REVENUE STRATEGIES THAT ENCOURAGE GRADUATES' WORK PLACEMENT IN SOUTH AFRICAN UNIVERSITIES

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ABSTRACT

Government institutions in South Africa, including universities, are diversifying revenue sources to maintain operations in response to financial pressures exacerbated by COVID-19. This study focuses on sustaining university finances amidst rising youth unemployment by investigating strategies that emphasize placing graduates in university-driven job opportunities. It addresses how universities support graduate employment aiming to integrate these initiatives into revenue strategies. By leveraging these strategies, the study seeks to combat South Africa's significant youth unemployment problem while benefiting university finances.

Conducted across all twenty-six South African public universities, the study employed a positivist epistemology and quantitative methodology. The first of two research questions were addressed by demonstrating a visual representation reflecting a comparison of the university graduate population to the top business industry in each province. This was intended to explore how the top industries relate to the profile of the total graduates produced in each province. The outcome would be to inform decision-making prioritizing industry relations as an important factor to graduates' work placement.

The study underscores the potential for universities to develop self-sustaining revenue streams through strategic investment in graduate work placement initiatives. The research not only offers crucial insights for universities to enhance financial sustainability but also addresses youth unemployment, a pressing challenge in the South African economy. By aligning revenue generation with graduate job placements, universities can enhance their financial health while contributing to broader societal goals.

Keywords: Higher education, strategies, student funding, universities, entrepreneurship

INTRODUCTION

One's education demonstrates one's ability to specialize in a particular field. This dream has been out of reach for most people, especially in South Africa, where historically disadvantaged citizens were prevented from attaining this goal, based on their race. Graduation ceremonies are cause for great celebration and pride. They are eagerly anticipated occasions for all. However, one more milestone to realize the hard work put into higher education studies is finding employment, especially in the field that the student has studied. In the higher education sector in South Africa, there are documented good intentions as stipulated by the White Paper for Post-School Education Training which aims to achieve valuable objectives by 2030 (Department of Higher Education and Training 2013a). Of the five key policy objectives of the White Paper, one objective that is relevant to this study aims to focus on strengthening the relationship between education, training institutions, and the workplace. This study thus seeks to investigate strategies that could be undertaken by universities to move closer to that relationship with the world of work (Department of Higher Education and Training 2013a).

Through the published Ministerial Statement on University Funding framework (2021), the South African government defined how government funding subsidies will be distributed to South African universities to supplement the institutions' financial resources. Through this funding framework, institutions of higher education in South Africa have a clearly outlined understanding of how the Minister of Higher Education allocates the education budget per university on a yearly basis (Department of Higher Education and Training 2021b).

Due to the Coronavirus (COVID-19) pandemic experienced in 2020, the economic situation has worsened and the unemployment rate in South Africa has risen (Odeku 2021). There has been an increasing trend in the unemployment rate in general for South Africa from 25,2% in 2012 to 32,9% in 2022 (Maluleke 2022). The South African government was already contributing financially to the higher education sector in several ways, as mentioned in previous paragraphs. Each year, it became increasingly necessary for other alternatives to be sourced for sustaining the academic enterprise and there was thus a need to re-strategize business operations in higher education institutions. The focus of this study has considered the population of all twenty-six public universities in the South African higher education sector. The study seeks to investigate strategies aimed at generating revenue income for universities through university-led job placement initiatives for graduates. The work placement implied in this context is the internship work opportunities that some undergraduate university programs

require to expose the student to experiential learning in the workplace and includes investigating any other initiative that boosts work placement by other means. In the context of this study, *graduates* imply students who have successfully completed studying a degree at the university and are seeking employment after graduating.

LITERATURE REVIEW ON UNIVERSITY REVENUE STRATEGIES

Relevant higher education policies: The White Paper and Ministerial Statement on University Funding

As the focus of this study is limited to public universities located in South Africa, we need to understand what policies govern public higher education institutions in this context. It is vital that policies inform how universities can devise strategic plans in order to remain beneficiaries of government subsidies. The government provides a funding subsidy to all public South African universities annually through the Department of Higher Education and Training (DHET) (Department of Higher Education and Training 2021b). A South African government-driven policy as a national funding framework, referred to as the DHET White Paper Post-School Education and Training, approved in 2013, sets the tone at a national level and gives strategic direction as to what priorities should be addressed through an integrated system in post-school educational institutions (Department of Higher Education and Training 2013a). This framework further encourages institutions of higher learning to show uniqueness by applying differentiation strategies, even though the primary purpose of these institutions is to educate their community.

The strategies defined in the White Paper are aimed at improving the capacity of the post-school education and training system in order to meet South Africa's needs and to provide guidance on where funding support should solve problems at public universities. According to the DHET White Paper for Post-School Education and Training (2013, 4), the main strategic objectives within DHET include but are not limited to:

- ensuring increased student access to quality higher education through enrolments accompanied by a cooperative relationship between training institutions and the workplace; and
- being responsive to the needs of society through linking education with employers in both public and private sectors (Department of Higher Education and Training 2013a).

South Africa's public universities should maximize the opportunities opened up and financially supported by the government to take advantage of initiatives that allow them to connect the work environment with university graduates. The content of the DHET White Paper (2013) supports the argument made in this study that initiatives relating to graduates' work opportunities should be made a priority at a strategic level within a university.

Developing university revenue strategies that create graduates' work opportunities

The state of university funding

Ahmad, Ismail and Siraj (2019) discuss the funding of public universities and argue that universities globally are faced with massification and significant government cuts in funding. The universities that are able to stay afloat require endowment funds, gifts and donations (Ahmad, Ismail, and Siraj 2019). Universities can also use their facilities as a form of asset utilization to gain more funds. In addition, universities can have strategic alliances with other universities and industries to secure research funding, to both break from the dependency on government funding and to become more sustainable (Ahmad et al. 2019, 322). Referring to the "Higher Education Business Model" (Lapovsky 2013, 2) notes that innovation includes increasing online programs rather than in-person programs as a responsive strategy for increasingly defunded universities. According to Di Carlo et al. (2019), university sustainability includes the ability to attract government and alternative funding, which emphasizes the need to source funds through alternative means. The main streams of income other than government grants are often competitive research grants and market-oriented/for-profit operations (Di Carlo et al. 2019).

In addition, university investment strategies indicate a shift towards a focus on a third income stream, which is sometimes referred to as private income that universities are able to generate. The good strides that all twenty-six South African public universities reflect in the CHE VitalStats (2019, 95) give hope that this stream of income has the potential to grow, as all universities reported it in the 2019 financial performance statements. Although moderate proportions of this stream range mostly below 50%, it implies universities have managed to find their feet in devising other private income capabilities meant to enable financial sustainability. More innovative initiatives would enable the range to grow much bigger than what it is currently reflecting (Council on Higher Education 2021). The financial sustainability

of universities, according to McLaren and Struwig (2019), has three basic elements, namely: (i) strategy; (ii) operating sustainability; and (iii) investments that are aimed at encouraging revenue generation for universities. It is therefore evident that universities need to find more capabilities to remain operational through financial sustainability.

Chumba, Muturi and Oluoch (2019) highlight the fact that Kenyan higher education institutions created additional income generation streams to mitigate reduced government funding. The income generation occurred through what the authors referred to as principles centered around resource mobilization strategies and academic entrepreneurship. Resource mobilization strategies imply that the university generated private income locally in order to supplement the public funding provided through government subsidy. Because government funding in Kenya had become insufficient to maintain sustainability, income-generating activities were created to address the challenge of diminishing government funding (Chumba, Muturi, and Oluoch 2019). A similar study was conducted at Zimbabwe universities seeking alternative income streams to supplement the financial base. Establishing best practices on resource mobilization mechanisms was amongs the main issues of interest. The study involving five selected Zimbabwean universities revealed that policies existed which provide guidance on mobilizing research and consultancy; however, they were not getting enough seed funding to begin income-generating projects. Additionally, they managed to formulate a profit-sharing formula between centralized administration and units of revenue generation, ultimately recommending the development of institutional strategic plans for resource mobilization mechanisms as a key pillar in the universities' operational plans (Chiwodza and Mapolisa 2020). The strategies referred to by the Kenyan and Zimbabwean universities are worthwhile means to boost income streams through revenue-generating tactics that this study is also recommending.

Being aware of the surrounding environment that universities serve is important because funding solicitation beyond the state requires that universities should improve their stakeholder relations capabilities (Almagtome, et al. 2019). Gebreyes (2015) also argued that universities need to engage in exchanges with their external stakeholders through which they can acquire resources in exchange for the education products offered by universities. In this way, both entities benefit from this strategy financially and the university builds a valuable reputation. A theoretical framework known as resource dependence theory was utilized by Gebreyes (2015) to examine the impact of universities on their environment (Gebreyes 2015).

Examining graduate work placement led by universities

This sub-section examines literature around graduates' work placement with the emphasis on universities playing a leading role in this activity.

Graduate placement and youth unemployment in South Africa

Similar to this study, Nattrass (2002) notes that placement schemes help to reduce the demand for social assistance and help young job seekers to find work. However, this author further emphasizes that placement helps the most skilled and that job placement may not affect or improve youth unemployment as much as desired (Nattrass 2002). The current study argues that job placement may not improve youth unemployment as some of those job placements may begin in the form of internship programs which could later translate to full-time employment for the incumbent who initially entered as a graduate. Such interventions may not be sufficiently impactful or occur at a significant pace as they depend on the capacity to absorb such skilled labor within a company. Those efforts might not be enough to boost youth employment; hence this study suggests investigation of new and additional university strategies that could extend the vision of addressing youth unemployment through university-led initiatives, using a different approach. The essence of job placement in the form of internships is to equip graduates for the world of work and the practicalities that are to be experienced in employment. Internship therefore contributes to youth employment partly. Recognizing graduate work placement in university strategies would thus be important to ensure that university management can monitor the effectiveness of such initiatives.

Betts et al. (2009) highlighted that higher education provides extensive opportunities for career development, placement, and advancement. Additionally, higher education provides new opportunities for career transition for displaced workers, individuals who are in fear of losing their jobs, and the unemployed (Betts et al. 2009). This implies that higher education institutions must examine and re-develop curricula to provide students with the necessary knowledge, skills and experience for career placement, advancement or transition (Betts et al. 2009). The little success from job placement mentioned by the authors in the above statements suggests that work placement needs to be approached in new strategic ways in order to lead to the success needed to contribute to addressing youth unemployment. While there are pitfalls with job placement in terms of addressing unemployment, it nevertheless plays an important role in higher education. According to Govender and Taylor (2015), experiential learning

involves placing students in the workplace and moving them from being learners to being novice professionals. In addition, work placements are being accepted as part of the academic curricula (Govender and Taylor 2015). Many universities are applying for work placement for students to gain insight into the workplace and to prepare them for the world of work. This practice remains a valid and necessary strategy to link the curricula being taught with the requirements of industry.

A case study that was conducted in Kenya to assess the impact of competency-based education proved that there is indeed a need for stakeholders to work together in redefining employability expectations (Ruparelia et al. 2021). In such situations, they asserted that policy must guide the partnership as its influence is a crucial factor in outlining processes and collaboration to ensure meaningful partnerships country-wide between universities and workplaces. The impact of this study resulted in the redevelopment of the undergraduate pharmacy program to suit the needs of the pharmacy sector (Ruparelia et al. 2021). This approach is a clear example of how the curriculum may become affected and influenced by the needs of the industry being served, which is part of maintaining good partnerships between industries and universities. Stakeholder engagement is one of the activities universities would ideally have to monitor in the strategies and tactics aimed at either establishing or maintaining guaranteed partnerships with certain industries of interest to achieve the goal of graduate work placement.

The impact of collaborations between universities and industries is an important matter in determining graduate employability. This is seen in a case study that was conducted in the Faculty of Engineering and the Built Environment at the University of Johannesburg (Aliu and Aigbavboa 2021). The study proved that such collaboration is highly effective in improving graduates' readiness for the world of work through exposure to relevant training, preparing the graduates for the job market and enabling increased professionalism in the long term (Aliu and Aigbavboa 2021). This notion of collaborations would ensure that impact is relevant to the industry partnership established and provides the industry with stability in the quality of work produced by incoming fresh staff from the work placement programs.

Considering universities as a placement agency

According to Hall et al. (2009), the idea of a university assuming the role of job placement has attracted the attention of many. These authors envisage this in the form of courses in the curriculum of undergraduate studies that focus on employment (Hall, Higson, and Bullivant 2009). In South African public universities, the practice is referred to as work-integrated

learning and it is one of the ways of exposing students to employment opportunities, even though the aim usually is to provide work experience. The work placement concept can be utilized further to contribute to creating job opportunities for graduates (Aliu and Aigbavboa 2021, 1093). Brouwer, Downey and Bokhove (2020) highlight lessons from Britain's placement of teaching graduates, which translates to an apprenticeship for teachers (Brouwer, et al. 2020). The examples clearly indicate that this challenge is also experienced by international higher education institutions and different strategies are being implemented to address the matter of job creation for graduates.

Many universities in Australia and the United Kingdom (UK) have been including work placements, internships and international study in their programs in order to enhance the graduates' employment prospects (Clarke 2017). It is also true for the South African university context because all the above-mentioned initiatives are being applied in some of the programs found at public higher education institutions (Aliu and Aigbavboa 2021). This kind of approach to start-up job opportunities such as internship programs does not take into consideration other crucial factors suggested by the graduate employability framework developed by Clarke (2017). Clarke suggested a framework containing six dimensions that address graduate employability, namely:

- Human capital, which refers to the degree that comes with relevant skills and knowledge taught in the curricula;
- Social capital, where universities assist students in building strong networks such as alumni associations;
- Individual attributes, refer to students' personal variables such as openness to experience and adaptability;
- Individual behaviors, referring to students' behavior self-confidence aspects;
- Perceived employability, which implies work-ready graduates; and
- Labor market factors, the role of industries' influencing relevance of curriculum design to advance the graduates' employability agenda.

Key stakeholders who should be prioritized for further engagements regarding the practicality of creating graduate work opportunities include the government, industries and universities so as to ensure supply and demand for specific programs aimed at better management of graduate work placement (Clarke 2017). The identified research gap emanating from this section is that even though graduates' work placement seems to be an existing practice in universities, it

however lacks a competitive focus that can yield financial benefits to universities and that ensures long-term employment for graduates rather than simply work exposure.

The use of stakeholder theory for graduate placement initiatives

A stakeholder is any person or a group of people either affected by the organization or able to influence the achievement of its objectives (Msibi 2021). This study adopts the stakeholder theory as a theoretical framework. This theory emphasizes the configuration of collaborative work and giving stakeholders "a more involving task" (Msibi 2021, 107). Furthermore, author D'Oliveira (2019) states that, according to stakeholder management theory, stakeholders are crucial to the sustainability and success of a business goal. Businesses should consider stakeholders' interests as part of the triple context in which they operate. It focuses on a mutual exchange in the stakeholder-organization relationship (D'Oliveira 2019). Stakeholder theory can be both descriptive and normative. In the descriptive sense stakeholder management theory is about describing and examining the connections between legitimate interests, supplier relationship management practices, and the achievement of organizational goals. From a normative perspective, stakeholder theory seeks to interpret functionality and identify moral or philosophical guidelines for businesses (D'Oliveira 2019). A legitimate relationship must be established between the university and the industry and including other stakeholders in the circle of engagements would be highly recommended.

Furthermore, it needs to be acknowledged that organizations have stakeholders and that relationships with these stakeholders need to be actively managed in order to ensure profitability and sustainability (Flak and Rose 2005). Borg, Scott-Young and Turner (2019) speak about using stakeholder theory to design curricula that create work-ready graduates. In this regard, these authors suggest that smart curricula need to be developed to endow graduates with the integrated work-ready skills and competencies of adaptation, flexibility, independence, creativity and innovativeness that are critical for working in the complex, fast-changing environment of the twenty-first century. In this regard, the stakeholders are educators, employers and graduates (Borg, Scott-Young and Turner 2019). The stakeholder theory is very relevant to the objective of creating work opportunities beyond the world of the student.

Overall, the study examines what insights the stakeholder theory, as a theoretical framework, provides for graduates' work placement in South Africa. In addition, the study will investigate the other stakeholder theories that prescribe strategies for graduates' employment. Integration of the stakeholder theory with analysis conducted in this study can be noted

specifically in research question two, where identification of the most dominant industry was the deciding factor in influencing which graduates' initiatives to prioritize. Figure 1 presented below reflects qualities that inform the stakeholder management theory framework applied in this study.
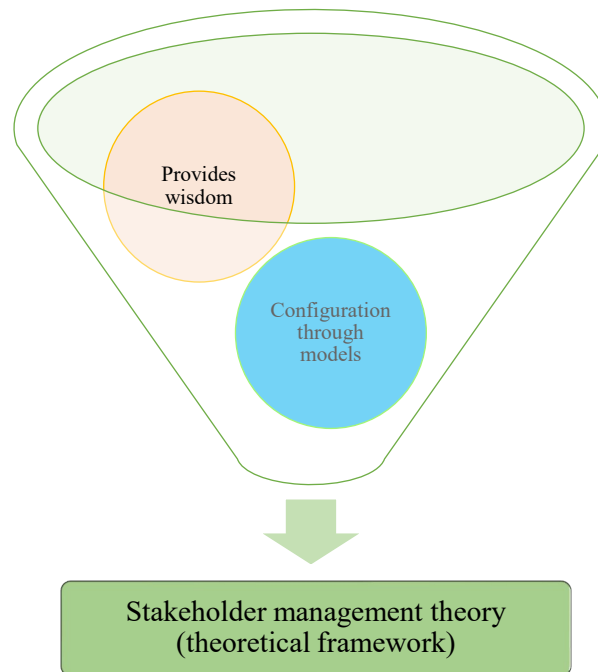

Figure 1: Qualities informing Stakeholder management theory

Source: Own contribution

Research methodology

The research design chosen in this study was positivist epistemology, which argues that there is a single reality and that things can be measured objectively. A positivist epistemology recognizes cause-and-effect relationships, and the research was based upon facts (Cassim 2021). The study further used a quantitative research methodology to investigate research questions defined in the following Figure 2 further below. A quantitative research method was selected because this allows the findings to be generalizable (Mkhize 2021). Secondary data was used because of the Protection of Personal Information Act (POPIA), which made some institutional gatekeepers reluctant to allow the researcher access to their personal data. Since secondary data was already available to source from public domains such as government department websites, they are audited data emanating from credible data sources within South Africa. It was thus decided to rather use this method to avoid the unauthorized use of

information about universities.

In South Africa, there are centralized data sources that are regarded as credible, such as the Council for Higher Education (CHE) and the Department of Higher Education and Training (DHET), which have both published valid, authorized and audited quantitative information about all public universities in the country. The data was profiled numerically, for example through frequency counts (Rowley 2014). Problem solving attempted by this study has been broken down into two research questions which are examined through quantitative techniques such as the choropleth maps showing density of variables analyzed and cross tabulation visualization encouraging decision-making practices in evaluating the desired business model suitable for the industry demand and university graduates' work placement plans. The conceptual framework that follows (Figure 2) represents the process followed in this study; a view of how it was conducted and how the research questions were addressed.
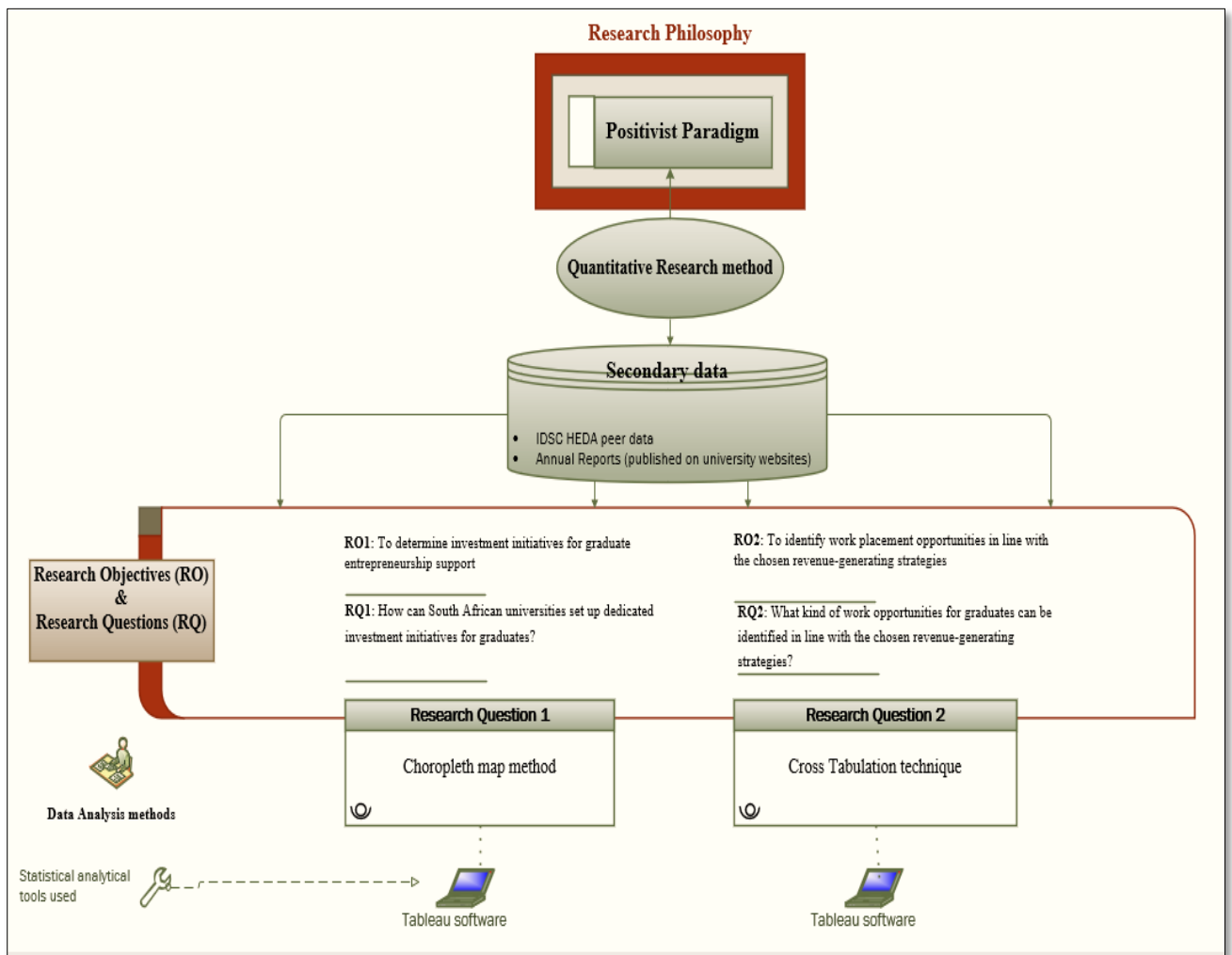

Figure 2: Conceptual framework of the research design and methodology process

Source: Own contribution

Although there are many other research methods that could have been used, such as qualitative and mixed research methods, the reason for not selecting these methods is due to the time limitation of one year to complete this study as seeking permission for a case study proved to be unsuccessful when an attempt was initially made (Nongogo 2021). Qualitative or mixed research methods (where qualitative and quantitative methods are combined) would have been more time consuming and resource intensive (Almalki 2016). There was insufficient time to explore the desired scope of the study extensively with the use of other research frameworks. Although the researcher desired to probe the topic further through a mixed method, it was not feasible to explore that kind of research design method (Nongogo 2021).

PRESENTATION OF RESULTS AND FINDINGS

This section provides a presentation of the results, interpretation of the analyzed data and findings emanating from analyzed secondary data.

Summary of the findings

- Research Question 1 (RQ1): Choropleth maps provided a clear view to universities in each region about which business types to consider for graduates' initiatives. Universities would therefore be able to know which business industries to focus on using strategic planning, which is an activity performed in the higher education sector.

- Research Question 2 (RQ2): The cross-sectional method through the cross-tabulation technique, reflects key variables that can be analyzed and presented in a tabular manner making it easy to understand and encourage prompt decision-making of work opportunities for graduates with the graduates' specialization population at hand in a certain period. These kinds of capabilities are valuable in strategic development activities.

Interpretation of results

RQ1 Interpretation and presentation of results

The sub-sections below will represent an interpretation of the results. The following conceptual map (Figure 3) reflects the links that address the association of graduates' specialization against

relevant job industries for addressing RQ1 within the South African higher education sector. Figure 3 seeks to illustrate the relationship between identified variables using a conceptual framework.
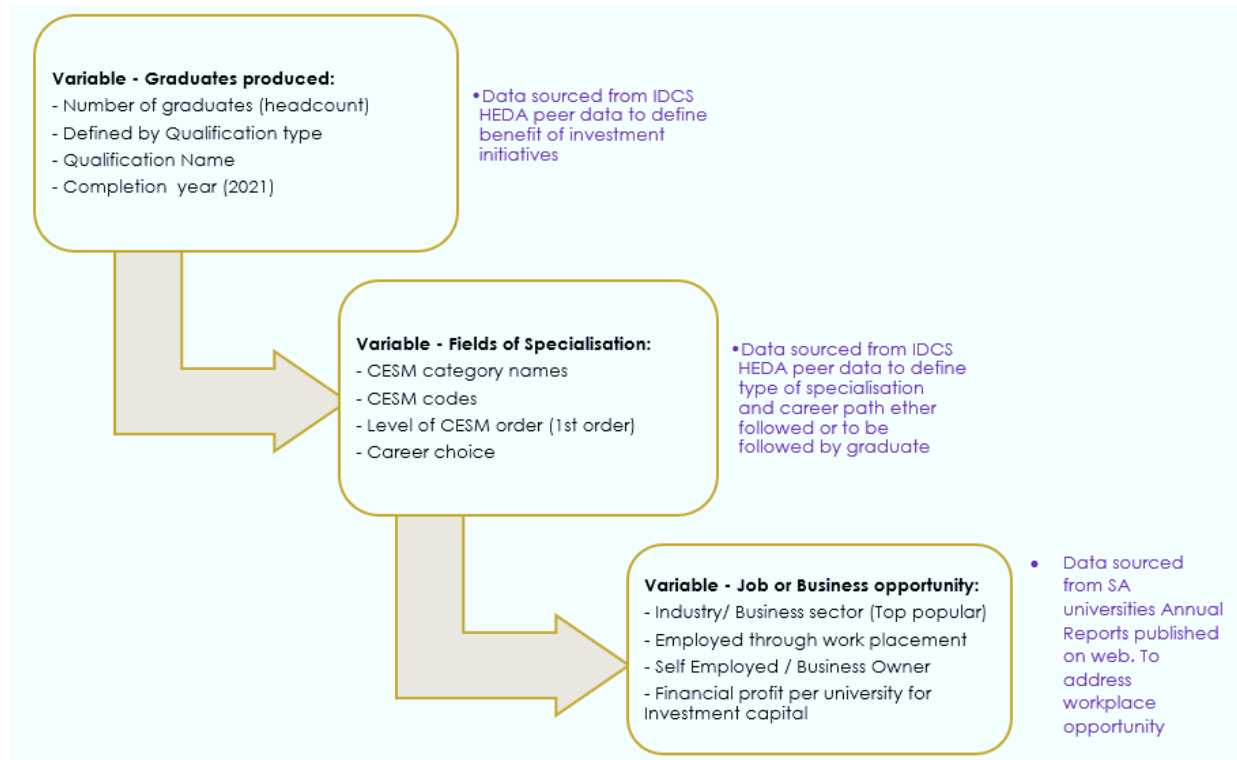

Figure 3: Conceptual framework- Identified variables sourced from secondary data (IDSC, 2022)

Source: Own contribution

The mind map was thus used to demonstrate how universities could set up dedicated business initiatives prioritized for graduates by considering the industries existing in each province in South Africa. The choropleth map technique seeks to present the options most useful to achieve RO1. The maps and analysis to follow were presented using the 2023 Tableau® visualization tool, which is one of the recent popular tools recommended by data analysts for storytelling using visualization. The 2023 Tableau® software tool is a sophisticated data visualization tool in business analytics specialization as it encompasses integration with native tools (Mitra 2023). In a blog published in early 2023, Mitra reports that demand for the Tableau® program had increased significantly from the year 2021, which resulted in the launch of a Tableau® Online web-based analytical platform with extensive sophisticated abilities to share dashboards

through visualization. The utilization of the Tableau® program in this study was because it provides an ease to the eye when variables are plotted in geographical representation for making the consideration process easy for decision makers when brainstorming during strategic sessions.

The following three **choropleth maps** to follow aim to compare graduates produced from universities in each province with the top three business industries that are most dominant in each province (mapping the connections). These kinds of maps use color patterns to show the industry type in each province in relation to aggregate values of total graduates produced within that province. Identified variables in this analysis are the total **Graduates produced (as a dependent variable)**, the **Province of the university location (as an independent variable),** and the **Top industry sector in each province (as an independent variable)** that was amongst the top three most dominant work industries. The leading three industries were informed by Statistics South Africa reports presented in an online article based on 2016 data collected in South Africa about the economics of provinces (Alexander 2021). The three choropleth maps demonstrate, based on dominant industries, which investment initiatives, universities could look into to help create employment opportunities for graduates. Universities could focus on taking advantage of industry areas that are least dominant within the relevant province targeted by need or demand.
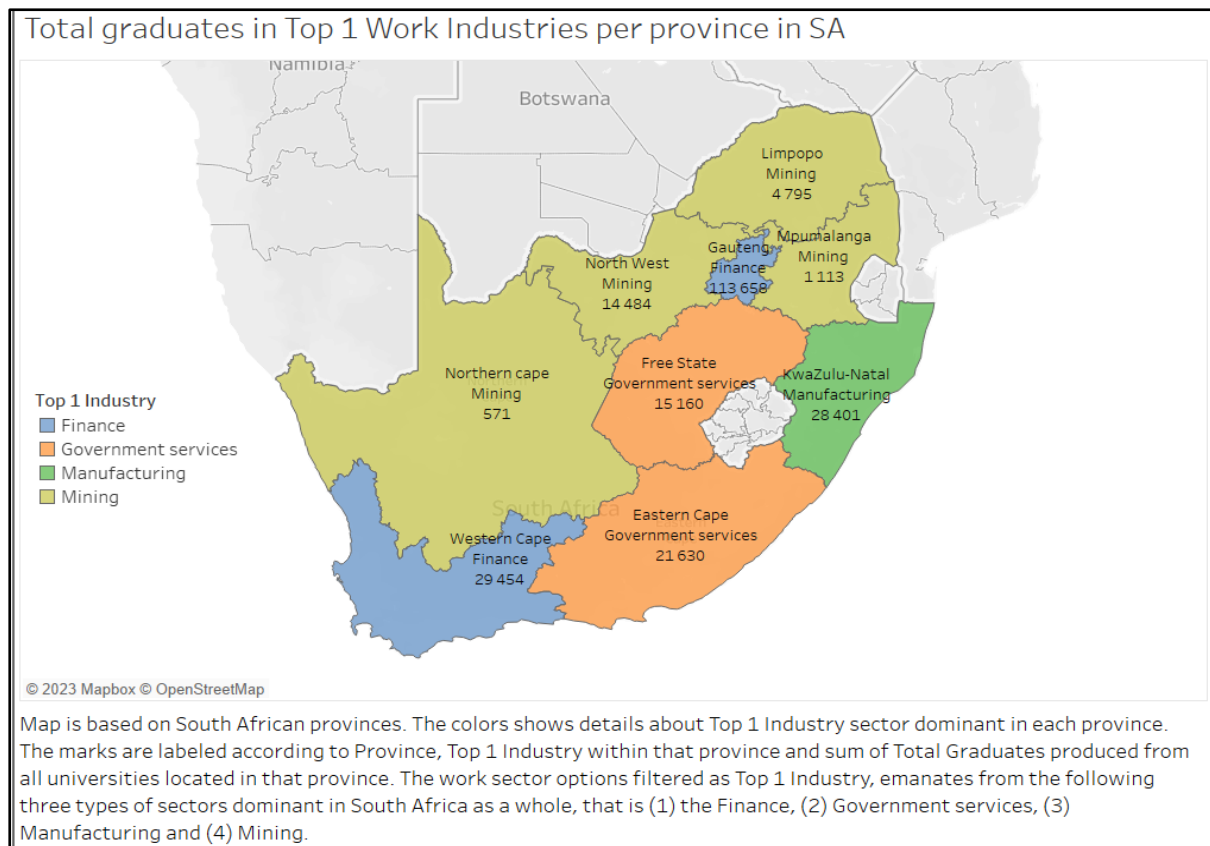
Map 1: Top industry per province alongside a total number of 2021 graduates produced in each province.

Source: Alexander (2021)

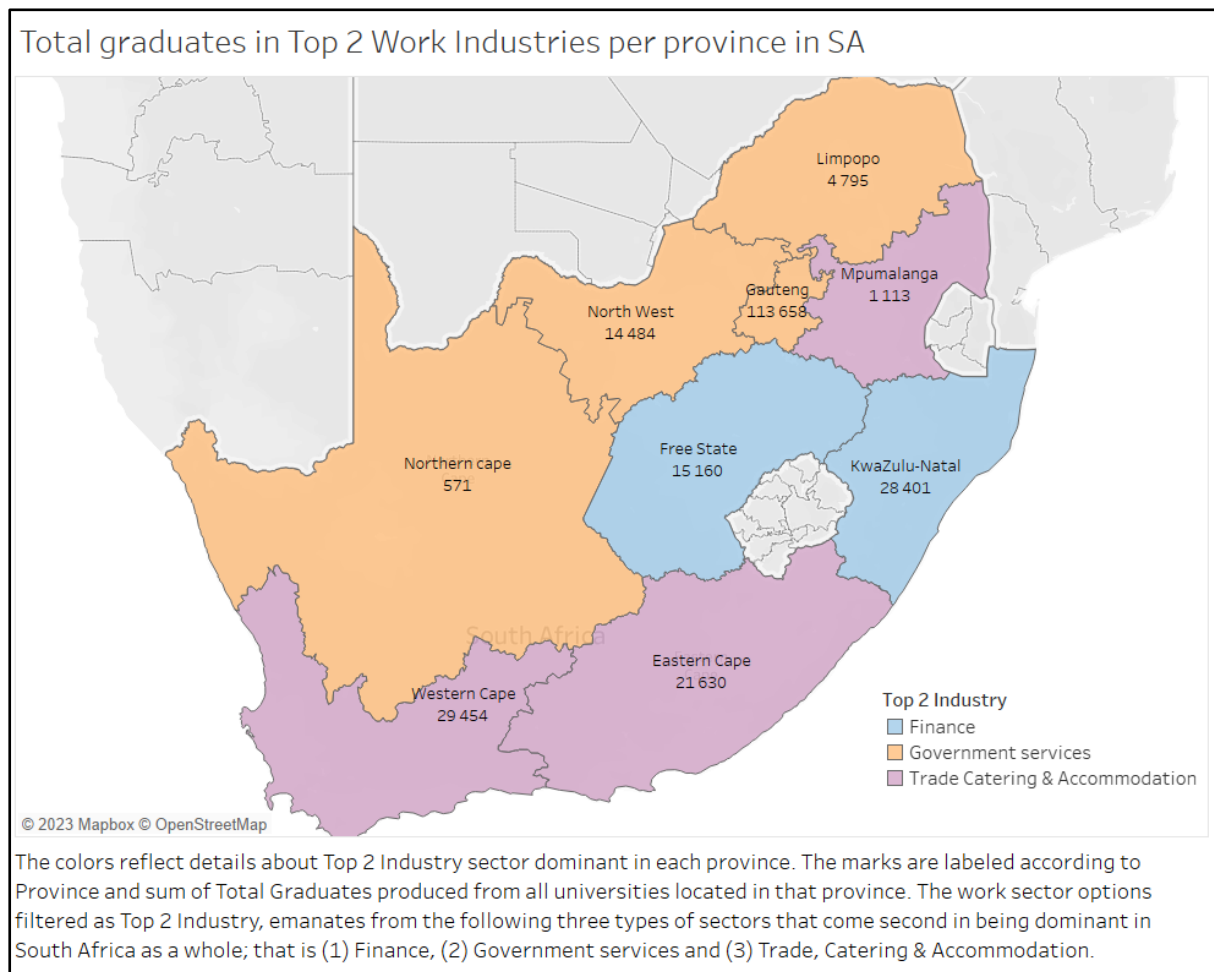**Interpretation of Map 1 results:**

Finance, presented in blue, was the top industry in the Western Cape and Gauteng provinces, implying that expertise in this field is most dominant in these areas. When looking at the graduates produced in these two provinces, it is clear that the high output of graduates was intended to satisfy the size of the Finance industry.

Government services, represented by orange, emerged as the top industry in two provinces, that is, the Free State and Eastern Cape provinces. This implies that these two provinces have a strong visibility of government services compared to the other provinces. Although not all provinces have a government service sector visible, it could be an opportunity for universities to explore as government services form the basis of providing basic service delivery to the immediate communities.

The **Manufacturing industry** is represented in green as the top sector in KwaZulu-Natal province. In this industry, the focus is on transforming goods, conducting repairs, and the

installation of industrial equipment.

The **Mining industry** is represented by a gold color as the top sector in the Northern Cape, North West, Limpopo and Mpumalanga provinces. Within this activity, mining extraction of precious minerals occurs, and these are transformed into mineralized forms. There is also the extraction of other geological materials such as rich deposits of platinum, chromite, gold, and uranium underpinning the industry with the aim of serving an economic benefit (Department of Statistics South Africa 2019).

Map 2: The second most dominant industries per province alongside total number of 2021 graduates produced per province.

Source: Alexander (2021)

Interpretation of Map 2 results:

Finance is presented in blue as the second-largest industry visible in the Free State and KwaZulu-Natal provinces. These two provinces could consider critically maintaining the high

level of concern in Finance expertise as the graduate population produced also seems high in these two areas.

The **Government services** sector is represented in orange as the second leading industry in the Northern Cape, North West, Gauteng and Limpopo provinces. This visibility of government capacity is good to have in areas highly dominated by mining industries, as was previously seen in the results of Map 1.

The Trade, Catering and Accommodation sector is represented in purple as the second leading industry visible in the Western Cape, Eastern Cape and Mpumalanga provinces. The existence of trading abilities is a good indication that sufficient consumption and utilization exist to close the loop cycle from production to consumption. Catering and Accommodation are also part of this consumption cycle, and this ensures a balanced force of industries.
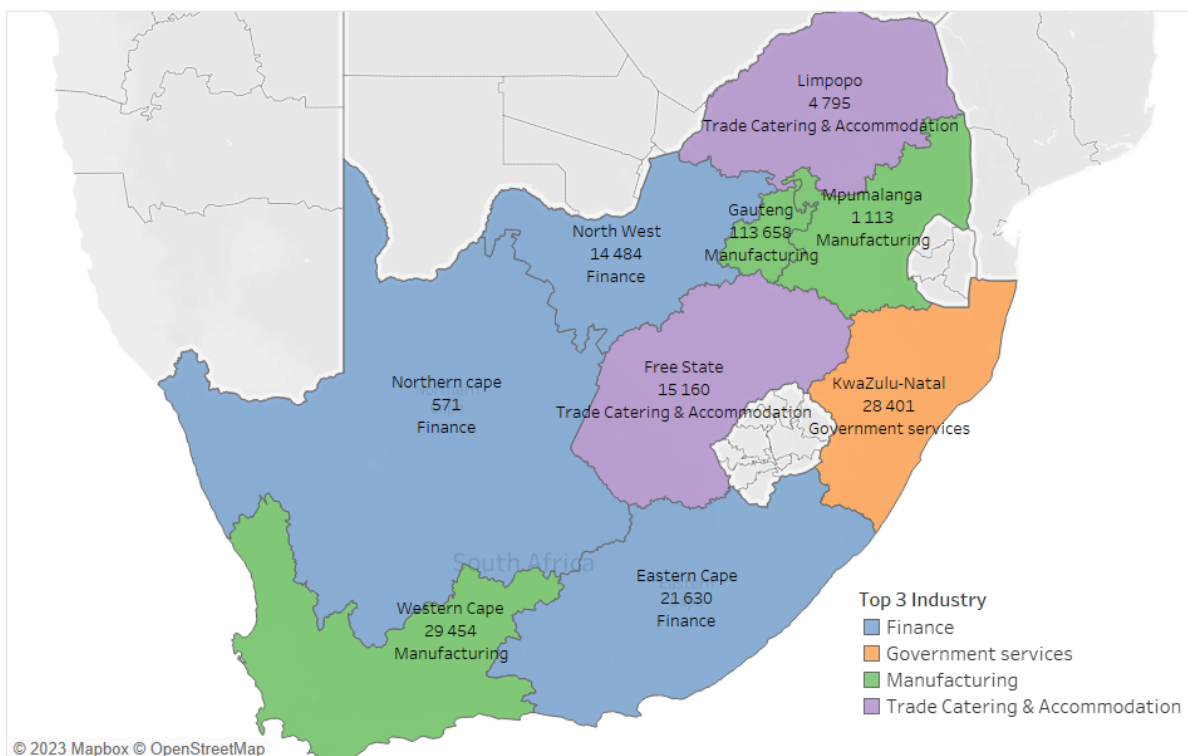
The colors reflect details about Top 3 Industry sector dominant in each province. The marks are labeled according to Province, sum of Total Graduates produced from all universities located in that province and by 3rd top industry within the province. The work sector options filtered as Top 3 Industry emanates from the following four types of sectors that come third place in being dominant at South Africa as a whole; that is (1) Finance, (2) Government services, (3)Manufacturing and (4) Trade, Catering & Accommodation.

Map 3: The 3rd highest industries per province alongside total number of 2021 graduates produced per province.

Source: Alexander (2021)

Interpretation of Map 3 results:

The **Finance** sector is represented in blue as the third top industry visible in the Northern Cape, Eastern Cape and North West provinces. These three provinces are in need of financial services directly in-house as they have dominant sectors in Trade, Catering and Accommodation as well as Mining and Government services, which all contribute significantly to financial transacting. Therefore, the need for managing finances in supporting dominant sectors is a good pre-requisite that could be beneficial to the demand needed for addressing financial services.

The **Government services** sector is represented in orange as the third top industry in KwaZulu-Natal province. Although this implies that for KwaZulu-Natal province the dominance of government entities comes below two sectors that may have considerable private business features, it is good to see a balance by having a government entity amongs the top three most visible sectors. In that way, local government would be available to encourage partnerships between government and private sector businesses. This is one area of opportunity that the universities within KwaZulu-Natal province could capitalize on, as there are most of both government and private sectors within one province.

The **Manufacturing** sector is represented by a green color as the third top industry in the Western Cape, Gauteng and Mpumalanga provinces. This sector involves processing skills that are important in production of goods or equipment, especially because there is a mix of other different dominating industries in Gauteng and Mpumalanga such as Government services and Manufacturing; and since they are the closest provinces to each other they would yield a good balance of forces for driving a positive economy.

Trade, Catering and Accommodation is represented by a purple color as the third top industry in the Free State and Limpopo provinces. The visibility of this industry in multiple provinces is a good boost in finances and ultimately the economic growth much needed for stability.

The overall interpretation of all choropleth map outcomes

The aim of the visualization was to compare the size of the graduate population in each sector to the top business industry in each province. This was meant to address the research question about how top industries relate to total graduates produced in each province in order to inform decision-making related to which universities could prioritize dedicated investment initiatives.

All three choropleth maps represent the highest leading industries dominant in each

province in the era of 2016 and the total number of graduates produced in 2021 within each province. This kind of view is meant to inform and enhance the decision-making strategy of a university in terms of determining which areas of business industry to invest in. Graduates could be strategically situated geographically to access relevant industries in order to participate in experiential learning related to their qualification.

However, what the study could not confirm was the staff demand each industry may need during a certain period of time, against suitable graduates produced by the university. Furthermore, another important factor to be considered would be the lifespan of each demand in line with the evolution of how competitive these industries will be in future.

RQ2 Interpretation and presentation of results

Within RQ2, the identified variables assessed were the classification of educational subject matter (CESM) categories indicating the **Specialization of graduates** (dependent variable/control variable) and the **Industry of interest** (as an independent variable) selected from the Top 1 industries dominating each province, influenced by outcomes of decisions made for RQ1 and RQ2. The aim here was to assess which specializations would be available in certain provinces where a university would prioritize investment decisions based on the graduate population in that particular year. Utilizing the 2023 Tableau® software cross tabulation feature as a technique for this analysis allows the researcher to compare categorical data of many different variables at the same time. That approach was relevant in this study as the graduation data collected focuses on one snapshot of time (the 2021 academic year), while still including various aspects with reference to graduates' specializations. Table 1 below reflects the results in a cross-tabulation manner.

Province	Univ number (Category + univ no.)	(BUS CESM) Finance & Govern serv. graduates	(EDUC CESM) All Educational graduates	(HUM CESM) Trade, Catering & Accomm graduates	(SET CESM) Manuf. & Mining graduates
Eastern Cape	CompUniv11	3 025	1 954	2 094	1 597
	CompUniv14	2 244	715	1 754	2 553
	TradUniv19	339	415	826	689
	TradUniv25	335	641	1 529	920
Free State	TradUniv24	1 572	3 258	3 476	2 226
	UoTUniv5	1 227	1 042	384	1 977
Gauteng	CompUniv7	0	0	38	1 446
	CompUniv13	15 502	14 195	19 079	5 902
	CompUniv15	5 097	1 246	2 806	3 849
	TradUniv16	2 502	993	2 259	4 430
	TradUniv20	3 168	1 971	2 780	5 673
	UoTUniv2	1 679	236	868	1 761
	UoTUniv3	6 790	1 119	3 517	4 753
KwaZulu-Natal	CompUniv10	770	998	1 188	903
	TradUniv23	1 896	1 971	3 431	3 627
	UoTUniv1	1 209	0	256	1 490
	UoTUniv4	4 965	348	1 100	4 250
Limpopo	CompUniv12	0	0	0	0
	TradUniv22	763	877	1 326	1 830
Mpumalanga	CompUniv8	284	116	100	612
North West	TradUniv21	3 373	5 029	3 143	2 939
Northern cape	CompUniv9	72	236	104	160
Western Cape	TradUniv17	942	717	2 090	2 001
	TradUniv18	2 202	664	2 130	3 687
	TradUniv26	1 678	352	2 094	2 959
	UoTUniv6	2 777	1 030	629	3 499

Table 1: Cross tabulation view of graduates' specializations vs Top 1 industry per province

Source: Own contribution

Interpretation of cross-tabulation results

The cross tabulation presented in Table 1 above presents categorical data in the form of text. The category of headings can be noted in the first row, which stipulates the Top 1 Industries found in each province in accordance with each South African university coded to protect its name, as per POPIA. The numerical numbering per university type is randomly decided. From the Top 1 industries dominating in each province, the following corresponding specialization can be allocated for each graduate population:

- Finance and Governance services – The Business CESM of graduates was applicable;
- All Educational services – The Education CESM of graduates was applicable;
- Trade, Catering and Accommodation services – The Humanities CESM of graduates was applicable; and
- Manufacturing and Mining services – The Science, Engineering and Technology CESM of graduates was applicable.

Although the specializations of graduates cannot be entirely restricted to the specific industries

identified here, the analysis seeks to give strategic guidance to inform the relevant industry per cohort of graduates produced in each field of specialization. The supply and demand factor can be further utilized to establish the practicality of work placement activity as an initiative option for graduates. For graduates' business start-ups, establishing partnerships with existing companies who are willing to do business with universities would be an ideal investment that is cost saving. It would be easier to rather grow an existing industry than to start a new one, as new businesses face challenges and may not yield profits in the initial year/s of operation. With the new start-up business option, the university would need to do a thorough analysis before committing to such investments. In the first column, defined as a Province, one can identify how many universities are visible and also how many graduates can be expected to be targeting a specific industry as a priority, based on their specialization upon graduation. The headcount of graduates has been placed in accordance with the area of specialization, which is the CESM variable as the controlling variable.

Discussion

In essence, there was limited literature regarding university strategies for revenue generation. In comparing the revenue generation study conducted by Gebreyes (2015, 35), this study adopted a similar approach of strategy development that is differently focused on creating initiatives that are funded by universities, prioritizing the approach of financially supporting students with the aim of boosting graduates' employment. The need for universities to find alternative income streams other than government funding was emphasized by Di Carlo et al. (2019), and as the main aim of this study supports the notion of encouraging revenue strategies.

Visualization for stimulating context setting in strategic decision-making

The results yielded by the RQ1 data analysis in section 4.2.1 also had an impact on the second research question (RQ2), in the sense that the same capital investment initiatives towards the graduates' work placement can also be channeled to address funding support needed in start-up businesses for graduates. As a result of limited research on strategic development issues faced by universities in seeking to be entrepreneurial, this led to focusing on management in strategizing development and implementation of revenue-generating strategies (Klofsten et al. 2019). This study supports strategically empowering executive management decision-making in addressing the issues of sourcing funding support for graduates' initiatives.

The perspective of commercializing research conducted by scientists was confirmed to be a deficiency that exists, although it has a clear potential benefit of industry funding directly to the university (Belitski, Aginskaja, and Marozau 2019). However, this view was not explored

in this study as it could not be related to a specific type of graduates initiative. Rather, this study was more focused on addressing at a strategic level the business start-up initiatives for graduates that can be prioritized by universities, whilst uniquely addressing ownership to be shared or wholly owned by the university.

Identifying priorities in favor of the university's revenue generation strategies

The first analysis conducted in the research question (RQ1) also informed the basis of analysis for the second research question (RQ2) in making use of a cross-tabulation method. The extract relevant from RQ1 was the determined strategy that may be chosen by the university to provide financial support as some kind of capital investment towards prospective graduates' business initiatives. The visual cross-tabulation in RQ2 makes it easier to spark engagements to brainstorm about prioritization of the population emanating from graduates' specializations against industries of high caliber (as seen in Table 1). In cross-tabulation, the benefit was the summarized categorical data, revealing frequencies of data being analyzed (Momeni, Pincus, and Libien 2018). These are the conversations that the executive management needs to engage and digest during decision-making sessions especially being informed by institutional research activity producing such presentations as seen in Table 1.

These initiatives could range between new business partnerships with existing viable industries with the aim of creating agreements that would open solid work opportunities for employing university graduates.

CONCLUDING SUMMARY AND RECOMMENDATIONS

Visualization that is easy on the eye: The key recommendation emanating from RQ1 is that universities should visualize the highest competitive industries and go as far as to study the least dominant industries to strengthen decision-making regarding which investment initiatives to prioritize. In that manner, it would be easier to link that decision to the various specializations of the graduates produced.

Listing priorities: The key recommendation emanating from RQ2 is that the cross-tabulation method identifies relationships and categories that are easy to understand for interpretation in limited time. There could be various perspectives that could inform decision-making easily for strategic planning assessment, which can be made readily apparent by placing the variables next to each other in a two-dimensional Table.

Valuable lessons have been learnt by the researcher from the journey of this study and

these make an important contribution to the field of work within the institutional planning specialization at higher education institutions in South Africa. The benefits from this study are relevant to be piloted by universities within the higher education sector, more especially because the problem is being experienced globally and since some of the literature reviewed reflected the popularity of similar studies conducted outside of the African continent. Locally in South Africa, the literature about similar studies of this nature proved to be limited and that is a further reason for recommending more research studies that encourage empowering university-led strategies for graduate work opportunities. New perspectives regarding the wisdom of such innovative strategies as presented by this study are required for higher education, business, and employment. The study can be enriched further by academic research to inform institutional planning divisions in particular. In this manner, such bold strategic initiatives would strengthen universities in being impactful participants in the world of work beyond the known scope of focus. The sky is not the limit for the education sector to participate in contributing to shaping the working field through the mandates it already has within society.

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