

Revenue Strategies that Encourage Graduates' Funding Initiatives in South African Public Universities



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ABSTRACT

As a result of the increasing unemployment rate amongst youth in South Africa, this study sought to investigate revenue generating strategies aimed at sustaining universities financially in the long run whilst focusing primarily on placing graduates in employment opportunities emanating from business start-ups or business partnerships led by universities. Under the theme of developing university revenue strategies that create graduates' work opportunities, two research questions aimed to address the role of universities in supporting graduates' business start-ups. The study examined how university-led graduates' initiatives could serve as a significant contributor to the university's third income strategy, whilst simultaneously reducing youth unemployment, which is currently one of the biggest challenges in the South African economy. The focus was on all twenty-six South African public universities using secondary data that was already publicly available. A positivist epistemology, using a quantitative research method, was used when statistically testing the first key research question which was conducted by demonstrating the strength of statistical association between two variables through applying the Pearson's correlation test. Thereafter, in the second research question forecasting technique determined how universities can realize benefits aimed at generating extra revenue from investment contributions made towards graduates' investment initiatives through forecasting anticipated targeted Returns on Investments. Key findings demonstrated that there was a significant association between each university's net profit and the graduates produced, and the funding subsidy from the South African government in higher education also confirms this practice. The forecasting approach using the Excel Solver equation was possible to apply in addressing the target return on investment. This implied providing positive guidance in solidifying executive decisions to strategize allocating a university profit proportion as the basis of financing capital resources supporting university-led graduates' initiatives for creating work opportunities.

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INTRODUCTION

In a South African context, universities are affected by challenges of financial support from the government that is meant to ensure there is sufficient funding for students studying at higher education level. It is clear that the Higher Education sector is having a struggle in this regard, and it is a challenge at the scale of national level. Higher Education institutions therefore need to be innovative to devise other means of financially sustaining the organizations in order to survive and contribute to offering the nation with the education agenda.¹ It seems that the entire economic landscape has been slightly constrained in recent budget allocations throughout government

¹ Fisseha Mamo Gebreyes, "Revenue Generation Strategies in Sub-Saharan African Universities" (University of Twente, Netherlands, 2015).

departments in South Africa. It was advised that institutions reprioritize to establish efficiencies in the system due to limitations that are likely to be experienced going forward as the funding stake becomes smaller. Measures to ensure adequate processes are in place to generate more third-stream income by universities are significantly encouraged by the government.² The earmarked funding grant is meant for designated purposes whilst the other grant type guaranteed to all universities is called the block grant as it is meant for legitimate university purposes.³ Other funding such as the National Student Financial Aid Scheme (NSFAS), further relieves the tuition fee burden as they aim to directly fund financially needy students.⁴ South African universities therefore receive government financial support by means of grants, which is regarded as a government grant income stream in the university's budget. Generally, one of the challenges in higher education, particularly in universities, is the number of graduates produced every year who seem to struggle to find employment once they complete their degrees, therefore contributing to the already high unemployment rate.⁵ For graduates with exceptionally good viable business ideas, the problem is further exacerbated by financial constraints caused by having no funding support to initiate any business that would contribute to job creation, which is greatly needed in the South African economy. Therefore, if universities fund graduates' initiative programs aimed at addressing work opportunity strategies, that activity would yield good returns for the university's income streams. The aim of this study is to investigate university revenue strategies where ultimately returns on investments are realized by South African public universities whilst complemented by factors addressing creating graduates' work opportunities. The study thus seeks to investigate revenue-generating strategies that are used to produce profit by South African public universities and to find out the returns on investments that the universities can expect to yield through these revenue-generating investment initiatives. The following sections presents the findings of the study.

LITERATURE REVIEW

Examining university-led investment strategies to establish business start-up initiatives for graduates

This section considers university-led entrepreneurship options that give rise to strategic development and tactics needed to contribute towards growing long-term returns on investments. This section intends to find out how the universities may get the returns on investments made toward graduates' business initiatives. The literature is further examined in the following sub-topics.

Universities entrepreneurship initiatives and the creation of graduate working opportunities

Employability skills, according to El Mansour and Dean, relate to acquiring skills, knowledge, attitudes, and other abilities enabling graduates to secure and sustain work opportunities within the labour force.⁶ A global challenge is that universities may produce graduates with skills that may not necessarily correspond to the needs of the job market and thus a proposed solution is to promote university connections or partnerships with industries that aim to increase graduate knowledge and skills within the job market.⁷ This notion of employability skills expected from graduates implies that students need to invest in mastering and applying academic skills to enable the practical application of knowledge acquired during the university journey.

Chan further states that a collaboration policy needs to be enacted between career services units within universities and technology firms as potential industries to absorb graduates based on their skills, over and above degrees.⁸ Fatoki, meanwhile, argues for the option of graduates opting for self-employment and entrepreneurship to address the youth unemployment problem in South Africa.⁹ In China, many universities offer students work placement,

² Department of Higher Education and Training, 2021, 2.

³ Council on Higher Education, "VitalStats Public Higher Education 2019," *Council on Higher Education*, February 2021.

⁴ Paul, Ashwin and Jennifer Case, *Higher Education Pathways: South African Undergraduate Education and the Public Good* (Cape Town: African Minds, 2018).

⁵ Ayanda Princess Nongogo, "Research Proposal [Unpublished Manuscript]," in *An Investigation of Revenue Generation Options That Provide Funding for Graduates Work Placement: A Case Study of a Comprehensive University in South Africa at KwaZulu Natal Province* (Durban: University of KwaZulu Natal, 2021), 1–27.

⁶ Bassou El Mansour and Jason C. Dean, "Employability Skills as Perceived by Employers and University Faculty in the Fields of Human Resource Development (HRD) for Entry Level Graduate Jobs," *Journal of Human Resource and Sustainability Studies* 04, no. 01 (2016): 39–49, <https://doi.org/10.4236/jhrss.2016.41005>.

⁷ Mansour and Dean, "Employability Skills as Perceived by Employers and University Faculty in the Fields of Human Resource Development (HRD) for Entry Level Graduate Jobs."

⁸ Roy Y Chan, "Understanding the Purpose of Higher Education: An Analysis of the Economic and Social Benefits for Completing a College Degree," *Journal of Education Policy, Planning and Administration* 6, no. 5 (2016): 1–40, https://scholar.harvard.edu/files/roychan/files/chan_r._y._2016._understanding_the_purpose_aim_function_of_higher_education._jeppa_65_1-40.pdf.

⁹ Olawale Fatoki, "The Entrepreneurial Intention of Undergraduate Students in South Africa: The Influences of Entrepreneurship Education and Previous Work Experience," *Mediterranean Journal of Social Sciences*, May 1, 2014, <https://doi.org/10.5901/mjss.2014.v5n7p294>.

internships and other employment initiatives; however, more innovations could be applied and tested.¹⁰ This could include university initiatives to encourage graduate entrepreneurship and generate revenue for the university. According to Krabel, many universities are becoming more entrepreneurial by financially supporting business start-up activities of graduates, putting in place programs that stimulate entrepreneurship and creating networks with local industries.¹¹ This kind of approach is in alignment with the argument in the current study that universities can support business start-ups by graduates. This could yield a longer-term income stream for universities.

In another study, Lose illustrates how business incubators within the South African context could be supported in order to realize a competitive advantage and to ensure the growth needed for SMEs.¹² The study explored the competitiveness of business incubators across eight provinces in South Africa by utilizing a resource-based theory for analysis. Contrary to the good objectives of incubator programs, Lose highlighted caution in that there are complexities that pose difficulties to imitating the aspect of physical, human and organizational capital resources which are important pillars in evaluating competitiveness for these incubators.¹³ Recommendations from this study by Lose presented the idea that collaboration of universities, investors, and government should be considered in order to incubate smart business ideas and attract innovation.¹⁴ Based on this elaboration by Lose, it proved that further empowerment of graduates to partake in these incubator programs is a matter of high consideration by encouraging partnerships with industries and universities to realize growth of SMEs and this can be pursued very well if graduates are put at the forefront of benefiting from those incubator programs by universities.

Universities as an Investor in Graduates' Start-up Business Initiatives

Powers and McDougall, note that universities have become increasingly interested in investing in start-ups, which, they say, is a risky form of entrepreneurial activity.¹⁵ The investment by universities towards start-up companies includes university-developed technology transfer or licenses instead of the commercialization being done by big firms. This is a form of university benefit through commercialization of the technology transfer activity as companies in industries such as biotechnology, rely heavily on universities for very basic research.¹⁶ The risk is that the university could make a loss from this kind of investment if it is not closely monitored. The business may be too immature to flourish from the beginning; however, to counter this disadvantage the university could collaborate with existing industries that are more experienced and successful in such business initiatives. A study done in China suggested that the innovative behavior of graduate start-ups is influenced by the quantity of human capital, the psychological make-up and the financial rewards expected by the investor, which is the university in this case, as returns on investments made towards such initiatives.¹⁷

According to Di Gregorio and Shane, university venture capital substitutes for external venture capital.¹⁸ Furthermore, start-ups and established company licenses differ in several important ways, which are (i) their tendency to contribute to local economic development, (ii) their tendency to generate significant income for universities and (iii) their decisions about knowledge disclosure and research norms.¹⁹ As an alternative to avoid high-risk complexities, Mayombe and Lombard state that it is often better to aim for self-employment after

¹⁰ Jun Li, Jingjing Qu, and Qihai Huang, "Why Are Some Graduate Entrepreneurs More Innovative than Others? The Effect of Human Capital, Psychological Factor and Entrepreneurial Rewards on Entrepreneurial Innovativeness," *Entrepreneurship & Regional Development* 30, no. 5–6 (May 27, 2018): 479–501, <https://doi.org/10.1080/08985626.2017.1406540>.

¹¹ Stefan Krabel, "Are Entrepreneurs Made on Campus? The Impact of Entrepreneurial Universities and Graduates' Human Capital on Graduates' Occupational Choice," *Journal of International Entrepreneurship* 16, no. 4 (December 2018): 456–85.

¹² Thobekani Lose, "Business Incubators in South Africa: A Resource-Based View Perspective," *Academy of Entrepreneurship Journal* 27 (2021): 1–11.

¹³ Lose, "Business Incubators in South Africa: A Resource-Based View Perspective."

¹⁴ Lose, "Business Incubators in South Africa: A Resource-Based View Perspective."

¹⁵ Joshua B. Powers and Patricia P. McDougall, "University Start-up Formation and Technology Licensing with Firms That Go Public: A Resource-Based View of Academic Entrepreneurship," *Journal of Business Venturing* 20, no. 3 (May 2005): 291–311, <https://doi.org/10.1016/j.jbusvent.2003.12.008>.

¹⁶ Powers and McDougall, "University Start-up Formation and Technology Licensing with Firms That Go Public: A Resource-Based View of Academic Entrepreneurship."

¹⁷ Li, Qu, and Huang, "Why Are Some Graduate Entrepreneurs More Innovative than Others? The Effect of Human Capital, Psychological Factor and Entrepreneurial Rewards on Entrepreneurial Innovativeness."

¹⁸ Dante Di Gregorio and Scott Shane, "Why Do Some Universities Generate More Start-Ups than Others?," *Research Policy* 32, no. 2 (February 2003): 209–27, [https://doi.org/10.1016/S0048-7333\(02\)00097-5](https://doi.org/10.1016/S0048-7333(02)00097-5).

¹⁹ Di Gregorio and Shane, "Why Do Some Universities Generate More Start-Ups than Others?"

graduation as a means of creating work opportunities for graduates.²⁰ The study therefore agrees with the idea of business start-ups suggested by Mayombe and Lombard, as one of the strategies that are worth considering.²¹

Graduates' Business Initiatives Addressing Youth Unemployment

In 2014, Fatoki noted that graduate unemployment was on the rise due to a lack of work opportunities.²² This author further argued that entrepreneurship is a possible solution to the issue of unemployment among graduates and that there is a high level of entrepreneurship intention found in business studies graduates, which is where the business initiatives would emanate from.²³ This argument is in line with the business initiatives for graduates that this study is highlighting as one of the possible means for universities to create work opportunities for graduates, and this also would address the high unemployment rate even though it would prioritize graduates.

In this way, unskilled labour automatically benefits from basic job opportunities that would be a basic necessity to the company operations, for example, opportunities in general work such as cleaning, gardening and maintenance work that are found in most businesses. Most importantly the universities would realize the investment benefits of having invested in the graduates' business start-ups through a concept known as Return on Investment (ROI). The ROI is known to be a method that yields the payoff of any intended program or solution, and it is a valuable means that does not deplete the resources of a company.²⁴ That is why it is identified by this study as a possible means for universities to realize the investment benefits aimed at contributing to the institution's revenue. Furthermore, revenue would be one of the positive financial income streams to the university's bank balance, ultimately implying that the university has found a strategy to sustain itself financially. The focus of empowering programs would be replicated in multiple projects once the practice and principles of the ROI are mastered by the university's strategy. That is why this study suggests an additional avenue for revenue generation by means of funding or investing in graduates' business start-ups, whilst at the same time providing work placement opportunities for graduates by the university.

Statistics SA report in 2022 showed that in South Africa the unemployment rate is sitting at 32.9% overall, inclusive of graduates and non-graduates. Of that percentage, the graduates' unemployment rate is at 10.7%.²⁵ Although the unemployment rate among graduates seems lower than the national unemployment rate, university graduates could play a very positive role by establishing business start-ups that could benefit the highly skilled, medium, low and unskilled youth and young adults whilst also benefiting the university that invested in the initiative. The number of unemployed graduates demands that universities and the state should look at alternatives to public and private sector employment in South Africa.

South African Universities have three broad categories of funding support namely (i) The Department of Higher Education; (ii) Student fees; and (iii) Donor and Research funding. This research study suggests that funding from investment in start-up ventures should be led by the university's strategy. This is one of the research gaps identified which needs to be fully explored in order to realize benefits from graduates' business initiatives. Graduate self-employment would be led by university-based business incubation for graduates, thus fulfilling the role that universities should play in creating working opportunities for graduates.

THEORETICAL FRAMEWORK

The Stakeholder Theory

This study adopted the stakeholder theory as a theoretical framework. This theory emphasizes the configuration of collaborative work and gives stakeholders "a more involving task".²⁶ In the case of what is being investigated as a means to generate revenue from investment support made towards graduates' business initiatives, it is vital for well-thought collaborative work between industries and universities in order to sustain this idea of investing in businesses benefiting graduates with work opportunities. Policies could be crafted to pave the criteria of collaboration and

²⁰ Celestin Mayombe and Antoinette Lombard, "How Useful Are Skills Acquired at Adult Non-Formal Education and Training Centres for Finding Employment in South Africa?," *International Review of Education* 61, no. 5 (October 12, 2015): 611–30, <https://doi.org/10.1007/s11159-015-9517-6>.

²¹ Mayombe and Lombard, "How Useful Are Skills Acquired at Adult Non-Formal Education and Training Centres for Finding Employment in South Africa?"

²² Fatoki, "The Entrepreneurial Intention of Undergraduate Students in South Africa: The Influences of Entrepreneurship Education and Previous Work Experience."

²³ Fatoki, "The Entrepreneurial Intention of Undergraduate Students in South Africa: The Influences of Entrepreneurship Education and Previous Work Experience."

²⁴ Jack J. Phillips and Patricia Pulliam. Phillips, *Proving the Value of HR : How and Why to Measure ROI*, 2nd ed. (Society For Human Resource Management, 2012).

²⁵ Risenga Maluleke, "Quarterly Labour Force Survey (QLFS) Q3: 2022.," <https://www.statssa.gov.za/publications/P0211/Presentation QLFS Q3 2022.pdf>, 2022.

²⁶ (Msibi 2021 p107)

implementation of safeguarding such business initiatives. It is important that what research question two (realization of ROI) seeks to achieve should be binding to all stakeholders however should also strike a balance of forces in ensuring fairness and benefits for all stakeholders to sustain the idea of collaboration for the long term.

Integration of the stakeholder theory with analysis conducted in this study can be noted specifically in research question two, where the basis of investment funding support gets to be determined by the university in relation to expected ROI from businesses established for graduates. Ultimately the findings of revenue generation tactics as a means to sustain the university through investing in graduates' initiatives, have been suggested in the aspect of return-on-investment strategic principle for university planning activities. Figure 1 presents a view of qualities that inform the stakeholder management framework applied in this study.

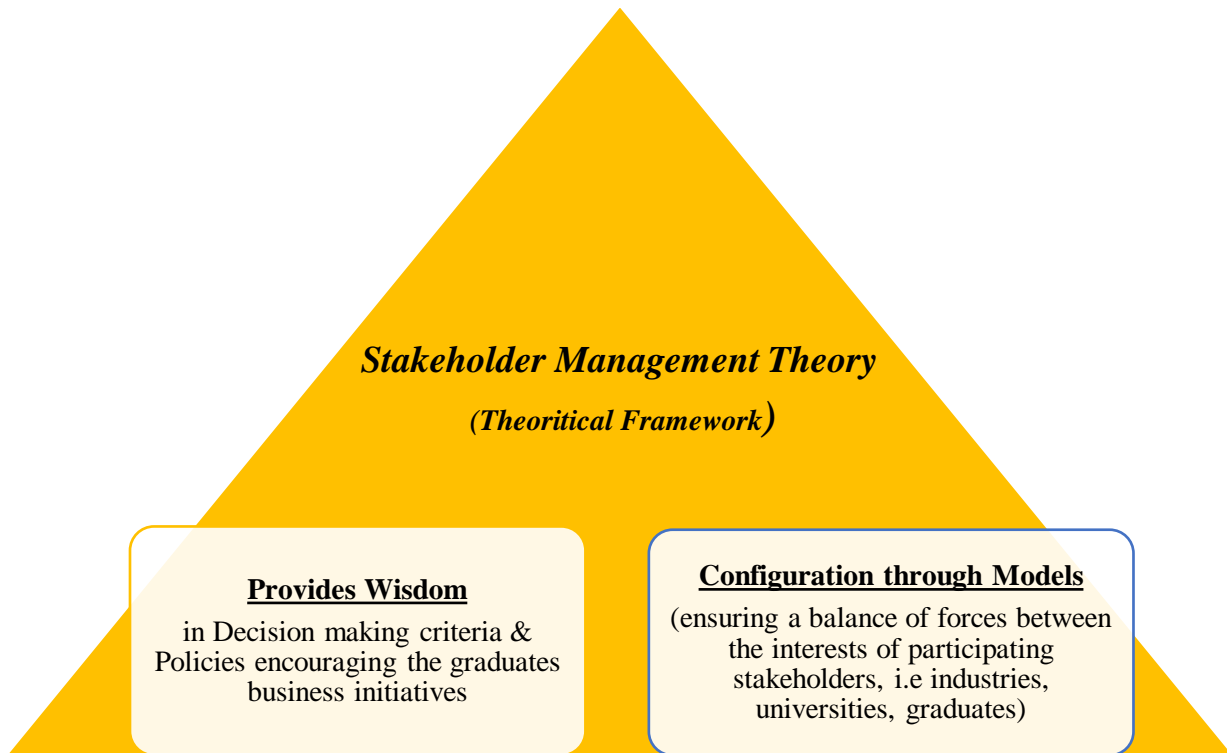


Figure 1: Nested structural view of the literature study

Source: Authors Contribution

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 is based on facts.²⁷ This study adopted a research philosophy of a positivist paradigm as a means of guiding the design and execution of the study by looking through a different positive lens in each research objective to be examined.

The study further used a quantitative research methodology to investigate both research questions of this study. A quantitative research method was selected because this allows the findings to be generalizable.²⁸ Through this research design, the research questions were addressed in a manner that would enable the collection of numerical data. The data was collected and analyzed electronically without physical contact with the population of the study, namely the twenty-six South African universities. The data was profiled numerically; for example, the plan was to be able to count the frequency of instances or occurrences, as it would have been if questionnaires were used to collect data.²⁹

²⁷ Layla. Cassim, "The Postgraduate Toolkit," in *An Overview of Research Design and Methodology*, 4th ed. (Johannesburg: Layla Cassim ERS Consultants CC, 2021).

²⁸ M Mkhize, "Advanced Research Methodology MCom Powerpoint Slides," UKZN (Durban: UKZN Learn2021, 2021).

²⁹ Jenny Rowley, "Designing and Using Research Questionnaires," *Management Research Review* 37, no. 3 (March 11, 2014): 308–30, <https://doi.org/10.1108/MRR-02-2013-0027>.

Secondary data was already available from public domains such as government department websites such as the Council for Higher Education (CHE) VitalStats 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. According to Pederson, Koval and Vingilis, secondary data is information that has been collected by someone who is not the original user and for purposes other than those originally intended. In this case, the secondary data referred to has been collected by DHET and was used to distribute subsidy funding allocation to all the South African universities.³⁰

The conceptual framework developed for this study follows as Figure 2 represents the process followed in this study; a view of how it was conducted and how the research questions were addressed.

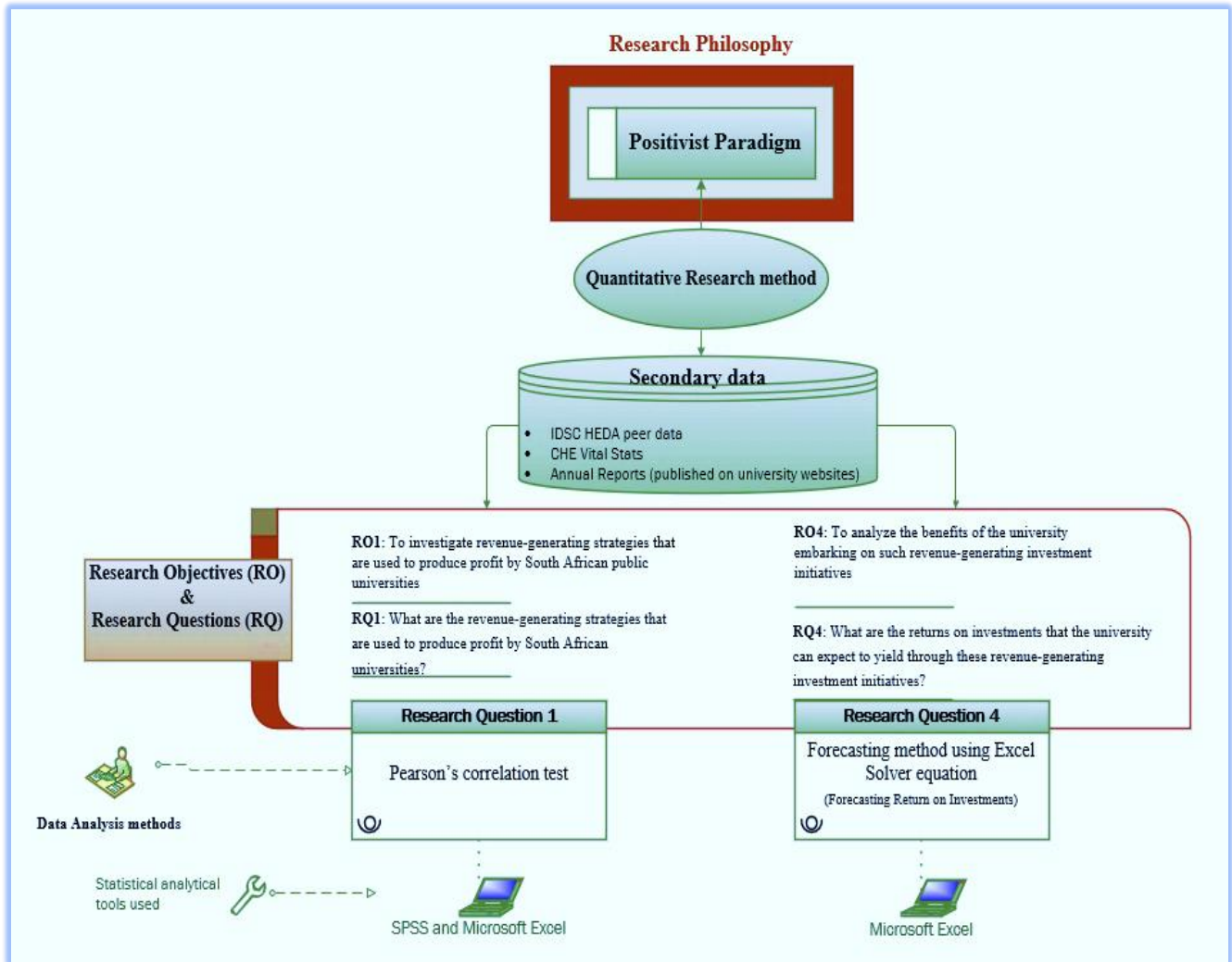


Figure 2: Conceptual framework of the research design and methodology process
Source: Authors contribution

Furthermore, the research design choice was guided by a careful analysis of the problem statement, research questions, conceptual framework and the relevant literature. The non-experimental design is a quantitative research design that does not involve experiments within the activity of data collection and is subdivided into three groups namely (i) survey design, (ii) casual-comparative design and (iii) correlation design.³¹ The relationships among variables enabled the researcher to generate data or test hypotheses through different data collection methods therefore conclusions were drawn with respect to the objectives or hypothesis following a series of data analysis.

³⁰ Linda L, Pederson, John J, Koval, and Evelyn, Vingilis, "Analysis of Secondary Data: Considerations Revisited," *Journal of Addiction Medicine and Therapeutic Science* 8, no. 1 (June 29, 2022): 010–013, <https://doi.org/10.17352/2455-3484.000054>.

³¹ Bostley Muyembe Asenahabi, "Basics of Research Design: A Guide to Selecting Appropriate Research Design," *International Journal of Contemporary Applied Researches* 6, no. 5 (2019): 76–89.

PRESENTATION OF FINDINGS

This section provides a presentation of the results of the study in response to each research question, an interpretation, detailed findings resulting from analyzed secondary data and summarized findings.

Interpretation and Presentation of Results for RQ1

Since research question number one (RQ1) focuses on strategy development, the ideal method of analyzing data in this regard was to deploy strategy development approaches meant to increase the revenue of the university and, in that way plan to sustain higher education institutions. When performing a comprehensive analysis of strategy development, the need to test the influence and impact of the variables was suitable to be conducted for RQ1 using Pearson’s correlation coefficient, as this is a measure of the intensity and association that occurs between two variables. As the research question seeks to investigate aspects aimed at profit-making, it was necessary to test the relationship between relevant variables.³² In these current times, investors are advised to take into account non-financial aspects in their investment decisions in relation to a risk factor, thus enriching variables utilized.³³ This correlation attempts to draw a line of best fit through the data of two variables and Pearson’s correlation coefficient, indicated as *r*, presents how far away the data points are from this line of best fit.³⁴ The variables chosen to translate the financial value (dependent variable as profit) and non-financial value (independent variable as graduates produced).

Table 1 below shows the correlation results between graduates produced and profit per university in South Africa. These results can set the tone for how a university can consider impactful factors needed to make a commitment toward graduates’ initiatives under scrutiny. These results emanate from data analysis conducted using IBM SPSS Statistics® Version 28.0.0.0(190).

Table 1: RQ1 Correlation results

RQ1 Correlation results (from IBM SPSS Statistics® Version 28.0.0.0(190))			
		Graduates produced	Profit per university in SA
Graduates produced (2021 completion year)	Pearson Correlation	1	.662**
	Sig. (2-tailed)		<,001
	N	26	26
Profit per university in SA (2021 financial year)	Pearson Correlation	.662**	1
	Sig. (2-tailed)	<,001	
	N	26	26

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

Source: Authors contribution

Furthermore, the graph in Figure 3 to follow, reveals the correlation between the same variables as analyzed in Table 1 above, that is graduates produced and profit per university in South Africa. In this case, the presentation was in a graphical manner to show the slope of the correlation results. Notably, there were two outliers in the university data utilized because of the fact that one university in South Africa offers distance education which could come with significant differences compared to the twenty-five contact universities. The second outlier is one university that did not publish the financial statements on their website.

³² TileStats, “How to Choose an Appropriate Statistical Test,” <https://www.youtube.com/watch?v=dYJLUvo0Q6g>, September 9, 2021.

³³ Raisa Almeyda and Asep Darmansya, “The Influence of Environmental, Social, and Governance (ESG) Disclosure on Firm Financial Performance,” *IPTEK Journal of Proceedings Series*, no. 5 (2019): 278–90.

³⁴ Ezezi Isaac Obilor and Eric Chikweru Amadi, “Test for Significance of Pearson’s Correlation Coefficient (),” *International Journal of Innovative Mathematics, Statistics & Energy Policies* 6, no. 1 (March 2018): 11–23.

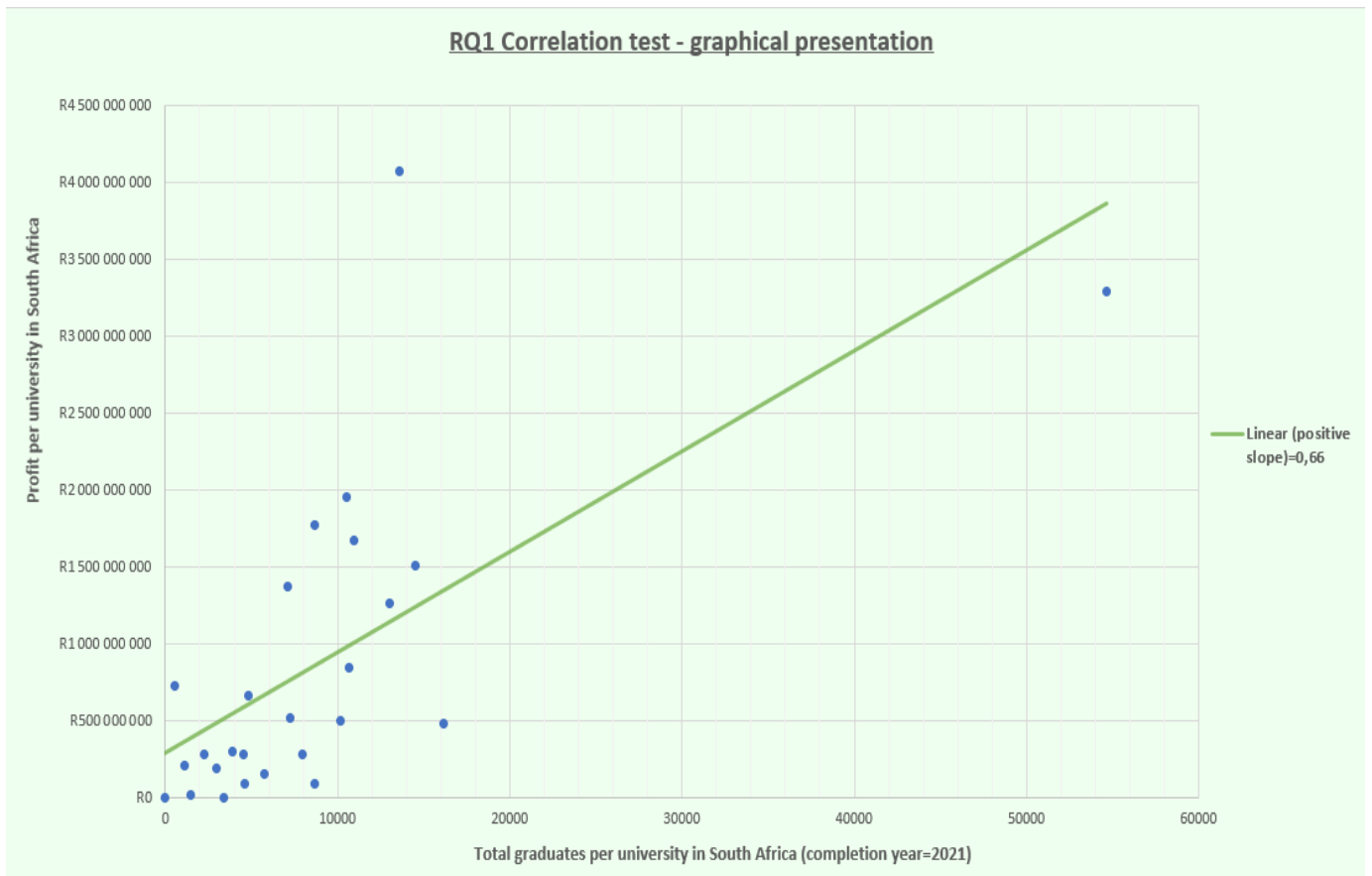


Figure 3: Correlation test of profit per university in SA vs. total graduates produced for 2021 (produced using Microsoft Excel® Version 2203)
Source: Authors contribution

Interpretation and Findings of Correlation Results (RQ1)

The results of the correlation test are presented above in two ways: (i) in Table 1, the output is based on results performed using the IBM SPSS Statistics® Version 28.0.0.0(190) analytical software tool; and (ii) Figure 3 illustrated above as a graph, is meant to present a graphical view of the same results obtained using Microsoft Excel® Version 2203. The reason for presenting these results using two separate analytical software tools is because, in IBM SPSS Statistics® Version 28.0.0.0(190), output information also displayed the p-value of the Pearson’s correlation test performed whereas in Microsoft Excel® Version 2203 this was not displayed.

The interpretation of these results is as follows:

- a. This analysis outcome indicates a significant relationship between profit and graduates as the output from IBM SPSS Statistics® Table 1 shows that the correlation is significant at 0.01 level (refer to the bottom of Table 1), meaning that the Pearson’s correlation coefficient $r = 0.662$ with N of 26 is statistically significant at 0,01 level where ($p = <,001$), which also implies $p = <,001$ in full mathematical value.
- b. Since the results of the correlation yielded a positive number of $r = 0.662$, it means that there is a positive relationship between variables and also implies that as the independent variable (number of graduates) increases, the tendency is that the dependent variable (profit) also increases.
- c. From these results, it was confirmed that there is a statistically significant association (based on the p-value being $<,001$) between the profit made by each university and the total number of graduates produced.

Summary of the findings

- RQ1: There is a significant relationship between the dependent variable of profit and the independent variable of graduates produced based on the p-value results being $<,001$. This implies that the two variables influence and impact each other significantly, which can be taken as the basis for strategizing on how universities can generate more revenue. By taking from this profit benefit, the university can commit a portion to invest in graduates’ initiatives using the profit made from graduates produced as the basis of capital to aid a revenue generation strategic objective that could be utilized to finance the

investment needed to fund graduates' entrepreneurship or business start-ups and work placement programs led by the university.

- RQ2: The ROI result of 120% over two years implies that the net returns gained by the graduates' initiatives or projects supported by the university would generate positive profits due to the fact the total returns would be higher than the associated costs.

This would, therefore, result in 20% ROI realized by the university from the initial invested capital or costs of investment made towards approved graduates' initiatives led by South African universities.

Interpretation and Presentation of Results for RQ2

In conventional financial forecasting, it is usual that predicting future values could be done by simply determining the annual performance by using an assumed baseline percentage as per historical financial percentage performance.³⁵ Excel Solver equation was used to determine targeted variables that could yield desired ROI values per university. Solver program is found in Microsoft Excel as an add-in feature which can be used for defining and computing what-if-analysis for a particular desired formula.³⁶ Excel Solver technique models are simple to use in forecasting since there is flexibility to create customized what-if scenarios based on captured formulae.

What is a good ROI?

Although many companies may view good ROI differently depending on how long they can survive without the investment yielding results, generally the wisdom highlighted by financial advisors at Forbes was that a good ROI of 7% or more is a good ROI to yield annually for a long-term investment that has been made.³⁷ The determination of a good ROI for an investment made by a university would be dependent on the risk tolerance level that the university executive committee may decide upon. For this study, an assumption of 10% was applied in the analysis calculation of ROI.

Forecasting Method Used to Analyze ROI

For this study, the investigation of ROI was undertaken using a forecasting technique called Excel Solver. This forecasting technique rather than the ordinary accounting technique of calculating ROI, was used due to the inability to assess ROI since the actual graduates' initiatives have not taken place as yet. However, these graduates' initiatives are being pre-assessed as to how they could perform and what targets could be set to pave the strategic tactics needed to monitor the investments aimed toward graduate initiative projects. This analysis was necessary to be applied in RQ2 in order to assess the projection of ROI and any unknown variable at the time of planning using the ability of the Excel Solver technique. On the contrary, the disadvantage of the ROI formula is that it does not take into account the period of allowing a hold on the investment; it only presents a snapshot of the benefit in one period of time.³⁸ With such a disadvantage, therefore, ROI presents a need for the time factor to be considered to determine exactly when the full benefit of the invested capital can be realized from a particular initiative or project. To cater to the disadvantage, the calculation of ROI in this study considered the time of realizing the benefits of the total investment within a three-year period.

According to the Microsoft 365 support platform, the Solver technique is useful when determining a potential outcome based on varying conditions.³⁹ An optimal value for a set objective (the formula), limited by specific conditions referred to as constraints, would be computed through an equation where values can be changed to inform decision-making, thus revealing the results presented by the objective cell. The Solver technique in this study was utilized to provide flexibility in determining other unknown variable values that complement the targeted results, that is the ROI.

³⁵ Michael Boyles, "7 Financial Forecasting Methods to Predict Business Performance ," <https://Online.Hbs.Edu/Blog/Post/Financial-Forecasting-Methods> (Harvard Business School Online Business Insights, July 21, 2022).

³⁶ Microsoft 365, "Define and Solve a Problem by Using Solver," Microsoft 365 Support, 2023.

³⁷ Emily Guy Birken and Benjamin Curry, "Return on Investment (ROI)," <https://www.Forbes.Com/Advisor/in/Investing/Roi-Return-on-Investment/> (Forbes Advisor., March 16, 2023).

³⁸ Andrew. Beattie, "How to Calculate Return on Investment (ROI)," *Investopedia*, August 11, 2022, <https://www.investopedia.com/articles/basics/10/guide-to-calculating-roi.asp>.

³⁹ Microsoft 365 Support, " Define and Solve a Problem by Using Solver. ," <https://support.microsoft.com/en-us/office/define-and-solve-a-problem-by-using-solver-5d1a388f-079d-43ac-a7eb-f63e45925040.>, 2023.

Forecasting ROI using the Excel Solver Technique

According to Edspira, the basis for calculating a suitable ROI is Net Income divided by the Cost of Investment (also known as Invested Capital).⁴⁰

In the case of this study, **ROI** (60% target) = **Net Income** (unknown Target Net income of graduate initiative) divided by **Cost of Investment/Capital Invested** (10% of University Profit made), therefore implying:

$$\text{Formula: ROI} = \text{Net Income divided by Capital Invested}$$

Definition of Variables

- (i) The Target ROI as 60% – This is the **target ROI as an Independent Variable** that should at least yield 10% per year, making 20% profit from the invested capital made towards a graduate initiative over a two-year period. The graduate initiative could be in the form of a project in order to manage, and trace performance during its lifespan and would be reported to the university at a strategic level as one of the subsidiaries partly owned by the university. The target of 60% ROI would be the minimum accepted target of the project initiative based on the executive decision of risk tolerance that can be set at 10% profit earnings expected per year from each investment by the university. More than 60% ROI per year would be considered above average performance.
- (ii) Target Net Income – This is the **target Net Income, an Independent Variable** expected from each graduate initiative project that was defined and approved during the strategic planning of the university. An acceptable minimum target amount can be determined using the Excel Solver equation to assist strategic planning and decision-making affecting the requirements of the graduates' initiative projects or programs.
- (iii) Cost of Investment – This is a **Dependent Variable** that is known as the **Invested Capital** based on a financial amount contributed towards the investment made, hence the cost of investment. Based on an executive decision about the company's risk tolerance, a standard threshold of 10% per year is expected each year for investments made.

Parameters applied using Excel Solver equation

According to Stratvert, the Excel Solver equation using Microsoft Excel®, as commonly used by many businesses, can be dealt with using the following steps in the Solver tab panel.⁴¹

Step 1: Set Objective = select ROI filled with ROI accounting formula (ROI=NI/CI)

Step 2: To = insert Value of 60 (as a minimum risk tolerance target of ROI)

Step 3: By changing variable cells = select the Target Net income field (unknown value)

Step 4: Subject to the Constraints = no constraints were defined for this analysis

Step 5: Select a Solving Method = GRG Nonlinear was selected as a suitable option as the forecast is simple and nonlinear

Table 2 below presents the implementation of calculating variables based on the Excel Solver equation in setting parameters according to the defined problem statement of solving RQ2 forecasting.

⁴⁰ Edspira, "How to Calculate ROI (Return on Investment) - YouTube," YouTube, November 2018.

⁴¹ Kevin. Stratvert, "Excel Solver & Goal Seek Tutorial," <https://www.youtube.com/watch?v=UD9e-gQCQsE..>, March 9, 2021.

Table 2: Determined ROI based on Excel Solver equation

<i>Data Source:</i>	University names coded due to POPLA	Annual Report 2021	Executive decision	Executive decision	Financial Accounting fomular (basic ROI)		
		University's Annual Report on published on each university's website	Capital Investment (10% of Net University Profit)	ROI = (calculated using Excel Solver)	Net income (project)	Cost of Investment (capital invested)	
	South African University	Net Profit per university in SA (year: 2021 data)	Capital Investment	Set Objective at Value of 60% risk tolerance	Net income (from graduates' initiative)	Capital Invested (towards graduates' initiative)	To maximise profit over two years (ROI x 2 years)
	UoTUniv1	R196 327 000	R3 926 540	60	R2 355 924	R3 926 540	120
	UoTUniv2	R283 789 880	R5 675 798	60	R3 405 479	R5 675 798	120
	UoTUniv3	R485 804 000	R9 716 080	60	R5 829 648	R9 716 080	120
	UoTUniv4	R850 940 000	R17 018 800	60	R10 211 280	R17 018 800	120
	UoTUniv5	R88 593 000	R1 771 860	60	R1 063 116	R1 771 860	120
	UoTUniv6	R280 360 360	R5 607 207	60	R3 364 324	R5 607 207	120
	CompUniv7	R19 927 000	R398 540	60	R239 124	R398 540	120
	CompUniv8	R212 364 374	R4 247 287	60	R2 548 372	R4 247 287	120
	CompUniv9	R733 000 000	R14 660 000	60	R8 796 000	R14 660 000	120
	CompUniv10	R299 516 000	R5 990 320	60	R3 594 192	R5 990 320	120
	CompUniv11	R96 363 000	R1 927 260	60	R1 156 356	R1 927 260	120
	CompUniv14	R322 881 000	R10 457 620	60	R6 274 572	R10 457 620	120
	CompUniv15	R1 262 123 000	R25 242 460	60	R15 145 476	R25 242 460	120
	TradUniv16	R499 109 000	R9 982 180	60	R5 989 308	R9 982 180	120
	TradUniv17	R158 679 537	R3 173 591	60	R1 904 154	R3 173 591	120
	TradUniv18	R1 778 467 000	R35 569 340	60	R21 341 604	R35 569 340	120
	TradUniv19	R279 619 000	R5 592 380	60	R3 355 428	R5 592 380	120
	TradUniv20	R4 073 710 000	R81 474 200	60	R48 884 520	R81 474 200	120
	TradUniv21	R1 510 040 000	R30 200 800	60	R18 120 480	R30 200 800	120
	TradUniv22	R662 063 000	R13 241 260	60	R7 944 756	R13 241 260	120
	TradUniv23	R1 676 714 000	R33 534 280	60	R20 120 568	R33 534 280	120
	TradUniv24	R1 955 198 000	R39 103 960	60	R23 462 376	R39 103 960	120
	TradUniv26	R1 372 183 000	R27 443 660	60	R16 466 196	R27 443 660	120
Note:							
	CompUniv12:	Excluded due to no graduates reported in 2021					
	TradUniv25:	Excluded due to no annual report published in 2021					

Source: Authors' contribution

Interpretation of Results for RQ2 Analysis

The basic accounting formula for ROI calculation required Net Income divided by the Cost of Investment; however, the analysis applied this in a forecasting manner as the graduates' initiative would not have been conducted as yet during the strategic planning phase by the university. The activity of determining target ROI was done based on the latest published 2021 Annual Report per university as information about South African universities' Net Profit made in 2021. The university would be determining targeted outcomes per initiative during the strategic planning process in order to formulate the appropriate key performance indicators that would be utilized for tracking and monitoring investments made. From the forecast presented in Table 2 above, the ROI, highlighted in green, was calculated using an Excel Solver equation and influenced by the executive decision-makers assumed minimum threshold of 60%.

The Solver equation, when applied, could determine the Net Income (which is to be a target income made after deducting expenses of the graduates' initiative/project). The Capital Invested was worked out using the executive decision-makers' basis of 10% of the university's Net Profit channeled toward investment initiatives. Ultimately, the ROI calculation answer yielded a total of 60% of the original invested amount as the ROI per year, which was presented as a positive percentage. If the same performance was attained over a two-year period, when the two years are combined the result of ROI would be 120%, which implies that more than 100% of the invested capital gained a profit of 10% each year and thus 20% over the two-year period; hence the 60% of ROI targeted per year to earn 10% ROI portion of the invested capital. The allowance would be to settle the original invested capital in two years as an expected term of payment from the graduates' initiative. Further executive decision would be needed to provide the term of payment for the ROI against the original invested amount to manage the sustainability of such financial support towards future graduates' initiatives.

DISCUSSION

There was limited literature regarding university strategies for revenue generation. In comparing the revenue generation study conducted by Gebreyes, this study adopted a similar approach of strategy development that is

differently focused on creating business start-up initiatives that are funded by universities, prioritizing the approach of financially supporting students with the aim of boosting graduates' employment.⁴² The need for universities to find alternative income streams other than government funding was emphasized by Di Carlo et al. and this study agrees with the notion of encouraging revenue strategies as the main aim of the study.⁴³

Revenue Strategy Informed by Pearson's Correlation Test

Basic Google Scholar search results while exploring literature brought up to 315826 from 38 databases, where matters about how work-integrated learning impacts universities both in success stories and negative ways were explored. Success stories attest to the importance of fostering collaborative partnerships between industry and university in offering work-integrated learning opportunities.⁴⁴ On the other hand, challenges in developing a partnership with curriculum design complexities reveal the negative shortfalls that are still a struggle in work-integrated learning infusion.⁴⁵ It was thus necessary for the researcher in this study to conduct a relevant statistical analysis for testing the relationship between identified variables; namely the university's **net profit** against **graduates produced** as conducted in RQ1.

The investigation of RQ1 using Pearson's correlation coefficient statistical test was conducted in order to confirm what the literature had also already revealed through the support offered by government block grant funding to universities.⁴⁶ Furthermore, what the literature review has shown was that the entrepreneurship aspect can be an encouragement towards enabling business partnerships between universities and business industries with the aim of tackling the activity of work placement for graduates through internship programs.⁴⁷ Therefore, even after all the existing attempts, there is still a gap in universities being proactive in facilitating the funding of business ideas and initiatives emanating from graduates so that the financial benefits can contribute back to the university as the intended returns on investment.

Forecasting ROI for Sustaining the University Revenue Streams

Ordinarily, the forecasting approach ideally requires vast historical data indicating performance for ROI.⁴⁸ However, the problem statement of this research question (RQ2), the ROI determined, was not informed by historical data as the suggested funding principle by universities is a new strategic proposed idea. For this reason, the relevant analysis for determining target ROI value would be to deploy a forecasting approach at an accepted threshold from underlying risk tolerance.

Similar to an approach confirmed by another study, utilizing financial risk tolerance when an organization plans to invest was highlighted as being crucial in conducting financial planning and strategic activity setting.⁴⁹ This was the manner in which RQ2 assumptions were made in addressing executive decisions about risk tolerance threshold for investment capital to contribute towards overall graduates' initiative projects that are under consideration. This study acknowledges the limitation of devising a more complex regression computation because of the time constraints of the study.

RECOMMENDATIONS

a. Ideal Revenue Strategy

The literature review explored in this study has revealed that DHET provides grants to South African universities for producing graduates in the form of a Teaching Output grant.⁵⁰ Similarly, the results of this correlation test prove that there is indeed an association between the two aspects of profit and graduates produced; one could say that this was expected.

⁴² Gebreyes, "Revenue Generation Strategies in Sub-Saharan African Universities," 35.

⁴³ Ferdinando Di Carlo et al., "Changing the Accounting System to Foster Universities' Financial Sustainability: First Evidence from Italy," *Sustainability* 11, no. 21 (November 4, 2019): 6151, <https://doi.org/10.3390/su11216151>.

⁴⁴ Denise Jackson et al., "Improving the Work-Integrated Learning Experience through a Third-Party Advisory Service," *International Journal of Training Research* 15, no. 2 (May 4, 2017): 160–78, <https://doi.org/10.1080/14480220.2016.1259005>.

⁴⁵ Sarojni Choy and Brian Delahaye, "Partnerships between Universities and Workplaces: Some Challenges for Work-Integrated Learning," *Studies in Continuing Education* 33, no. 2 (July 16, 2011): 157–72, <https://doi.org/10.1080/0158037X.2010.546079>.

⁴⁶ Department of Higher Education and Training 2021

⁴⁷ Krabel, "Are Entrepreneurs Made on Campus? The Impact of Entrepreneurial Universities and Graduates' Human Capital on Graduates' Occupational Choice."

⁴⁸ Fotios Petropoulos and Spyros Makridakis, "Forecasting the Novel Coronavirus COVID-19," *PLOS ONE* 15, no. 3 (March 31, 2020): 231–36, <https://doi.org/10.1371/journal.pone.0231236>.

⁴⁹ Yilmaz Bayar et al., "Financial Literacy and Financial Risk Tolerance of Individual Investors: Multinomial Logistic Regression Approach," *SAGE Open* 10, no. 3 (July 25, 2020): 215824402094571, <https://doi.org/10.1177/2158244020945717>.

⁵⁰ Department of Higher Education and Training 2021.

The key recommendation emanating from RQ1 is that as a strategic tactic of the university, these funds could be used to invest in graduates' initiatives by universities instead of relying on government grants as main streams of income. Since it has been proven that funding can be available to plan for such interventions, the source of capital investment funding can come from this profit benefit directly so that in the future this subsidy funding can be used to return the investments made. Eventually, in the long term, this could be a crucial financial sustainability strategy that universities could use to grow and mature. In this way, the research objective of looking into revenue generation strategies that universities in South Africa can use has been investigated and can be impactful to the financial revenue boost that is much needed in this sector.

The long-term strategic planning that is conducted by universities can incorporate such elements in order to ensure that they dedicate funding resources towards graduates' investments needed by business start-up ideas.

b. Forecasting Targets of ROI

The key recommendation emanating from RQ2 is that a thorough forecasting analysis could be conducted using a customized financial forecasting model based on each university's risk tolerance complemented by other determination factors that are non-financial for evaluating the proposed graduates' initiatives, in order to ensure extended consultations have been explored even through seeking the assistance of financial experts specializing in business case analysis. That kind of comprehensive study would better inform the executive decision-making process at the strategic planning levels of the university.

The determination of ROI targets through forecasting methods proved to be a complex exercise, especially because the variables are not yet available from existing graduate initiatives. Therefore, determining what value the university can invest in the capital initiatives towards creating work opportunities and dedicated business start-ups for graduates would be beneficial to the universities, based on the risk tolerance level that the executive management would be comfortable with.

CONCLUSION

Once the ROI can be established, the university will be in a good position to define a suitable key performance indicator (KPI) within the university's strategic plan that is aimed at boosting or gaining profit from the investment made. The reason for enabling the university to inform the strategic planning mechanisms about such investments is so that monitoring the ROI can be done to financially sustain the university in the long run. The benefits from this study are relevant to be piloted or implemented in other countries in the higher education environment as the problems of unemployment are a global challenge. For Institutional Planners in the higher education sector, this study provides new perspectives that could be valuable to bringing the wisdom of innovative strategies for higher education to conduct business with the aim of boosting employment in South Africa. 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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