, we have people or students who are not working and who are not employed because of such issues".*

However, during interviews, the experienced head of department (HOD) pointed out that the need for change is not merely based on a lack of a good curriculum.

He criticised the university models,

"*I think we are guided by the curriculum, and I think it is relevant and sufficient but now the models we use somehow don't meet each other" (***Participant 3***).*

Participant 3 was supported by Participant 7.

"*It is not a curriculum that fails us, it is a lot of things, it is lack of collaboration, lack of access, and mostly lack of financial support from the government. The curriculum requires in-depth engagements and approvals from different structures within the institution to be changed or restructured"*(**Participant 7**).

6.3.2 Innovation and entrepreneurship education reducing unemployment

Innovation plays a vital role in new businesses, the existing businesses in the 21st century require more innovation and research engagements to stay on top and to keep up with the latest trends. Innovative entrepreneurship allows business owners the opportunity to develop existing ideas or come up with innovative concepts to reach the target market all the time. Innovation exists through new creativity or upgrading existing services which then lead to the creation of new ventures.

The interviewer engaged participants in asking questions with regard to innovation and entrepreneurship education.

The interviewer asked the participants, "In your opinion do you think integrating innovation and entrepreneurship education could assist in reducing unemployment by introducing more innovative entrepreneurs in the job market?"

A participant expressed that,

"*Definitely, strongly, strongly, strongly agree we can't teach the same thing in 2023 the same thing that was taught in the year 2000. So you need to incorporate things that are innovative and entrepreneurial to help students even if the economy is struggling to give students jobs, the students should be able to come up with something different to sustain themselves. This is a difficult period in our country where everyone is fighting unemployment, therefore university education should help equip students with skills to be part of job creators"*(**Participant 1**).

The other academic staff member supports **Participant 1** statement by emphasising that,

"*This particular approach would ensure that be it people who do any qualification, be it engineering, be it psychology they have that business mindset*". She further said, "*I think you are introducing a very important part and it is something in my view that should have been introduced a while back, but we are here. It's something that institutions should reflect on and have that as part of curriculum*" (**Participant 7**).

One of the academics agrees with integrating innovation and entrepreneurship education, however, he feels that technology must be integrated with all the changes since everything is modernised.

He said,

"*We can't ignore technology as part of our daily lives or living using artificial intelligence as means of enhancing entrepreneurship education and entrepreneurship skills is a way to go or is the future".*

While he was explaining the significance of technology in this day and age, he expressed that,

"*In terms of understanding what the competitors are doing, the use of technology can enhance and position the entrepreneur in a space where they can compete competitively with their competitors, therefore introducing entrepreneurship and aligned with innovation, which is the future because we know how innovation has helped in a smaller scale"* (**Participant 5**).

He further stressed that,

"Technology can enhance the existing skills and knowledge, therefore it's important that we include it as part of innovation. Like I have explained, in the job market, it will position an entrepreneur in a better light because they will be able to use technology to try and predict, for example, if their business won't be successful in the next couple of years, they will use technology to also read what market requires, they will use technology to succeed in a competitive environment"(**Participant 5**).

The contribution of technology cannot be ignored in the business sector, a senior lecturer concurred with her colleague by saying,

"*Once we ignore technology and its benefits a lot can go wrong, let's assume post that qualification if they don't use technology to rate what markets require". "The response to the*

*product that he is selling or service that he is selling, he would respond very late to the consumers and that will bring negative impact in the business"(***Participant 7***).*

An example supporting the use of technology in a business was given during an interview which supports statements by Participants 5 and Participant 7.

She discussed that,

"*Before 2020 academics didn't think they would come to a point where we would be able to teach virtually but COVID-19 has taught us, and we learned so fast that we can easily move to conduct classes and meetings using Zoom and Microsoft Teams space. This was a swift turning point from the traditional way of teaching to the virtual mode of teaching"(***Participant 8***).*

An experienced professor stated that,

"*Yes, I do believe that integrating entrepreneurship education and innovation in our programmes could contribute immensely to employment issues because it speaks to, first it addresses the employment issues where students and graduates are able to be equipped with skills, they need to go about starting their own businesses and also it speaks to the notion of having students that graduate for employment. It brings that shift for students to not see themselves as mere employees but see themselves as employers and innovators in the sense that they are able to create something from the experience of being a student and they are able to be equipped with skills that sort of contribute to them being entrepreneurs"*(**Participant 2**).

6.3.3 Creating new businesses can bring satisfaction to students

Entrepreneurship education can ignite business ideas in a person's mind, whereas innovation and creative thinking can result in new start-ups. With the skills acquired from business education, one can opt to take entrepreneurship as a career and start a business. In other colleges/ faculties, students may prefer to use education and skills obtained from qualification as a point of reference when starting businesses. This question was aimed at finding out from academic staff if there are students in their class who think starting a business could satisfy them. This sort of question was asked to find out if students are interested in becoming entrepreneurs or not. The question reveals if lecturers and students have a relationship beyond teaching, this was to see if students engage in lectures outside of course content.

The interviewer asked if lecturers have students who may say creating a business could satisfy them.

An academic who is a senior lecturer said the current curriculum does not give more options, therefore it is a survival of the fittest.

He said,

"*If the programme of business education was designed at an early stage, it would have trained them to think about business while still at school so that business doesn't become Option 2 but it becomes an option that they have throughout, therefore it is hard to get those students because they learn to memorise course content and pass exams"*(**Participant 3**).

Other academic staff said,

"*The current curriculum teaches students only content in their area of expertise and if they went to do business, it wouldn't satisfy them because it is just Option 2 but if we introduce a programme such as business education it opens the mind early*".

An experienced academic further emphasised that,

"*Entrepreneurship education will allow them to think about business so that when they complete degrees, they don't take business as Option 2 but as Option 1"* (**Participant 4**).

An experienced professor engaged more on this question expressing understanding and the type of feeling he gets when interacting with students.

He said,

"*Yes, there are students that would be saying that right at the end, but we need a lot of support mechanisms to assist them. For most black businesses one of the factors that would affect them not being successful is the resources that are not available including raising capital. The government needs to play a very critical role here to support new entrepreneurs and create an environment or space where if they require funding they are supported with competitive and reduced interest rates and repayment periods. Therefore, once those sorts of environments are made equal for everybody you might find a lot of black businesses to say these sorts of words but at the moment, they are facing a lot of challenges"* (**Participant 2**).

On this question, it was evident that most academic staff almost had similar responses, a senior lecturer discussed why it is hard for students to start businesses.

He said,

"*Most of our students are studying to get jobs because the curriculum teaches them that. However, we have a few students in chemistry who have started their businesses. Most of them have no creativity in mind and the reason for that is lacking exposure to business models*" (**Participant 6**).

From Participant 6's statement, the evidence was clear that entrepreneurship education might help a great population across the institutions. Introducing innovative entrepreneurship education may stimulate creativity that will enhance the majority of venture creation. Students need to be exposed to creative thinking, they must use what is taught in the curriculum to come up with innovative businesses.

Participant 6 was supported by Participant 8.

She said,

"*I haven't really come across a student who feels that way because with online learning we had limited interaction with students but taking into consideration that the University of KwaZulu-Natal accommodates or has a high percentage of students that come from impoverished communities and backgrounds*.

She continued said,

"*I would argue that in most cases we don't have students like that, I would expect them from the University of Cape Town or one of these universities that accommodate people from privileged backgrounds. So, some of the students within our university will obviously come with the perspective or point of view that they want to get their degrees, go to the workplace and work and provide for their families because that is the reality. Majority of our students come from disadvantage background, they have responsibility to look after their families, so starting the business is probably last thing in their mind* " (**Participant 8**).

Another participant concurred with his colleagues.

His comment was,

"*They first need to work in order to be able to say I want to start my own business. They don't have a choice or leisure to decide on what they want to do. So, yes, I haven't had a student who actually said that creating my business could bring me satisfaction.*

However, one lecturer had a different response compared to his colleagues.

He said,

"*Yes, I think all those only come up when you go in-depth with students in terms of mind-shifting their perspective. I had a few last year because I conducted and coordinated a module called Exercise Science Internship, so that internship throughout the years it been teaching students the expertise of exercise science, the physiology behind what you need to do, and the capabilities of excelling that as a practitioner*.

He further said,

"*The vision that I saw last year was that a lot of students can be in that mindset if we expose them to business education*" (**Participant 5**).

6.3.4 Adding entrepreneurship education across qualifications

Every academic staff participated in this research interview agreed that entrepreneurship education could assist students in terms of career path, job creation, economic development, and creating sustainability in the communities and the country at large. The question of adding entrepreneurship education across qualifications was asked to see how academics think about it and how they think it can contribute to each qualification.

A researcher during the interview asked: Using your experience and knowledge, do you think adding entrepreneurship education can be good for qualifications?

One of the academics with the experience of being a senior lecturer responded as follows:

"*Yes, number one, definitely. It has to improve because Health Science graduates are usually not just people, they want to expand, be it a doctor, optometrist, pharmacist, they don't want to be under the government forever, at some point they will want to start their own practice (business)"* (**Participant 6**).

However, in his statement he explained that,

"*But what is happening at present is that a person even if they think about it, I want to open my own practice they need to think that I need to get business skills. I need to go and do a bit of accounting and do a bit of this so a lot of them end up doing postgraduate diplomas, Master of Business Administration (MBA), and all those things, but if this is something that is entrenched*

within the program then it eliminates the need because it will be something a student will have after completing a degree".

In closing, responding to the same question he said,

"So, I agree that adding entrepreneurship education to other qualifications can eliminate problems such as time and money wasting because there won't be a need to do a postgraduate diploma or Master of Business Administration. So, we need to incorporate business education in our current programmes"(**Participant 6**).

Another academic who is a professor responded to the suggestion of adding entrepreneurship education across qualifications as follows:

"*Yes, I think I also touched on this particular question at the very set of start when I said, each qualification leads itself to some kind of a business. There are very few qualifications that will not lead to a business environment, therefore, we really need this kind of curriculum of entrepreneurship education like you indicated in your introduction statement to broaden or give ultimate opportunities for those who cannot be absorbed in a job market and that will also lessen a burden on the government to create more jobs and then people would know other ways to survive".*

He further points out that,

"I cannot think of any qualification that doesn't require entrepreneurship, even if that entrepreneurship knowledge will be used in a job market but you need somebody to know that when you run an activity you should run it in a business manner where you are constantly mindful of your income, constantly mindful of your expenses, constantly mindful of the profit that you are going to make for the survival of your business or entity you are making profit for" (**Participant 2**).

A head of department (HOD) somehow blamed the curriculum on failing students.

He pointed out that,

"*The key gist of the matter is that yes curriculum has some extent of failing students not to think in business mindset but access as well and a lot of other things. Access to funding, there is serious red tape, the number of documents that people need to fill, and approval from*

government officials, especially ward councillors. This is something that needs to be reviewed because it disadvantages other people to get funding".

He stresses that,

"Yes, there's a lack of business education, but there's also a lack of emphasis"(**Participant 3**).

One of the senior lecturers agreed that adding entrepreneurship education is vital; however, he highlighted that this should be introduced at an early stage.

He insisted that,

"Yes, we do need introduction of entrepreneurship education at an early stage of our degrees. If we can introduce it in undergraduate degrees because in postgraduate studies they do have InQubate, but it comes at a later stage after someone has not been exposed from day one. When you start your masters, you are told about business, and you have to think like an entrepreneur attending these workshops from InQubate. They do help but it is too late for most of our postgraduates to start at that level to think about business models because they already started with projects that are not aligned with business. They can't even use their thesis to come up with something that can help our community as a whole"(**Participant 4**).

Participant 1 concurred with Participant 4 by proposing that,

"*The whole lot of business education that needs to be done way before high schools or varsities but I think it needs to start as early as high school*" (**Participant 1**)

On the other hand, one lecturer was not totally convinced, and she disagreed by saying,

"*…so I will say that there are some elements that can be conducive or could work in sort of relating the two but in most cases, I would say no".*

A colleague said something different when she said,

"In our faculty, a community of practitioners may use entrepreneurship education to develop community by spotting a potential in the community, guide people from the community to take that business opportunity and that could benefit the society and decrease unemployment".

6.3.5 Entrepreneurship as a career option

This section looks at entrepreneurship as a career choice for students. In the past decade, getting a job was easy compared to what is happening currently.

The interviewer asked if adding entrepreneurship education may increase career options for students given that the job market is saturated.

The response was positive from the participants,
One participant said,

"*Yeah definitely, some of our students here get jobs to become sales reps; they get into these companies but what happens is that they get there with science knowledge, but they don't know how to sell, they don't know how to promote products. So, usually what tends to happen is that they must go and attend training courses for like a year where they teach them about the business side of science because everything has a business side to it.*

The participant supported entrepreneurship as a career, he added,

"Now imagine if you have got a new graduate that has got a background of science and side of entrepreneurship, what is going to happen is that a recruiter will think I don't have to waste money on training this new person, so now this new person becomes a key target for this company" (**Participant 4**).

Another participant said,

"Definitely there will be a big difference. I don't want to blame government, I don't want to blame higher education and institutions but all I'm saying is that there is a lot of things now that we are aware of that we can improve and mostly on the aspect of business" (**Participant 1**).

One academic stated that their teaching strategies produce job seekers not people who can be business owners.

She said, *"In South Africa, the way that we learn, the way that our students learn they learn to go find jobs they don't learn to go start businesses. It is rooted back and our government plays a bigger role in that and the whole lot of other factors that lead to this manipulation."* (**Participant 8**).

One of the lecturers gave an example reflecting the significance of having an entrepreneurship education and outlined the benefits.

Her comment was, *"Yes, in my case, for example, I like football, football players don't have to get degrees to start their careers. So, even singers as artists just use their talent. Also, science can be taken as a talent that you can use to help the community but if you don't have an entrepreneurial mindset, it is difficult to start something. Students must think of science as a career option, not something to get a job. Entrepreneurship education can help to open the student's mind".*

She advised that,

"A person without business education ends up struggling. This shows the importance of business education to everyone across the globe not only graduates. Even our institution needs to teach everyone entrepreneurship not just students from the College of Law and Management. Everyone needs to be exposed to entrepreneurship if we want to grow as a country because the leading countries are the countries with more entrepreneurs than workers" (**Participant 7**).

Participant 5 agreed that there will be a change. He highlighted the benefits it will bring to students by saying that,

"*There will be a change, it will increase career options for students because they will be thinking outside the box in terms of identifying opportunities within their communities or even outside their communities. They can identify an opportunity to start businesses or collaborate with other organisations"* (**Participant 5**).

6.3.6 Entrepreneurship education benefits to the institution

Several studies have discussed the importance of entrepreneurship in terms of uplifting the community and contributing to the country's economy. As discussed by Kunene (2009); Stokes *et al.* (2010); Steenekamp *et al*. (2011) and Chimucheka (2014) in literature, entrepreneurship education can develop certain skills through learning, and economic growth and can boost confidence in students. Rodrigues *et al*. (2012) on the other hand discussed that students who take entrepreneurship education turned out to be more creative.

The interviewer engaged in a discussion with the participants asking if expanding entrepreneurship education is good for the institution. The majority of responses positively agreed that expanding entrepreneurship education could benefit the university and other communities.

An professor agreed with what is proposed by the research. He said,

"*It is good, there is a lot we currently not exploring. One of the things which I did not havehave maybe its my limited information or limited interaction with entrepreneurship material that is out there. I've not seen the integration of innovation, technology, and entrepreneurship. Therefore, it is something for me that I think should be there maybe it has currently been practised or done or taught at some point or level, but it is lacking the fact that I'm an academic at the University of KwaZulu-Natal and I'm not aware of it. It means there is room for it to widen that scope because the more people know about it one would think it would have a wider impact. Therefore, expanding entrepreneurship education is very very important and it will enhance the entrepreneurship skills of graduates, staff members, and everybody who interacts with the entrepreneurship information that is disseminated."* (**Participant 2**)**.**

An academic leader supports what was discussed by the professor by saying,

"*The answer is definitely good for everything, as I was saying everything has a business side to it. The reason why we look for jobs, we look for jobs in existing businesses. Every qualification if you want to go into the business side or want to work, you are working for someone's business. So, at some point, we need to integrate entrepreneurship into all our degrees. Everywhere if you gonna be moving up the ranks, one of the other things is even if you get a job, if you don't have an entrepreneurship side it is harder for you to move up the ladder. Even in the company you work for, because you don't have management skills, you don't have the business side of things"*

The academic leader further said,

"*So, even if you get a job with your qualifications, you stay where you are it is hard to get a promotion. If you got that business side of things, you come in and you can contribute not only on the science side but even on the business side, therefore, this is something that needs to be integrated"* (**Participant 1**).

However, a senior lecturer disagreed, saying expanding entrepreneurship education will not yield the expected results.

He expressed that,

"*It won't work if the focus is on students. Life doesn't work like that. The reason I raised all these things is I highlighted the high level where the problem is high school, and you know prematurely. The problem here is the focal point when you always focusing on students, students yes they are the attention, and the teaching needs to be student centred, right, but what I'm saying here is that the integration needs to involve teaching staff, deans of teaching, DVCs etcetera, for them to really evaluate the plans of teaching and it needs to start from professors, senior lecturers, lecturers and senior tutors people who are involved in teaching need to realise".*

He further stressed that,

"Business model or business education can be lost and perish if we start integrating it into students without looking back at the root cause of why things are failing today. It is easy to sell a model when the government is involved, and the ministers of education are involved. I think the government is not really playing their part. We cannot now take something that has not passed levels and integrate it, it will fail sooner or later. All I'm suggesting is that there needs to be a rebirth of teaching if I can indicate that because the truth is there's a lot of things that are failing it not only education, I think I need to highlight that" (**Participant 3**).

In closing he said,

"We need to understand one another then we can transform the education system collaboratively".

Another senior lecturer had a different view when he responded, he mentioned that the majority of students can benefit from entrepreneurship education especially those who plan to create ventures after graduation.

In his response he said,

"I think it is important that all students must be introduced to entrepreneurship education and even graduates. I see students in Health Science when they complete their degrees, they want to open practice, in rural areas we have pharmacies now which belong to the graduates and

those practices help the community. Imagine if they didn't have the gut to utilise their ideas the community would still be poor even though they produce pharmacists. So, I think it is important to start introducing the business model to kids, if you give a child a pocket money of 2 rands and decide to use 1 rand save the other 1 rand. It teaches them the concept of saving at an early age, even when he is old he would be able to save money because you can't teach an older person to save salary while he didn't learn at an early age maybe in high school" (**Participant 6**).

The statement by the senior lecturer touched on different aspects of life that contribute to a good business person, it talks about teaching students to save money at a very young age to give them an opportunity to have capital when and if they want to start a business. It also reflects the aspect of responsibility which is a significant part when starting a business.

The other participants agreed but raised other important aspects of why entrepreneurship education should be expanded.

An experienced lecturer said,

"*Of course, it will be good for the institution, I think definitely because when you look at issues around non-payment of fees, at the moment students finish their degrees and they are unable to pay because they can't afford. But in this instance, if students are equipped with skills, and ideas on how to start their own businesses they can open companies or businesses after graduation. In this instance, it will contribute positively because you may be able to pay university debt from money you make from your business.*

She points out the benefits of expanding entrepreneurship education to students, universities and the country. This is evidence that expanding entrepreneurship education to boost student innovation in South African universities could benefit the majority of people across the country even internationally. The statement from the academic mentioned that.

She highlighted that,

"*The institution likes to associate itself with achievers therefore, it can be a good outlook for the institution itself. What is good for the institution is also good for a country as a whole because it means that there is economic development or economic growth is taking place, there's a number of businesses that have been opened by graduates produced by the institutions"* (**Participant 8**).

Other responses to this question were the same, they all agree that expanding entrepreneurship education is good for students, society, universities and the country's economy. The responses from participants show that there was an existing gap. This research will assist in providing solutions to close the existing gap.

Qualitative results consolidation

The qualitative part of the research was inductive, the researcher had to observe certain patterns. Both genders were fairly represented to observe, compare individual behaviour, attitude and decision-making. The research findings revealed that attitude plays a significant role in decision-making, what students perceive is within their reach they can explore. Academics revealed that background specifically where students come from has an impact on decision making. The background component is looking at the society of upbringing and conditions of living. The state of readiness of students for businesses depends on access to finance, quality education, mentorship, and exposure to motivation.

The qualitative research of this study leans more on the theory of planned behaviour, the theory looks at social norms (SN), perceived behavioural control (PBC), and personal attitude (PA). These three components inform entrepreneurial intention (EI). When an individual is surrounded by support from family, environment, friends, culture, and peers chances of that person to start a business are high (Ajzen, 1991). When an individual has a positive attitude toward business development, that individual may become successful in starting a venture (Cheon *et al*., 2012; Ajzen, 1991).

Perceived behavioural control relies on individual introspection, when an individual deeply asks his/her conscience about how difficult or easy it is to perform a task, the decision is influenced by past experiences, obstructions, obstacles, and success rate (Ajzen, 1991). These components influence intention and can result in a person taking or aborting a task.

6.4 TRIANGULATION OF THE RESEARCH FINDINGS

The key findings from literature reveal that more research has been done in the area of entrepreneurship education previously, however, the focus areas were not the same. The majority of researchers agree with the fact that entrepreneurship can alleviate poverty and create growth opportunities (Cudia *et al*., 2019; Kareem, 2015; Goel & Rishi, 2012; Hussain *et al.*, 2014). Crumpton (2012) believes that innovative entrepreneurship creates more effective and efficient processes which are a driving force for solutions. Sahut and Peris-Ortiz (2014) said

the link between innovation and entrepreneurship arises in the process of using resources to exploit opportunities for new products or services. They further said to create a strong association with long-term goals, entrepreneurship and innovation must go hand in hand. Research by Radipere (2012) discussed that entrepreneurship programs yield low outcomes due to old and outdated traditional ways of teaching.

The findings below were obtained from participants using the research objectives below.

6.4.1 To determine if the existing education equip students with innovation skills across the institution

The participants (academic staff) highlighted the issue of outdated curriculum and difficulties caused by the traditional way of teaching. Academic staff believe that the curriculum is outdated and needs to be re-adjusted to address current problems. On the other hand, students have raised a concern saying the lecturers are not using innovative ways to enhance teaching and make it more interesting. Staff and students agreed that the curriculum needs to be revised.

In 2017, the former president of South Africa, Mr Jacob Zuma, said, "Entrepreneurship is a tool to stimulate the economy and it can be used for cutting-edge innovations". Using theory U, this statement can be linked with Component 2 highlighting the observation period and discovering potential where a researcher was investigating if education exposed students to innovation.

6.4.2 To determine if knowledge acquired from qualification exposes students to innovative ideas

Objective 2, Statement 6 yielded the following results. Only 38.6% of students agreed that in the curriculum innovation was emphasised all the time. Mamabolo *et al.* (2017) argued that entrepreneurship workshops created exposure and awareness for students. This was evidence that the curriculum needed to be revised to promote innovation. Academic staff encouraged the inclusion of technology. They highlighted that technology is part of our daily lives and it can boost entrepreneurship skills.

Students disagreed with the statement saying that the curriculum allows all students to be business-minded. Just above 28% of students agreed with the statement, the majority of the students were against it. For students to answer this question they were using reference from *Objective 1* to emphasise that curriculum must be restructured. Academic staff believe that they

need to play a significant role in curriculum development, starting by engaging senior lecturers, DVCs research, professors, heads of departments to come up with a plan to develop up-to-date content in the curriculum.

6.4.3 To investigate the assumptions/views the students have towards innovative entrepreneurship

Findings from postgraduate students show that students would like to have businesses in the near future but the lack of business knowledge limits them in exploring business opportunities. This was evidence that expanding entrepreneurship education could help students with skills to run daily operations of business and understand managing business holistically. Entrepreneurship education may encourage students to take entrepreneurship as a career, future investment, and a legacy.

The academic staff when they were interviewed, mentioned the kind of students who would think more about entrepreneurship or innovative entrepreneurship may come from other institutions like the University of Cape Town, the University of Witwatersrand, the University of Stellenbosch, or the University of Pretoria. They explained that students from the institutions mentioned above come from wealthy families and they may have luxury time to think about business opportunities. On the contrary, they highlighted that the majority of students from the University of KwaZulu-Natal, the University of Zululand, and Walter Sisulu University are dominated by students from poor backgrounds, therefore they are studying to finish degrees, get jobs and support their families back home.

The parallel information between staff and students reflects that lecturers do not engage with students outside the classroom regarding career options, the only time they talk is during the lecture. There was no sign of lecturers having conversations with students concerning career guidance or advice. More than 76% of students indicated that they wanted to take entrepreneurship as a career and that they are interested in innovative entrepreneurship which then contradicts information provided by other academic staff.

6.4.4 To determine the attitudes students have towards innovation and entrepreneurship education

Using the questions prepared, it was discovered that students have a positive attitude toward innovative entrepreneurship. The research questions had positive responses which reflected a positive attitude and good entrepreneurial intent. The statement, " I am interested in innovative entrepreneurship", had 75.3% which is proof that more students are interested in becoming business owners and they can take entrepreneurship as a career. This is a good start because changing the curriculum needs buy-in from different stakeholders.

Academic staff believe entrepreneurship education can be a better tool to help students because it will bring support mechanisms when they think about challenges faced by new business owners. Some academics support the entrepreneurship education initiative by saying, "If the programme was designed or started early, it would have helped the majority of South Africans and the student population at large". The majority of lecturers think that business knowledge will allow students to practise entrepreneurship soon after completing degrees, and consider owning businesses as a lucrative choice to eliminate negative thoughts of taking entrepreneurship as an option to survive from hand to mouth.

Lecturers point out that students need extensive support from well-established businesses, other Small and Medium Micro Enterprises, communities, and the government to change their mindset and trigger business interest among students. Other academics emphasised the use of technology to advance new and existing businesses. They highlighted that innovative entrepreneurship using recent technologies could produce long-lasting enterprises that could be the key solution to economic growth and reduce unemployment.

6.4.5 To determine if entrepreneurship education can help boost innovation among students

Innovation plays a significant role in new business development. Students believe that expanding entrepreneurship education to other qualifications will help stimulate an entrepreneurial mindset in students. Developing innovation centres could be beneficial to students and other external dedicated community members since it would provide an opportunity to brainstorm, share ideas, fine-tune, and develop solid projects for the world.

Both participants (academic staff and students) agreed that expanding entrepreneurship education could help uplift the unstable economy because every student will get an opportunity

to learn business skills and apply business skills to start modern businesses that will have more job opportunities. It was further discussed that it can reduce the burden on government social grants while contributing positive results to the economy.

6.5 LINK BETWEEN RESEARCH FINDINGS

Research findings had a significant impact since they suggested prompt responses from curriculum developers, heads of departments (HODs), deputy vice-chancellors (DVCs), professors, and many other academics. Findings suggest that academics relook at the curriculum and make changes that will equip students with skills that are in demand. These research findings suggest expanding entrepreneurship education across all qualifications to grant the entire student population equal innovation and entrepreneurship skills.

Students believe this could benefit their peers in terms of business skills. This initiative could push students to think about starting businesses even before completing their degrees. When students engage in business development, it will create job opportunities for South Africans, and reduce unemployment while stabilising the country's economy. Academics believe this is a turning point to a good start because expanding entrepreneurship education could create opportunities for every youth and graduate while reducing the number of people depending on social grants. If fewer people depend on social grants, the extra funds could be redirected to aid the government to use funds to establishing new state-owned entities (SOEs), funding new ventures, developing innovation centres, and building more institutions of higher learning.

Both staff (academic staff) and postgraduate students had different reasons but positive towards supporting expanding entrepreneurship education. The findings support that there is a need to expand entrepreneurship education across all offered qualifications. The literature had several researchers, namely; Gamede & Uleanya, (2018); Singh & Pandey, (2017); Rozali *et al*., (2017); Bokhari (2013); Steenekamp *et al.*, (2011) supporting entrepreneurship as a solution to unemployment and a tool to reach new innovative frontiers. Universities may use the research findings as a point of reference to better understand what is needed by students. The findings from academics could assist in shaping the views of other academics in terms of understanding the impact of technology on the existing curriculum and why there is a need to restructure it. The skills obtained from course content may assist students in having more than one source of income.

6.6 CHAPTER SUMMARY

The researcher chose to respect gender equity across institutions, and balanced gender in terms of participation. This was done to get general feelings of the staff members, to investigate if gender had a significant influence on decision-making, or to check whether there was no inconsistency in the results. In the number of participants, both males and females gender were represented to avoid bias in the findings.

All participants who were interviewed believe that there is a need to introduce new changes in the curriculum to meet current expectations. The research touched on the curriculum that is offered to students, both staff and students emphasised that the curriculum must be re-evaluated and restructured to better equip students with current and relevant skills. Other participants indicated that this issue must be tackled at the high school level where the combination of subjects is encouraged. The curriculum must be structured in a way that addresses the shortage of skills in the country. A study by Fatoki and Chindonga (2011) revealed similar information when they observed that a lack of entrepreneurship education, support, and skills have left the South African economy in an infancy stage. One academic argued that curriculum should equip students with skills to start their own businesses while acquiring skills from a specific faculty/college.

Engaging on the importance of integrating innovation and entrepreneurship education, participants strongly agreed that the combination will bring a significant change. The relevant skills must equip students with the knowledge to compete globally with other students, and skills must complement what is required in the world of the Fourth Industrial Revolution (4IR). An experienced academic argued that the content that was taught in the year 2000 is outdated, therefore, it needs innovation to allow the utilisation of new models and systems. Integrating innovation and entrepreneurship education will give every student an equal chance to start productive businesses. Innovative entrepreneurship will allow the use of technology to enhance existing skills and knowledge. These findings support literature by Etzkowits and Zhou (2007) and Wong *et al*. (2007).

Lecturers were asked if they engaged in discussions with students on career paths, and a senior lecturer said, "*The current curriculum teaches students content in their area of expertise, if they go to business it won't satisfy them*". He further highlighted that bringing entrepreneurship education could easily assist in shifting students' mindsets to think outside the box and become more creative. Other academics believe that there are students who are keen in starting new

businesses. Reflecting on students registered at the University of KwaZulu-Natal and the University of Zululand, the majority of students come from disadvantaged backgrounds. Some of them want to complete degrees and get jobs to support their families. Those students are not thinking about starting a business because they believe starting a business requires an individual to have capital.

The common response across all participants was the agreement that expanding entrepreneurship education could benefit students, staff, communities, and the country. Participants further revealed and emphasised that introducing entrepreneurship education across all qualifications could produce more creative entrepreneurs which will then create employment opportunities in the country. This research may stimulate entrepreneurial intent among students.

Findings from academic staff suggest curriculum development that can focus more on keeping up with recent trends, societal demands, innovation, and technology. Findings further suggest curriculum development that can integrate innovation, entrepreneurship education, and Technology (IT) to produce creative future business leaders. Academics have a great influence on curriculum development and curriculum change, therefore, with their support expanding entrepreneurship education across the institutions is possible.

CHAPTER 7
DISCUSSION AND RECOMMENDATIONS

7.1 INTRODUCTION

The final chapter of the study focuses on recommendations and conclusions. According to the data analysis and discussions in Chapters 5 and 6, both staff and students would appreciate if entrepreneurship education is expanded to other colleges/faculties to better equip students with knowledge and skills to create innovative businesses. Both participants point out that the current curriculum offered to students needs to be restructured to accommodate and furnish every student with relevant skills. The research aim was to investigate if expanding entrepreneurship education could assist in boosting students' innovation in South African universities. This can be achieved by adding entrepreneurship education to other qualifications across the institutions to give students alternative career options. The goal is to give students the option to look for a job or use creative skills obtained from qualifications to start innovative ventures.

The country is in dire need of new innovative businesses since traditional businesses are struggling to keep up with technology advancement. The consequence of the Fourth Industrial Revolution (4IR) resulted in people losing jobs, businesses shutting down permanently, and an increase in graduate unemployment which then forced the Higher Education Institutions (HEIs) to respond urgently to the problem. Youth and graduates must create innovative businesses that should provide solutions today and in the future. This can be achieved by introducing new ways of thinking in HEIs. The University of KwaZulu-Natal and the University of Zululand were the two institutions that participated in the research study, specifically senior academic staff members, heads of departments (HOD), and postgraduate students. The questions were designed following five components of Theory U and literature by Otto Scharmer (2009). Theory U is known as the awareness-based theory for changing systems, which theory blends innovation, systems thinking, and change.

The findings magnify the significance of closing the gap of unemployment by suggesting entrepreneurship education curricula, seminars, and workshops to promote entrepreneurship. Findings reveal that students are willing to own businesses, and they have good intentions and positive attitudes toward venture creation. However, there are obstacles, which include the lack and shortage of entrepreneurship education in other faculties/ colleges which hinders the

process of embarking on a successful business journey. Students believe that with proper entrepreneurship education and training, starting businesses will be easy.

7.2 STUDY LIMITATIONS

The study focused on postgraduate students and academic staff at the University of KwaZulu-Natal and the University of Zululand. The study only focused on the universities. Notably, the universities of technology (UoTs) did not form part of the study. The results could have been different if UoTs were investigated. This would have afforded a chance to compare opportunities provided by UoTs and traditional universities. Another limitation was that only postgraduate students participated as undergraduate students were not included.

The findings were based on the institutions located in KwaZulu Natal only. The institutions located in other provinces did not participate and the findings cannot be generalised to the whole student population from other HEIs in South Africa because other institutions may have different views compared to the investigated institutions. The different types of universities attract different kind of students, therefore, the mindset, decision-making, and career choice cannot be the same due to social impact. Due to limited funding, the researcher could not take more universities to be part of the study. Other institutions did not respond to the gatekeeper's application.

The researcher interviewed senior academic staff members because they have in-depth knowledge of curriculum development, however, the study could have been different if other staff members had been interviewed. Junior staff members may have different views or suggestions since they are still young and some of them are students under the new generation of academics programme (nGAP) which may help to get information or challenges that are faced by junior academic staff.

7.3 CONTRIBUTION OF THE STUDY

The research was conducted to investigate if expanding entrepreneurship education across all qualifications could have a significant impact on reducing unemployment while yielding more innovative entrepreneurs. The findings revealed that entrepreneurship education must be expanded to other qualifications to allow more career opportunities for the entire student population in the institutions. The research has the potential to provide solutions to sustainable goals. It could play a significant role in reducing poverty because when students use entrepreneurship education to open businesses, people will get employment and will be able to

support their families. Other stakeholders including society will refer to universities as quality education producers when a combination of entrepreneurship education, innovation, and other modules produces graduates who are determined to make a difference in the communities. Economic growth will be part of key responsibilities since the young entrepreneurs will be participating in productive entrepreneurship aiming to make a difference in society. There will be peace, justice, and strong institutions when unemployment, poverty, and inequality are reduced.

Findings challenge academics find more innovative ways to teach students, emphasise curriculum development, and extra seminars or workshops to allow students to meet business owners. During the investigation, a lot has been discovered in terms of curriculum, quadruple helix actors, raising awareness, use of technology, and future research recommendations.

7.3.1 Curriculum

The information obtained from participants (academic staff and postgraduate students) revealed that the curriculum offered to students does not address current challenges faced by the nation. The curriculum should try to address the high level of unemployed graduates, changes brought by 4IR in the job market, and life after the COVID-19 pandemic. Quite a significant number of postgraduate students highlighted that the curriculum needs to be restructured to accommodate changes brought by the new technologies. Students believe that curriculum changes can help introduce a high volume of innovation, and innovative ideas can lead to new ventures and job opportunities. Chapter 1 explained that a high level of unemployment results in a high crime rate, fraud, corruption, and more illegal activities in the country because people are trying to survive.

The academic staff concurred with students by admitting that the curriculum needs to be restructured. The academics emphasised that changes are vital to help students survive in this fast-changing world of technology, however, one must ensure that science does not get lost in the process. They further emphasised that integrating entrepreneurship education with other qualifications could open students' minds to take entrepreneurship as a career, not as a second option. Lecturers believe that moving away from the traditional way of teaching and introducing innovative ways could encourage students to think out of the box and stimulate creativity. The example given in one of the interviews is that, "*Academics didn't think there would come a point where they would have to teach virtually, however, the COVID-19*

pandemic forced everyone to utilise Zoom and Microsoft Teams space for teaching and other academic activities". This was evidence enough that technology is part of our daily lives.

7.3.2 Quadruple helix actors

The collaboration between different stakeholders can be beneficial to the nation. Each stakeholder must play a significant role in changing society and the status of the economy. The quadruple helix actors consist of four stakeholders, namely: university-industry-government-civil society. The quadruple helix promotes an entrepreneurial university where the traditional way of doing things is replaced by the transition to a knowledge-based economy. The knowledge-based economy is the process of developing intellectual capital commercialisation and entrepreneurial capacity to promote economic growth (Wong *et al.*, 2007).

7.3.2.1 University

The universities play a vital role in the economic growth of the country. Each university must invest in research to find more ways to eradicate poverty and develop innovative businesses by introducing cutting-edge ideas in the market. Universities must review the existing curriculum, and identify failures, gaps, and opportunities produced by the existing curriculum to conclude if there is a need to make small or big curriculum changes. The universities must invest in creating more innovation centres, promote entrepreneurship education, and have more seminars where students meet business owners for information sharing and mentoring. The entrepreneurship development policy promotes a dynamic culture and collaboration, therefore, universities can collaborate with industries where the industry funds researchers and researchers can transfer knowledge to the industry.

Entrepreneurship development in higher education (EDHET) must have more road shows to emphasise entrepreneurship policy and share information on the benefits of having entrepreneurship skills. The collaboration can be beneficial to both stakeholders since the industry can use research findings obtained from the university to advance and develop new products or services. Universities must develop confidence in students in a way that they see a need to action innovative entrepreneurship in different scales. After being exposed to entrepreneurship education, students will be able to draw business plans, apply for business funding, and have the knowledge to start and maintain the daily operations of the business.

7.3.2.2 Industry

The industry has an important role to play in universities and society. Industries must collaborate with universities to provide funding for research projects and employment opportunities for graduates, and create room for knowledge sharing all the time. When universities do research for industries, it is the responsibility of each industry to give necessary feedback to the university. Well-established industries must promote products produced using local innovation and give local products enough exposure to the market to attract global customers and potential investors.

The relationship between industry-university is based on licensing (royalties), patents (including invention disclosures), and spin-offs (Rossi, 2010). The knowledge transfer from university to industry must be commercialised and generate streams of income for both entities (Rossi, 2010). Research by Bekker and Freitas (2008) quoted from Salter and Martin (2001) stressed the importance of and positive contribution of academic research on industrial innovation. Bekker and Freitas (2008) further observed that only 10% or less of new products introduced by industries could be developed without the contribution of research, however, the outcome using that route could be delayed or fail dismally.

7.3.2.3 Government

Each stakeholder has its own responsibility. The government is the custodian of policies guiding the nation. It has the responsibility to design programmes that strengthen community innovation and connect the local community to universities and industry. Ansah *et al.* (2023) revealed that all public policies and decisions are made by the government, and the other entities in a country are advised to adhere to the policies. In this research, it was discovered that to succeed in expanding entrepreneurship education, the government must have a role in the process by fast-tracking policy development in education that seeks to amend the curriculum. The government should also allow academics to have input on policy development and suggest what could assist when developing innovative entrepreneurship education.

The government can use an export-import regulation policy to facilitate access to local products to the international market (Doh, 2018). Furthermore, depending on the type of programme, the government can assist with funding and request progress reports to verify if the funding was utilised accordingly (Doh, 2018).

The major role of government is to support programmes related to the economic development of a country and each stakeholder contributes according to its function in the society (Abrahams, 2018). The government needs to create a platform where business owners who were initially funded by the government get the opportunity to mentor potential young entrepreneurs. It should be compulsory that mentors visit or engage with students regularly to give students motivation, offer them practical skills, offer support on career choice, and monitor progress towards the desired initial plan. Government officials must ensure that agencies like the National Youth Development Agency (NYDA), Small Enterprise Development Agency (SEDA), Department of Trade and Industry (DTI), National Empowerment Fund (NEF), and Small Enterprise Finance Agency (SEFA) that are tasked to assist with funding and other business-related issues are available to help the community. The process of application must be clearly explained to avoid red tape, complications, and delays. The government should publish types of businesses that are eligible for funding, businesses that will have a great impact on the economy using the South African 2030 development plan to avoid regulatory constraints (NPDF, 2020).

7.3.2.4 Civil-society

Civil society was the last element added to the shift from the triple helix (TH) model to the quadruple helix (QH) of innovation (Hasche *et al.*, 2020; Arnkil *et al*., 2010). Civil society organisations consist of non-governmental organisations (NGOs), community groups, indigenous groups, labour unions, faith-based organisations, charitable organisations, professional foundations, and professional associations (Roman & Fellnhofer, 2022). These groups are part of regional innovation systems (RISs), and they serve different interests and purposes as the main drivers of innovation (Roman *et al*., 2020). The quadruple helix model plays a significant role in social innovation, it strengthens freedom in decision-making of innovation strategies and regional research (Roman *et al*., 2020).

Research by (Roman *et al*., 2020; Deakin *et al*., 2018; Cavalli *et al*., 2016; Carayannis & Campbell, 2009) has emphasised the importance and value of involving civil society when engaging the innovation process which was not included in the triple helix model. Deakin *et al*. (2018) mentioned the advantages of using the quadruple helix innovation model over triple helix because it supports sustainable innovation. Cavallini *et al.* (2016) point out that the quadruple helix innovation model reveals how civil society exerts a significant influence on the generation of technologies and when knowledge is taking place and how society becomes end

users. The fourth component, “civil society” was recently added to instil balance and make all components well represented. There is more research that needs to be done on this component.

7.3.3 Raising awareness

This research will assist students, lecturers, institutions, communities, government, and the nation at large. Implementing research findings will help students get skills from their respective degrees plus entrepreneurship education and become aware of the importance of becoming an entrepreneur. Students may collaborate with other students from different colleges/faculties which will expose them to creativity and innovative thinking. This will allow students to respond to real-world issues and demands. Collaboration allows people to think outside the box and that can raise awareness among students. This research could give lecturers a heads-up to fast-track or start the process of restructuring the curriculum. The research will give lecturers a clear indication of what is happening in the job market and push them to work towards changing to innovative ways of teaching and learning.

Lecturers can play a significant role in ensuring entrepreneurship modules become compulsory to every student to allow equal opportunity to students. Lecturers can communicate with relevant stakeholders to ensure a smooth transition in the process of introducing entrepreneurship education and ensure students receive adequate support during the process.

Institutions must provide the necessary support for employees to keep them motivated and excel in their duties. Universities must build innovation centres where students and lecturers can meet and share creative ideas. Institutions must request donations from the Department of Higher Education and Training (DHET), industries, and business owners in the communities.
To raise awareness about entrepreneurship, the government must change from having the Entrepreneurship Week once a year and come up with more awareness expos in a year. When universities conduct career fairs, entrepreneurship awareness as a career must be included. This can have a positive impact on mind shifting, create awareness in students and it can develop interest in students.

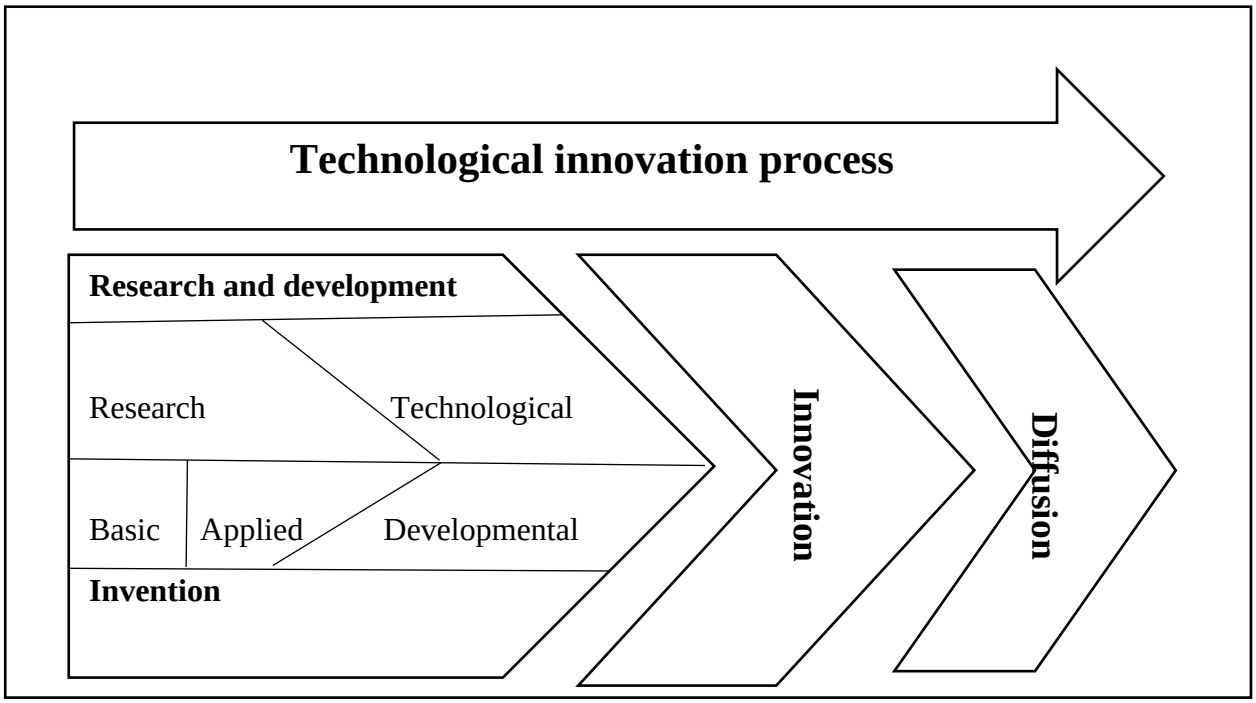
The government will benefit from the process since some students may start businesses while still at school and be able to fund their education. This process can yield extra funding for disadvantaged students. A developing nation leads to a great nation because young entrepreneurs can develop products that may reach the international market. A building nation can be a winning nation, leading to no crime, no corruption, less dependence on government

funds, low unemployment, and strong economic growth. Expanding entrepreneurship education can close the gap of unemployment while teaching students to use education to their benefit by applying theoretical knowledge to practical use.

7.3.4 Technology as part of innovation

The role of technology in business development cannot be understated as it generates growth for the future (Harmse, 2011). Technology plays a significant role in our communities as it allows people to achieve goals, satisfy needs, support industrial, corporate, and social change, and improve human living conditions (Coccia, 2021). Technology increases innovation skills, brings positive change to society, and establishes different problem-solving approaches. The evolution of technology and innovation brought artificial intelligence where manual labour by a human is replaced by artificial intelligence in the form of machines, robots, computer programmes, and complex components of artifacts (Coccia & Watts, 2020). In this day and age, innovation and technology go hand-in-hand since fourth industrial revolution (4IR) dominates all sectors. The diagram below unfolds the technological innovation steps.

Figure 7.1: The technological innovation steps



Source: Adapted from Diaconu (2011)

Figure 7.1 above shows how technology innovation coexists in business sectors to increase economic competencies. Companies respond to market demands, the innovation process commences when combining and reviewing existing knowledge to improve or introduce something new in the market. The global interest in enhancing innovation within the business sector particularly in technology aimed at maintaining or improving economic competitiveness. Technological innovation process emphasizes the need for new production and consumption patterns due to concerns about resource depletion and environmental impact (Diaconu, 2011). The focus is on the technological innovation on both micro and macroeconomic levels highlighting how organizations capacity to generate new ideas can drive production, employment, and economic growth using research and development office for new innovation (Feldman *et al.*, 2012). Research and development offices become an economic moving force as they play an important role in providing high-profile research to industry (Diaconu, 2011). A study by UNCTAD (2021) reveals that innovative technologies represent a total of $350 billion in the market currently and could grow to reach $3.2 trillion by the year 2025. This is evidence that business opportunities are not fully explored or utilised. For businesses to be competitive, entrepreneurs should keep up with 4IR technologies and artificial intelligence strategies (Philibert, 2003).

Introducing technology in the job market reduces the labour force. Therefore, developing countries might find it challenging to adapt and this might cause discrimination toward poor people. The government must ensure all changes are introduced in phases to allow citizens to accept and learn to adapt. Authorities must consider looking at affordability, awareness, availability, accessibility, and effectiveness, and use of technology advancement to bridge the gap (UNCTAD, 2021). Students must use technology for their career benefits since it has been proven by different researchers that technology is the future.

7.4 FUTURE RESEARCH AND RECOMMENDATIONS

The findings agree that expanding entrepreneurship education can bring positive change by helping boost students' innovations. Students are willing to take entrepreneurship as a career, they want the current curriculum to be revised into updated curriculum content. Results show that students have a positive attitude towards business development and the majority of students agreed that entrepreneurship education must be introduced into their qualifications. Students requested that academics use innovative ways to teach and avoid using traditional ways of delivering content. The statement saying, "*Adding entrepreneurship education is good for my*

qualification", had the majority of students agreeing with it. This was a reflection that students want to use entrepreneurship skills obtained from education to develop innovative businesses.

7.4.1 Opportunities in entrepreneurship

Entrepreneurship education may equip students with skills to draw up a business plan, source funding, start a business, manage the daily operations of a business, manage staff, and manage the finances of a business. Adding entrepreneurship education will provide students with skills and could revive innovation and business opportunities that can be internationally recognised.

Academics believe some students can become good in business but they lack intention and entrepreneurship skills. The majority of academics highlighted that this study will make a great contribution to the graduates, institutions, and the country's economy. They believe that it will increase the chances of innovation and collaboration which will result in more innovative business startups.

The study may contribute to the field of entrepreneurship education since the majority of students will learn more about entrepreneurship, the significance of entrepreneurship, how it is used to mitigate poverty in our communities, and the benefits when taking entrepreneurship as a career. Entrepreneurship education will spark elements of creativity and innovation in students across all colleges/faculties. It can reduce or eliminate the mindset of becoming employees, and develop the mindset of employers and business owners. The study could raise awareness among students that every field or qualification offered at the university can lead to business, however, adding entrepreneurship education can stimulate business interest in students and it can become easy to spot a business opportunity.

The findings can provide a solution to the high unemployment rate in South Africa, create innovative businesses, and challenge academics to regularly visit course content for relevant updates.

7.4.2 Future research possibilities

Future research could look at the unemployment rate in 2023 before adding entrepreneurship education across qualifications, and then utilise longitudinal research to investigate changes over time. The research could collect data from universities and investigate if university location has an impact on unemployment, and compare universities based on provinces they are located in. The other research possibility can be collecting data from Traditional Universities, University of Technologies and Technical and Vocational Education and Training

(TVET). This could help identify institutions producing graduates without jobs or businesses. This will help policymakers to make an informed decision when planning to intervene and coming up with strategies for mitigating the problem. The policymakers must also look at the opportunity of adding entrepreneurship education at an early stage like high school to introduce a business mindset early. This can help since students will get a chance to decide what they want, what they are passionate about at a young age. This can bring motivation, and a positive impact and allow students to choose wisely in terms of career choice.

The recommendations proposed in the study benefit students, institutions, and the country by reducing unemployment and creating more economic development platforms, and the community will benefit in the process. The significance of entrepreneurship education can not be denied, however, the impact can be measured after implementing recommendations and observing changes over some time. The research emphasises expanding entrepreneurship education to other colleges/faculties to provide equal opportunities and benefits to students. The research findings can be used to generalise students at the University of KwaZulu-Natal and the University of Zululand because the findings were from these two institutions. Findings could be different if one extra university was added to the study and the comparison could have been different as well.

7.5 CHAPTER SUMMARY

This chapter discussed the contribution of the study, study limitations, technology as a part of innovation, opportunities in entrepreneurship, awareness, and future research possibilities. The research contributed to the entrepreneurship education body of knowledge, teaching and learning office, it gave students an opportunity to know and understand what entrepreneurship is about. The research discussed opportunities when taking entrepreneurship as a career, the benefits of adding entrepreneurship education to other qualifications, and stimulating creativity and innovative ideas. The research discussed limitations on the study due to financial constraints, and late or no responses from other institutions which resulted in only two institutions being part of the study.

Benefits that might come with technology when integrated with entrepreneurship were discussed. In the 21st century, technology plays a huge role in business and people's livelihood, and understanding technology can be of benefit to everyone. Technology as part of innovation plays a vital role in new ventures since businesses utilise online platforms for advertisements and sales. Students might get opportunities to become independent and create employment for

people while building a legacy for future generations. Students were eager to get entrepreneurship education, they had a positive attitude, and they supported adding entrepreneurship education across all qualifications.

The research contributed to students by raising awareness of career choices. Some students were not aware that entrepreneurship can be a career. Students may use skills obtained from any qualification combined with entrepreneurship education to develop innovative businesses. The future research possibilities were discussed in detail, and limitations encountered by the researcher could be research gaps for future studies.

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Appendix A:

UNIVERSITY OF KWAZULU NATAL
SCHOOL OF MANAGEMENT, IT and GOVERNANCE (SMIG)

Dear Respondent (University of KwaZulu-Natal & University of Zululand postgraduate Students),

PhD (Entrepreneurship) Research Project

Researcher: Thabo Wonder Mtshali: 073 612 0362

Supervisor(s): Dr Pfano Mashau: 031 260 7147 & Dr Vangeli Gamede:

HSSREC/00004152/2022

Research Office: Ms P Ximba 031-2603587

I am **Thabo Wonder Mtshali**, a PhD student, at the **University of KwaZulu-Natal, School of Law & Management Studies, Westville campus**. May you please participate in my research project entitled***; Expanding entrepreneurship education to boost students' innovation in South African universities*.** The aim of the study is to investigate if expanding entrepreneurship education in higher education institutions can assist boost students' innovation.

With your participation, I will understand the importance of curriculum development in entrepreneurship education, whether students agree with expanding or adding entrepreneurship education on the existing curriculum or not, if not I should be able to investigate what contribute to that phenomenon. I will find out if students acquire entrepreneurship skills and education to establish innovative ventures and compete in the fast changing world of technology. The research project aimed to investigate if the current entrepreneurship education in the institutions adequately equip students with innovation skills. The results of the survey will have good contribution to the university especially the teaching and learning office.

I wish to state that there will be no monetary gain from participating in this survey, your participation is voluntary. You may refuse or withdraw to participate on the survey at any time. Everything you say or do will be confidential and anonymity of records identifying you as a participant will be kept by the **RESEARCHER & HIS SUPERVISORS** at the University of **KWAZULU NATAL**.

Any questions about the questionnaire, interviews or about participating in this survey, please contact me or my supervisors at the numbers listed above.

The survey should take you about twenty (20) minutes to complete.
Sincerely,

Investigator's signature_____ Date_____

CONSENT

I…… (Full names of participant and surname) hereby confirm that I understand the content of this document and the nature of the research project, and I consent to participating in the research project.
I understand that my participation is voluntary.
I understand that I can withdraw from the project at any time.

SIGNATURE OF PARTICIPANT ……..DATE…….

Appendix B: UNIVERSITY OF KWAZULU-NATAL.

Entrepreneurship: Expanding entrepreneurship education to boost students' innovation in South African universities.

Section A (Biographical Data)

Please tick (√) the appropriate box

1. Gender: Male	
Female	
2. Age: 17 – 20	
21 – 25	
26 – 30	
31 – 35	
36 – 40	
41 & above	
3. Year of study:	
4th year/ PGDip/ Honours	
Masters	
PhD	
4. Race: Black	
coloured	
Indian	
White	
5. **University of KwaZulu-Natal postgraduate Students** College: Agriculture, Engineering & Science	
Health Sciences	
Humanities	
Law & Management	
6. Current degree……..	

Section B

For each question select the ONE option that best applies to you.

1. **The existing education in terms of innovation:**

Indicate your agreement with the following statements:

Statements	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
1.1 I am aware of the university entrepreneurship education.					
1.2 Skills I receive from the university education encourage me to be innovative.					
1.3 My courses will equip me with skills to get a job or start innovative business.					
1.4 My courses offer skills that allow me to upgrade existing business to new business model.					
1.5 I find the knowledge in the curriculum sufficient.					

2. **Knowledge contribution to business development and innovative ideas:**

Indicate your agreement with the following statements:

Statements	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
2.1 My university provide services like extra classes, seminars, and workshops to support innovation.					
2.2 My university has innovation centre.					
2.3 My university supports new innovative businesses.					
2.4 My lectures are innovative.					
2.5 My lecturers are always available to help me with innovation.					
2.6 In my curriculum innovation is emphasized all the time.					
2.7 To gain more innovation knowledge is essential for my career.					

3. **Assumptions/ views students have towards innovative entrepreneurship:**

Statements	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
3.1 I am aware that university has collaborated with various stakeholder to teach me fundamentals of venture creation.					
3.2 I am aware that my degree encourages innovation and creative thinking.					
3.3 The current curriculum offered by the institution allow all students to be innovative and business minded.					
3.4 My university has enough infrastructure to support innovation and entrepreneurship education.					
3.5 The knowledge I receive from my qualification address key national challenges.					
3.6 I can use knowledge I received from my qualification to start a modernise venture.					

4. **Attitude students have towards innovation and entrepreneurship education:**

Indicate your agreement with the following statements:

Statements	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
4.1 My degree will give me competitive advantage in the job market.					
4.2 My degree does not allow me to compete globally with students from international universities.					
4.3 I have role models who are business owners to look up to if ever I need inspiration.					
4.4 Given resources, I would start innovative business.					

4.5 I can take entrepreneurship as a career.					
4.6 I am not interested in being an entrepreneur.					
4.7 I am interested in innovative entrepreneurship.					

5. The impact of entrepreneurship education on boosting innovation among students:

Indicate your agreement with the following statements:

Statements	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
5.1 My degree is structured in a way that allow me to be versatile in industry and in venture start-ups.					
5.2 The relationship university have with other sectors and stakeholders open doors for me.					
5.3 The fourth industrial revolution world requires education to contribute to technological innovation advancement.					
5.4 What I have learned is not sufficient to trigger innovation.					
5.5 University course content need to improve for me to be innovative.					
5.6 University entrepreneurship education need to improve for me to be innovative.					
5.7 University-society-industry need to collaborate and develop research & development centres.					
4.8 Adding entrepreneurship education in my curriculum will help stimulate entrepreneurial mindset.					

UNIVERSITY OF ZULULAND.

Entrepreneurship: Expanding entrepreneurship education to boost students' innovation in South African universities.

Section A (Biographical Data)

Please tick (√) the appropriate box

1. Gender: Male	
Female	
2. Age: 17 – 20	
21 – 25	
26 – 30	
31 – 35	
36 – 40	
41 & above	
3. Year of study:	
4th year/ PGDip/ Honours	
Masters	
PhD	
4. Race: Black	
coloured	
Indian	
White	
5. **University of Zululand postgraduate students** Faculty: Art	
Commerce, administration & Law	
Education	
Science, agriculture & engineering	
7. Current degree…….	

Section B

For each question select the ONE option that best applies to you.

1. The existing education in terms of innovation:

Indicate your agreement with the following statements:

Statements	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
1.1 I am aware of the university entrepreneurship education.					
1.2 Skills I receive from the university education encourage me to be innovative.					
1.3 My courses will equip me with skills to get a job or start innovative business.					
1.4 My courses offer skills that allow me to upgrade existing business to new business model.					
1.5 I find the knowledge in the curriculum sufficient.					

2. Knowledge contribution to business development and innovative ideas:

Indicate your agreement with the following statements:

Statements	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
2.1 My university provide services like extra classes, seminars, and workshops to support innovation.					
2.2 My university has innovation centre.					
2.3 My university supports new innovative businesses.					
2.4 My lectures are innovative.					
2.5 My lecturers are always available to help me with innovation.					
2.6 In my curriculum innovation is emphasized all the time.					
2.7 To gain more innovation knowledge is essential for my career.					

3. Assumptions/ views students have towards innovative entrepreneurship:

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
3.1 I am aware that university has collaborated with various stakeholder to teach me fundamentals of venture creation.					
3.2 I am aware that my degree encourages innovation and creative thinking.					
3.3 The current curriculum offered by the institution allow all students to be innovative and business minded.					
3.4 My university has enough infrastructure to support innovation and entrepreneurship education.					
3.5 The knowledge I receive from my qualification address key national challenges.					
3.6 I can use knowledge I received from my qualification to start a modernise venture.					

4. Attitude students have towards innovation and entrepreneurship education:

Indicate your agreement with the following statements:

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
4.1 My degree will give me competitive advantage in the job market.					
4.2 My degree does not allow me to compete globally with students from international universities.					
4.3 I have role models who are business owners to look up to if ever I need inspiration.					
4.4 Given resources, I would start innovative business.					
4.5 I can take entrepreneurship as a career.					

4.6 I am not interested in being an entrepreneur.					
4.7 I am interested in innovative entrepreneurship.					

5. The impact of entrepreneurship education on boosting innovation among students:

Indicate your agreement with the following statements:

Statements	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
5.1 My degree is structured in a way that allow me to be versatile in industry and in venture start-ups.					
5.2 The relationship university have with other sectors and stakeholders open doors for me.					
5.3 The fourth industrial revolution world requires education to contribute to technological innovation advancement.					
5.4 What I have learned is not sufficient to trigger innovation.					
5.5 University course content need to improve for me to be innovative.					
5.6 University entrepreneurship education need to improve for me to be innovative.					
5.7 University-society-industry need to collaborate and develop research & development centres.					
4.8 Adding entrepreneurship education in my curriculum will help stimulate entrepreneurial mindset.					

Questionnaires in a form of link

University of KwaZulu-Natal Questionnaire link:

https://docs.google.com/forms/d/e/1FAIpQLScKVH1hRJPlsbNd2T0n3frKcWiZ8BtDzeVXvTC17oPLXCE6Cw/viewform?usp=sf_link

University of Zululand Questionnaire link:

https://docs.google.com/forms/d/e/1FAIpQLSeNdnuZXTVgn8EB5jJMnDu5VzpNUuInXK8doRdrWDJ2i_pl5g/viewform?usp=sf_link

Appendix C:

Interview Questions

CONSENT

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

I understand that my participation is voluntary.

I understand that I can withdraw from the project at any time.

SIGNATURE OF PARTICIPANT ……..DATE…….

To investigate how entrepreneurship education can be expanded to boost students' innovation (for interviews):

1. Does the existing education equip students with innovation skills across the institution?
    - To determine if the existing education equip students with innovation skills across the institution.
2. To what extent qualifications offered in the institution exposes students to innovative ideas?
    - To determine if knowledge acquired from qualification exposes students to innovative ideas.
3. Creating businesses could bring satisfaction to students?
    - To investigate the assumption/ views academics have about students towards innovative entrepreneurship.
4. Adding entrepreneurship education can be good for qualifications and increase career option for students?
    - To determine if entrepreneurship education could assist in reducing unemployment by introducing more innovative entrepreneurs in the job market.
5. Can entrepreneurship education knowledge help to boost innovation among students?
    - To determine if expanding entrepreneurship education is good for the institution.

Interview schedule

Place	**Sample**	**Sample size**
University of KwaZulu-Natal	UKZN academic Staff	4
University of Zululand	UNIZULU academic Staff	4

Appendix D:

Outcome of Doctoral research proposal (University of KwaZulu-Natal)

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

To: Mr Thabo Mtshali (210534694)

From: School of Management, IT & Governance

Issued on: 15 February 2022 Valid until: 15 February 2024

Subject: Outcome of Doctoral Research Proposal

Student Name & Student Number: Mr Thabo Mtshali (210534694)	**Title on Proposal : 'Expanding entrepreneurship education to boost students' innovation in South African universities**
Qualification, Major & Campus: Phd, (ENTR) TOME, WST	**Supervisor: Dr V Gamede**
	Co- Supervisor: Dr Pfano Mashau
Proposal presentation Date:	**23 November 2021**
Decision:	**You may proceed.**

You may proceed with your study.

Please ensure that this Outcome Letter, together with Research Proposal (RP), are uploaded on the HDMS system.

Thereafter, you may proceed to apply for Ethical Clearance via the RIG system (https://rig.ukzn.ac.za). On RIG, under Tab 4 'Amendments', please also upload the HDMS approval email of the RP.

This Outcome Letter is effective from the date of this letter and expires on 15 February 2024. It is requirement that the student applies for Ethical Clearance via RIG, as soon as possible and within the validity of this Outcome Letter.

Wishing you all the best with your study.

Yours sincerely,

[redacted]

Dr B Qwabe
AL: Research & Higher Degrees
School of Management, IT & Governance
University of KwaZulu-Natal – Westville Campus

Appendix E:

Gatekeeper's Letter (University of KwaZulu-Natal)

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

11 April 2022

Mr Thabo Mtshali (SN 210534694)
School of Management, IT and Governance
College of Law and Management Studies
Westville Campus
UKZN
Email: 210534694@stu.ukzn.ac.za

Dear Mr Mtshali

RE: PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to conduct research at the University of KwaZulu-Natal (UKZN) towards your postgraduate studies, provided Ethical clearance has been obtained. We note the title of your research project is:

"Expanding entrepreneurship education to boost students' innovation in South African universities."

It is noted that you will be constituting your sample as follows:

- **By conducting interviews with staff members at UKZN and the University of Zululand (Taking in account any regulations that may be imposed. ZOOM, Skype or telephone interviews recommended).**
- **With a request for responses on the website. The questionnaire must be placed on the notice system http://notices.ukzn.ac.za. A copy of this letter (Gatekeeper's approval) must be simultaneously sent to (govenderlog@ukzn.ac.za) or (ramklssoonh@ukzn.ac.za).**

Please ensure that the following appears on your notice/questionnaire:

- **Ethical clearance number;**
- **Research title and details of the research, the researcher and the supervisor;**
- **Consent form is attached to the notice/questionnaire and to be signed by user before he/she fills in questionnaire;**
- **gatekeepers approval by the Registrar.**

You are not authorized to contact staff and students using the 'Microsoft Outlook' address book. Identity numbers and email addresses of individuals are not a matter of public record and are protected according to Section 14 of the South African Constitution, as well as the PAIA and POPI Act. For the release of such information over to yourself for research purposes, the University of KwaZulu-Natal will need express consent from the relevant data subjects. Data collected must be treated with due confidentiality and anonymity.

Yours sincerely

[redacted]

Dr KE Cleland
Registrar

Appendix F:

Gatekeeper's Letter (University of Zululand)

UNIVERSITY OF ZULULAND

University of Zululand, Private Bag X1001, KwaDlangezwa, 3886
W: www.unizulu.ac.za

T: +27 35 902 6434
E: MothilallD@unizulu.ac.za
Office of the Registrar

Our ref: Permit: 25/2022 19 June 2022

Your ref:

PERMIT TO COLLECT DATA

The University of Zululand hereby permits T W Mtshali to conduct research and collect data in accordance with his Ethics Clearance Certificate HSSREC/00004152/2022 issued by the University of KwaZulu Natal dated 19 May 2022, and UNIZULU's POPI Declaration and Indemnity form dated 17 June 2022.

The Researcher may commence with data collection from the date of this Permit. This permit is valid for 12 months from date of issue.

UNIZULU retains the right to withdraw or amend this permit if:

- Any unethical conduct is revealed or suspected;
- Relevant information has been withheld or misrepresented;
- Regulatory changes of whatsoever nature so require;
- The conditions contained in the Declaration has not been adhered to.

[redacted]

D MOTHILALL
REGISTRAR

.

Appendix G:

Editorial Certificate

EDITORIAL CERTIFICATE

Author: Thabo Wonder Mtshali

Document title: Expanding Entrepreneurship Education to Boost Students' Innovation in South African Universities

Date issued: 29/11/2023

This document certifies that the above manuscript was proofread and edited by Prof Gift Mheta (PhD, Linguistics).

The document was edited for proper English language, grammar, punctuation, spelling and overall style. The editor endeavoured to ensure that the author's intended meaning was not altered during the review. All amendments were tracked with the Microsoft Word "Track Changes" feature. Therefore, the author had the option to reject or accept each change individually.

Kind regards

[redacted]

Prof Gift Mheta (Cell: 073 954 8913)

Appendix H:

Ethical clearance (University of KwaZulu-Natal)

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

29 June 2022

Thabo Wonder Mtshali (210534694)
School Of Man Info Tech & Gov
Westville Campus

Dear TW Mtshali,

Protocol reference number: HSSREC/00004152/2022
Project title: Expanding entrepreneurship education to boost students innovation in South African universities
Degree: PhD

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 06 May 2022 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the 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.

This approval is valid until 29 June 2023.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,

[redacted]

Professor Dipane Hlalele (Chair)

/dd

Humanities and Social Sciences Research Ethics Committee
Postal Address: Private Bag X54001, Durban, 4000, South Africa
Telephone: +27 (0)31 260 8350/4557/3587 **Email:** hssrec@ukzn.ac.za **Website:** http://research.ukzn.ac.za/Research-Ethics
Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville