AN ASSESSMENT OF RESEARCH CAPACITY DEVELOPMENT IN INSTITUTIONS OF HIGHER LEARNING: A CASE STUDY OF THE FORMER POSTGRADUATE STUDENTS AT THE HONOURS, MASTERS, AND DOCTORAL LEVELS IN SOUTH AFRICA

by

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Declaration

*I declare that '**An assessment of Research Capacity Development in institutions of higher learning: a case study of the former postgraduate students at the honours, masters and doctoral levels in South Africa"** is my own, original work. Where I have used source material, it is acknowledged in accordance with departmental requirements. I understand what plagiarism is and I am aware of the departmental policy on it.*

08 May 2021

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F. Malamatsho Date

Dedication

This dissertation is dedicated to:

- God Almighty, who made all things possible; for standing up for me, “I will praise you O’ Lord with all my heart, I will tell all of your wonders” Psalm 9:1.
- my dearest late son, Murendeni; knowing you humbles me, you will remain my first love.
- my late father, James Ratshibvumo Tshikovha Mudzielwana, I wish you were still with us and witness what the Lord is doing in our lives.

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Abstract

Background: Little is known about Research Capacity Development (RCD) in postgraduate studies, particularly in South Africa. This study assessed RCD for postgraduate students in South African public universities in order to learn how it was implemented between 2010 and 2020; and if it was 'sufficient' for postgraduates. In doing so, past postgraduate experiences inform future RCD guidelines, Standard Operating Procedures and the assessment of the programme.

Methods: In this quantitative study, former postgraduate students who registered in South African public universities at the honours (*n=24*), masters (*n=25)* and doctoral (*n=24*) levels between 2010 and 2020 and have had research exposure, were recruited using referral sampling in order to complete an online survey.

Results: A needs-driven RCD which measures progress must be coupled with strong supervision, policy and career-related support, an exposure to collaborations and emotional support to ensure student satisfaction, which may lead to increased throughput rates and less dropouts in postgraduate studies.

Keywords: Research Capacity Development; Research capacity building, research capacity, capacity development, postgraduate studies, honours, masters and doctoral, institutions of higher learning, South African Universities, next generation of researchers, public universities.

Manweledzo

Marangaphanḓa: A hu athu u vha na ṱhoḓisiso yo no itwaho nga ha Mveledziso ya Vhukoni ha Ṱhoḓisiso (RCD) kha ngudo dza nṱha ha vhutelwadigirii, nga maanḓa Afrika Tshipembe. Ngudo heyi yo ela RCD kha matshudeni vha nṱha ha vhutelwadigirii kha yunivesithi dza nnyi na nnyi dza Afrika Tshipembe u itela u guda uri yo phethiwa hani vhukati ha 2010 na 2020; na u vhona uri yo vha yo 'lingana' kha nṱha ha vhutelwadigirii. Musi zwo ralo, tshenzhemo ya nṱha ha vhutelwadigirii ya tshifhinga tsho fhelaho i do eletshedza nyendedzi dza tshifhingani tshiḓaho dza RCD, Maitele a Zwilinganyo zwa Kushumele na u ela Mbekanyamushumo.

Ngona: Kha ngudo heyi ya khwanthethivi, matshudeni vhakale vha nṱha ha vhutelwadigirii vho di nwalisaho kha yunivesithi dza nnyi na nnyi dza Afrika Tshipembe kha maimo a honasi (*n=24*), masiṱasi (*n=25)* na vhudokotela (*n=24*) vhukati ha 2010 na 2020; vhane vha vha na tshenzhemo ya ṱhoḓisiso, vho nanguludzwa hu tshi khou shumiswa tsumbonanguludzwa dzine wa tou livhiswa hu tshi itelwa u ṱhaphudza ṱhoḓisiso ya kha lubuvhisia.

Mvelelo: RCD ine ya vhangwa nga ṱhoḓea, ya ela mvelaphanḓa, i fanela u ṱangana na nyendedzo yo khwaṱhaho, mbekanyamaitele na thikhedzo i elanaho na zwa mabuḓo, tshenzhemo kha tshumisano na thikhedzo ya vhupfiwa, hu u itela u vhona uri matshudeni vha a fushea, zwine zwa nga livhisa kha u engedza phimo ya u bveledza, na u fhungudza u ṱutshela tshikolo kha ngudo dza nṱha ha vhutelwadigirii.

Maipfi a ndeme: Mveledziso ya Vhukoni ha Ṱhoḓisiso; u fhaṱa vhukoni ha ṱhoḓisiso, vhukoni ha ṱhoḓisiso, mveledziso ya vhukoni, ngudo dza nṱha ha vhutelwadigirii, honasi, masiṱasi na vhudokotela, tshiimiswa tsha pfunzo ya nṱha, Yunivesithi dza Afrika Tshipembe, murafho u ḓaho wa vhaṱoḓisisi, yunivesithi dza nnyi na nnyi.

Tshobokanyo

Tlhaloso: Go itsiwe go le gonnye fela ka Tokafatso ya Bokgoni jwa go Dira Tlhotlhomiso (RCD) mo dithutong tsa morago ga kalogo, segolo bogolo mo Aforikaborwa. Thutopatlisiso e sekasekile RCD ya baithuti ba dirang dithuto tsa morago ga kalogo mo diyunibesithing tsa botlhe tsa Aforikaborwa go leka go tlhaloganya le go itse gore e tsentswe jang mo tirisong fa gare ga 2010 le 2020; le gore a e ne e 'lekane' mo baithuting ba dirang dithuto tsa morago ga kalogo. Ka go dira jalo, maitemogelo a mo nakong e fetileng a dithuto tsa morago ga kalogo a kaela dintlhakaedi tsa mo isagong tsa RCD, Mekgwatiriso ya botlhokwa ya tiragatso ya tiro e rileng le tshekatsheko ya lenaneo.

Mekgwatsamaiso ya tlhotlhomiso: Mo thutopatlisisong e ya kgobokanyo le tshekatsheko ya *data* ya dipalo, baithuti ba neng ba dira dithuto tsa morago ga kalogo ba mo nakong e fetileng, ba neng ba ikwadisitse mo diyunibesithing tsa botlhe tsa Aforikaborwa mo maemothutong a onase (*n=24*), mmasetase (*n=25)* le a bongaka (*n=24*) fa gare ga 2010 le 2020 le ba ba nnileng le maitemogelo a tlhotlhomiso, ba ne ba rotloediwa go tsenela thutopatlisiso ka go dirisa mokgwa wa go kopa batsayakarolo ba thutopatlisiso go rotloetsa batsayakarolo ba bangwe go tsenela thutopatlisiso ka maikaelelo a go wetsa patlisiso e neng e dirwa mo inthaneteng.

Diphitlhelelokgolo: RCD e rotloediwang ke ditlhokego le e lekanyetsang tswelelo e tshwanetse go kopanngwa le kaelo e tseneletseng, tshegetso ya go tlhangwa le go tsenngwa tirisong ga pholisi le tshegetso e amanang le tiro (porofešene), maitemogelo a tirisanommogo le tshegetso ya maikutlo go netefatsa gore baithuti ba kgotsofalela le go itumelela thuto ya bone, sengwe se ka dirang gore go nne le dielo tse di oketsegileng tsa baithuti ba konosetsang dithuto tsa bona ka nako le dielo tse di kwa tlase tsa baithuti ba tlogelang dithuto tsa bona mo dithutong tsa morago ga kalogo.

Mafoko a botlhokwa: Tokafatso ya bokgoni jwa go dira tlhotlhomiso; maatlafatso ya bokgoni jwa go dira tlhotlhomiso, bokgoni jwa go dira tlhotlhomiso, tokafatso ya bokgoni, dithuto tsa

morago ga kalogo, onase, mmasetase le bongaka, ditheo tsa thuto e kgolwane, Diyunibesithi tsa Aforikaborwa, batlhotlhomisi ba mo isagong, diyunibesithi tsa botlhe.

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Glossary

- **Academic staff:** lecturers or supervisors for postgraduate students.
- **Emerging researchers:** Researchers from postdoctoral levels who are still establishing themselves.
- **Established researchers:** Researchers who have established themselves as independent research leaders in their own right.
- **Next generation of researchers:** Honours, masters and doctoral students.
- **Previously registered postgraduate students:** Students who were registered for the honours, masters and doctoral studies between 2010 and 2020.
- **Research Capacity Development:** The process for promoting research through the advancement of researchers' knowledge, supporting the research community, uplifting the research environment and linking researchers to research resources in order to achieve world-class research, knowledgeable researchers and quality research environment (same as research capacity building and research capacity strengthening)
- **Research community:** All researchers from an honours level to an established researcher.

List of Abbreviations and Acronyms

COVID-19: Corona Virus Disease of 2019

DHDC- Departmental Higher Degrees Committee

DHET-Department of Higher Education and Training

HE-Higher education

HEIs: Higher education institutions

HIC: High-income country

LMIC: Low-and middle-income country

NDP- National Development Plan

NRF-National Research Foundation

ODL-Open Distance Learning

RCB: Research capacity building

RCD- Research Capacity Development

RCS-Research capacity strengthening

SRIPCC-Senate Research, Innovation, Postgraduate Degrees and Commercialisation Committee

UNISA-University of South Africa

CHAPTER ONE: INTRODUCTION

1. Background of the study

The Higher Education landscape in South Africa comprises of various kinds of institutions. Such institutions include universities, Technikons and various types of colleges. There is a thin line dividing these institutions. While universities are known for producing academic qualifications (e.g. degrees, diplomas and certificates) and research outputs (research articles in approved journals, conference proceedings, books, posters, patents/licenses and research income), Technikons on the other hand are differentiated from universities by their Greek meaning. "The word "technike" that refers to anything related to technique or technology…" (Raju 2006, p. 4). Technikons and colleges are therefore known for apprentice education and training in South Africa. As opposed to this function, universities are the cornerstone in the production of the honours, masters and doctoral students. Such students enroll in advance higher-level training which comprises of some, if not full research project. This is the focus for this study.

South Africa presently has twenty-six (26) public universities; public universities are government-funded. There are three different types of universities in South Africa, namely: traditional universities, comprehensive universities, and universities of technology. Bunting and Cloete (2010, p. 2) differentiate the three types of universities in South Africa as follows:

"(a) [Traditional] Universities: offer basic formative degrees such as BA & BSc, and professional undergraduate degrees such as BSc Eng. and MBChB.; at postgraduate level offer honours degrees, and range of masters and doctoral degrees; e.g. University of Pretoria

(b) Universities of technology: offer mainly vocational or career-focused undergraduate diplomas, and BTech which serves as a capping qualification for diploma graduates. Offers limited number of masters and doctoral programmes; e.g. Tshwane University of Technology

(c) Comprehensive universities: offer programmes typical of university as well as programmes typical of university of technology"; e.g. University of South Africa

Each province in South Africa has at least one university. Gauteng Province is the only province with six of these institutions, followed by the Western Cape with four universities. According to Universities South Africa (2020), public institutions of higher learning include the following twenty-six (26) universities: University of Cape Town (UCT), Stellenbosch University (SUN), University of Pretoria (UP), University of the Witwatersrand(WITS), KwaZulu Natal (UKZN), University of the Western Cape (UWC), Rhodes University (RU), The University of South Africa (UNISA), University of Johannesburg (UJ), North West University (NWU), University of the Free State (UFS), Nelson Mandela University (NMU), Cape Peninsula University of Technology (CPUT), Durban University of Technology (DUT), University of Zululand (UNIZULU), Vaal University of Technology (VUT), Central University of Technology (CUT), Walter Sisulu University (WSU), University of Limpopo (UL), Tshwane University of Technology (TUT), and University of Fort Hare (UFH), Sefako Makgatho Health Sciences University (SMU), University of Venda (UNIVEN), University of Mpumalanga (UMP), Mangosuthu University of Technology (MUT), and Sol Plaatjie University (SPU). The newest Universities are Sefako Makgatho Health Sciences University (about 6-years-old), Sol Plaatjie University (about 8-years old) as well as University of Mpumalanga (about 8-years-old).

To accelerate research in institutions, there is a need for Research Capacity Development. Historical facts and information that is available proves that Research Capacity Development in institutions of higher learning is of utmost importance, particularly for postgraduate students. Bai, Millwater and Hudson (2008) argue that the capacity of a country is dependent on its research. This means that Research Capacity Development not only assists postgraduate students or a university, but contributes to the development of a country. This factor makes Research Capacity Development crucial and relevant to the development of any country.

Statistical data indicated in universities and Department of Higher Education and Training reports share the same sentiments by indicating how postgraduate students have benefitted from Research Capacity Development. For an example: UNISA's research community benefits from different Research Capacity Development initiatives which broadly include research programmes, research grants, research Chairs and Institutes (Research Innovation @ Unisa 2017). However, Research

Capacity Development data reported in universities documents is mostly about what they have achieved throughout the years. For an example, most universities have done outstanding work resulting in human development throughout the world, particularly in Africa; however, lacking in these documents are the voices of postgraduate students, whereby they describe how they perceived Research Capacity Development initiatives during their postgraduate studies.

It is not an easy task to separate Research Capacity Development from research outputs. A lot of emphasis is placed on the importance of research outputs within the institutions as this also carries monetary gains in a form of subsidy from the Department of Higher Education and Training (DHET) to universities. According to the department's report on the evaluation of the 2015 universities' research output (2017), rewarding quality research outputs helps to sustain current research and increasing research productivity, which is a requirement to meet development needs of the country at national level. However, it is not stated as to how the postgraduates would want to be supported in order to produce more research outputs, advance knowledge and meet national expectations. Within the report, there is no indication of what universities, postgraduate students and other researchers have done to produce a certain number of research outputs. This explanation can set a trajectory of what is required to strengthen Research Capacity Development in African institutions which enrol postgraduates. It makes my study relevant to current discourse pertaining to the strengthening of research capacity in institutions of higher learning.

In order to know how Research Capacity Development strategies work, it is crucial to ask its direct beneficiaries, i.e. postgraduate students. According to Onyancha and Jacobs (2009), the trend on the production of research projects is one of the factors reflecting a pattern of research capacity building in higher learning institutions. This means that the more postgraduate students are enrolled, the more the research projects; the more the research projects, the more the research outputs. At the same time, as these postgraduate students progress as the next generation of researchers, they are then encouraged to proceed with the journey to become emerging researchers; eventually, these emerging researchers become established researchers who then drive the Higher Education landscape by ensuring that research projects increase, research outputs improve and the reputation of an institution is enhanced. Such research projects are the ones that improve the quality

of life in communities and also put the country on the map. This is the end to which Research Capacity Development should lead.

In light of the above, in this study, I argue that it is important for Research Capacity Development to begin at an institution level, addressing the needs of the research community first before building on additional capacity initiatives. This is the reason this study is crucial. Other studies indicated that although there is a lot that could be done to improve Research Capacity Development, there are basics in achieving it; which may include "identification of needs, the making of basic policy choices and…selection of foreign expertise" (Sawyerr 2004, p. 213). However, it is not mentioned as to how the identification of needs can be conducted within an institution of higher learning. Thus, this study focused on the previously registered postgraduate students with the view to analyse the needs for Research Capacity Development at the honours, masters and doctoral levels so that in future, postgraduate students can conduct research which is both life changing and leading to the production of quality research outputs with limited or no challenges.

In assessing Research Capacity Development for postgraduate studies in South Africa, this study brought in the voices of postgraduate students into Research Capacity Development. Knowledge gained from this study will advance the ministry of Higher Education and institutions of higher learning from various angles such as in research education and training, funding support, policy development, implementation etc.

2. Problem statement

In ensuring that more students are exposed to the research world, institutions of higher learning recruit and encourage students to register for postgraduate studies. Although some higher learning institutions may have research methodology as a module in undergraduate studies, it is usually in postgraduate studies that students are introduced to the practical world of research. This is coupled by exposure to other opportunities they may embark on. Universities are therefore, central to strengthening the postgraduate students. It was also mentioned that "As institutions of advanced research, universities play a pivotal role in building a country's research capacity. While knowledge production is not the exclusive purview of higher education, universities forge the frontiers of knowledge in many societies" (Lee & Kuzhabekova 2019,p. 343) .

The challenge becomes that at the same time, universities also need to focus on other aspects of the institution to ensure sustainability. Mirzoev, Le, Green, Orgill, Komba, Esena, Nyapada, Uzochukwu, Amde, Nxumalo & Gilson (2014) shared the same sentiments when mentioning that universities often find themselves trying to strike a balance between meeting academic objectives such as ensuring that degree-level training runs smoothly and also making sure that policy-relevant work is implemented, Research Capacity Development is therefore overlooked. In the view central to this study, Research Capacity Development should be seen as one of the cornerstones of a functioning Higher Education institution.

South African institutions of higher learning do not seem to have standardised policies or guidelines designed to guide institutions on how to implement Research Capacity Development. However, this does not mean that the ministry of education ignores this important aspect. In its various documents such as policy, funding frameworks etc, the Department of Higher Education and Training discusses issues pertaining to Research Capacity Development in Higher Education institutions. However, what is observable is that the main focus has been the research outputs. This is possibly because they are a great measure for the quality of an institution. In this study, it is emphasized that the department needs to start developing policies, guidelines and standard operating procedures which specifically address Research Capacity Development. This will provide a guide for universities and will serve as 'the bible' for Research Capacity Development

in HEIs of South Africa. This will also enable universities to identify which resources are crucial for Research Capacity Development, and work on closing identified gaps.

Currently, institutions of higher learning tend to implement their own programmes which they think will work. In order to achieve Research Capacity Development in South African universities, a comprehensive strategy which is inclusive of various stakeholders and activities is necessary. Stakeholders may include: previously registered postgraduate students, university management, academic staff, the research administration personnel, funding agencies, government, partnership organisations and collaborating countries and researchers. Activities may include: research methodology skills development workshops, funding, research infrastructure, availability of time for researchers, ensuring an environment that promotes quality research etc. However, the main idea is that if RCD is targeted at Postgraduate students, it is the postgraduate students themselves who need to define what Research Capacity Development should look like.

3. Research objectives

The main objective of the study was to assess Research Capacity Development in postgraduate studies in South African institutions of higher learning. In order for the study to achieve the main objective, the following were its subsidiary objectives:

a. To explore the South African Research Capacity Development for postgraduate studies at the honours, masters and doctoral levels;
b. To identify the key role players in Research Capacity Development in South African public universities;
c. To identify the activities and tools for Research Capacity Development in South Africa, and
d. To explore the extent to which Research Capacity Development initiatives have benefitted previously registered postgraduate students at the public universities in South Africa.

4. Introduction

Several concerns which have translated into some questions have led to the need to conduct this study, these are: is Research Capacity Development implemented in institutions of higher learning of South Africa? Is it sufficient for postgraduate students? This study aims to answer these questions. Research capacity development is below what the country needs, and strategies on how to advance research capacity in the country must include the provision of access to resources, ensure quality research, research internationalisation and forming and maintaining collaborations. However, it is not stated if this is what postgraduate students recommend in order to become quality researchers in South Africa. This study is; therefore, the result of a conviction that in order to understand the phenomenon at hand, it is crucial to hear "from the horse's mouth"; this means that it is best to inquire directly from the beneficiaries of Research Capacity Development.

This study revolves around the need to establish what public universities are doing to ensure that the journey of a postgraduate student becomes bearable and smooth. Further to that, the study seeks to provide a picture of how Research Capacity Development in institutions of higher learning of South Africa looks like. This is hoped to be achieved by learning directly from postgraduates, particularly, the extent to which they were supported during their postgraduate studies. The study also hopes to identify existing gaps in the implementation of Research Capacity Development in South Africa. Furthermore, former postgraduate students had an opportunity to define what would work for them if there were to register for postgraduate studies at a South African Higher Education institution again.

Research Capacity Development is of utmost importance in institutions of higher learning, it focuses on the researchers in order to promote and stimulate more research ideas and innovation, which may lead to the betterment of communities and the country at large. In an ideal institution of higher learning, from the honours to doctoral level, students are offered opportunities to learn and interact with fellow postgraduate students, emerging and established researchers locally and internationally; as they embark on their research trajectory, they are also exposed to various

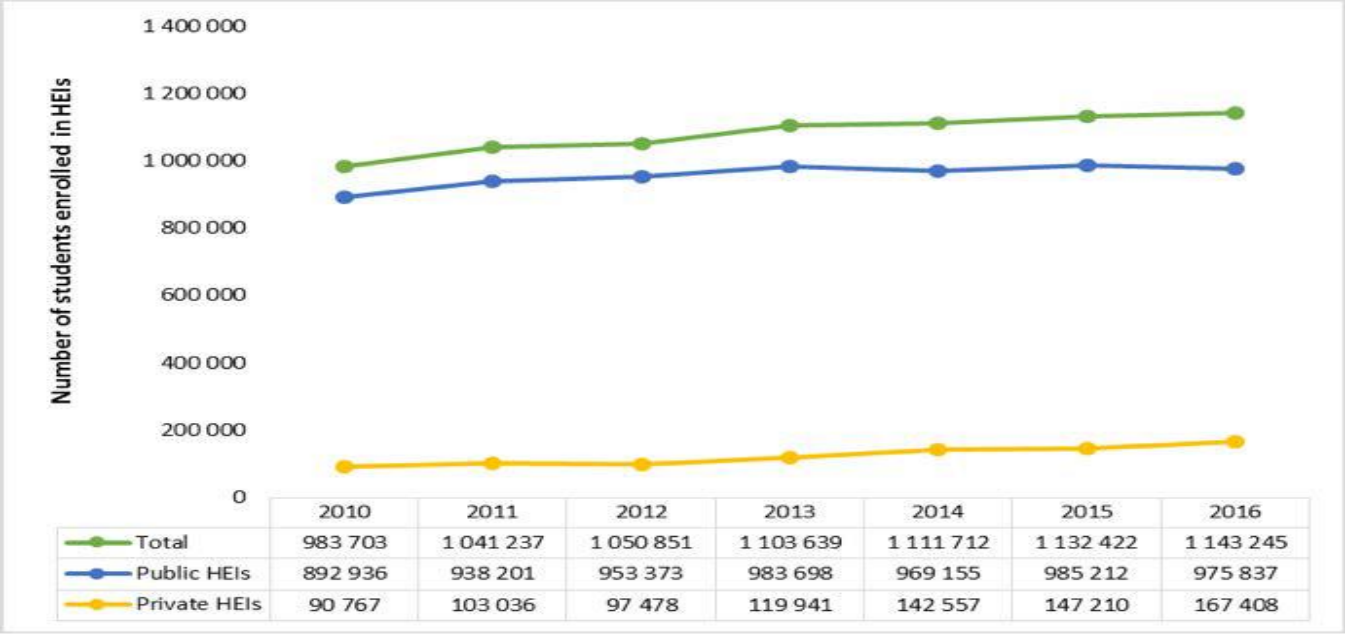
collaborations which may contribute to their research and careers. This is usually implemented with an exposure to the various funding opportunities to support postgraduate students with tuition, research running costs, travel funds as well as publication fees. Institutions also support postgraduates by ensuring that there is adequate infrastructure such as having a functioning library which supports postgraduate students, laboratories with functioning equipment required to undertake the various tests etc. With all these, coupled with a great supervisor, postgraduates should find their journey in academia fulfilling. It remains to be seen whether this is the case in South Africa, and if so what are the gaps, if any, in RCD.

This study intended to determine if some, if not all of these activities above form part of Research Capacity Development in institutions of higher learning in South Africa. Additionally, it will also establish if these initiatives are regarded as 'sufficient' to support postgraduate students. Further to the above, the study will also assist in providing an understanding of what Research Capacity Development for postgraduate students in South Africa should incorporate in order to be regarded as 'sufficient'. It is important to highlight that different postgraduate students will have different support needs in postgraduate studies and research. However, it is of utmost importance to ensure that postgraduates have support throughout their studies, as this benefits not only students, but institutions of higher learning as well. As a result of this, student satisfaction is the key driver if universities are to ensure increased throughput rate and lessen dropout rates.

When postgraduate students are satisfied during their studies, they will tend to learn faster and gain confidence in the academic space, they will also complete their degrees on regulation time. As a result, the academic reputation for the institution of higher learning is enhanced in many ways. In South Africa, for instance, when an institution produces more postgraduate students, it attracts more funding from the Department of Higher Education and Training. This study; therefore' aimed to listen to the postgraduate students in order to bring a topographical view of Research Capacity Development in public universities of South Africa between 2010 and 2020.

This dissertation is part of a Master of Arts (MA) degree in Development Studies at the University of South Africa (UNISA); it will assess Research Capacity Development in former postgraduate

students at the honours, masters and doctoral studies in institutions of higher learning in South Africa. South Africa has more public universities than private ones, therefore, the majority of both undergraduate and postgraduate students are produced by the public universities. Attesting to this, Figure 1 below shows that majority of students registered in public Higher Education institutions of South Africa stood higher than the one for private institutions between 2010 and 2016.



	2010	2011	2012	2013	2014	2015	2016
Total	983 703	1 041 237	1 050 851	1 103 639	1 111 712	1 132 422	1 143 245
Public HEIs	892 936	938 201	953 373	983 698	969 155	985 212	975 837
Private HEIs	90 767	103 036	97 478	119 941	142 557	147 210	167 408

Figure 1: Number of students enrolled in public and private HEIs, 2010-2016

Source: DHET (2016, p. 9)

The figure above explains that the total number of students registered in both public and private Higher Education institutions was 983 703 in 2010, from that number, 892 936 (91%) were students registered in public institutions, whereas only 90 767 (9%) were students registered in private institutions. The same trend applies to the rest of the years from 2011 to 2016, where the majority of registered students were in public Higher Education institutions. There may be many reasons for this trend, among which is the possibility that public education might be cheaper to access. However, that is not a topic of concern in this study.

5. Summary of the methodology

5.1 Research design

This was a case study focusing on previously registered postgraduates at the honours, masters and doctoral levels (the case) in south African public universities. According to Auriacombe and Mouton (2007), a case study is a research method which focuses on investigating specific phenomenon holistically by focusing on the single or few cases rather than on many variables. This study was; therefore, quantitative in nature. It made use of survey questionnaires to collect data from participants.

Due to the Corona Virus pandemic (COVID-19), survey questionnaires were administered online only. In recruiting participants, the researcher ensured that she screened them by making use of the inclusion and exclusion criteria. When participants had shown interest, a link was then sent to screened participants. The link contained information leaflet and a consent form for the study. Where participants read the information leaflet and agreed to participate in the study, they ticked a "yes" box to continue with the completion of the survey questionnaire. Where participants did not wish to participate in the study, they ticked a "no" box and discontinued completion of the survey.

5.2 Study population sampling

The study practiced a non-probability sampling method, namely, referral sampling. The principle of referral sampling dictates that the researcher identifies a number of specific respondents based on a specific reasoning, in turn, the first group of respondents recruit more respondents (Dragan & Isaic-Maniu 2013). This is done until the researcher is satisfied with the amount of data received. The study recruited previously registered postgraduate students of any nationality, race, colour, gender etc. This is because issues of Research Capacity Development are relevant to all postgraduates regardless of their demographic information.

However, this study excluded postgraduate students who were registered for postgraduate diplomas because "a Postgraduate Diploma (NQF Level 8) is generally multi- or interdisciplinary in nature, but may serve to strengthen and deepen the student's knowledge in a particular discipline or profession. The primary purpose of the qualification is to enable working professionals to undertake advanced reflection and development by means of a systematic survey of current thinking, practice and research methods in an area of specialisation. A sustained research project is not required, but the qualification may include conducting and reporting research under supervision" (National Research Foundation 2018).

During data collection, I also learned that five universities that used to offer Bachelor of Technology degrees and not the traditional honours degrees may not have honours postgraduate students; these are the Universities of Technology such as: TUT, VUT, MUT, CPUT, and DUT. According to VUT (2020), the institution will no longer offer BTech Programmes, but will offer Diplomas and Advanced Diploma. For data collection, five extra honours participants were added in order to ensure that the sample remained the same; these participants were selected randomly and not from specific institutions.

In order to collect recent data which may be relevant in developing implementation policies around RCD, previously registered postgraduate students must have been registered and studied at a South African public university in the past 10 years between 2010 and 2020. Although five years is the highest regulation time for completing a doctoral degree, this study also considered the reality that some postgraduates are working and have started families, which may slow down completion time.

The study ensured that 73 (n=73) survey questionnaires were completed by the relevant participants. This number assisted in ensuring representativity by the majority of public universities in South Africa. The plan was to ensure that I recruit three (3) previously registered postgraduates per university (n=3x24). This number was developed with the presupposition that the two newest public universities, SPU and UMP, may not have produced any or more postgraduate students. Should respondents from SPU and UMP be recruited, the sample will

increase to 78 (*n*=3x26). Although SMU is still a new University, previously registered students who were studying under the University of Limpopo, Medunsa campus, may have progressed under SMU. Table 1 below indicates the study population for this study.

Table 1: Study population

Key population	**Study level**	**Number of Survey Questionnaires**
Previously registered postgraduate students in South African public universities	Honours	24
	Masters	25
	Doctoral	24
TOTAL		**73**

5.3 Recruitment of participants

As mentioned above, I used referral sampling in order to select previously registered postgraduate students in public universities to participate in survey questionnaires. According to Onwuegbuzie and Collins (2007), in referral sampling, participants are requested to recruit more participants. Since the aim was to collect three per each study level, the first participant in any level found first helped in identifying the next participant (s), preferably, participants identified by an individual postgraduate must be from the same institution. The plan was to recruit one postgraduate per institution, then ask them to identify two more former postgraduates from the other study levels in the same university. Participants were then informed to pay attention to the inclusion and exclusion criteria below when identifying research participants. The researcher's job was to keep track of the new participants and ensuring that they were eligible for the study by asking further questions such as when they completed their postgraduate studies, as well as the institution at which they were registered with. The following was the inclusion and exclusion criteria for this research:

Inclusion Criteria

i. Participants must be 18 years and older;
ii. Previously registered postgraduate students at the honours, masters and doctoral levels;
iii. Must have registered and studied at the public university for at least 12 months;
iv. Participants must have registered for the degree between the years 2010 and 2020;
v. Participants must be willing to sign a consent form by ticking a "yes" box to indicate they agree to participate, and
vi. Participants must have been exposed to some research element of their studies (e.g. developing a research proposal)

Exclusion Criteria

i. Participants should not be younger than 18 years of age
ii. Previously registered postgraduate students in postgraduate diplomas;
iii. Previously registered postgraduate students in private universities and other institutions of higher learning;
iv. Previously registered postgraduate students who registered for their studies before the years 2010 and after 2020; and
v. Participants not willing to sign a consent form by ticking a "yes" before completion of the survey questionnaire.

5.4 Data collection

Survey questionnaires were used to gather data from research participants whose consent was obtained. Questionnaires were created on google form, an online link was generated which was then shared with interested participants. It was through the link that participants were able to answer questions in the survey. Once the questionnaire was completed, participants had to click on 'submit' to send the questionnaire to the researcher. Questionnaires were completed at the time convenient to the research participants.

5.5 Data analysis

Since data was collected using the google form, the researcher was able to populate it into an Excel spreadsheet; this made is easier to filter and analyse the data. Where necessary, a statistician assisted in validating my method of data analysis to ensure reliability of research results.

5.6 Rigor

The validity and reliability of the survey questionnaire were tested prior to data collection. To ensure that the survey questionnaire covers all content that it should (validity), the researcher first conducted the survey questionnaire with some of the university colleagues who are knowledgeable in Research Capacity Development so that they provide their opinion on whether the survey questionnaire could measure the concept it was intended, and if inferences could be drawn about test scores related to the concept that was being studied.

With the view to ensure reliability (internal consistency) of quantitative data, the investigator ensured that her test was stable by using Test-retest reliability. Heale and Twycross (2015, p. 66) mentioned that "this [test-re-test reliability] is assessed when an instrument is given to the same participants more than once under similar circumstances". Lastly, the researcher also ensured equivalence by giving the questionnaire to her colleagues at a senior level (University) to rate the relevancy of each item on the survey as well as consistency in their scores related to the level of what Heale and Twycross (2015) call inter-rater reliability.

5.7 Ethical considerations

The study involved humans; therefore, I first submitted this research proposal to the Departmental Higher Degrees Committee for ethical clearance. Apart from these requirements, my study ensured that research participants are treated with respect and dignity by making use of the Informed Consent Participation leaflet and Informed Consent Form. The leaflet contained crucial

information pertaining to the study. After participants had been provided with information regarding the study, they were offered them an opportunity to ask questions before they could agree or disagree to participate in the study. All participants were given contact details which they could use in cases where they had questions related to the study. In the consent form, study participants had to indicate if they agreed or disagreed to participate by ticking the online Informed Consent Form (ICF), no signatures were collected.

To ensure that participants were not coerced into participating in the study, they only received reimbursement after completion of the questionnaire so as to compensate them on the amount of time and data they used when completing the survey. Electronic data collected has been be kept safe and confidential to the best of my ability, all electronic files will be encrypted. Participant numbers were assigned to all participants in order to protect their identity. The names of the Universities have not been used in the research report, instead, Universities were assigned pseudonyms, (e.g. U001).

With the view to safe-guard the ethical considerations of this investigation, the study focused on postgraduates who were 18 years and older at the time of the questionnaire completion. According to the Southern African Marketing Research Association (2015), when interviewing participants who are 18 years and older, no parental consent is required. Gaining consent from parents might mean that a meeting between the researcher and parents must be arranged so that she could explain what the study was about. This process may take longer and may also increase the risk of COVID-19 infection.

6. Scope of the research

The scope of this study has been limited as follows:

- This research enables the researcher to qualify for a Masters degree, its regulation time is two years, studying many cases may require more than two years to complete, thus a choice was

made to focus only on previously registered postgraduate students at the honours, masters and doctoral levels as the case.

- The study ensured representativity by ensuring that postgraduates from all public universities responded, except in the cases of the newest universities (i.e. SPU and UMP). My supposition is that since they are still new, there is a possibility that they have not produced more previously registered postgraduate students. It may take longer to find such students and recruit them for the purpose of this research.
- Although Research Capacity Development may also include emerging and established researchers, the study focused only on previously registered postgraduate students (next generation of researchers).
- Only quantitative data was collected and this was done by making use of online survey questionnaires. This is because the regulation time for the masters degree is only two years. Qualitative data collection may require more time than that. The COVID-19 pandemic was also a concern as qualitative data is best conducted in person, if conducted online, it can incur higher data costs as in-depth interviews may take longer.
- The study focussed only on students who previously studied at universities in the past 10 years. Although the Academy of Science South Africa report (2010) in Kritzinger and Loock (2012) states that the average time to complete a doctoral degree was 4.8 years, using ten years as the benchmark was still appropriate as it is crucial to collect recent data with the potential to assist in developing relevant policies which are aligned with current trends.
- Furthermore, this study did not compare responses for participants registered in different years. Although this aspect would have been interesting and possible, it would have meant that recruitment is also aligned with the various years of registration, that would have slowed down recruitment.
- The study focussed on all previously registered postgraduate students regardless of gender, race, and citizenship; as long as they registered in a public university in the past 10 years for the honours, masters or doctoral studies.

7. Significance of the research

Research is the *sine qua non* of the country. In sections above, it has been demonstrated how important and necessary research is to the country as a whole. According to the Department of Higher Education and Training (2001), in all its forms and functions, research is like a useful mode of transport which can assist the country in deepening the hard-earned democracy, it is said that "research engenders the values of inquiry, critical thinking, creativity and open-mindedness, which are fundamental to building a strong, democratic ethos in society… It creates communities of scholars …it makes possible the growth of an innovation culture in which new ideas, approaches and applications increase the adaptive and responsive capacity of our society, thereby enhancing both our industrial competitiveness and our ability to solve our most pressing social challenges. It contributes to the global accumulation of knowledge and places our nation amongst those nations…" (Department of Higher Education 2001, p. 61)., One cannot, therefore, imagine a modern society with no research.

This study assessed Research Capacity Developments for previously registered postgraduate studies at South African public universities; it basically evaluated what recent capacity building approaches in research have been working and which ones have not been working by using Cooke's (2005) framework for research capacity building. This study is; therefore, another tool to communicate with the research community in order to inform universities' research capacity strategies and innovation. Data that was collected in this study provides a way forward on how research capacity at the universities must be shaped and at what study levels (honours, masters, and doctoral) are certain approaches more important than others.

With that being said, it is important to note that for the world to have fully-fledged researchers who will become the drivers of positive change and development of a country, postgraduates become the 'cream of the crops', particularly those who embark in a doctoral journey. This makes this research so important to the Higher Education landscape, to South Africa and the world. This is because the findings of this research will become a 'voice' for postgraduate students in South

Africa; it may also impact on other countries' practices in implementing Research Capacity Development policies concerning postgraduate students. One observation supporting this claim is by Schulze (2014),who states that across the globe, there is a lot of pressure on scholars to obtain doctoral degrees; this is because such a qualification enables academics in becoming full members of the research community in an institution. In other words, a doctoral degree empowers them to also develop a voice and an identity in an academic sphere. It is in this academic sphere that "knowledge is constructed, held and transmitted by the academic community, and this keeps the [research] community alive. It provides the language in which academics understand themselves and converse about ideas…" (Schulze 2014, p. 2).

One important aspect of Research Capacity Development is to remember that as it is implemented, people's lives are improved; in the process of developing postgraduate students by supporting them during their postgraduate studies, one is also building their careers. As they learn how to become researchers, they are, simultaneously, embarking on a career development which will enable them to be absorbed in the job market. This also changes lives of these postgraduate students. South Africa has a high challenge of unemployment, and developing researchers who will be able to open career doors for themselves is invaluable. Nel (2018, p. 71) elucidates on this point more vividly as he argues, "Based on his newly acquired research skills, such as research project management, publications, peer reviewing, funding/grant applications, and consultations during the PDF [Post-doctoral fellowship) programme, he[sic] [the postdoctoral fellow] has clarity relating to his career goals. As a result, he has gained the confidence to apply for a research position…to strive to be recognised as a rated researcher".

This study is also crucial in that it will contribute to the knowledge economy relevant to the achievement of the Sustainable Development Goals (SDGs). When postgraduate students are supported in the research field, they are more likely to want to participate in finding solutions to global challenges. As stated by DeFries *et al.* (2012) in Annan-Diab and Molinari (2017, p. 77) "Scientists from many arenas including physical, biological, and social scientists and engineers working from local to global scales need to bring together the scientific knowledge, tools, and approaches to assist society in developing solutions for pressing sustainability challenges while

helping societies to advance". When RCD is implemented, knowledge generation, dissemination and application is realised, and innovation and capacity building in science and technology is enhanced. Also, very important is the fact that the conclusion and recommendations generated from this study may contribute to the application of best practices in Research Capacity Development. Finally, this study will also close some knowledge gap in the implementation of RCD in South African academic institutions.

8. Limitations of the study

- This research was conducted during COVID-19 pandemic. The only best approach in meeting or recruiting participants was via virtual platforms such as phones, emails, etc.
- Since this study was on Research Capacity Development, it would have been beneficial to also interview relevant management/representatives from the universities and Department of Higher Education of and Training (DHET) so that they could provide information on what universities and government are doing or have done to contribute to Research Capacity Development of institutions of higher learning.
- Lastly, Research Capacity Development is inclusive of research infrastructure, therefore funding agencies are a relevant target for this study; again, due to time limitations, the study relied on literature and survey data collected.
- Although the researcher was able to elicit some qualitative responses, this study required some in-depth inquiry. A qualitative or mixed-method approach would have been of assistance in closing gaps in other sections that required more probing. Both these approaches may have required more time and money to implement during COVID-19.

9. Chapter outline

This dissertation consists of six chapters. CHAPTER ONE of this study is an outline of the background of the research, which includes statement of the problem, summary of the methodology to be used in the study and ethical considerations. In the chapter, there will also be

discussions on the scope, limitations and significance of the research. Basically, this chapter sets a trajectory for this research.

CHAPTER TWO of this research focuses on the literature review which presents an overview of Research Capacity Development. The overview included the various definitions of RCD, the various types of RCD, its history and how RCD looks like in South Africa and globally. The chapter also discusses the theoretical framework for this study.

CHAPTER THREE discusses the research design, methodology and procedures followed in this study. This chapter is basically about all the steps taken in this research in order to arrive at the last chapter of this study. Issues such as how the literature search was conducted, data collection methods, sampling techniques, how data was analyzed etc. form part of chapter three.

CHAPTER FOUR is about the presentation and analysis of study findings. Data is presented as is and per each question asked in the survey questionnaire regardless of whether or not findings are relevant to the study aim and objectives. Data was also analyzed in this chapter to aid understanding.

CHAPTER FIVE of this research is an interpretation and discussion of the study findings presented in chapter four. As mentioned, chapter four presents and analyzes the results as they are. In addition, this chapter will bring a breakdown of the implications of the data collected and analyzed. It is also in this chapter that issues of whether or not findings respond to the research objectives are discussed.

CHAPTER SIX is the last chapter of this study, which closes the research by bringing an overview on what the study was about, what was learned in the study, what the limitations were, what can

be recommended from this study and also for future research. This chapter is basically a conclusion of the entire study, it therefore does not have a chapter summary.

10. Chapter Summary

Majority of universities in South Africa are public universities; these are government-funded. South Africa has twenty-six universities which include traditional universities, comprehensive universities and Universities of Technology. Research Capacity Development is of utmost important in institutions of higher learning as it promotes and stimulates more research ideas and innovation which may lead to the betterment of communities and the country at large; it is the basis for research support. This case study assessed Research Capacity Development for postgraduate students in public universities of South Africa by making use of questionnaires which were targeted to former postgraduate students at the honours, masters and doctoral levels, who studied between the years 2010 and 2020. The main idea of this study was based on the awareness that in order to establish which Research Capacity Development strategies work, it is crucial to ask its direct beneficiaries, in this case, former postgraduate students.

CHAPTER TWO: AN OVERVIEW OF RESEARCH CAPACITY DEVELOPMENT

1. Introduction

The previous chapter has emphasized that research is of utmost importance in South Africa and the world at large. It moves society to the next level in terms of innovation and the betterment of lives. Research is defined as an "original investigation undertaken to gain knowledge and /or enhance understanding" (National Research Foundation 2014, p. 18). Research is; therefore, not routine work that does not involve new inquiries.

In this chapter, we discuss the literature that is available for Research Capacity Development locally and abroad. The chapter begins with a focus on what Research Capacity Development entails, its history, the types of Research Capacity Development, activities for Research Capacity Development and how RCD looks like by comparing the global North and the South; the chapter also included some challenges in the field of Research Capacity Development. This chapter was also used to delineate the theoretical framework in which this study is based; it is in this section that an explanation on the theory or framework chosen to guide my study and how I have used it in relation to the assessment of Research Capacity Development in institutions of higher learning. The chapter ends with a summary.

1.1 What is Research Capacity Development?

In order to define Research Capacity Development, one should first deal with what capacity development is. According to Hope (2009, p. 80), capacity development is "the enhancement of the competency of the range of social actors enumerated to engage in activities in a sustainable manner for positive development impacts such as poverty reduction, improvement for governance quality, or meeting the millennium [development] goals". In light of this definition, it makes sense to mention that Research Capacity Development stems from capacity development as it also aims to bring positive impact in the development of researchers. As it was highlighted above, it is

research that drives new enquiries in the challenges the country is facing. Therefore, Research Capacity Development becomes more relevant in the field of capacity development as it ensures that researchers have the capacity and competencies which qualifies them to conduct studies which lead to the improvement of lives.

In speaking of millennium development goals, Research Capacity Development for postgraduate students is not included under goal 4 as I expected which is to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations 2016, p. 12). An idea of lifelong learning in this study is that it should encompass research and development for postgraduate students. This is guided by the fact that postgraduate research is regarded as the beginning of the country's innovation and the essential variable for future scientific research and development.

The construct of Research Capacity Development is frivolously talked about under Millennium Development goal 9 which is to 'build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation'. The aim of this goal is to "enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular, developing countries by 2030, encouraging innovation and substantially, increasing the number of research and development workers per one million people and public and private research and development spending" (United Nations 2016, p.12). This goal vaguely touches the improvement of research capacity, and yet fails to necessarily speak to postgraduate Research Capacity Development. According to ESSENCE on Health Research (2014), strengthening Research Capacity Development in low-and middle-income countries is one of the prerequisites of development, it is therefore crucial for the millennium development goals to always speak to the strengthening of Research Capacity Development in postgraduate studies.

Research Capacity Development (RCD) has become the buzzword in academic institutions. There are many terms used to address RCD, some refer to it as research capacity building (RCB) or research capacity strengthening (RCS); these terms can be used interchangeably. This is supported

by Blagescu and Young (2006) in Edwards, Kaseje and Kahwa (2016) who also indicated that the terms 'capacity building', 'capacity development', 'capacity strengthening' and 'capacity enhancement' may be used interchangeably. Various definitions of RCD also highlight the exchange of these terms . Most of these terms have been used in the health field as there is still less literature on RCD in academia. This study; is therefore envisaged to contribute to the body of knowledge on the subject matter.

Development in itself is often a process, it does not take place overnight; the same applies to Research Capacity Development. In defining Research Capacity Development, according to Cooke (2005) the Department of Health in the United Kingdom views Research Capacity Development as a process of developing individuals and institutions in order to ensure high skill levels and greater capability to conduct valuable research. This definition focuses on both individual and institutional development, which means that RCD must not be one-sided. It also recognises RCD as a process, which suggests that it may take a few steps and more time to achieve the desired end.

Research Capacity Development is a cycle. Institutions of higher learning enrol new postgraduate students each year. This may suggest that a university may not arrive at the end of Research Capacity Development; the process should then be ongoing, at both individual and institutional level. This is because the new cohort of postgraduate students that enrol at a university may require Research Capacity Development; also, postgraduate students who are in their second, third, fourth etc year may not be working on similar scope as that of their previous year of study. With that in mind, it is fair to say that Research Capacity Development for postgraduate students must be tailor-made for each study level at the various stages of their research trajectory.

To further the discussion above, it is also important to note that due to the various studies that take place globally and locally, the body of knowledge in various subject matters improves each day, Although the research process may not change, Research Capacity Development should be ongoing and must be driven by the needs of the research community. Consider this scenario:

During the first year of her masters degree, student M001 learnt how to conduct literature review and was informed that she could visit the library and request articles and books. Her research proposal was approved by the end of 2019. In her second year, she had to completely change the literature search to online due to COVID-19. This means that university efforts for Research Capacity Development must include educating all postgraduate students on how to use available technologies to conduct literature search as meeting the librarian will no longer be possible due to COVID-19.

In terms of institutional development, there are new technologies and procedures that emerge each year; therefore, institutions of higher learning may not 'rely' on developing universities to meet the demands of postgraduate students. They need to 'move with the times'; they are to be in alignment with the current developments to ensure that researchers are supported holistically within an institution. For an example, due to COVID-19, institutions of higher learning had to immediately learn to use online platforms in order to continue delivering quality education. Different technologies that enhance the learning experience, postgraduate supervision, meeting platforms etc have emerged. This means that universities have to continuously learn which technologies bring the best learning experiences and ensure that they make such technologies available.

With a suitable assessment of Research Capacity Development, postgraduate students may inform technology needs useful for their studies; hence the importance of this study. This kind of an assessment can be done locally at an institution, in each year or as needed because new cohorts of postgraduate students register, some also pass and go to the next levels of their postgraduate studies, e.g. in first year, they develop a research proposal, but in second year, they may start collecting data and writing up the chapters of their dissertations, the gist of this discussion is that each year is different.

Research Capacity Development is a concept which is activity-based; meaning that it is mostly defined by the activities that take place; these activities may also be referred to as 'tools' for RCD.

In agreement with the definition above Nchinda (2002) explained research capacity strengthening as a concept consisting of two interconnected and mutually dependent activities, namely: training of scientists to strengthen their capabilities to conduct quality research, and providing support at an institutional level which could be in a form of equipment and other logistics support needed to conduct and advance research. Again, this definition emphasizes the importance of both individual and the institutional support that should take place within an institution of higher learning. It also highlights the 'interconnectedness' of the individual and institutional support. This means that universities cannot train postgraduate students the current year of registration, and plan to implement institutional support in the following year; these two require concurrent undivided attention in each academic year.

Most definitions of capacity development view it as a multifaceted process. For an example: Horton *et al.* (2008) in Merino and Carmenado (2012) defined two categories of capacity that institutions must develop, namely: resources and management. Resources may include staff, infrastructure, technology, funding etc., and management may incorporate strategic leadership, program management, processes management and the formation of networks or collaborations. Again, this definition of capacity development views it as a process whereby a holistic development must be achieved time and again at the individual and institutional levels. It is important to note that individual needs change over time and they are also influenced by a lot of factors, mostly emanating from the development of the world, be it positive or negative e.g. new technologies, natural disasters such as the COVID-19, the fluctuating economic status of the country etc. At the same time, it is the individual needs that influence the institutional needs in Higher Education. Thus, this research is crucial as it documents which individual needs should inform Research Capacity Development in Higher Education. Institutions may use this research data to develop a relevant Research Capacity Development strategy which can be updated each year.

Research Capacity Development is an act of knowledge investment. When scholars are equipped with the knowledge and are supported throughout their research trajectory, a lot can be achieved. For an example: the current established researchers who are making huge impact in areas such as

nanotechnology, human development, indigenous knowledge systems, paleoscience, neuroscience, medicine etc, were once postgraduate students at the honours, masters and doctoral levels. Although not all postgraduate students end up in academia, these established researchers are the ones putting South Africa 'on the map'. Some research graduates have opted to exercise their research skills in different fields of work such as: in manufacturing, agriculture, clinical trials research, social services sector, entrepreneurships, basic education, social development and policy development. These researchers ensure that the daily practices of the business are informed by research. They are contributing immensely to the improvement of communities, directly and indirectly, be it in private or public spheres. It makes sense why other authors such as Airhihenbuwa, Shisana, Zungu, Belue, Makofani, Shefer, Smith & Simbayi (2011, p. 7) mentioned that "building capacity simply means investing in the scholars of tomorrow"; although that definition is too broad as it does not unpack what "investing" entails, this research closes this gap by asking postgraduates how universities can invest in them in terms of Research Capacity Development.

Some authors define research capacity in terms of what is required to ensure that institutions have enough capacity to carry out research. For an example: Sawyerr (2004) mentions that research capacity incorporates: the quality of the research environment, availability of funding, adequate infrastructure, research incentives, availability of researcher time to focus on research, etc. All these requirements provide a holistic view of Research Capacity Development as they include the individual, environment, funding and other supplementing resources such as time for individual development and focus. In a nutshell, this definition also confirms the researcher's sentiments below, that Research Capacity Development is three-fold, namely; individual, institutional and supra-organizational or supranational. Nevertheless, Sawyer (2004) does not mention if his definition was derived from what individual beneficiaries of Research Capacity Development have reported in the past. This study is, therefore, intended to close that knowledge gap as it brings in the voices of postgraduate students in order for them to define Research Capacity Development and to give it direction as to how it should look like.

In general, the term 'development' literally suggests that change must happen and that the process will take steps and time; thus, as mentioned above, Research Capacity Development is a process which does not happen overnight. Kiwombojjo (2001) adds to this definition by discussing issues of personal development, that capacity building must be planned in such a self-conscious way so as to promote the principles of empowerment and equality. Capacity development; therefore, becomes a development issue. In research, capacity development, postgraduate students must be empowered to do well in their research holistically; this 'empowerment' must also be nurtured by ensuring equality. For an example; this could be done on variables such as race, gender and the distribution of resources. The moment personal development is included in Research Capacity Development, it suggests that individual beneficiaries must be consulted and be asked what areas of personal development would they require in order for them to meet their desired goals. The intention of this study is to close this very gap.

In this study, Research Capacity Development is defined as the process for promoting research through an equal advancement of researchers' knowledge and skills, linking researchers to research resources, and uplifting the research environment in order to achieve world-class research, expert researchers and a quality research environment. This definition encompasses all contributions needed to drive Research Capacity Development at the university level.

1.2 Types of Research Capacity Development

In the theoretical framework of this study, readers will learn that Cooke (2005) suggests that each principle of RCD should function at an individual, team, organisation and supra-organisational levels. However, the above definition of Research Capacity Development, discussions as well as data collected during this study have led to a conclusion that there are three main types of Research Capacity Development. These are:

i. Individual Research Capacity Development

As the name suggests, this is Research Capacity Development at an individual level. The main role is to ensure that postgraduate students or individual researchers have the knowledge and skills they need to conduct quality research in their field of study. For an example, in a study conducted by Chu, Jayaraman, Kyamanywa and Ntakiyiruta (2014), it was learned that at an individual level, postdoctoral fellows need skills such as leadership, grant writing and network building. For an institution to know what individual students or researchers need, a need assessment at a university level must be conducted each year and whenever necessary. This will help universities to stay relevant, as they will be able to meet the most needed expertise. This study is an example of such an assessment, as it is assessing RCD at all universities in the country.

ii. Organizational Research Capacity Development

Organizational Research Capacity Development, on the other hand, is concerned with the surrounding settings in which the postgraduate students or researchers are in within the institution of higher learning. Its main focus is to ensure that university processes of an institution enable researchers to conduct quality research. Additionally, it is concerned with structural, administrative, legislative, and other executive processes that ensure that a university is functional to support researchers. In Chu *et al.* (2014), it was confirmed that when researchers conduct their studies in settings that do not have infrastructure to supports them, research can be disruptive to the regular local services. For an example, in health research, if the settings are unprepared in terms of infrastructure and health care workers, local medical and educational services will be disrupted and will; consequently, have a huge negative effect by taking the already overworked health care providers away from their clinical and teaching responsibilities. It is; therefore, crucial to ensure that there is an appropriate plan which will creates a balance of research and services; especially, in those universities that are also providing services to the public, e.g. Sefako Makgatho Health Sciences University.

iii. Supra-Organizational Research Capacity Development

At the supra-organizational level, Research Capacity Development is concerned about high-level processes at the national and regional levels such as the involvement of broader research community, policy developers and government to ensure the facilitation of Research Capacity Development in institutions. This includes the role played by DHET in decision-making processes in shaping the Higher Education landscape of South Africa.

1.3 The history of Research Capacity Development

At this point, it is acceptable to mention that worldwide, research is what leads to the advancement of lives. A simple example is the COVID-19 pandemic; the whole world has embarked on a journey to search for the vaccine or the cure for COVID-19. This is meant to improve the lives of communities as the world has witnessed millions of deaths due to the pandemic. Amongst the researchers for the vaccines are doctors, scientists and academics who often collaborate to come up with the various vaccines.

Research Capacity Development Capacity development in general is a relatively new field which originated from the practice field, particularly in health. Bockstael (2017, p. 336) states that capacity development is a developmental approach and a methodology stemming "from colonization and has yet to be colonized…now considered a field in itself, capacity development originates in the realm of practice, and did not originate in any particular academic discipline". This explains why there is not much literature in this field; especially, in Research Capacity Development in Higher Education.

It is not surprising to learn that the field of capacity development emanated from the practice field. The field of health; for an example, is more crucial for the obvious reason, health is a basic need. The field also has a constant need of staffing solutions to tackle the day-to-day duties in hospitals, clinics, hospices, communities etc. Such staff require constant capacity development so as to

ensure that they have the skills relevant to deal with patients health. The bottom-line is that capacity development has become crucial, as it enables an organisation to stay relevant, useful and productive.

Returning to the concept of Research Capacity Development, it is not clear as to when this began as a field. However, ESSENCE on Health Research (2014), states that since the 1970s and 1980s, there were research capacity strengthening initiatives which were basically focusing on both individual and professional development; thus, Research Capacity Development is still a new discipline. It is not stated how this discipline has evolved over the years to where it is today. Its current status is also not well-documented. This research will add more insight to the discipline of Research Capacity Development.

It is important to note; however, that some countries are far better than others in terms of their practices and how they conduct research. Chu *et al.* (2014) argue that in the health field, the most burden of disease is from low-and middle-income countries (LMICs). However, these countries conduct less biomedical studies which may lead to improved lives. It is therefore the high-income countries (HICs) that introduce preventive and therapeutic interventions for diseases in Africa. Although the COVID-19 affects the whole world, it is notable that the first vaccine did not come from Africa. This lead to the next section which deals with how Research Capacity Development looks like in HICs (the Global North) and LMICs (the Global South).

i. Research Capacity Development: the global view

The world is divided, not only geographically, but most importantly, economically. Thus, some countries are referred to as the Global North and others called the Global South. The Global North are developed countries such as Australia, Canada, Israel, Japan, South Korea, Europe, the United State of America, while the Global South are still in a developing state e.g. Africa, Latin America, and developing countries in Asia. The issue of imperialism has been the major drive between the Global North and the Global South. Imperialism is defined by Tabb (2005, p. 48). as "the process

whereby leading fractions of the ruling class or, in more sanitized framing, policy makers of more powerful countries use economic and military capacities to appropriate the land, labor, natural resources and markets of other counties to foster capital accumulation under the control of wealthy interests at home and abroad" It is regrettable to learn that this imperialism somehow finds its ways in the research field; it in fact affects all spheres of lives. This is because modern politics is about capitalism; and in most cases trade practices become an unfair game for the Global South.

The above political and economic background has been narrated on purpose because in South Africa, it is often confessed that 'money talks', which translates to 'if you have money, you get what you want'. This is because the global political economy impacts the economic development of the Global South; often, developing countries have weaker currencies which eventually lead to high unemployment rate, poor infrastructure and social sufferings. South Africa; for an example, produces: gold, diamond, platinum and coal; these minerals are also exported in high volumes to other countries. Unfortunately, it is always at a lower rate when they are sold to the Global North. In turn, the same minerals are then sold back to South Africans in the form of jewelleries and other inventions at a higher rate. Most South Africans do not even afford purchasing such products as they live below the poverty line.

Due to economic challenges that the Global South experiences, skilled personnel leave home countries and join developed countries. This move is caused by unemployment rates after obtaining higher degrees, poor income, and poor working and living conditions; for example: South Africa produces many medical doctors, teachers and scientists; however, such personnel migrate to countries such as the United States, Japan etc for 'greener pastures'. Losing skilled expertise to other countries hinders development. Another example is provided by the Chinese Academy of Social Sciences which reveals that, "… of over one million Chinese students who had studied abroad between 1978 and 2006, seventy percent never returned to China…for now; China continues to play a role of net emitting skilled workers to the North" (Fischer 2015, p. 715).

In some cases, the situation is not all gloomy and blue, there are positives that the contemporary global economy reveals. For an example, Fischer (2015) mentioned that in the last three decades, production has increased in both poor and rich countries; as a result, the Global South produces billionaires; and the world's largest corporations are also found in the South. With that in mind, one cannot forget to mention that China is part of the Global South. However, its economic growth is quite significant. Ayers (2013), reveals that China's FDI stock in Africa reached $7.8 billion at the end of 2008, and that there has also been an increase of trade between Asia and Africa too. These illustrations are some indication that although the Global North seem to be in control of many activities in the Global South, it is at times promising that the Global South does not operate 'in limbo', but they also actively 'fight back' economically by increasing efforts to develop. However, these efforts may not be enough yet for the Global South to be considered 'developed'.

In connecting all these to Research Capacity Development, it is inescapable that the poor economic status of the Global South contributes to the manner in which Research Capacity Development is implemented in these regions to some degree. Chu *et al.* (2014) has indicated that for effective research to take place, there is a need for:

- individual research skills and ability
- appropriate infrastructure,
- relevance to national policies and
- the ability to contribute to global research and research needs.

With all these pre-requisites, it is obvious that the Global South, and South Africa in particular, is besieged as it is hard to achieve such pre-requisites in balance. The 'individual research skills and ability' may be met, but lacks then 'appropriate infrastructure' to support research. Chu *et al.* (2014) further indicate that although forming collaborations with researchers in developed countries is possible, and it has been practiced, there is a great possibility of power imbalance in these relationships as most of these researches carried out in the African continent is led, funded and published by the Global North without equal collaborations. This is because high-income countries fund these research projects, and they often dictate the research agenda. National policy

makers in the Global South need to consider these important factors when formulating policies relating to Research Capacity Development in institutions of higher learning.

One cannot overemphasize that developing continents such as Africa continue to face many challenges, most of which can be attributed to gaining independence a few decades ago as compared to developed countries. It has been a journey of taking one step at a time, but it; however, still puts Africa in a compromising situation in terms of using its own resources for own development. The lack of technical skills is what encourages Africa to form collaborations and networks with the global north. A study conducted by Nchinda (2002) indicates that the global north has many trained scientists who conduct their research in well-equipped laboratories and also have enough financial support to conduct world-class research. The global South lacks the expertise of high-end scientists and also institutional support. More development is needed for Africa. These inequalities need to be attended to because "only societies that are able to exploit 'knowledge' seem to grow economically and offer decent living conditions to their population" (Velho 2004, p. 172). Thus, it is important to focus on research capacities in the global South from as early as undergraduate studies.

Central to the production of researchers in Africa are universities. These universities utilise resources and training programmes to equip researchers. According to Sawyerr (2006, p. 215). This is one of the reasons Africa is able to participate in the "advancement of the national interest on all fronts, economic, social, social, cultural, and political". However, African universities face various challenges which are mainly caused by lack of resources, managerial skills, socio-political factors and others. According to Sawyer (2006), the main challenge is the underfunding of public universities in pursuit of strengthening basic education. Although this may not be the only challenge, it does; however, affect Research Capacity Development in Higher Education.

ii. Research Capacity Development in South Africa

In narrowing these factors to South Africa in particular, regardless of challenges mentioned above and more, for the country to compete, globally, it has to move with the times in terms of ensuring that there is enough expertise in the country. This cannot, however, take place over night, " Every society must have the capacity to generate, acquire, adapt, and apply modern knowledge if it is to take advantage of the opportunities and reduce the risks posed by the rise of knowledge society" (Sawyerr 2004, p. 213). Issues of innovation and development rely on the knowledge economy which builds a country that can be able to compete in the global economy. Therefore, Research Rapacity Development stands paramount; and it is; therefore, crucial for all institutions of higher learning to actively participate in this exercise.

In South Africa, universities may have internal funds to support registered postgraduate students. Such funds may have been generated by means of subsidies from the DHET, as well as public and private donors. However, there are also external grants from funding agencies such as the NRF, Desmond Tutu Training grants etc.; and Research Chairs and institutes e.g. DST-NRF SARChi Chairs in different disciplines or niche areas, Institute for African Renaissance Studies etc. In one way or another, these activities contribute to the betterment of communities in the end. The Department of Higher Education and Training rewards universities that ensure fast throughput rates of postgraduate students, as each postgraduate student that graduates generates income for the university. However, most of that income is used for the operational needs of the university and not for research purposes only.

iii. Research Capacity Development activities

Various activities form part of RCD in Africa as a continent. They are the core development drivers of the research community. According to Marjanovic, Cochrane, Robin, Sewankambo, Ezeh, Nyirenda, Rweyemamu & Chataway (2017), these may include individual training, strengthening research career prospects and profiling of research in universities, improving research governance, management and administration capacity, improvement of research infrastructure, strengthening

collaborations between individuals and organizations. However, institutions should assess the needs of their research community in order to provide them with the support they essentially need.

Universities in South Africa have been participating in some RCD for years. For an example: According to the University of South Africa (2017), its RCD activities include research programmes, Chairs and institutes, and research grants. Some of the programmes include: the Masters and Doctoral Support Programme (MDSP), Postdoctoral Fellowship Support Programme (PSFP), Emerging Researchers Support Programme(ERSP),Vision Keepers Programme (VKP), Academic Qualification Improvement Programme (AQIP), Visiting Researcher Programme (VRP), Research Professors Programme (RPP), Innovation Support Programme (ISP) for staff, Innovation challenge for students, Open Distance Learning (ODL) Research Support Programme (RSP),Women In Research (WIR) Programme etc. None of these programmes can be successful without funding.

It is also important for capacity development initiatives to focus on other activities that aid their research career; programmes on soft skills which can be obtained through life coaching or mentoring are equally important to programmes on technical skills which focus on how to utilize technology. A professional development study for occupational therapists by Craik and Rapport (2007) highlighted the importance of mentoring as a way to assist emerging researchers in developing important skills such as critical analysis and integration of research evidence. These skills are of utmost importance in a life of a researcher.

Similarly, the issue of building collaborations with other countries is of importance. This enables the country to place itself on the map and be known, be able to learn new skills from abroad and incorporate them into what is available in the country; it also promotes innovation and enhances diversity. However, Sawyerr (2004) believes in ensuring that local cadres are the ones that make decisions in terms of the important needs within an institution, which policies will work best, and which foreign expertise to utilize for local advancement, instead of allowing other countries to take charge.

Research in itself cannot survive without funding. However, as much as funding is of utmost importance, there are other crucial practices that must take place within institutions. This is expatiated by Sawyerr, (2004, p. 211) in the observation when stating that "…while the adequacy of public funding is crucial, there are a number of concrete programmatic initiatives that could be taken by the Higher Education and research institutions themselves…these include strengthening of graduate study, improvements in the management of research, provision of 'soft landing' for young faculty, identification and concentration on "areas of strengths," and pooling resources with other institutions". This statement means that Research Capacity Development is achieved through collective efforts. The university must organise itself such that there is synergy in terms of Research Capacity Development activities for postgraduate students.

As indicated above, most literature on capacity development is from the field of practice, such as in public health and community development. This is also supported by Merino and Carmenado (2012). There is not much literature which is related to RCD in academic institutions, particularly in South Africa. By recruiting former postgraduates who were registered in the majority of South African universities, this study intends to close that gap in knowledge.

The study will open doors to more inquiry which could lead to a better RCD in South African academic institutions. The view above is made more crucial by Marjanovic *et al.* (2017) who insists that policy makers and funders are also interested in the evaluation of research capacity building programmes… and that there is a need to account for the expenditures of investments, outline successes, providing a platform for learning about success factors and to inform future decision-making. This research project may, further, alert the DHET and the DSI to intensify their focus on research and development.

iv. Challenges concerning the field of Research Capacity Development

As with each field, Research Capacity Development also faces challenges. These challenges are at the individual, organisational (at the university or institute levels) as well as supra-organisational levels . According to the ESSENCE on Health Research (2014), in the past, the lack of established career pathways used to be amongst the challenges of Research Capacity Development, however,

recent years provide an array of opportunities in research and development. Postgraduate students may decide to stay in academia, to work in practice fields and in policy and development. Both the public and private sectors provide opportunities for researchers to make use of their research skills. The challenge is that such opportunities are scarce or they are low-salary opportunities. Another challenge may also be the lack of mentorship of postgraduate students. Below is a discussion of some of the challenges concerning the field of Research Capacity Development.

- **No common framework used to evaluate Research Capacity Development**

  As indicated in several sections above, Research Capacity Development is a new field; as a result, "there is no commonly used framework for evaluating research capacity strengthening …" (ESSENCE on Health Research 2014, p.8).

- **Interventions in Research Capacity Development are broad**

  As mentioned, there are different kinds of Research Capacity Development; these are interconnected. For an example: a challenge at an individual level may require a change at the organizational level as a solution; the same interaction may also take place between the individual and supra-organizational levels. For an example: a postgraduate student may report challenges with the dissemination of data due to the lack of dissemination funding; which is caused by the absence of a policy on postgraduate funding for the dissemination of research results. Due to the broad interventions, staff working on Research Capacity Development must be open-minded to identify where the bottlenecks are and bring better solutions.

- **Research Capacity Development is a long process**

  The process to implement research capacity and be able to measure impact is long, as it involves a mixture of activities to achieve the desired end. For an example, masters students who attend a workshop on how to write a research proposal will have to first implement the skills they learn by developing a sound proposal. The proof that the workshop was helpful will only be realized when the students have passed the proposal module; such a process may take the whole year in some South African institutions. It is also not easy to pinpoint the start and the end of Research Capacity Development as research is a journey involving ongoing learning.

- **Research Capacity Development is defined differently**

  As noted under the definition of Research Capacity Development, many scholars have defined Research Capacity Development differently, based on their experiences and understanding of the concept. This study has also defined it in a different manner. The ministry of Higher Education should come up with a universal definition for Research Capacity Development which will guide universities. In Edwards *et al.* (2016), it was mentioned that a common understanding of what capacity development means would facilitate the design of appropriate research capacity development interventions and the development of tools to measure improvements thereof. The lack of consistent terminology across settings, organisations and individuals presents a challenge in planning, implementing, monitoring and evaluating outcomes of capacity-building interventions across projects.

2. Theoretical framework

As a new discipline, the field of Research Capacity Development also does not have more conceptual frameworks. Some frameworks do not even speak to the field, directly. Since capacity development emanated from the practice field, i.e. health and community development, this research learns from the practice field on to how to better assess Research Capacity Development. Some of the conceptual frameworks which were consulted to aid the understanding of the concept of research capacity strengthening include the following:

- **The World Health Organization (WHO) model**

  This framework "offers a model focused on capacity development ranging from the individual to the supranational" (Sewankambo, Tumwine, Tomson, Obua, Bwanga, Waiswa, Katabira, Akuffo, Persson & Peterson 2015, p. 2). The literature surveyed so far has revealed that not enough information was provided regarding this model. Its name also makes it hard to find as WHO is the custodian for Health worldwide, and may have many models.

- **The Alliance for Health Policy and Systems Research Framework**

  As explained by Sewankambo *et al.* (2015), this framework focuses on the supranational level of capacity development as its main focus is the identification of gaps as well as health systems and policy. I found that this Framework cannot be useful as it does not include the other levels of capacity development.

- **The situated learning theory**

  The situated learning theory may assist in understanding the concept of Research Capacity Development to some extent. However, it cannot assist in its assessment. According to Wenger (1998) in Schulze (2014), the situational learning theory states that there are two concepts that are important, namely: community of practice and legitimate peripheral participation. Community of practice is concerned with the mutual engagement of members, the negotiation of activities and the development of a shared repertoire. My interpretation of this theory is that since universities are made up of different communities of practice (different departments, study disciplines and student teams) each postgraduate student will be involved in the various communities at different levels and that their learning is embedded in their roles in these communities of practice. Research Capacity Development then takes place when the postgraduate students actively participate in these levels. For an example, field trips or laboratory experiments where learners experience the work environment. However, the theory does not take into consideration the fact that funding is also required in order for one to achieve the desired end.

- **The symbolic interactionism (SI) theory**

  In Schulze (2014), this theory states that individuals learn to interpret and attach meaning to the world by interacting with others. It can only be used in understanding the importance of collaborations in Research Capacity Development.

The literature also revealed Cooke's (2005) framework for evaluating research capacity building. This is the framework which is more relevant to the topic at hand. Below is the description of this Framework and how it was used to assess Research Capacity Development in institutions of higher learning in this study.

2.1 Cooke's Framework for evaluating research capacity building

This study is informed by Cooke's Framework for evaluating research capacity building as shown in Figure 1 below. Developed in 2005, the framework was developed to evaluate research capacity building in health care; however, this framework was found applicable for the evaluation of Research Capacity Development in an academic context due to the following reasons:

- It is integrated. That is, it considers various structural levels at which Research Capacity Development may take place, and describes Research Capacity Development as an activity which cannot be achieved in isolation (Cooke 2005). The idea of viewing RCD as integrated and not achieved in isolation is supported by various definitions of RCD as mentioned in explanations above. In a systematic review conducted on research capacity building for allied health workers which used Medline, CINAHL, Embase, AustHealth and Web of Science, Matus, Walker and Mickan (2018, p. 1) suggested that "research capacity building strategies are interlinked and interdependent and should be implemented as part of an integrated 'whole of system' approach, with commitment and support from all levels of leadership and management" This suggestion also supports Cooke's idea that RCD cannot be achieved in isolation.

  In agreement, Edwards *et al.* (2016) highlighted that Cooke's Framework considers the reciprocal effects of RCD and the context in which it is applied, it also considers the importance of policy context whereby socio-political aspects may assist or affects the processes of implementing RCD, lastly, Cooke's framework is future-oriented as it considers the aspect of sustainability and continuity.
- based on the literature review conducted on the phenomenon, there is presently no tool in academia which evaluates Research Capacity Development.

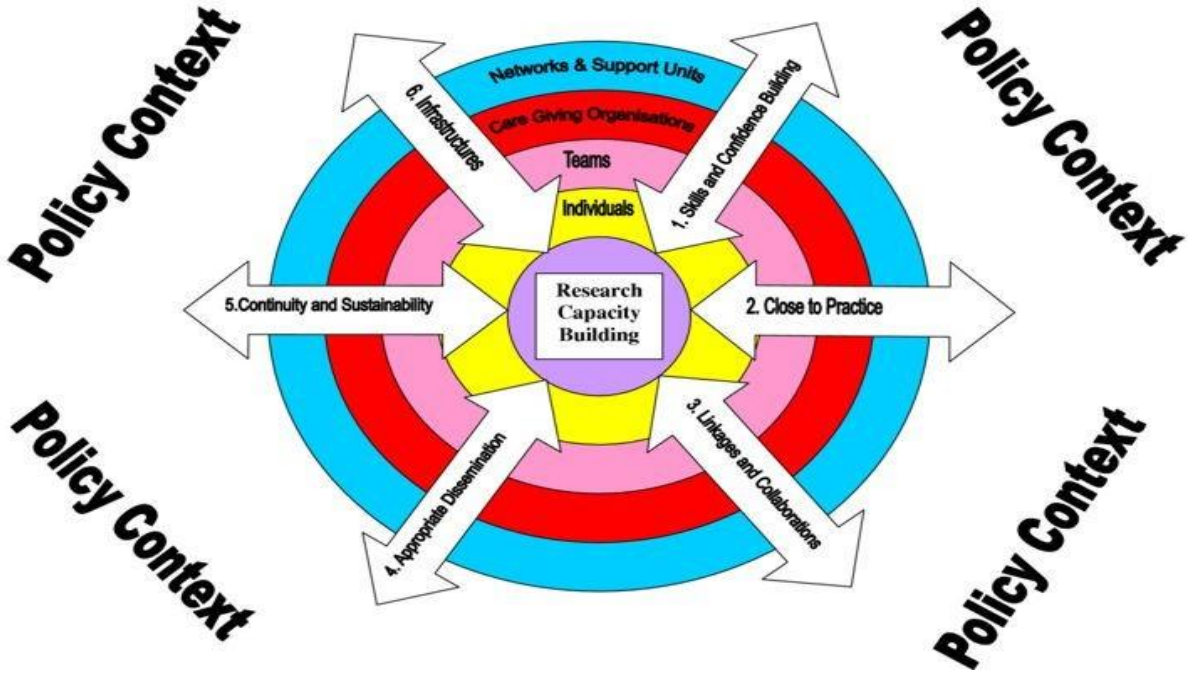


Figure 2: Research Capacity Building: A Framework for Evaluation

Source: Cooke (2005, p. 3)

In evaluating development and plan for change, Cooke suggests a Framework for evaluating RCB that introduces the **six principles of RCB**, which indicate that RCB should:

a. "developing skills and confidence;
b. ensuring that the research is 'close to practice';
c. supporting linkages, partnerships and collaborations;
d. developing appropriate dissemination;
e. investing in infrastructure; and
f. building elements of sustainability and continuity" (Cooke 2015, p. 1).

Cooke further suggests that each of the above principles of RCB should function at an individual, team, organisation and supra-organisational levels (i.e. networks and support units, government level). Since this framework was designed for the health environment, Figure 1 also focused on health. However, for the framework to stay relevant to my study, 'Care giving organisations' were replaced by 'academic organisations'.

In addition to the above, Cooke's framework recognises that RCD takes place in a policy environment, meaning that various policy decisions may have positive or negative impact of the achievement of RCD. For an example: an RCD policy which does not put emphasis on the importance of research infrastructure within a university such as a research laboratory within an academic institution, may have negative impact on RCD as other principles of RCD such as training, creating opportunities to apply skills, and ensuring that there are elements of continuity and sustainability may not be achieved. Policy environment may also refer to the higher level of policy, i.e. at government level.

2.2 Application of the Framework in the study

In order to evaluate RCD, this framework was applied in the following manner:

a. Principle 1: Building skills and confidence

The first principle in Cooke's Framework is that of building skills and confidence through training; and creating opportunities for applying skills learned. According to Van Rensburg, Armstrong and Geyer (2017), building skills and confidence for the research community is achieved through training, mentoring, sharing of knowledge and skills, guidance and practicing acquired skills. The importance of building skills and confidence is also supported by Marjanovic *et al.* (2017, p. 84), who identified "training and empowering individuals to conduct research, strengthening institutional receptiveness such as career development prospects at universities" as one of the 'categories of efforts' in ensuring that RCD is achieved. Manabe, Katabira, Brough, Coutinho, Sewankambo & Merry (2011) also supported the importance of building skills and confidence by asserting that in an Infectious Diseases Institute in Makerere College of Health Sciences, short courses in research methods, lectures and other resources generated more than 40 Masters and PhD projects within the institute. This is a clear indication that when one is skilled, their confidence levels in conducting a task increase, they participate in innovation and become more independent, in turn, they may be able to teach others.

In applying Principle 1 of Cooke's (2005) Framework to evaluate RCD, this study asked former postgraduate students if they had been trained on research and supporting skills such as thesis or manuscript writing, communication, etc. The study also explored other opportunities that build skills and confidence such as mentoring, guidance and platforms whereby postgraduates can practice the skills that they have acquired. Principle 1 was applied at individual, team and organisation levels only.

- At an **individual level:** research questions addressed the following: Skills developed and how, information on progressive skill development (how long it took, practical work done etc.)
- **Team level**: the study focused on whether or not there have been an exposure of groups of postgraduates to be part of a team that conducts research, or that enables them to apply existing skills; or work with other professional groups in research.
- **Organisation level**: this study asked questions related to the availability and use of research training funds.
- S**upra-organisational level**: this study asked questions that will address aspects of research learning packages, for an example, if in their undergraduate studies, research methodology was included in their studies to prepare them for the research world.

b. Principle 2: Ensuring that the research is 'close to practice

It is crucial to ensure that research conducted will enhance current practices in order to improve lives or the standard of living. In principle 2, Cooke states that conducting research which is 'close to practice' helps to generate knowledge which is useful to the client (i.e. communities) and existing concerns regarding current practices. Therefore, useful research may have immediate outputs in terms of its relevance to policy concerns, it also enhances critical thinking which is crucial in decision-making within an institution. Van Rensburg *et al.* (2017) support the idea of ensuring that research is 'close to practice' because this stimulates the research culture, as evidence must address fundamental issues related to a particular field. However, it must be argued that the issue of ensuring that research is 'close to practice' can be made possible when postgraduates have skills to adequately respond to the country's issues and problems. This argument is also supported

by Airhihenbuwa *et al.* (2011). Singh (2011) and Tijssen & Kraemer-Mbula (2018) in Lee & Kuzhabekova (2019) have shared almost a similar view by emphasizing the importance of research that addresses local challenges so that it stays relevant and local communities stand to benefit.

For this study, principle 2 was applied by establishing whether or not previously registered postgraduate students were given permission to conduct research that is 'close to practice'.

- At an **individual and team levels**- the study wanted to establish if the practice of research conducted by postgraduate students was improving lives of communities or if it intended to improve lives.
- At an **organisational level**-the study inquired on the previously registered postgraduate students' perceptions about the issue of research culture in universities in order to understand if research was valued and promoted. According to Lee & Kuzhabekova (2019), the end goal for research capacity building is to ensure that a culture that embraces and inspires research is developed and maintained.
- At a **supra-organisational level**-this study inquired on former postgraduates whether or not there were networks and support units aimed at ensuring that they conduct research in a resourceful environment, e.g. if they were able to ask for certain resources and were able to receive them. This may also include the need for academic exchange opportunities.

c. Principle 3: Support linkages, partnerships and collaborations

In South Africa and most African cultures, there is a common saying that says 'I am, because you are'. This notion encourages the spirit of partnerships and collaborations; these elements encourage people to learn from each other and improve lives by addressing challenges or problems. In Matus et al, (2018) the issue of working together was also emphasized; and it was mentioned that it can be achieved through the formation of strategic collaborations and partnerships, networking with various structures such as universities and various industries and by also having a shared drive in research. In agreement, Cooke (2005, p. 6) explains building partnerships and collaborations as "the mechanism by which research skills, and practice knowledge is exchanged, developed and

enhanced, and research activity conducted to address complex…problems". This principle was implemented at the:

- **individual level**-this study asked previously registered postgraduate students whom they worked with, the knowledge they gained and shared during their studies.
- **team level**-the study asked former postgraduate students if they worked with other research teams, and the networks they have developed. This question also addressed this principle at an **organisational level** as their answers could be relevant in addressing questions related to links with other universities or institutions, memberships to networks, work with funding bodies such as the National Research Foundation (NRF), South African Medical Research Council (MRC) etc. Participants had an option to add more opportunities they were exposed to.
- **supra-organisational level**-the study did not address Principle 3 at this level as it focused on the development of international links, links across networks, collaborations with other academics, teams etc., including joint posts that have been hosted by the institutions. University management should answer such questions.

d. Principle 4: Development of appropriate dissemination

In order to make more impact, RCD must promote dissemination of research to peer reviewed publications, through presentations in conferences and other platforms such as local symposiums, seminars, research days etc. If I were a participant for a study, I would appreciate feedback on that study, it is a fair practice to provide feedback to research participants and communities. That way a researcher does not appear as 'using' the participants for own gains.

- At **individual and team levels**-the study asked previously registered postgraduate students how they have contributed to research dissemination, whether or not they participated in other platforms created by universities, in which dissemination of research takes place.
- At an **organisational level**-the study achieved principle 4 by establishing whether or not previously registered postgraduate students knew of any research dissemination strategy or policy, if institutions created research platforms for research dissemination such as ease of access to research undertaken locally, seminar programmes etc. It was useful to learn if the

universities had funding to support previously registered postgraduate students in disseminating research findings, including support offered to postgraduates with regards to the protection of intellectual property.

- At a **supra-organisational level**-this research did not apply principle 4 at this level as it is not relevant to them. University management would have been the correct target group for questions at this level as they would have focused on establishing if universities had networks and support units for research and development which assist previously registered postgraduate students in research dissemination.

e. Principle 5: Investment in infrastructure

Principle 5 is about universities' plans or strategy to advance research capacity for postgraduate students. According to Cooke (2005), it includes structures and processes that have been established to ensure that research projects run effectively. In Manabe *et al.* (2011), the issue of infrastructure was also indicated as crucial for quality research, for an example, they mentioned that in order to produce doctoral students who can conduct research independently, there is a need for programmes that are well-funded in a sturdy environment with suitable infrastructure.

Investment in infrastructure also extends to support with skills development such as project management skills which can assist researchers to move projects forward and be accountable, building of laboratories and other infrastructure that makes postgraduate research possible, information provided to students regarding calls for funding that are open, support for research staff with skills that can aid research teaching, and ensuring that the university has "research management expertise" (Cooke 2005, p. 8).

- At an **individual and team levels**-the study focused on projects that postgraduates have been involved in, mentorship and supervising structures and methods, completion of postgraduate studies on regulation time, and other resources provided to assist postgraduates in their research, including issues pertaining to the protection of intellectual property.

- At an **organisational level**-this research was not able to collect data as this level is interested in research dissemination strategies, availability and use of backfill to support RCD. Universities can answer such questions.
- At a **supra-organisational level**-the study focused on collaborations such as authorship and co-authorship and information exchange events. Previously registered students were asked how the university handled such concepts.

f. Principle 6: Building elements of sustainability and continuity

Principle 6 speaks to ensuring that there is continuity and sustainability of research. According to Cooke (2005), measuring this aspect may involve a focus on enabling opportunities to develop skills and experience, as well as career acceleration. To achieve an element of sustainability and continuity, Van Rensburg (2017) mentioned that there must be strong mentor-mentee relationships whereby established researchers support and work alongside emerging researchers; this is also referred to skills transfer and can help universities in succession planning.

- At **individual and team levels**-this study established if previously registered postgraduates have had access to funding for continued application of skills such as grants and fellowships, continued professional relationships with collaborators and linkages, and if they are trained to become knowledgeable in the research field and also with other skills such as presentation skills, soft skills such as communication and interpersonal skills which may help them to further create own networks and collaborations.
- At an **organisational level**-the study could not address this level as it is interested in finding out if Universities have had secondment of funding opportunities that enhance RCD.
- At a **supra-organisational level**-this study gathered data on collaborations, linked support with career pathways for previously registered postgraduate students.

The study used Cooke's (2005) Framework for evaluating RCB with the view that RCB interventions can focus on the 4 levels, namely: individual, team, organisational and supra-organisational levels. However, for a successful RCD to be achieved, development must have

occurred at more than one level. According to Cooke (2005), there is also a possibility of different levels of RCD to interact. For example, the research culture at universities may be enhanced by research workshops undertaken each year, that may in turn result in increased research outputs which lead to high levels of research dissemination and future collaborations and linkages with other institutions, locally and abroad. Although this study focuses on previously registered postgraduate students, it does not disregard the important roles played by academic staff, the research office, school/college Deans and Heads of Departments.

3. Chapter summary

Capacity development in general is a relatively new field which originated from the practice field. Research Capacity Development (RCD) originated from the field of capacity development and it has recently become the buzzword in academic institutions. There are three main types of Research Capacity Development; namely, the individual, organizational as well as supra-organizational. Various activities form part of RCD in Africa. As is with other fields, Research Capacity Development also faces challenges, these are at each level of RCD; namely, at the individual, organisational (at the university or institute levels) as well as supra-organisational levels (in policy development at a national level).As a new discipline, Research Capacity Development does not have conceptual frameworks or theories which guide the field. This study used Cooke's (2005) Framework for evaluating RCB with the view that RCB interventions can focus on the four levels; namely: individual, team, organisational and supra-organisational levels.

CHAPTER THREE: RESEARCH DESIGN, METHODOLOGY, AND PROCEDURES

1. Introduction

In chapter one, a brief discussion of the research methodology for this study was done. This Chapter discusses detailed steps which were taken in order to have data for this research. It is important to remember that this study was conducted during COVID-19. The COVID-19 regulations were changed all the time depending on the level of COVID-19 the country was in. Based on a subjective understanding of the COVID-19, levels varied from one (1) to five (5); where level one meant that the country was managing the pandemic better, and consequently, the infections were low and that the hospitals were coping well under the circumstances; level five meant that the country was in a crisis and not managing well as the infections were rising in every twenty-four-hour period; this means there were more deaths due to the pandemic and that hospitals and health care workers were under severe pressure.

In the above section, mentioned was made of the fact that "based on a subjective understanding" of COVID-19 since the pandemic triggered a lot of misperception and there were so many myths in the community and the world at large; societies implemented the COVID-19 regulations based on how well they understood them, and I was no exception. The understanding of this pandemic is a topic for another day; however, it is imperative to highlight that the research methodology for this study also had to consider the pandemic as well as the objectives of the study; other research activities were also carried out during the pandemic, and therefore, the researcher, in this study, had to consider the COVID-19 regulations.

The most important regulation for the pandemic was that of limiting contact with other people; therefore, the entire methodology had to ensure that the researcher does not meet research participants to avoid the spread of the Corona virus. This was not favourable as I was initially planning to conduct a mixed-method study which included in-depth interviews. Although these can be conducted via a telephone, it is important to note that in-depth interviews are generally long

as they require the researcher to probe. The main idea was to gain a deeper understanding of the phenomenon under study. These interviews are best conducted in person which offers the researcher an opportunity to note the facial expressions and other gestures of the participant which can aid more meaning in the subject matter.

Since the country was in a state of emergency, the investigator was also not sure if she would find a bursary to further her studies, as government needed extra funds to manage the pandemic. This implied that the budget had to be limited and confined to a method that could be cheaper and yet reliable and productive. Due to the pandemic and the new technologies that have emerged, A decision was made to take advantage of that and make use of electronic data collection methods to support the research methodology. However, the costs associated with data used by both the researcher as well as research participants were high. The next sections explain, in detail, how as the researcher managed to conduct this research during COVID-19. It will also demonstrate the kind of challenges one faced in certain research procedures such as data collection and strategies used to mitigate such challenges.

2. Literature Searches

Most research literature for this study was collected prior to 2019. Secondary sources such as: books, book chapters, journal articles, Framework documents, and presentations were used. Literature was sourced from various platforms including the NRF repository, UNISA Library, Google scholar, and Sefako Makgatho Health Sciences University library. The researcher relied more on electronic sources than printed ones. At first (2018-2019) in efforts to save the environment by learning how to rely on electronic materials; in 2020, relying on electronic sources became obligatory as limiting contact became a norm to avoid being infected with the COVID-19. One had to rely more on materials which were freely accessible on Open Access.

During literature review, I learned that the Higher Education field did not have more literature like the other fields such as psychology, health etc. This finding proved that this study contributes to the body of knowledge in Higher Education. Substantiating this is the observation below:

> *What emerges then is an active, confused field, lacking many of the attributes of a discipline, yet demanding more disciplined effort. Its future is obscure; but if the present lines of development are strengthened and if the many perplexities are resolved, it may join the band of established specialities such as history, sociology and medicine, which once were in similar limbo" (Blitzer and Wilkinson 2009, p. 373).*

With that ideology, it was also worth finding out some of the reasons why there is a dearth of Research Capacity Development in Higher Education literature. One of the reasons is that in the past, research was not listed as one of the themes in Higher Education. The following figure illustrates the list of Higher Education themes according to Tight (2003) in Blitzer and Wilkinson (2009); numbers 9 and 10 were his suggestions that they should be added in the list of themes. Research Capacity Development in Higher Education is not in any of those themes.

Table 2: A South African extension of Tight's (2003) classification of themes in HE studies and research (Suggested additions in italics)

1.	Teaching and learning
2.	Course/curriculum design
3.	Student experience
4.	Quality (or ICTs?)
5.	System policy
6.	Institutional management
7.	Academic work
8.	Knowledge
9.	*HE transformation in South Africa*
10.	*HE and socio-cultural links/relationships/responsibilities*

Source: Blitzer and Wilkinson (2009, p. 394)

Due to the nature of the topic and having realised that Research Capacity Development seems to have little literature, one used a general literature review which according to Onwuegbuzie and Frels (2016) focuses on providing a review of the most crucial and critical features of the current knowledge and the research topic. The choice of this method was influenced by the need to find any content related to Research Capacity Development. Most of literature was found in the practice field; it is in the health discipline that capacity building has been addressed in depth. There is some literature which focused only on activities of Research Capacity Development, for an example: some articles only addressed postgraduate funding in Higher Education. In fact, one could not find any material titled 'Research Capacity Development in postgraduate studies or with a title that is closer to this study title. Again, this highlights the need for this study in Higher Education.

3. Research design

As indicated in Chapter one, this investigation was a case study focusing on former postgraduate students at the honours, masters and doctoral levels in South African public universities. According to Auriacombe and Mouton (2007), it focused on investigating specific phenomenon holistically by paying attention to a single or few cases [former honours, masters and doctoral students in public universities] rather than on many variables. The aim for this study was to assess Research Capacity Development in postgraduate studies in South African public institutions of higher learning. The following were the reasons a case study was chosen in the instance of former postgraduate students:

1. Postgraduate students form the basis for research in institutions of higher learning

These days and as Luruli (2014) contends, universities are focusing more on research than on teaching; this also forces academics to adapt to this change if they would like to remain in academia. Academics therefore need to build a good research profile which may include experience in postgraduate teaching and research supervision, research grants applied for and

awards received, number of publications, whether or not they have been rated by the NRF. Although postgraduate students need to start as undergraduate students, they should become a focus in Higher Education, as compared to undergraduate students. This is because they are the next generation of researchers.

In my career, I learned that there are different kinds of researchers in higher education, namely: Next Generation of Researchers, Emerging Researchers and Established Researchers. According to Mouton, Botha, Boshoff, Prozesky, Swart, Treptow, Redelinghuys, Ford, Van Niekerk, and Visagie (2018), the Next Generation of Researchers are the honours, masters and doctoral students who are mostly referred to as postgraduate students as they are still being trained to become active in research, innovation and scholarship. They are also not yet employed as academics or researchers in knowledge-based organisations or institutions; however, they are being trained to become active researchers. Emerging Researchers are defined as those researchers who are younger than 40 years of age; they are employed as academics or researchers in knowledge-based institutions; they either have not obtained their doctoral degrees and or have not established themselves as active researchers. Established researchers, on the other hand, are independent researchers with the track record of an active researcher, they produce more research outputs and are instrumental in the training of young researchers.

All these researchers require Research Capacity Development; their needs differ at each category. For instance, an established researcher may need more specialised research equipment; whereas the postdoctoral fellow needs workshops on postgraduate supervision. What should be noted is that both emerging and established researchers have to start as next generation of researchers from the honours level; thus, postgraduate students form the basis for research and an important case to focus on. Knowledge of research methodology coupled with Research Capacity Development initiatives and funding opportunities may form a great foundation for postgraduate students, thus the resolution to focus on postgraduate students as 'the case'.

2. The importance of quality versus quantity

In research, one learned that quality surpasses quantity. In quantitative research too, the standard of quality in the conducting of research must be maintained. As with the definition of a 'case', it enables a researcher to focus on 'specific' phenomenon and not be 'all over'. This helps a researcher to have enough time to bring a holistic view and understanding of specific phenomenon. In this case, the aim of the research was to ensure that one focuses on one group of researchers so as to bring a clear picture and quality research.

3. Time limitations

If selected cases were too many, the study would have taken too long. The regulation time for a masters degree is two years; although some universities do allow a final third year; UNISA is one such example.

4. Methodology

Although connected, there is a difference between methodology and methods; these two terms may make or break a research project. Morse (2016) defined methodology as a cautious process, with well-developed rules of Investigation .If the methodology chosen for the study is not going to be effective in answering research objectives, the methods chosen for the study will follow suite. According to Crotty (1998) in Scotland (2012), methodology is a plan of action behind the choice of effective research methods and approaches to arrive at the objectives of the research; and research methods on the other hand are the tools a researcher uses to collect and analyse data. Therefore, it goes without saying that research methodology is the first step when planning a research project as it is the rationale behind the research approach.

It is also important to highlight that "the type of research methodology the researcher chooses is determined by the research philosophy [research paradigm] which the researcher adheres to and this choice determines the research objectives and the research instruments developed and used…" (Khaldi 2017, p.16). According to Perera (2018), a research paradigm is a set of common beliefs and agreements shared between scientists on how problems should be understood and solved. There are different paradigms which include positivism, interpretivism, critical theory and many others.

Having said that, this study is based on critical theory or critical methodology as a research paradigm. According to Rehman and Alharthi (2016), critical methods are used in both qualitative and quantitative enquiries. This method aims to bring about change in the outlook of social systems in order to ensure that intellectual and social needs are met; it engages research participants in a dialogue with the aim to bring about change. It is also believed that critical theory "possesses more comprehensive means to understand social reality and diagnose social pathologies" (Thompson 2018, p.1). This study focused on this role of critical theory as it was assessing Research Capacity Development in postgraduate studies in order to bring about an understanding of what has been taking place in institutions of higher learning as well as a possible way forward, if data suggests.

The methodology of this study was quantitative in nature; Creswell (2014) explained quantitative research as an inquiry in which numerical data is collected to explain phenomena; data collected was analysed using mathematical methods, statistics in particular. The study could have been qualitative or a mixed method to bring deeper understanding. However, I chose a quantitative design because my study was an assessment, it required a lot of questions to be asked in order to bring a holistic picture. If conducted in qualitative enquiry or mixed methods, it would have needed more time so that participants can be probed. That may have had budget implications as well as time constraints. With the quantitative design, the possibilities of completing the study on regulation time were higher and one was able to minimise the costs; most importantly, I was able to include all relevant questions in order to reach the aim and objectives of the study.

It is important to also highlight that few questions asked in this research were able to capture some element of qualitative responses; since this study was based on critical theory or methodology which aims to bring about system change, this was implemented in order to seek clarity on certain themes or to gain an understanding which could assist in the way forward. For an example: in section 2.2, participants were asked if their institutions implemented RCD, if participants answered no, they were first asked why they thought their institutions had not practiced Research Capacity Development. This kind of approach was implemented for participants to have an opinion of their own, which could bring change in institutions that have not paid much attention to RCD. It is also not an eccentric idea to have an element of another methodology in research as it was mentioned that:

> *"This partly explains why some qualitative data analysis software programs such as Atlas/it easily interface with SPSS©, a statistical package. It is unhelpful and unproductive to view data analysis in the two research traditions [Qualitative and quantitative] as mutually exclusive" (Ngulube 2015, p. 2).*

5. Study setting

This study collected data in South Africa because it is the researcher's country of origin; This choice was advised by the need to contribute to the development of one's own country first. As indicated in chapter one, South Africa has 26 universities; all of which offer postgraduate studies. I chose to collect data from former postgraduate students at the honours, masters and doctoral levels in all universities of South Africa merely because Research Capacity Development is a topic which affects all institutions; and since there is not much content on Research Capacity Development in the South African Higher Education, it was important to collect data from all institutions obtain a topographical view of what is currently taking place.

6. Study participants/sampling

The study applied a probability sampling technique called the simple random sampling Onwuegbuzie and Collins (2007, p. 285) explained that "every individual in the sampling frame [i.e., desired population] has an equal and independent chance of being chosen for the study"). This study was targeted at previously registered postgraduate students of any nationality, race, colour and gender. This is because issues of Research Capacity Development are relevant to all postgraduate students regardless of their demographic information.

However, this study excluded postgraduate students who were registered for postgraduate diplomas and focused on traditional postgraduate degrees which have a component of a research project. According to the National Research Foundation (2018, p. 4), "a Postgraduate Diploma (NQF Level 8) is generally multi- or interdisciplinary in nature but may serve to strengthen and deepen the student's knowledge in a particular discipline or profession. The primary purpose of the qualification is to enable working professionals to undertake advanced reflection and development by means of a systematic survey of current thinking, practice and research methods in an area of specialisation. A sustained research project is not required, but the qualification may include conducting and reporting research under supervision It is only the five universities of technology which currently do not offer the traditional honours degrees, namely: TUT, MUT, CUT, DUT, and CPUT; instead, they offer Postgraduate Diplomas which are at NQF 8, just as the honours degrees; as explained, the main difference is the content of these degrees.

In order to collect recent data which may be relevant in developing implementation policies around RCD in this study, previously registered postgraduate students who had been registered and had studied at a South African public university in the past 10 years between 2010 and 2020 were targeted. Although five years is the highest regulation time for completing a doctoral degree, this study also considered the reality that some postgraduates were working and had started families, which may slow down completion time. At times, some students may study for the 6th, 7th or even 8th year etc. at a university due to various reasons.

The study recruited 73 (*n*=73) former postgraduate students and requested them to complete survey questionnaires. This number assisted in ensuring representativity for the majority of public universities in South Africa. Each study level was represented at each university. For each university, the researcher first aimed at recruiting three previously registered postgraduate students (*n*=3x24), however, at the masters level, 25 (n=25) was recruited instead. The sample size has been developed with the presupposition that the two newest public universities (SPU and UMP) may not have produced any or more postgraduate students. Had respondents from SPU and UMP been recruited, the sample was going to increase to 78 (*n*=3x26). In order to make up for the five universities of technology which do not offer honours degrees, I recruited five more honours participants from five various universities. These five institutions were randomly selected. Table 1 of this study indicates the study population for this research.

7. Recruitment of participants

Since the aim for my study was to target three participants per each study level, the recruitment strategy for this research was to recruit one postgraduate student per institution, then ask them to identify two more former postgraduates from the other study levels in the same university. For an example, if I recruit a former doctoral student at DUT, I would then ask the doctoral participant to refer me to those who also studied at DUT for an honours and masters degrees between 2010 and 2020.

All research participants were over 18 years of age; this is because, in South Africa, an individual who is not yet 18 years-old is considered a child. Ethically, and as mentioned in Ferdousi (2015) the researcher must then ask for permission from their parent(s) or guardian (s) if I were to include them in the study. Such a process would take longer and could be cumbersome as it might require extra paperwork such as a signature from the parent or guardian. In a nutshell, the following was the inclusion and exclusion criteria for this research:

Table 3: Inclusion and exclusion criteria for research participants

Inclusion Criteria	**Exclusion Criteria**
Must be 18 years and older	Participants younger than 18 years of age,
Previously registered postgraduate students at the honours, masters and doctoral levels,	Previously registered postgraduate students in postgraduate diplomas,
Must have registered and studied at the public university of South Africa for at least 12 months,	Previously registered postgraduate students in private universities and other institutions of higher learning,
Participants must have registered for the degree between the years 2010 and 2020,	Previously registered postgraduate students who registered for their studies before the years 2010 and after 2020,
Participants must have been exposed to some research element of their studies (e.g. developing a research proposal)	Participants whose postgraduate studies did not have a research component, i.e. coursework
Participants who are willing to sign a consent form by ticking a 'yes' before completion of the survey questionnaire.	Participants not willing to sign a consent form by ticking a "yes" before completion of the survey questionnaire.

It should be noted that recruitment of study participants was not easy. This research was carried out without research assistant (s), to assist with recruitment or data collection; this helped in cutting costs and gave the researcher an opportunity to have first-hand experience of all research activities. Recruitment began soon after obtaining ethical approval. Although some participants did not have problems with this study and were willing to participate, one nevertheless faced some challenges

in recruitment. The following were the challenges the researcher faced and mitigation strategies which were implemented:

i. Participants promising to complete the survey, but never completed them for reasons unknown to the researcher; this happened in about 3% of all participants. They were followed up with reminders, however, some still did not complete questionnaires. A decision was made not to remind a participant more than twice. This was done to avoid making them to feel coerced into the study. Those who were reminded for the second time were given two weeks to complete a questionnaire. If they did not do so in two weeks, they would be replaced by recruiting another participant at their level of study.

ii. Since this was a referral recruitment, the participants had to be asked to refer other participants at other levels, e.g. if the first identified participant were a PhD participant at UP, he/she would be asked to identify other former postgraduate students at the honours and masters levels at UP. However, one learned that this was a bit hard as the levels were different. Interestingly, one also learned that it was easier for a former PhD student to identify other former PhD students from another institution.

In the end, research participants were permitted to recruit any former postgraduate students at any level and university, but adhering to the inclusion and exclusion criteria. However, prior to the participant taking a survey, referring participants had to confirm with me as the researcher that such a participant studied at e.g. UP and they were doing a masters degree. It was in that way that I kept track of my sample. This was difficult, though it translated into a learning curve.

What made the exercise difficult was the fact that the questionnaire did not include the name of the university, for if it did, there would have been no need to manually ask which universities participants were registered with. However, a decision was made to leave that question deliberately as the email addresses of the participants were collected. There was a choice to limit personal identifiers of the participants so they could feel free that although their email addresses were collected, their responses were not associated with a certain institution.

Keeping track of who was being recruited was cautiously observed with the view to ensure proper representation per institution, i.e. 1 honour, 1 masters, and 1 doctoral student per institution. Also, caution was exercised to avoid ending up with up with too many responses which were unknown to the investigator. The researcher needed email addresses for two reasons: 1. It is through email addresses that one could identify if a participant responded more than once to a questionnaire; 2. The researcher also needed to be able to contact research participants so that she could send them reimbursement vouchers and later, feedback regarding the study.

iii. Towards the end of data collection, the research was left with gaps arising from non-participation by certain institutions. For an example, one honours and one PhD students were found, but could not find any referral for a masters level. To solve this problem, I made use of LinkedIn. Linked-in is a professional Application website or application where professionals connect. It is also a great platform for professionals to profile themselves well to attract employment recruiters or to network; and also, to be recognized for your qualifications or great work. In LinkedIn, one is able to see which qualifications a certain individual has and to connect and chat with that individual. This strategy was used to complete recruitment.

iv. Another challenge was that due to COVID-19, people are living in busier times whereby they have to alter various roles during a 24-hour day. For instance, some former postgraduate students have children who require home schooling, they have full-time jobs, and are also furthering their own studies. As much as they may want to complete the survey, it does not become a priority due to the many roles that they need to juggle in a day; one would come across some participants who indicated that they were too busy; and

v. other participants assumed that the survey will take too long to complete; however, they were assured that it usually takes about seven minutes.

Surprisingly, no participant mentioned data challenges while completing the questionnaire.

8. Data collection methods and instruments

In any study design, various methods are used to collect data. In order to meet the objectives of this research, I chose to use a survey questionnaire as it stood out to be the most appropriate method of data collection. Due to COVID-19, an online survey questionnaire was chosen. This choice was guided by the fact that it is an exceptionally convenient tool as one would not have to be in physical proximity with the research participants. Also, one did not need to probe participants for more information or to influence their responses in any way; it is also a cheaper and faster way to collect data. Apart from that, it is a great opportunity to be able to learn how to utilise available technology which is there to advance lives.

The survey questionnaire was developed on google form. This form made it possible to type in all questions and be able to add the answer options, once completed and ready to be sent to participants, the researcher can generate a link, which participants will use to access the survey. After developing the tool, it was tested seven times prior to testing it for validity and reliability as indicated in the section below. On completion, the tool was sent to the supervisor who also tested the tool, made input and gave a go-ahead that it could be sent to potential participants. Note well, it is not a requirement to test the tool seven times, seven times is how long it took me to perfect the tool. When participants had shown interest, a link which contained the information leaflet and a consent form for the study was sent to them. When participants read the information leaflet and agreed to participate in the study, they ticked a "yes" box to continue with the completion of the survey questionnaire. When they did not wish to participate in the study, they ticked a "no" box and discontinued completion of the survey.

The questionnaire used during the study was long. This is because the study is an assessment; and therefore, it had to include as much content as possible, in order to ensure that a more holistic view of our universities on the subject matter is achieved. According to the Oxford dictionary, the word 'assessment' means "to make a judgement about the nature or quality of somebody/something". Therefore, for one to make such judgement, there was a need to collect as much information as

possible and to ensure that the most important topics in Research Capacity Development are covered, e.g. postgraduate supervision, research funding. This was also guided by the theoretical framework used for this study, i.e. Cooke's (2005) Framework for evaluating research capacity building. Although the questionnaire was long, one could still spend an average of seven minutes or less to complete it. It took ten weeks to complete data collection.

9. Rigor for the study

As indicated above, the testing of the data collection tool was done prior to sending it to the Supervisor for final comments. The purpose for that was to establish rigour for the study. According to Heale and Twycross (2015) rigour is about the meticulousness of the researcher in ensuring quality of the study, and this is achieved by measuring the validity and reliability of the study. According to them, validity is when a questionnaire covers all content accurately and reliability is when an instrument repeatedly shows same results if administered in the same situation. For an example: if I set an alarm so that it rings daily at 08 pm and the alarm rings at 08:30 instead, it means that the alarm is reliable as it can ring daily but it is not valid as it was set to ring at 08:00. In referring to this study, my questions had to be about Research Capacity Development in postgraduate students if they were to be valid; and if my research participants would respond similarly to the questionnaire if they were to complete it twice or many times, my study would then be reliable.

To ensure that the survey questionnaire covered all content accurately (validity), I conducted the survey questionnaire with two of my colleagues who understand what Research Capacity Development is about so that they provide their opinion on whether the survey questionnaire measured the concept it is intended, and if I was going to be able to draw inferences about test scores related to the concept that I am studying. I also administered the tool to two postgraduate students in order to measure if they would have difficulty in answering certain questions and their overall experience with the questionnaire.

In ensuring reliability (internal consistency) of my survey tool, I made sure that my test was stable by using Test-retest reliability. According to Heale and Twycross (2015, p. 66), "This is assessed when an instrument is given to the same participants more than once under similar circumstances". I achieved this by asking the same postgraduate students to complete the questionnaire again and compared their responses. I also ensured Equivalence by giving it to two of my colleagues to rate the relevancy of each item on the survey, consistency in their scores measured what Heale and Twycross (2015) call inter-rater reliability.

10. Data analysis

Data collected in this study was in quantitative nature. An advantage of using a google form is that data collected can be populated into an Excel spreadsheet; the form is also able to organise data into tables and graphs. In a spreadsheet, data could be cleaned by checking if there were incomplete forms; duplicates could also be removed. After data cleaning, a statistician's aid was acquired to assist with coding and analysis processes. Once data analysis was complete, it was presented and analysed in chapter four, and was interpreted and discussed in chapter five.

11. Ethical considerations

In terms of ethical considerations, it is worth mentioning that crucial in studies involving humans and animals is an ethical approval by ethics committees; in this manner, research subjects or participants spared from any form of harm. This study targeted humans as research participants, therefore, one applied for ethical approval from the Departmental Higher Degrees Committee for ethical clearance at the University of South Africa. Appendix 1 A contains the ethical clearance certificate for this study.

In the beginning of this study, the study's interests were to focus on one distance learning institution, i.e. UNISA. Since the study needed contact details for participants, a request was submitted to the Research Permission Sub-committee of the Senate, University of South Africa.

Permission in Appendix 2 was granted to collect data from the former postgraduates at UNISA. Later on, the study changed the scope and focused on getting a broader view of all universities, the recruitment strategy changed too and therefore, the permission was no longer required.

Apart from the requirements above, care was taken to ensure that research participants were treated with respect and dignity by making use of the Informed Consent Participation leaflet and Informed Consent Form. The leaflet was presented in the first page of the online survey for participants to read and understand what the study entailed and what was expected of them as research participants, in other words, the information leaflet contained all crucial information pertaining to the study. After participants were provided with information regarding the study, they were also offered an opportunity to ask questions before they agree or disagree to participate in the study. Since an online survey was used to gather data, all participants were provided with contact details which they could use in cases where they had questions related to the study. The contact details were for myself as a researcher and my Supervisor. Furthermore, study participants had to decide if they wanted to participate in the study or not. If they agreed, they ticked a 'yes' in the consent form and if they did not agree, they ticked a 'no' in the consent form.

Data collected has since then been kept safe and confidential to the best of my ability, all electronic files are encrypted. Participant numbers were assigned to all participants in order to protect their identity, e.g. masters students codes are M001 up until M025. The names of the Universities were not used in the research report; instead, Universities were assigned pseudonyms, (e.g. U001). No adverse events were reported during recruitment and data collection. All participants who provided valid email addresses will receive feedback for this study once the thesis has been accepted and assessed.

12. Chapter Summary

In this chapter, it was explained how the research approach, methodology and methods for this study were decided on and which ones were used. Decision on which methodology to use was

guided by the research paradigm, i.e. critical theory, as well as the objectives of the research. This study was quantitative in nature; a survey questionnaire was administered online to collect data. Simple random sampling was used to select research participants. Any former postgraduate student at the honours, masters and doctoral levels had an equal chance to take part in the study. Former honours, masters and doctoral postgraduate students from various public universities in South Africa were recruited using the referral method; this is where a researcher recruits the first line of participants and thereafter ask those who have participated in the study to recruit other participants. Although recruitment was slow, data collection was completed in ten weeks. Ethical standards were maintained during the study, no adverse events were reported during recruitment and data collection. Where necessary, a statistician was consulted to assist with data analysis.

CHAPTER FOUR: PRESENTATION OF STUDY FINDINGS AND ANALYSIS

1. Introduction

The main aim of this chapter is to present study results as is, and providing an analysis of these results. An analysis serves as the breakdown of data into meaningful segments. Since this study aimed at learning from the former postgraduate students, this chapter therefore will have little to no inputs from other literature, it therefore serves as the 'voice' of research participants. Chapter 5 will then bring an interpretation and discussion of data; furthermore, the Chapter will also explain how the data presented and analysed relates to study objectives.

As indicated in Chapter three, data collection for this study was not easy due to various challenges including COVID-19. However, it took ten weeks to collect all data in this research. It had been expected that it would be concluded in six weeks. This presupposition was based on the fact that due to the nature of my recruitment strategy (the referral method), it would be easy for participants to refer each other. Although the referral took place, it did not mean that all referred participants were going to be interested to participate in the study. It is important to highlight that only participants who agreed to participate in the study in their own freewill completed survey questionnaires. No adverse events were reported during data collection.

The survey questionnaire had sixty-one questions which were to be answered by all former postgraduate students. The questions were not uniformly structured; for example, in the Likert style, questions may ask all participants to tick if they agree, disagree, strongly agree and strongly disagree. In the survey questionnaire, questions varied depending on content that needed to be covered in the assessment of Research Capacity Development. The aim of the questionnaire was to capture what truly transpired during participants' studies, therefore, the questions were designed for them to reflect in their postgraduate journey, to some extent.

Various kinds of questions were asked in the questionnaire. Some questions depended on participant's responses on previous questions. Some of the questions required participants to just click on the correct answer, some required them to enter one word answers, others required one to two sentences. Although this was a quantitative research, one could still quantify these kinds of responses in the report as they would first be coded. Each question was crucial in closing the knowledge gap, assisting in answering research objectives and in the implementation of the theoretical framework of the study. In this chapter, we report the findings for this research as per participants' responses to each question. Data interpretation, discussion and recommendations are not included in this chapter. In a nutshell, this chapter only presents data collected and breaks it down to aid understanding.

The study was a quantitative design with sixty-one questions in the survey questionnaire. The sample for the study comprised of twenty-four (n=24) former honours students, twenty-five (n=25) former masters students, and twenty-four (n=24) former doctoral students who were registered at different public higher education institutions. The main objective of the study was to assess Research Capacity Development in postgraduate studies in South African institutions of higher learning. In order for the study to achieve the main objective, the following were its subsidiary objectives:

a. An exploration of the South African Research Capacity Development for postgraduate studies at the honours, masters and doctoral levels;

b. An identification of the key role players in Research Capacity Development in South African public universities;

c. Identification of activities and tools for Research Capacity Development in South Africa; and

d. An exploration of the extent to which Research Capacity Development initiatives have benefitted previously registered postgraduate students at the public universities in South Africa.

It is also worth mentioning that questions in the questionnaire were divided into sections; section A dealt with background information for research participants, section B is about the role players, tools, benefits and beneficiaries of RCD, Section C focuses on the activities of RCD, section D is about building skills and confidence, section E is on research that is 'close to practice, Section F deals with the support linkages, partnerships and collaborations, section G is on developing appropriate dissemination, section H is on investment in infrastructure, and lastly, section I focuses on building elements of sustainability and continuity. Such sections were guided by the research aim, objectives and the theoretical framework of this study. This means that questions were also developed in alignment with Cooke's (2005) framework for research capacity building; in so doing, it will then become possible for the researcher to determine if Research Capacity Development in South African public institutions of higher learning can be evaluated using Cooke's framework and if based on the framework, the universities are doing well in RCD implementation.

Microsoft Excel was used to analyze research data. The following were the reasons for choosing Excel:

- familiarity with Excel as the researcher uses it most of the time at work,
- Efficiency, as it is quicker to filter and use pivot tables when inserting graphs,
- It makes it easier and quick to find discrepancies or pick up errors ,
- It is easier to make calculations or use formulas and
- Most of all, one gets the results they need to understand and interpret data.

The first section in the data reporting and analysis focused on a brief understanding of the research participants who completed the questionnaires. In a nutshell, questions asking about when participants registered for their postgraduate studies, the level of studies they registered for, e.g. masters, regulation time for their degrees, how long it took them to complete their postgraduate studies, reasons for completing on time or not on time etc. were included in this section. Other sections flowed from section A.

All participants who completed the questionnaire agreed to participate by selecting a "yes" in the questionnaire. Those who did not want to participate were expected to click a "no" and discontinue participation. No data was collected from Sol Plaatjie university and the University of Mpumalanga. This is because during recruitment, the researcher did not come across any former postgraduate student from these institutions. This may be attributed to the fact that these universities are young and therefore do not have many postgraduate students.

2. Study findings and analysis

In this section, I report study findings per section. Each section was indicated in the questionnaire of this study. Each section was crucial to build rapport with participants, to answer research objectives and to assess RCD in line with the theoretical framework used for this study.

2.3 Section A: Background Information

i. Study population

This study aimed at recruiting seventy-two (N=72) postgraduate students, however, since I used the referral method to recruit participants, I ended up with seventy-three (N=73) participants as indicated in table one.

This study recruited participants who were registered between the years 2010 and 2020 as per the inclusion criteria. From each public university, one honours, one masters and one doctoral postgraduate student were recruited except in universities of technologies as they do not offer the traditional honours degrees. Since there are five universities of technologies, five more participants were recruited from various universities; this means that in some universities, the researchers recruited two honours students to ensure that recruitment targets are met. In one university, two masters students responded to the questionnaire. A decision was made to include this data as one did not foresee potential impact in data analysis; one person (1%) may not make

significant difference in data reporting. Demographics such as age, gender, race did not matter in this study as Research Capacity Development concerns all postgraduate students regardless of demographics.

ii. Research methodology course (REME)

In this section, this study wanted to learn if former postgraduate students who registered between 2010 and 2020 were first enrolled in the research methodology module or course prior to their postgraduate studies (i.e. during undergraduate studies). The following figure provides a summary of that aspect.

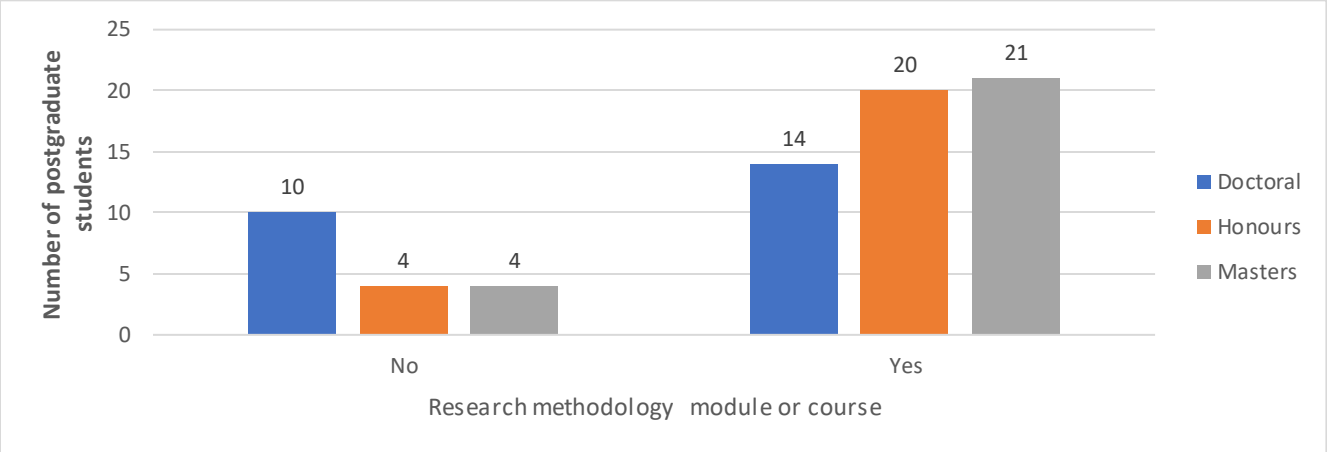


Figure 3: Number of participants enrolled in research methodology course/module during undergraduate studies

The figure above indicates that 18 (25 %) postgraduate students were not enrolled in the research methodology course or module in their undergraduate studies. Of these, ten were at the doctoral level, four at the masters level, and four at the honours level. Majority of postgraduate students (55), which is 75%, had been enrolled in the research methodology module/course in their undergraduate studies.

In comparing the research methodology module/course completion with degree completion, this study learned that majority of those who did not complete their degrees, had enrolled for the research methodology course in their undergraduate studies. The figure below illustrates:

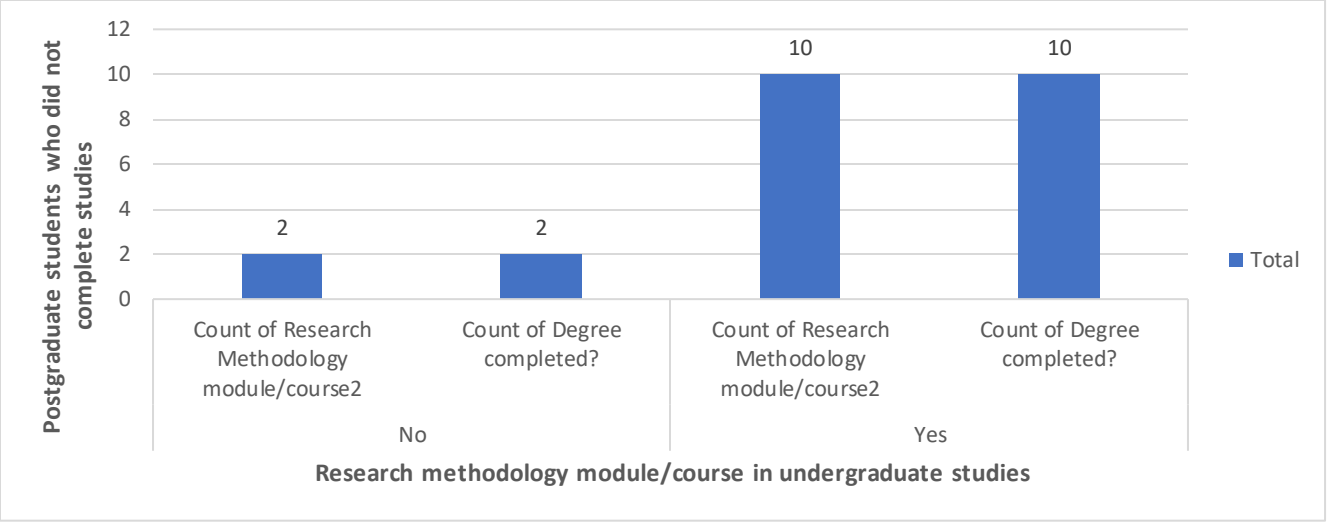


Figure 4: Relationship between research methodology course completion and degree completion

The figure above illustrates that of the 12 (4 honours, 5 masters and 3 doctoral) postgraduate students who did not complete their degrees, only 2 (1 master, 1 doctoral) were not enrolled in the research methodology module or course during undergraduate studies.

iii. Participants' study levels and year of registration

In the following figure, we demonstrate the profile of the study participants in terms of their study levels and year of registration.

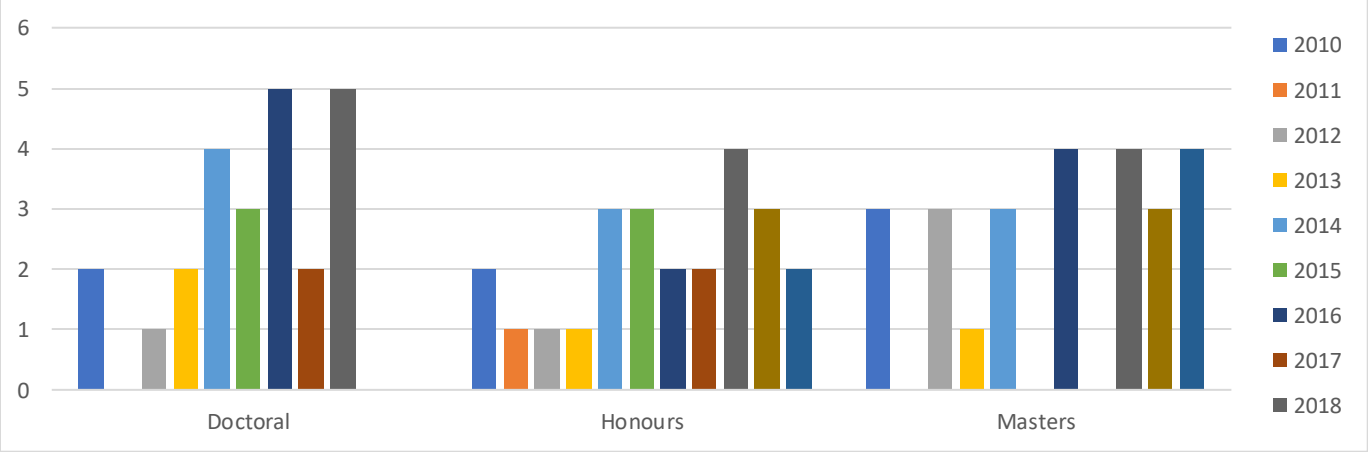


Figure 5: Year of registration per study level

Of the participants at the honours level, most of them registered in 2014 (n=4), followed by 2014, 2015 and 2019 (n=3 each year), in 2010,2016,2017 and 2020, only 2 (n=2 each year) participants registered in those years; fewest participants were registered in 2011,2012 and 2013 (n=1 each year) at the honours level.

Most participants at the masters level were registered in 2016,2018, and 2020 (n=4 each year), followed by 2010,2012, 2014, and 2019 (n=3 each year), in 2013, only one (n=1) participant registered for masters studies.

For the doctoral participants, most students were registered in 2016 and 2018(n=5 each year), followed by 2014 (n=3), in the years 2010, 2013 and 2017, only few participants registered (n=2 each year), and in 2012, only 1 (n=1) registered for a masters degree.

iv. University regulation time

Participants were also asked if they understood the regulation time for their degrees. The following graph indicates postgraduate students' perceived regulation time.

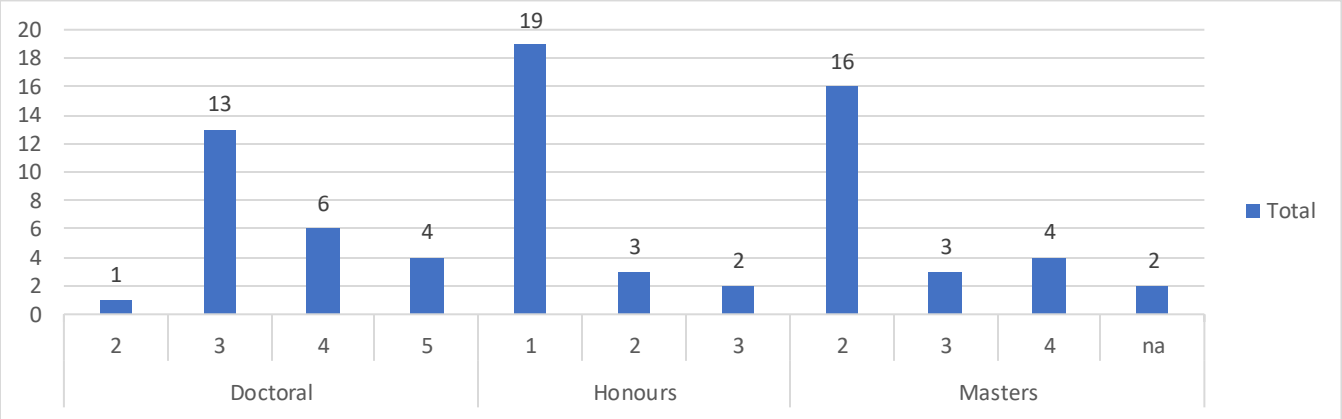


Figure 6: Participants' perceived understanding of university regulation time

This figure indicates that most doctoral participants (54%) believed the regulation time for their degree was three years, most of the masters participants (64%) believed it is two years, only two

of them did not respond to this question (na), and most honours participants (79%) stated that their degree was a one-year qualification.

v. <u>What made it easy and difficult to complete postgraduate studies</u>

In this study, participants who answered that they completed their postgraduate studies were asked what made it easy for them to complete. Of those who completed their studies, the following were the reasons they reported:

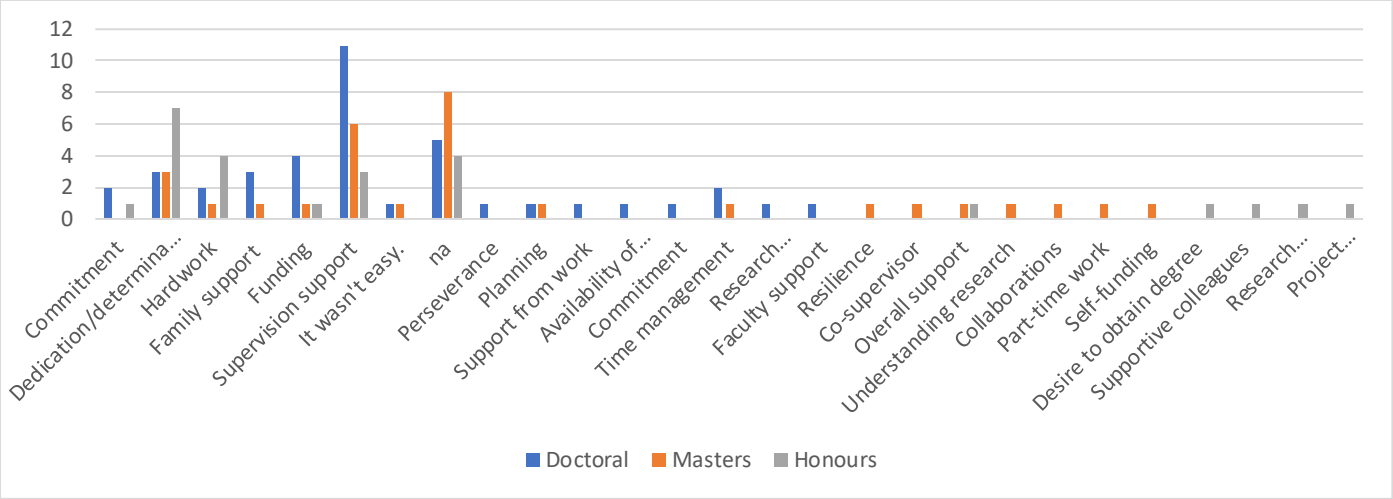


Figure 7: What made it easy for postgraduate students to complete their degrees

The figure above indicates that most doctoral (n=11) and masters (n=6) students completed their degrees because of the supervision support they received. At the honours level, most participants (n=7) indicated that what made them complete their studies was their dedication or determination while supervision support was only mentioned by 3 participants (n=3). Since this question was not compulsory, some participants did not respond to it because it did not apply to them or they did not want to respond to it, such participants were labelled as no answer (na).

Participants who reported that they did not complete their degrees were also asked reasons for not completing their studies. The following were the reasons why they (n=12) did not complete their postgraduate studies:

Table 4:Reasons for not completing postgraduate studies

Doctoral participants (n=3)	**Masters participants (n=5)**	**Honours Participants (n=4)**
"Difficulty in getting permission to collect data"	"Supervisory issues"	"I fell pregnant and got ill"
"Supervisor passed away and I waited too long to get another one, the new one was very rude and made me feel worthless so I dropped out"	I got married and started family; I lacked academic writing skills	"Financial challenges"
"COVID-19 related challenges"	"Poor health"	"Lack of funding"
-	"Lack of funding"	"Supervisor did not like me"
-	"Supervisor delayed my work"	-

The table above indicates that most participants who did not complete their studies had challenges with supervisors (*n=4*), funding and financial challenges (*n=3*), personal challenges including starting a family and poor health were some of the reasons for non-completion (*n=3).* Although not explicitly stated, COVID-19 related challenges were also mentioned(*n=1)* and difficulty in getting permission to collect data (*n=1).*

vi. Percentage of research conducted

Research participants were also asked how much research they conducted in their postgraduate studies. The graph below indicates the percentages as per their responses.

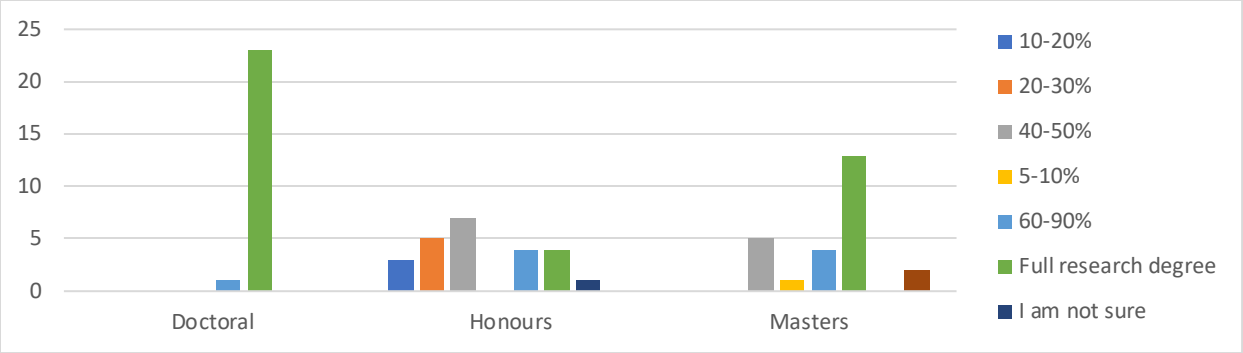


Figure 8: Percentage of research conducted

The figure above indicates that majority of doctoral (96%) and masters (52%) participants indicated that they conducted 100% research projects, however, majority of honours (participants conducted forty to fifty percent of research.

vii. Research completion time

One of the questions this study asked was on how much time it took postgraduate students to complete their research. This question is not asking how long it took them to complete their entire degrees; however, for students who did 100% research , there may be a correlation between the time it took them to complete research and the time it took them to complete their degrees. The figure below indicates how long it took participants to complete their research.

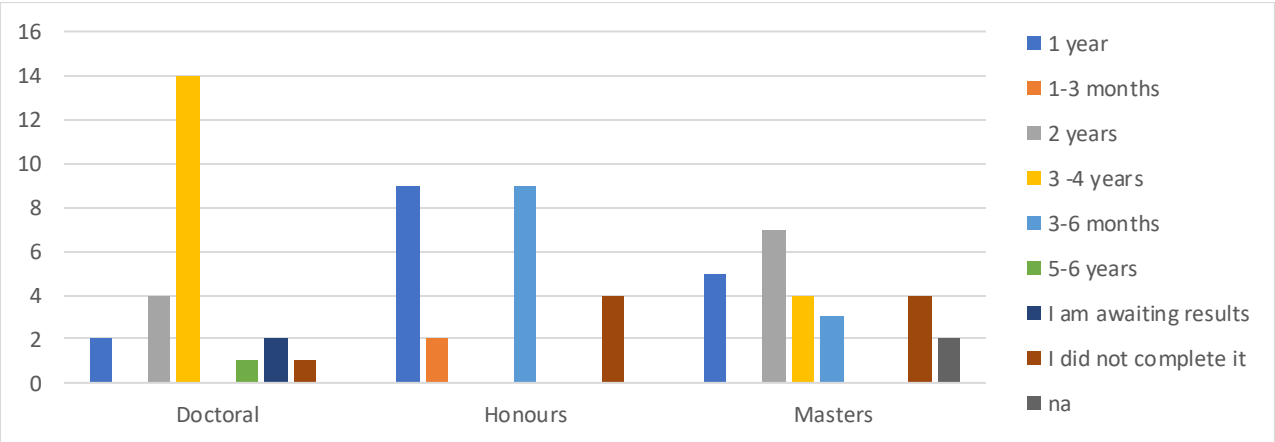


Figure 9: Research completion time

The figure above indicates that most doctoral participants (58%) took 3-4 years to complete their research; this was followed by 17% of participants that took 2 years to complete. A small percentage of doctoral participants (8%) took one year to complete their research. Some participants (8%) are still awaiting their results , only one (4%) participants did not complete their research, and another one (4%) took 5-6 years to complete their research.

Most masters participants (28%) took two years to complete their research , followed by those who took 1 year (20%) ; some participants (16%) took 3-4 years to complete their research, while others did not complete the research (16%), some (12%) took 3-6 months to complete their masters research. Those who did not respond to this question (na) were only two.

Of the honours participants, majority took one year and 3-6 months as both were at 38% respectively. While 17% of these reported they did not complete their research, 8 % completed in 3-4 years.

2.4 Section B: Role players, tools, benefits and beneficiaries of Research Capacity Development

In this section, one needed to know what were the role players, tools, benefits and beneficiaries of Research Capacity Development in South African public institutions of higher learning. The questions asked at this section are crucial as they set a trajectory for the rest of the sections which are aimed at assessing Research Capacity Development. This section provides some answers to objectives of this study which were to:

- explore the South African Research Capacity Development for postgraduate studies at the honours, masters and doctoral levels;
- identify the key role players in Research Capacity Development in South African institutions;
- identify the activities and tools for Research Capacity Development in South Africa, and
- explore the extent to which Research Capacity Development initiatives have benefitted previously registered postgraduate students in South African public universities.

i. Role players for Research Capacity Development (Source of support)

The study asked participants who their source of support during their postgraduate studies was. The source of support questions refers to the people that played a role in the participants' life during their postgraduate trajectory. This question is crucial and relevant to RCD question to ask as the postgraduate throughput rate is of utmost importance in institutions of higher learning. The question is also more crucial as the 'human' element in research capacity development is In this question, participants were allowed to tick more answers that applied to them. When asked this question, postgraduate students responded that the following were their source of support:

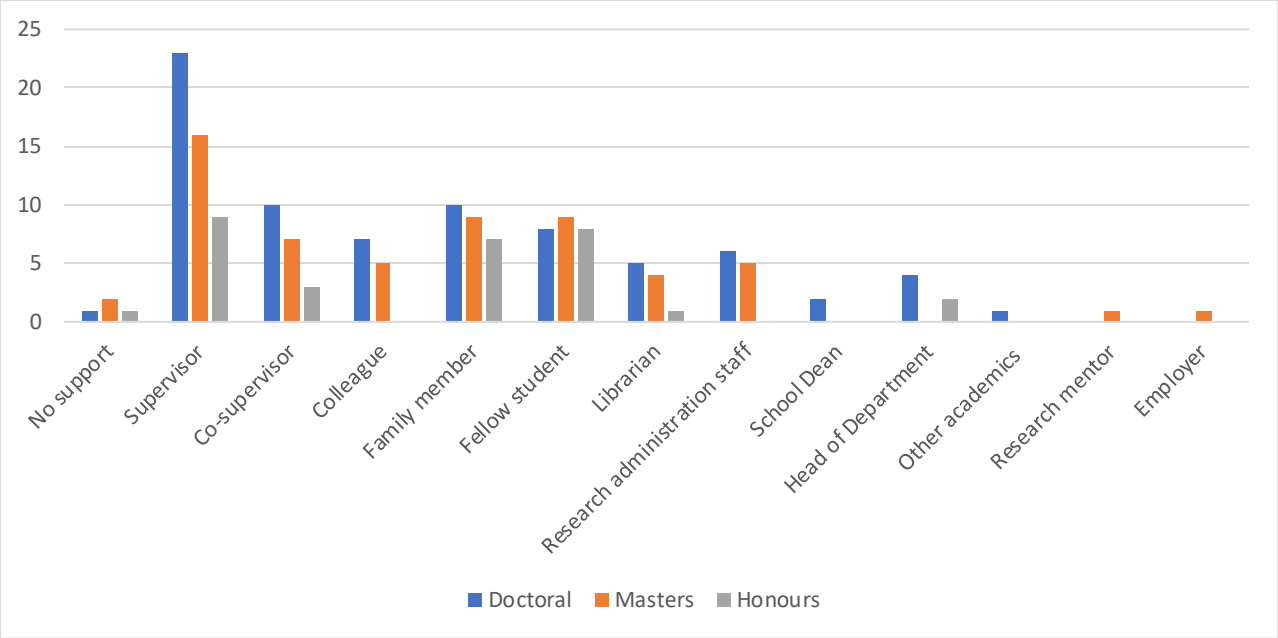


Figure 10: Source of support for postgraduate students per study level

The figure above indicates that at the doctoral level, most participants reported that they received support from their supervisors (n=23), followed by the co-supervisor and family member (n=10), fellow student (n=8), a few were assisted by the Head of Departments (n=4).

For the masters level, most participants indicated that they received support from their supervisors (n=16), followed by the family member and fellow student (n=9), and research administrative staff and colleague (n=5).

For the honours level, most participants indicated that they received support from their supervisors (n=9), followed by the fellow students (n=9), family member (n=8), and co-supervisor (n=3).

Few postgraduate students reported that they did not receive any support (n=4); some were supported by employer (n=1), research mentor (n=1), and other academics (n=1).

The next question of the questionnaire focused on the kind of support these postgraduate students experienced; the figure below illustrates.

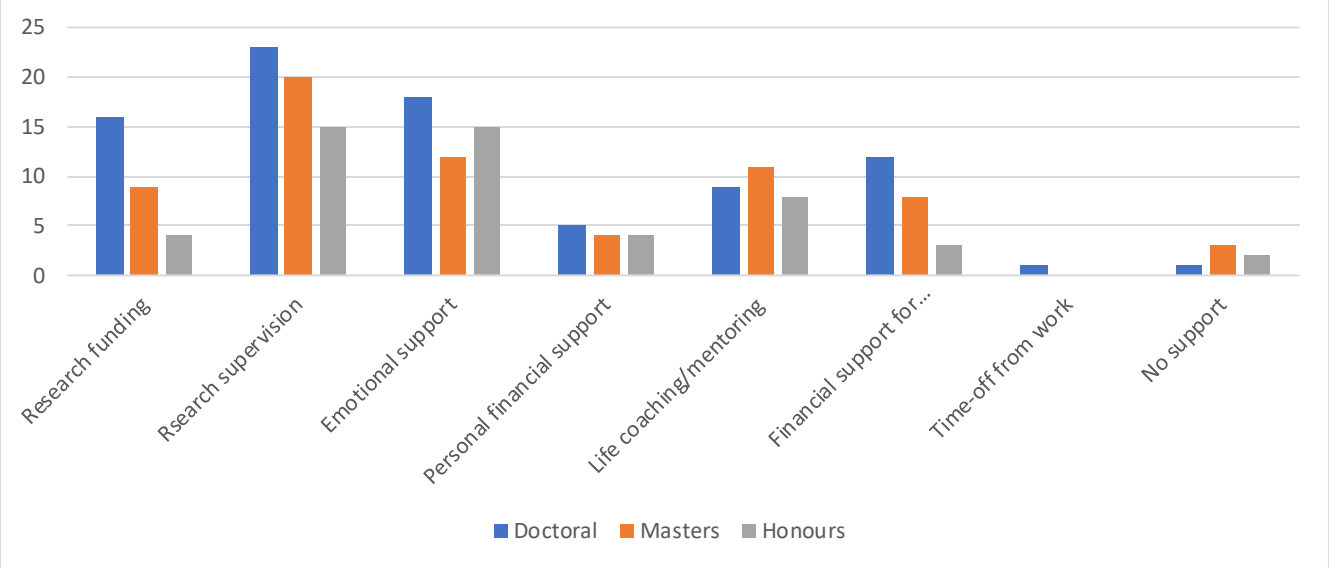


Figure 11: Kind of support received by postgraduate students

The figure above indicates that most research participants reported that they received research supervision (79.5%), followed by emotional support (61.6%), research funding (38.4%), tuition (31.5%) and personal financial support (17.8%). Few students (9.6%) indicated that they did not

receive any support while others mentioned time off from work as a benefit (1.4%). These percentages indicate the number of times that kind of support was mentioned by participants.

ii. Are institutions of higher learning in South Africa implementing RCD?

The first question the researcher asked was whether or not institutions of higher learning participants were registered with were implementing Research Capacity Development. If participants answered yes, they continued with the questionnaires. If participants answered no, they were first asked why they thought their institutions had not practiced Research Capacity Development.

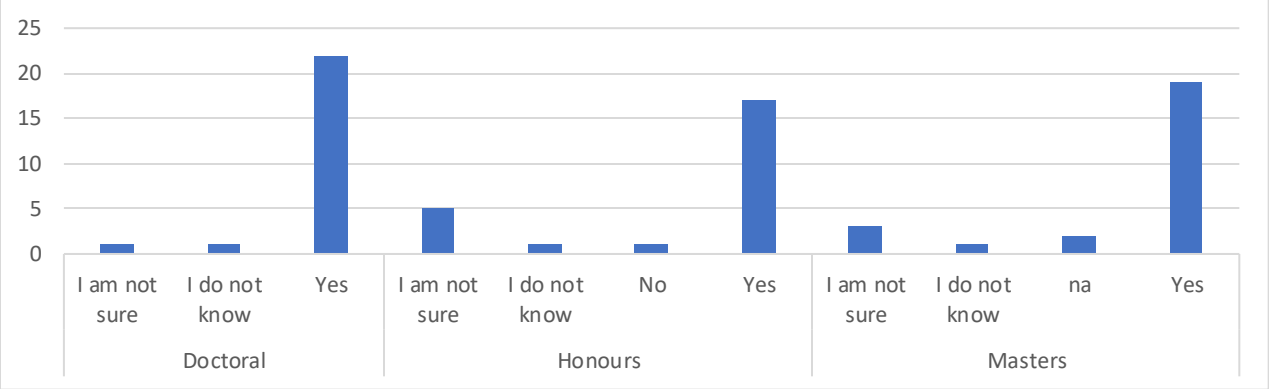


Figure 12: Implementation of RCD by universities

The figure above indicates that the majority of participants (79%) at all study levels (honours, masters and doctoral) indicated that their universities were implementing RCD. Only 12% of participants were not sure, 4% did not know, 1% did not think the university they were registered with implemented RCD. Only two participants did not respond to the question.

Of the participants (n=4) who indicated that their universities did not implement RCD or they were not sure or they did not know, they stated the following reasons:

- "I was struggling with funds."
- "Limitations to research capacity rollout has to do with limited institutional and funder capacity to conceptualize impactful interventions and often limited funding that is normally once off and project based".
- "I am not sure."
- "I think the department does not have a vision to invest in its students w.r.t quality research"

2.5 Section C: Activities For Research Capacity Development

As indicated in the section above, majority of students indicated that the universities they were registered with implemented RCD. In this section one wanted to look closely at the RCD activities which were offered.

i. <u>RCD activities offered to postgraduate students in South African public universities</u>

In light of the above, this section started by asking which RCD initiatives their universities offered them during their postgraduate studies. The figure below illustrates:

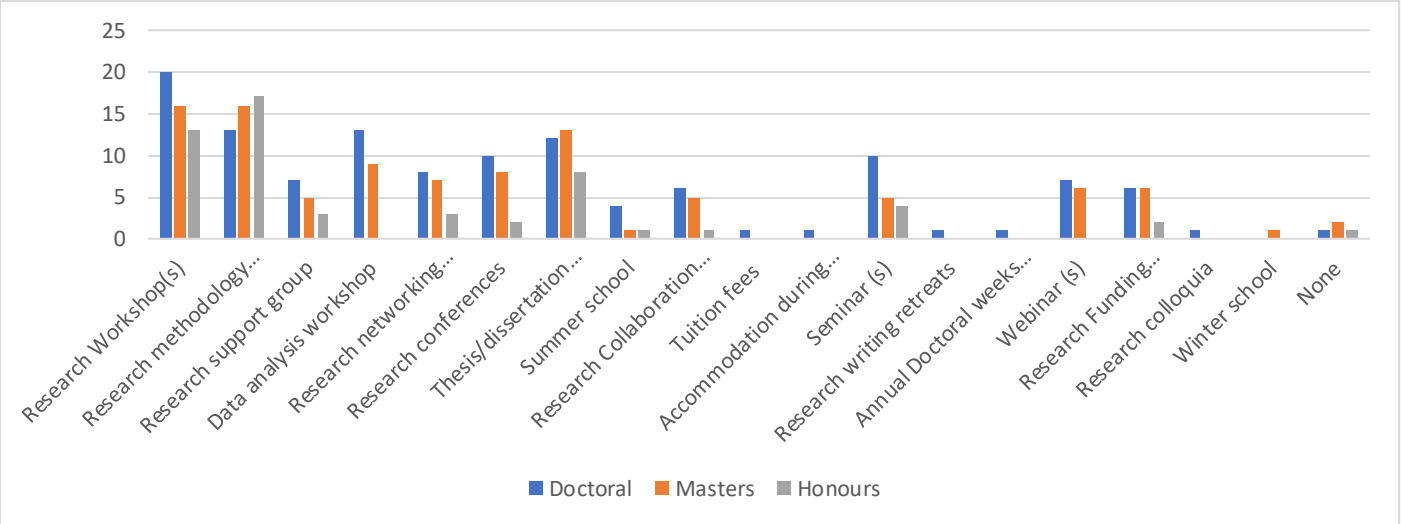


Figure 13: RCD activities offered by universities to postgraduate students per study level

The figure above illustrates that out of 24 doctoral participants, majority (n=20), had access to research workshops followed by the research methodology course (n=13), some mentioned thesis/dissertation writing workshops or retreats (n=12), some (n=10) were offered seminar(s) and research conferences, data analysis workshops (n=9), research networking opportunities (n=8), webinars and support groups (n=7), and funding workshops (n=6).

A few doctoral participants were offered collaboration opportunities (n=6) and summer school (n=4), The following activities were only mentioned once: Tuition fee, research writing retreats, research colloquia, accommodation during workshops. Only one (n=1) doctoral participant was not part of any RCD activity.

At the masters level, the same number (n=16) of participants mentioned research methodology course and research workshops as the activities they were offered by their universities. This was followed by the thesis/dissertation writing workshops or retreats (n=13) and data analysis workshops (n=9). Research conferences (n=8), research networking sessions (n=7) , webinars and funding workshops (n=6), and collaboration (n=5) were also mentioned. Only one (n=1) was offered winter school and two masters (n=2) participants were not offered any RCD activity.

For the honours participants, most students attended the research methodology course (n=17), followed by research workshops (n=13), some mentioned thesis/dissertation writing workshops or retreats (n=8). Only one (n=1) honours participant was not part of any RCD activity.

In this study, the researcher had a privilege to collect more data by leaving the "other" option which also allowed participants to explain what they meant by 'other'. This was because the researcher understood that she did not know all Research Capacity Development initiatives; thus, one of the activities of this study was to explore RCD in higher education institutions of South

Africa. It is also appreciated that whenever participants mentioned something they assumed may be unknown to the reader, they would also explain it in short.

In the study, one learned RCD initiatives such as the research colloquia as well as the four annual doctoral weeks which were reported by the doctoral participants. One participant mentioned that "Research colloquia: every time I completed a section of my thesis, I had to present it to the faculty - this ensured rigor and it enabled me to address additional methodological questions - hence I attended four such colloquia (proposal defense, methodology, findings, final submission). This was a critical success factor in my study". The participant who reported the four annual doctoral weeks stated that "four annual doctoral weeks where we were based at the university for a week to work and discuss our studies and research writing retreats".

When reporting data ,it was highlighted that twelve (n=12) participants (3 doctoral, 5 masters and 4 honours) did not complete their studies (Table 4 under the participants' profile). When comparing data on those who did not complete their studies (n=12), the intention was to confirm if there is a correlation between the non-completion rate for students and , and their institutions' implementation of RCD. The table below illustrates:

Table 5: Comparison between non-completion of studies, lack of support and RCD implementation by universities

Study level	Degree completed?	Who supported you?	Did your university implement RCD?
Masters	No	"I did not get any support"	Yes
Doctoral	No	"I did not get any support"	Yes
Honours	No	"I did not get any support"	Yes
Masters	Yes	"I did not get any support, I struggled during my studies hence I took longer to complete. I had bad experience with my supervisor as he was always busy and hardly had time to assist."	I am not sure

In table above, it was observable that of those who did not complete studies and did not get support elsewhere, their universities implemented RCD. This means that, there is no link between their non-completion of studies and the implementation of RCD. This data is supported by data above (**Table 4:** Reasons for not completing postgraduate studies); in that data, participants who did not complete their studies never mentioned that their non-completion was also attributed to the fact that their universities did not implement RCD.

Interestingly, one participant who is not sure if the university they were registered with implemented RCD managed to pass but mentioned that it took long for them as they did not get any support. This means that the participant did not receive support elsewhere, including from RCD but managed to complete studies; however, it took her 3-4 years to complete the 50-60% of research. Focus on this participant, attributed his/her completion to the research methodology course which they were a part of during undergraduate studies; when asked what made them complete, the participant mentioned "Understanding of different research methods" as the only reason that made them complete their studies.

ii. <u>How long RCD activities offered to postgraduate students took?</u>

In the table below, I report on how long the RCD activities took based on participants' responses.

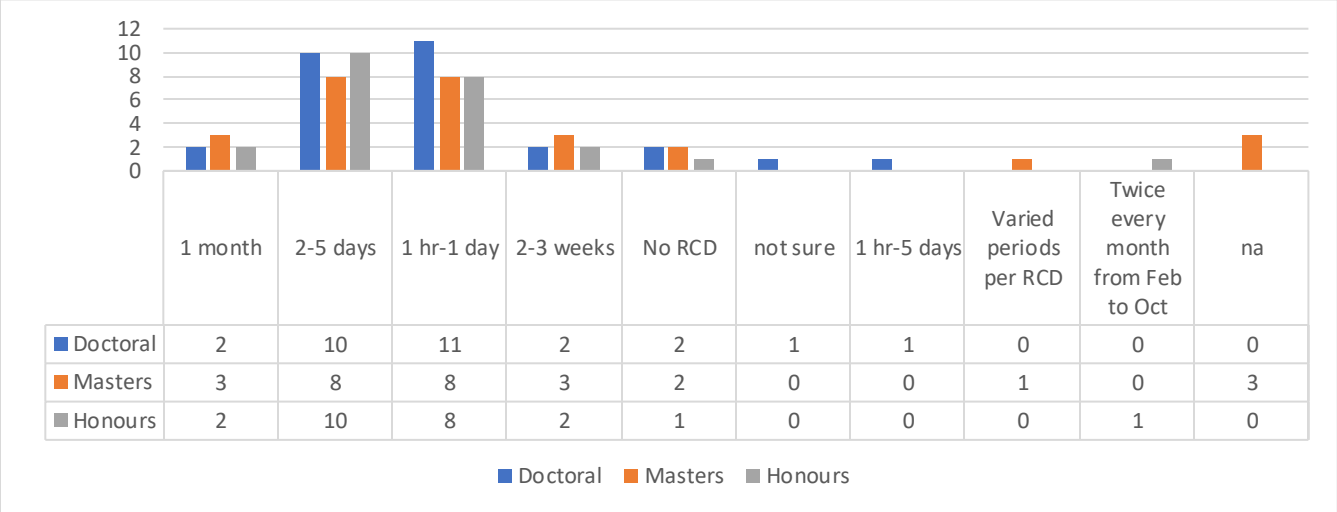


Figure 14: The length of RCD activities

The figure above indicates that majority of participants (*n=28*) reported that most RCD activities took 2-5 days; this was followed by activities that took one hour to a day (*n=27*). Very few participants (*n=7*) mentioned that some activities took two to three weeks and some, a month.

Previously reported data on RCD activities offered to postgraduate students per study level as presented in **Figure 13**, indicated that only one doctoral participant reported that the institution he/she studied with did not offer RCD; in this section, what could be surmised is that one more doctoral participant has indicated that there was no RCD offered. However, this particular participant (D014) has reported confusing information; when asked ':

- "Did your university implement RCD? Yes
- IF no, why do you think it did not implement RCD? Na (not applicable)
- Which RCD initiatives did your university offer? None
- Average time these initiatives took? I was not part of the initiatives offered
- Was time allocated enough? There were no Research capacity initiatives"

An inference one was led to arrive at about this participant in this instance is that the university had implemented RCD but he/she did not participate in it due to the reasons known to him/her.

iii. Was time allocated to RCD activities enough?

This question aimed at finding out if research participants thought that sufficient time was provided for the delivery of these RCD initiatives offered to them. For example, the university may offer a data analysis workshop in one day but postgraduate students may realize that one day was not enough for them to understand the content of the workshop. Below were their responses:

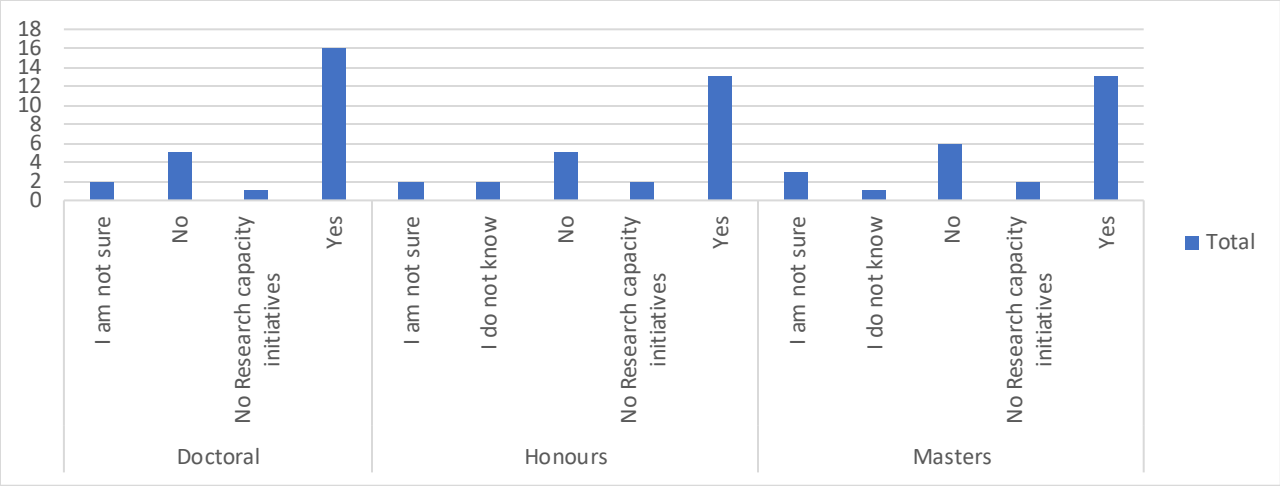


Figure 15: Viewpoints on time allocated for RCD activities

As indicated in the graph above, 67% doctoral participants, 52% masters participants, and 54% honours participants reported that the time provided for RCD initiatives was sufficient to them. Of those who mentioned that the time allocated was not sufficient, 20% were doctoral participants, 24% were masters participants and 20% were honours participants. Those who mentioned there were no RCD initiatives offered made 7%. Only 10% of the participants was not sure if the time allocated was sufficient and 4% only mentioned that they did not know if the time allocated was sufficient.

iv. Research activities which benefitted postgraduate students the most

Research participants were also asked which RCD initiatives benefitted them the most. This question is crucial for universities to know which RCD activities they can continue implementing or they should start implementing for postgraduate students. In this question, participants listed the following activities:

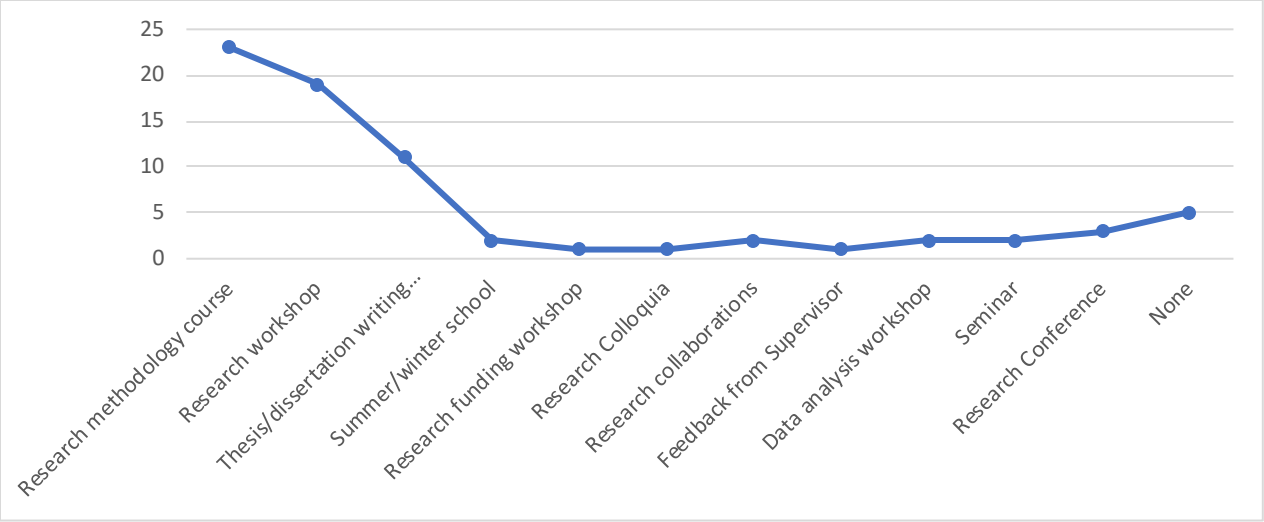


Figure 16:RCD activities/initiatives that benefitted postgraduate students the most

The figure above indicates that most research participants (32%) benefitted from the research methodology course/module, followed by the research workshops (26%) and thesis/dissertation writing retreats (15%). Some participants (7%) indicated that they did not benefit from any RCD initiative. Of these,5% reported that their institutions did not offer them any RCD; although one participant was offered research workshop and webinar, the participant did not benefit the most from them. One participant's university implemented RCD, but she was not offered any RCD activity.

v. Research activities which benefitted postgraduate students the least

Some RCD activities unfortunately did not make more impact in the life of some postgraduate students. When asked which RCD activities benefitted them the least, they listed the following:

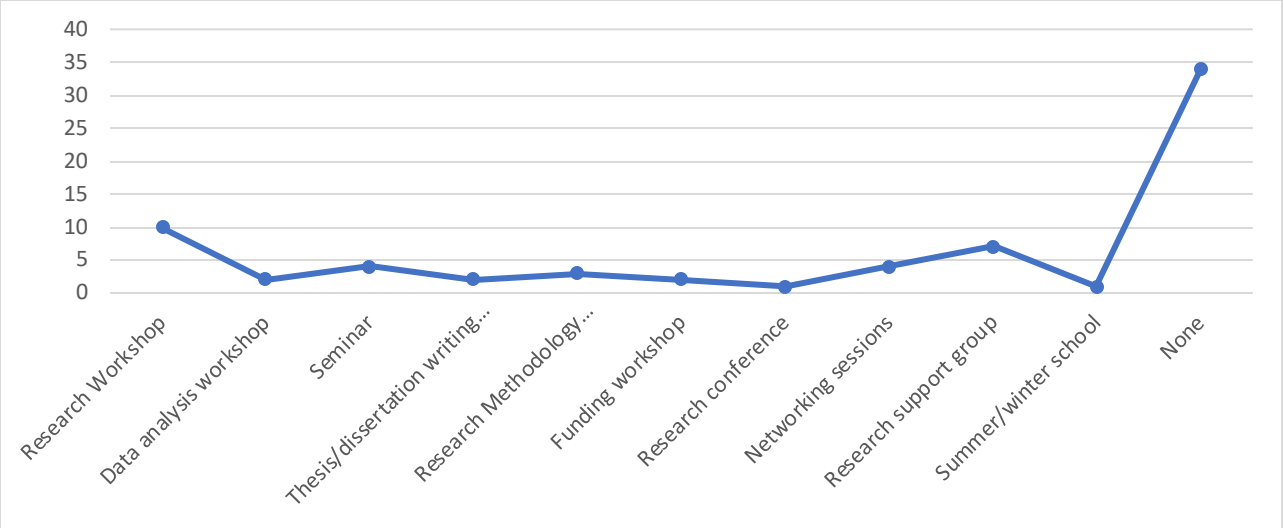


Figure 17: RCD initiatives that benefitted postgraduate students the least

In the figure above, 47% of participants did not respond to this question. Only one mentioned that the reason for no response was because they only had one RCD activity they participated in, therefore they do not have any other activity to compare it with. Of those who benefitted from RCD, most of these benefited the least from research workshops (14%) and research support groups (10%).

vi. Research activities which did not benefit postgraduate students

Participants were also asked a question on which RCD activity did not benefit them at all. Majority mentioned 'none', it was only one participant who mentioned that they did not benefit at all from RCD initiatives offered by the university.

vii. Other RCD activities postgraduate students wished they participated in

Participants were also asked if there were other RCD initiatives they wished to be a part of. Those who answered 'yes' listed the following initiatives, in no particular order:

Table 6: Other RCD activities participants wished to take part in

Research workshops	Writing for Publication	To have a present supervisor
A research group for support and motivation	Group work	Thesis writing retreats
Research seminar	Data analysis, especially modelling	Publication writing retreats
Regular interaction with prospective supervisors	Frequent meetings between (co)-supervisor and student	Research support groups
Research networking	Research conferences	Research Methodology
Mental health and coping with pressure at an honours level	Presentation and public speaking,	Identifying novelty for new research niches.
Assistance with Registration with professional bodies in my field	Mentorship	Policy and laws in my field
Writing review articles for publication	Research funding workshop	Job and career strategies

The table above indicates that although other participants needed more RCD activities, others were merely interested in other kinds of support such as psychological support, career-related strategies, and assistance with the registration to professional bodies.

2.6 Section D: Building Skills And Confidence (Principle 1)

From this section to section I, questions that were asked were meant to assess RCD according to Cooke's (2005) framework for evaluating RCB. The section on RCD activities offered, flows well into this section as RCD does not achieve the results in silo. Apart from research related activities that universities offer to postgraduate students. According to Cooke's framework, there is a need for other skills training that compliment RCD, such training may build skills and confidence for

the beneficiaries of RCD. In addition, it is important that we highlight that RCD exists in a policy environment.

i. Additional skills training offered

In this section, the researcher asked the participants if apart from RCD activities they had been offered any other skills training. The question was intended to elicit answers regarding various skills trainings offered to postgraduate students in South African public universities of which the list includes:

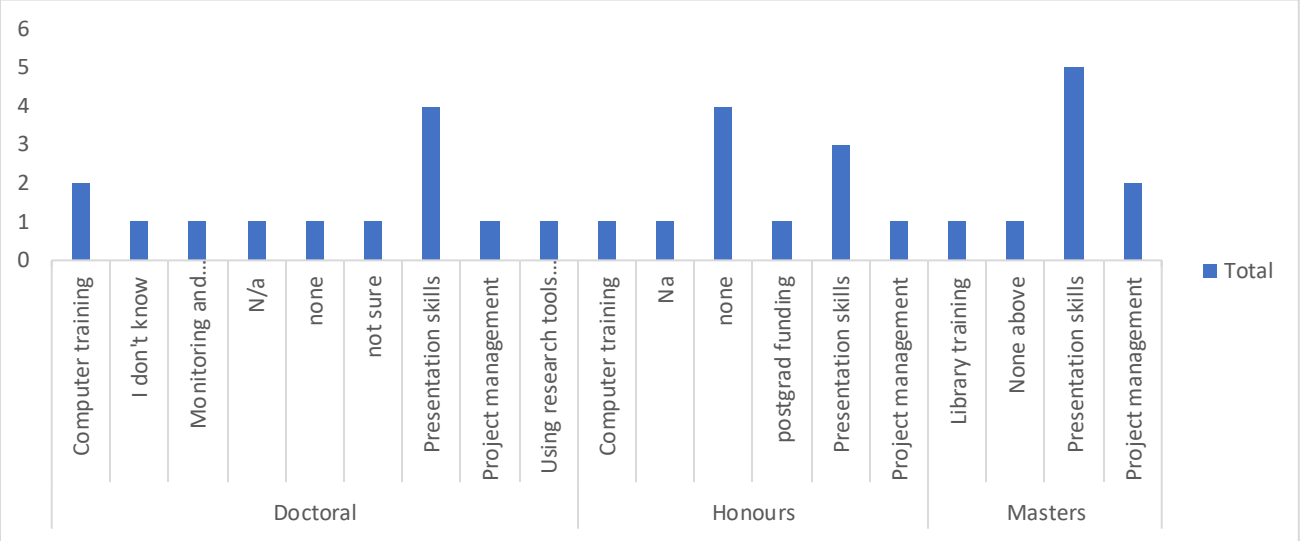


Figure 18: Additional skills training offered to postgraduate students in South African Public universities

The figure above indicated that majority of postgraduate students (n=9) were offered training on presentation skills, followed by project management (n=4), and computer training for doctoral students(n=2). The rest of the skills trainings such as monitoring and evaluation, using research tools such as Mendeley, library training etc. were offered to a few students per study level.

ii. Opportunities to practice skills learned

This section also asked participants if after the above-mentioned additional skills trainings, they were also offered opportunities to practice what they had learned, these were their responses:

Figure 19: Opportunities to practice skills learned by postgraduate students

The chart above indicates that research seminars were the common opportunity (n=12) provided to postgraduate students. This was followed by those who were able to implement their skills in practical work completion (n=5) e.g. in laboratory experiments. Only one participant (n=1) was not offered an opportunity to implement skills learned, while others (n=12) did not respond to this question.

2.7 Section E: Research That Is 'Close To Practice' (Principle 2)

This section asked if participants thought or believed that the research they conducted was 'close to practice'. In this section, the study wanted to establish if research conducted by postgraduate students was improving or meant to improve the lives of clients (i.e. students, staff, community in general). Apart from that, the section also aimed at exploring students' perceptions about the issue of research culture in universities in order to understand if research was valued and encouraged.

i. Research that is 'close to practice'

When asked if they believed that their research may contribute to the lives of communities, majority (77%) mentioned 'yes', and they provided the following as the benefits of their research:

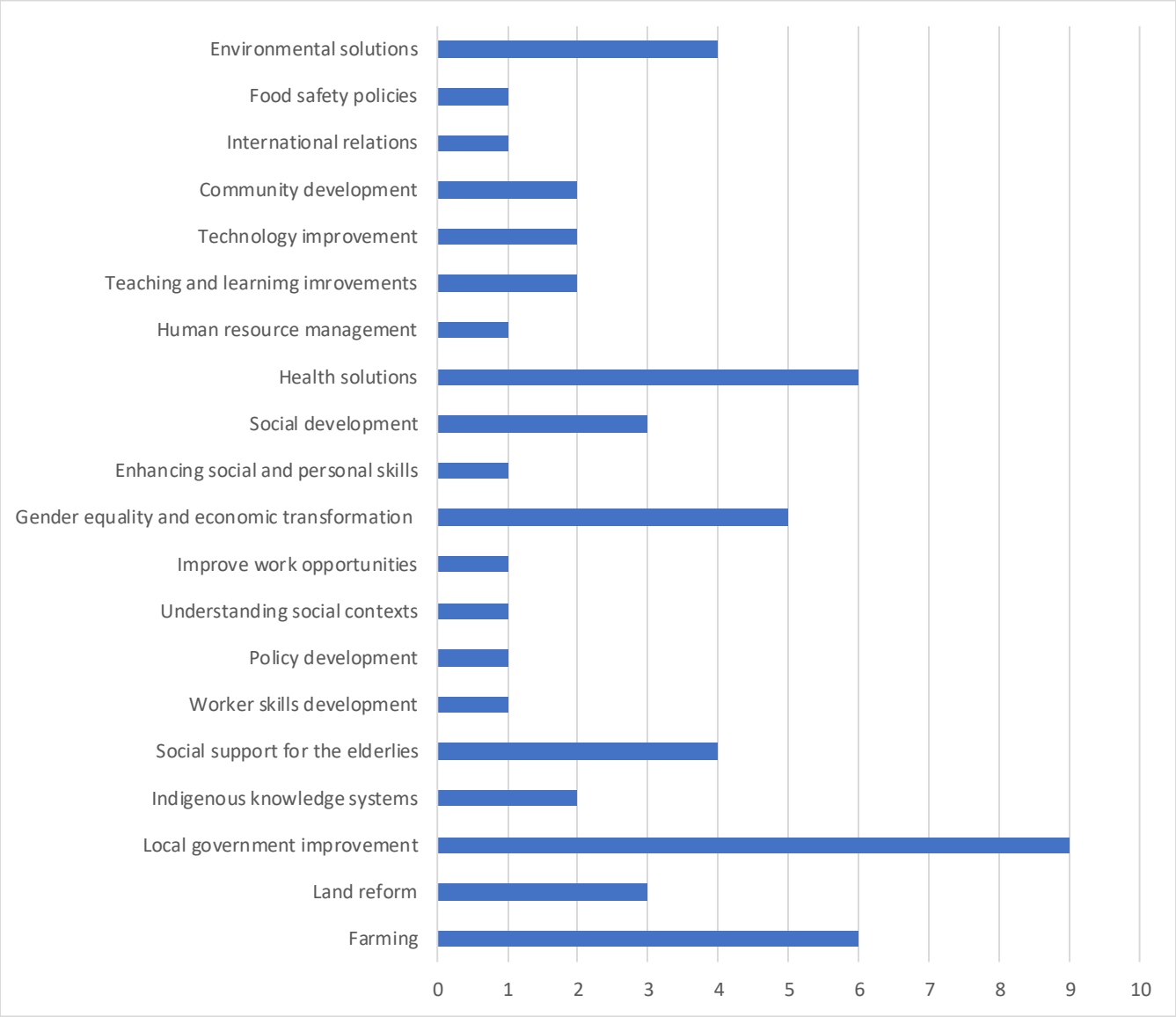


Figure 20: Research that is 'close to practice'

In the graph above, most participants 's research aimed at improving lives of communities in the areas of local government (16%); this was followed by those whose work aimed at improving health and farming solutions (11%). The number of those who indicated that their research

provides or would to provide environmental solutions and social support for the elderly was equal (7%); the same applies to land reform solutions and social development (5%). Community development, technology improvement, teaching and learning improvements and indigenous knowledge systems were also mentioned equally (4%). Other areas of 'close to practice' which were seldom mentioned include food safety policies, international relations, human resources development etc.

ii. University research culture

In this subsection, participants were asked if they thought research was valued and promoted at their universities. The following figure illustrates:

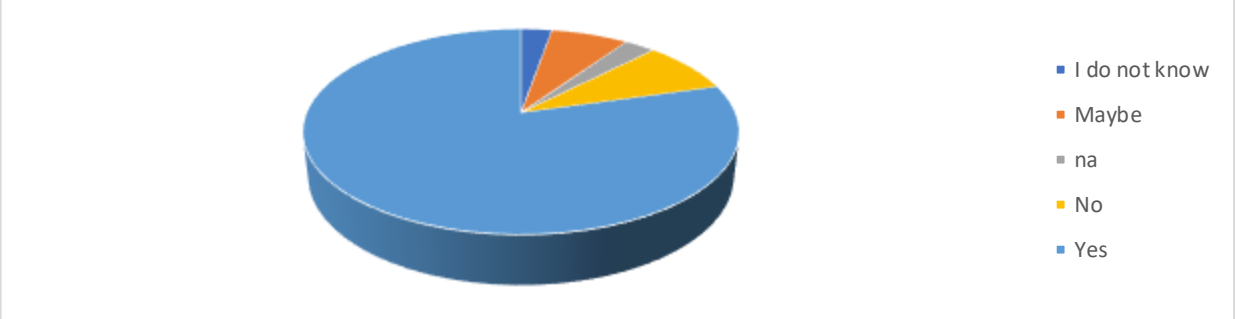


Figure 21: Is research valued and promoted?

In the figure above, an equal number of participants (77%) indicated that they believed research was valued and promoted at their universities.

2.8 Section F: Support Linkages, Partnerships and Collaborations (Principle 3)

In this section, the study asked participants if they worked with other research teams and the networks they have developed ,or were a part of in figures 16 and 17 above, some participants indicated that they benefitted from research collaborations and networking sessions This section

expands knowledge from those sections as it focused on establishing whether or not participants were part of research teams and if such teams benefitted them.

When asked if they were part of the research team/group during their postgraduate studies and if they benefitted from being part of these teams/groups, the following were their responses:

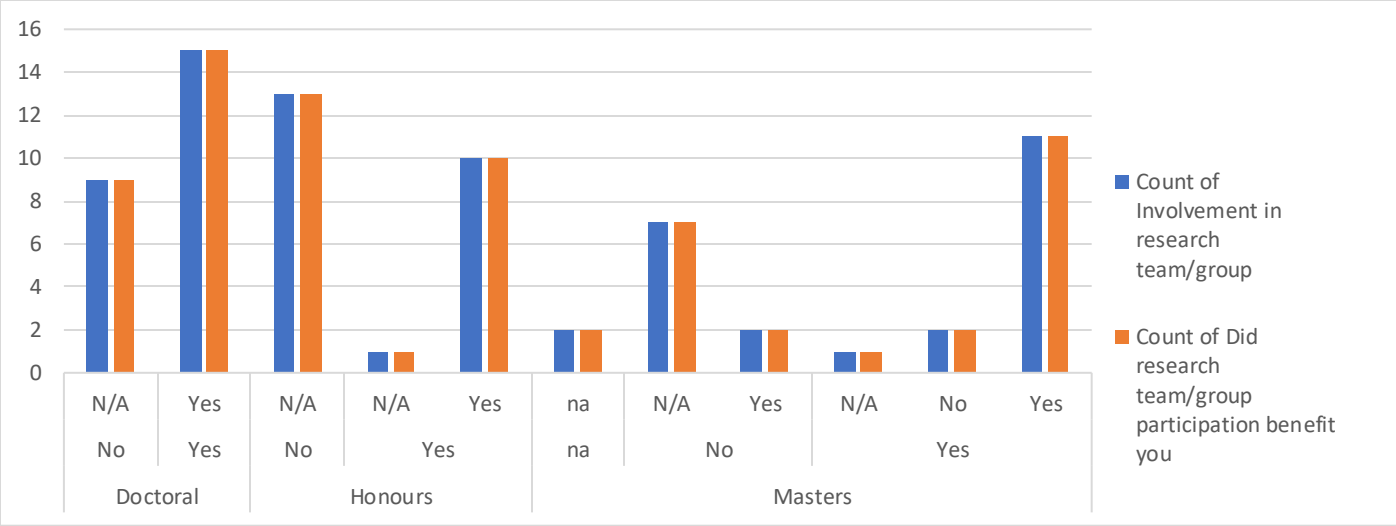


Figure 22: Research team/group involvement and whether participants benefitted from them

The figure above illustrates that of all the participants who mentioned they were part of the research team/group (53%), all of them indicated that they benefitted from these teams or groups. Some participants (42%) were not part of the research team or group, most of these were at the honours level (18). Four participants (5%) at the masters level did not respond to the questions (na).

Participants were also asked which activities they were involved in when they were collaborating with others. The chart below depicts such activities.

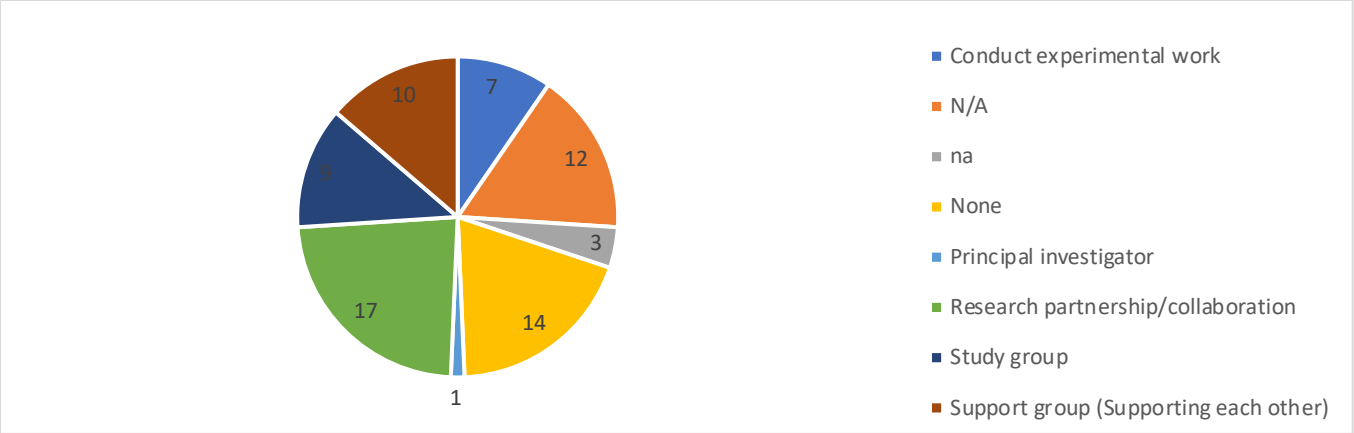


Figure 23:Actvities participants were involved in when working within a team/group

The chart above indicates that most of the postgraduate students (n=17) were involved in a research partnership or collaborative work, some (n=10) reported that they were in a support groups where they provided support to each other. Some participants conducted research experiments together (n=7). Some participants (n=14) reported that they were not involved in any group activities and some (n=10) indicated that the question did not apply to them (N/A).

2.9 Section G: Developing Appropriate Dissemination (Principle 4)

In order to make more impact, RCD must promote dissemination of research to peer reviewed publications, through presentations in conferences and other platforms such as local symposiums, seminars, research days etc. Dissemination of research may also have ethical implications; it is a fair practice to provide feedback to research participants and communities that participated in the research. Apart from developing appropriate dissemination strategies, in this section I also included issues pertaining to the protection of intellectual property as it is crucial that the novel ideas or new innovations are protected from theft.

i. Research dissemination

In this section, I asked postgraduate students what they know about dissemination of research results at the universities. I first asked participants if their university had a dissemination strategy/plan/policy, the next question was if the universities offered platforms for research dissemination and lastly, if universities had funding opportunities for the dissemination of research.

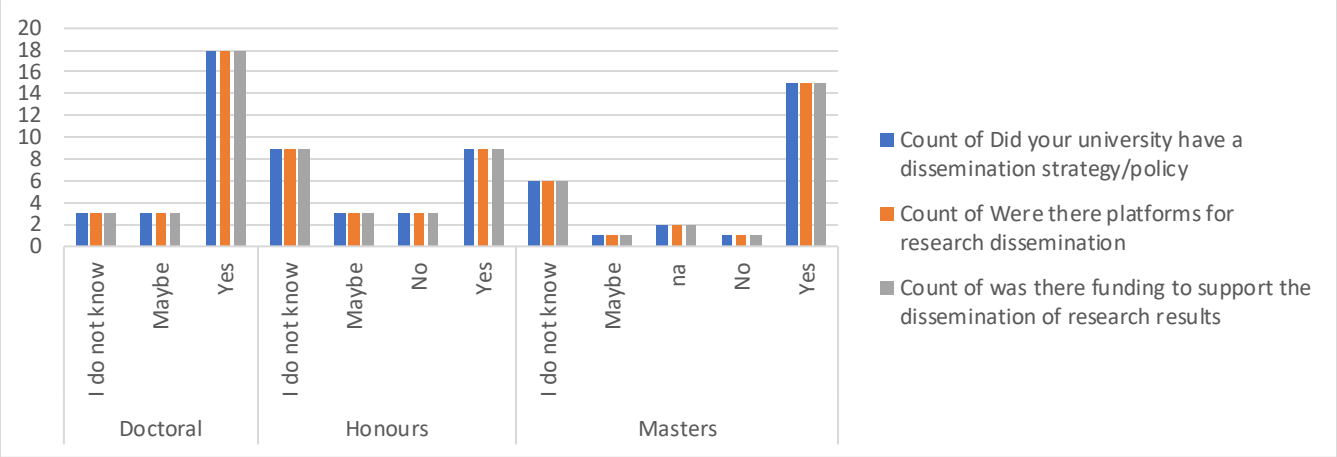


Figure 24: Research dissemination strategy, platforms, and funding opportunities

The figure above indicates that most doctoral participants (75%), and masters participants (60%) reported that their universities had research dissemination strategy/plan/policy. The same number of participants indicated that there were also platforms for research dissemination at their universities. With regards to the honours participants, the same number (38%) of these indicated that their universities had the research dissemination strategy/plan/policy, dissemination platforms and that there was funding to support the dissemination of results.

There were some participants who indicated that they did not know if their universities had a strategy, plan or policy on research dissemination. Fewer participants (5%) mentioned their universities did not have a dissemination plan and platforms for research dissemination. Some participants (10%) were just not sure if there were dissemination strategies/plans/policies as well as dissemination platforms such as seminars, research days, conferences etc. at their institutions.

Data above also indicates that majority of all participants (47%) indicated that their universities had funding for research dissemination, 25% did not know, 16% of participants reported that their institutions did not have funding opportunities for research dissemination, while some (10%) were not sure. The rest of participants did not answer.

ii. Protection of intellectual property

In terms of the protection of intellectual property (IP), in this study I needed to know if postgraduate students were aware of the measures in place to protect the intellectual property for postgraduate students in their universities. The following were their responses:

Figure 25: Measures in place to protect the intellectual property for postgraduate students

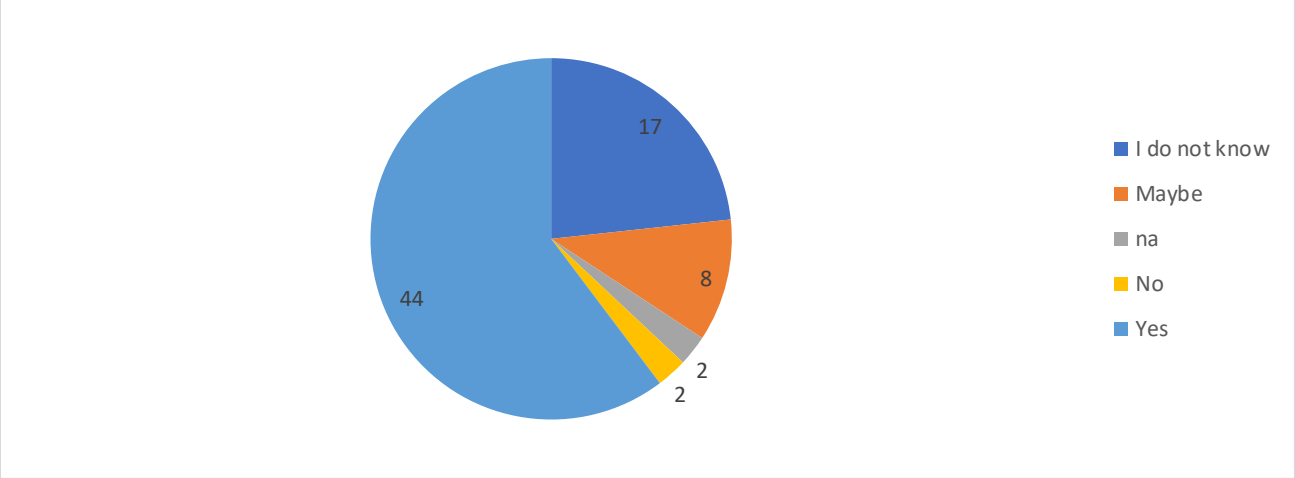


Figure 25: Measures in place to protect the intellectual property for postgraduate students

The chart above indicates that majority of postgraduate students (60%) mentioned that their universities had measures in place to protect the intellectual property of their research outputs. Some participants did not know (23%) while others (11%) were not sure if there were measures in place to protect the intellectual property of research outputs.

2.10 Section H: Investment In Infrastructure (Principle 5)

This section is very crucial in RCD; for RCD to be complete and have impact, there is a need of infrastructure to support it. In this section, I was particularly interested in whether or not participants had the resources they required to complete their research projects, whether or not there were involved in other research projects, issues pertaining to the mentorship and supervision of postgraduate students, as well as how issues of authorship and co-authorship were being handled in universities.

i. Availability of resources

Participants were asked if there were resources they needed during their postgraduate studies and if they were able to get or find them. If participants did not find their resources, they were asked to provide reasons for not getting or finding such resources. The following were their responses:

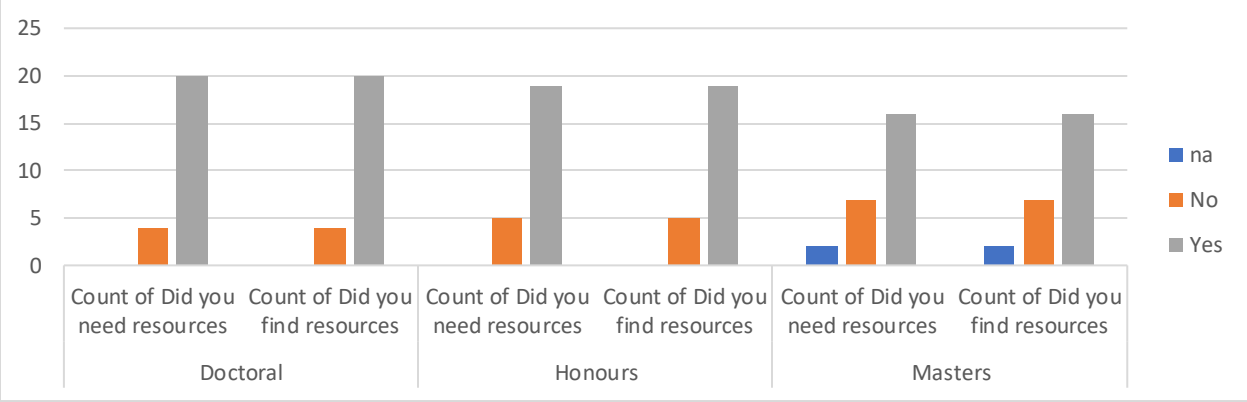


Figure 26: Availability of resources

The graph above shows that majority of participants at all study levels who needed certain resources in order to conduct their research ended up finding such resources. Only a small percentage (5%) of all participants did not find the resources they needed. When asked about the reasons why they did not find such resources, the following reasons were stated:

- "The university denied access of funds even though I had funding"

- "The University gave limited access to Data Analysis tools such as SPSS and STATA"
- "No funding"
- "I applied for various funding opportunities but did not get any"

ii. Availability of funding

One cannot talk about infrastructure or resources and leave out funding. Funding makes research possible as researchers are able to buy or pay for what is required. This may range from tuition to operational costs such as transport to visit research facilities to conduct experiments, payments for the statistician or language editor etc. In this study, I was interested to know if research participants received funding to support their research and which funding they received. In the figure below, participants indicated if they received financial support for their research.

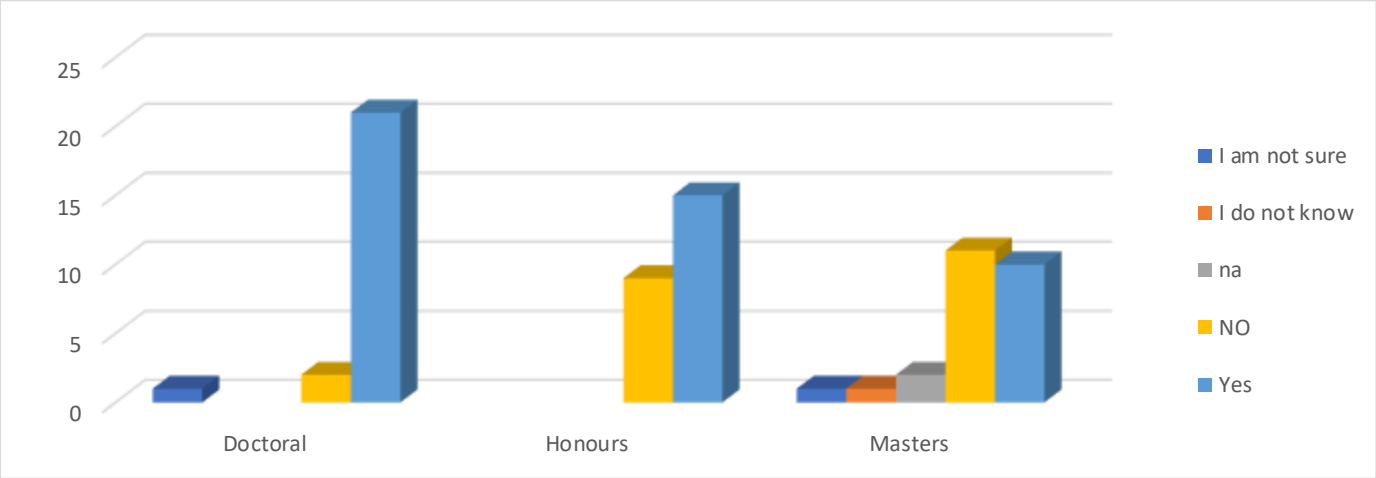


Figure 27: Was there financial support for research in postgraduate studies?

The graph above indicates that the majority of participants at the doctoral (88%) and honours (63%) levels knew there was financial support for the research in their universities, while the majority of masters students (44%) indicated no awareness of financial support; however, a considerable number of masters (40%) participants also indicated there was financial support at their institutions.

Participants were also asked which funding they had during their studies. It is crucial for this study to know who were the main funders of research in South African public universities. The following graph represents their despondences:

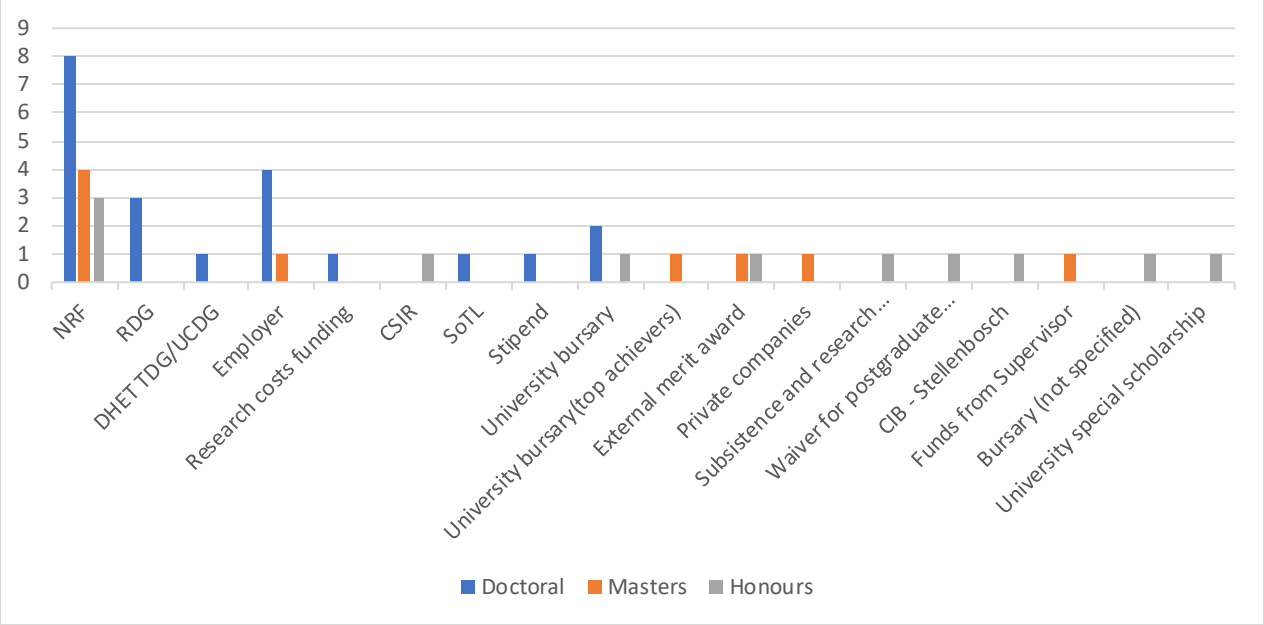


Figure 28: Source of funding

Of those students who indicated that funding was available (n=47), majority of them (n=41) received funding. Majority of those who received funding were funded by the NRF (n=15), other funders who supported some doctoral students include employers (n=4) and the Research Development Grant (RDG). The university bursary only funded two (n=2) doctoral students while the rest of the funders such as the Scholarship of Teaching and Learning (SoTL), university bursary for top achievers, subsistence and research operational funding, external merit award, university special scholarship etc. funded some postgraduate students.

iii. Participation in other projects

Participants were asked if there were other projects they worked on apart from the honours, masters and doctoral research projects. Based on the responses received, majority of doctoral participants

(58%) participated in other projects, while others did not participate in other projects (42%). Most of those at masters (64%) and honours (72%) level did not participate in other projects.

Of those who mentioned that they participated in other projects, the following is the list such projects:

- Tutoring
- Conducting In-Depth Interviews and Focus Group Discussions
- Analyzing data at work
- Writing of an Abstract, poster and article
- Being a co- author
- Writing a manuscript/book
- Conducting laboratory experiments
- Managed research projects in the office

When asked who they worked with in projects above, they indicated that they worked with:

- colleagues
- research assistants
- colleagues from other institutions .
- international students/researchers
- researchers from other departments
- fellow students
- students and researchers from other universities
- my supervisor

Still in this section, an attempt was made to ascertain if participants benefited or not benefit from working in those projects. Those participants who participated in other projects mentioned that they enjoyed the following:

• "Being in another institution/environment"	1
• "I gained laboratory experience"	1
• "My interpersonal skills have improved"	1
• "My research knowledge and skills have improved"	22
• "My Writing skills improved"	4

However, some of the participants did not enjoy participating in other research projects, as expressed in the following:

- "I did not have enough time to focus on the project(s)"
- "The collaborators were not friendly"
- "They were time consuming"
- "A little out of focus of what my Doctoral studies intended researching."
- "Too long to complete"
- "Too much information in a short period"
- "Unfriendly participants"

iv. Supervision and mentorship

In section B above, most postgraduate students mentioned that the supervisors were their main source of support. In most cases, supervision goes hand in hand with mentorship. However, postgraduate students may have separate mentors who focus on their personal and career development. In this study, one asked an array of questions pertaining to supervision and mentorship because they are very crucial in RCD and the postgraduate journey.

Most (n=54) research participants mentioned that their universities had a policy or structure for mentoring and supervision. Participants were also asked to differentiate between supervision and

mentorship. The researcher inquired if they understood the differences between the two roles. Here is a summary of their responses in no particular order or comparison:

Table 7:Participants' description of a Supervisor and Mentor

Supervisor	**Mentor**
Guides you in research	Mentor guides you in all areas of life
Oversees the project	Provides guidance in your studies
Observes and monitors project	Not obliged to give guidance like supervisor
Provides constructive feedback	Gets involved in project
In charge of research supervision	Helps you accomplish goals
Student -supervisor relationship and guidance	Assists in supervision
Task-oriented	Has more time to assist than supervisor
Has expert knowledge of the research topic	Connects students to opportunities
Relevant in honours and masters levels	At doctoral level, a mentor is needed more
Is academically oriented	Focuses on personal development
Contractual	Informal arrangement
Ensures order	Focuses on academic and professional guidance
Project related	Advices and provides help
Provides constructive feedback	Goes beyond your work scope
Is about directing	Is grooming
Is periodic	Is long-term/ongoing
Provides direction in research project	Guides and counsels on scholarly and career development
Is professional	Could be your peer or senior staff
Shows you the way	Is broad
Is authoritative	Allows autonomy
Promotes the student	Has experience regardless of the discipline
Is in a work or educational environment	Mentor can be from anywhere
Shows you the way	Walks with you
Teaches you	Motivates you

Is lecturing and showing how it's done	Helps you further understand
	Is emotional support
	Mentor leads by example

The table above is basically a list of characteristics of the supervisors and mentors and not their differences. These responses were based on participants' experiences with supervision and mentorship. A few participants (n=4) mentioned that the two terms are the same and can be used interchangeably, others did not respond to the question, while some (n=2) mentioned that they cannot tell the difference between the two terms as they only experienced supervision and did not have a mentor. Only one participant mentioned that the difference is the experience, however, it is not clear what the participant meant by that.

Participants were also asked to rate their supervision and mentorship experiences. The following figure illustrates their experiences with their supervisors:

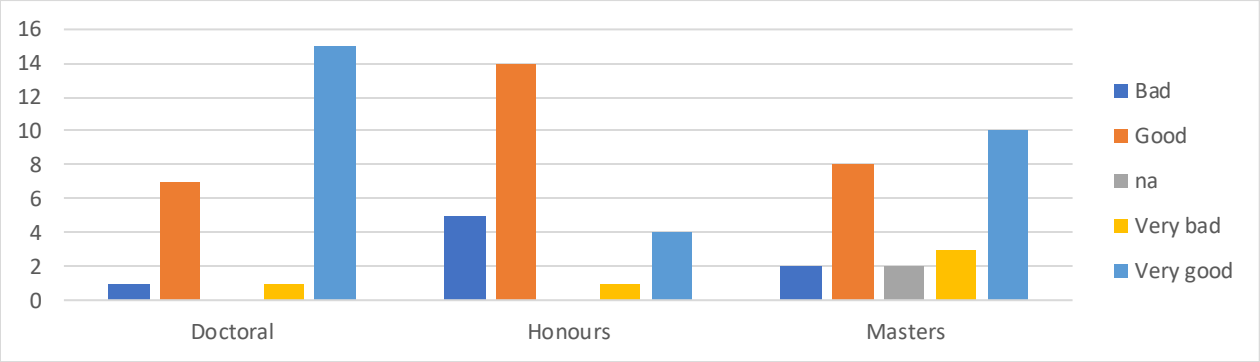


Figure 29: Supervision experiences

The figure above indicates that the majority of postgraduate students at the doctoral (63%) and masters (40%) levels had very good experiences with their supervisors. At the honours level, more students (58%) had a good experience with their supervisors. Of those who had bad and very bad experiences,8% were at the doctoral level, 20% at the masters level and 25% at the honours level.

Participants were also asked to briefly explain reasons for their experiences with supervisors. Those who mentioned that their experiences were good or very good highlighted the following as their reasons:

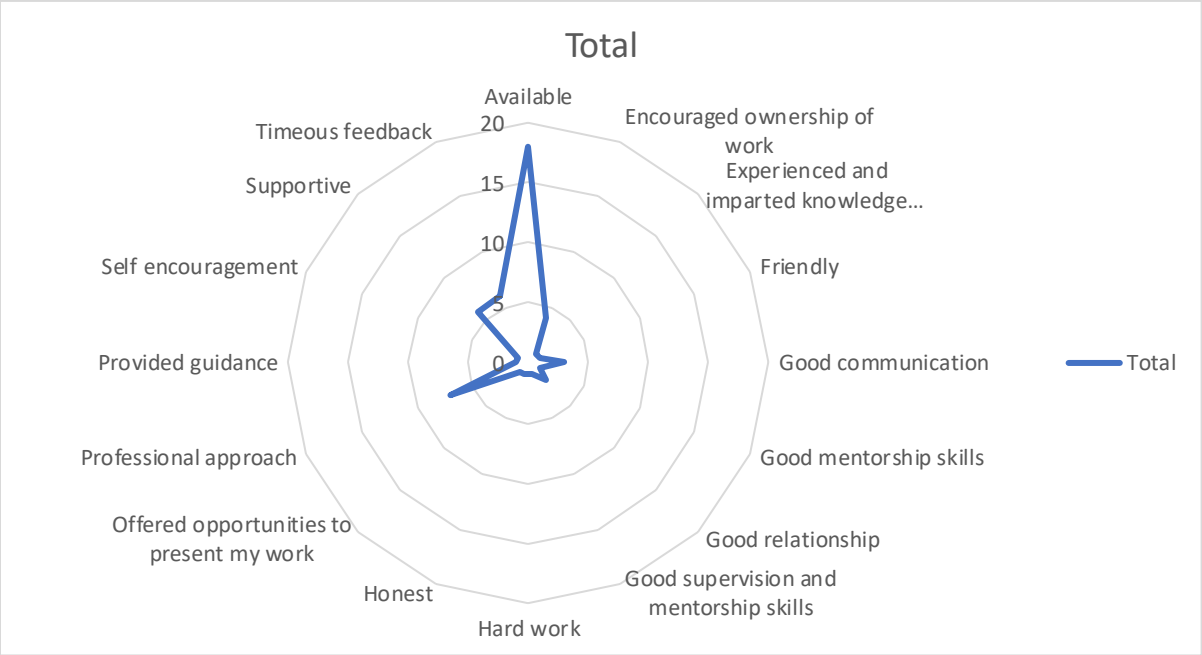


Figure 30: Explanations for positive experiences with supervisors

The figure above indicates that most of the postgraduate students who reported positive experiences with their supervisors alluded these experiences to the availability of their supervisors, while some highlighted the professional approach of their supervisors, a few also highlighted that their supervisors were supportive, provided timeous feedback and encouraged ownership of own research work. Of those who did not have positive experiences with their supervisors, the following were their reasons:

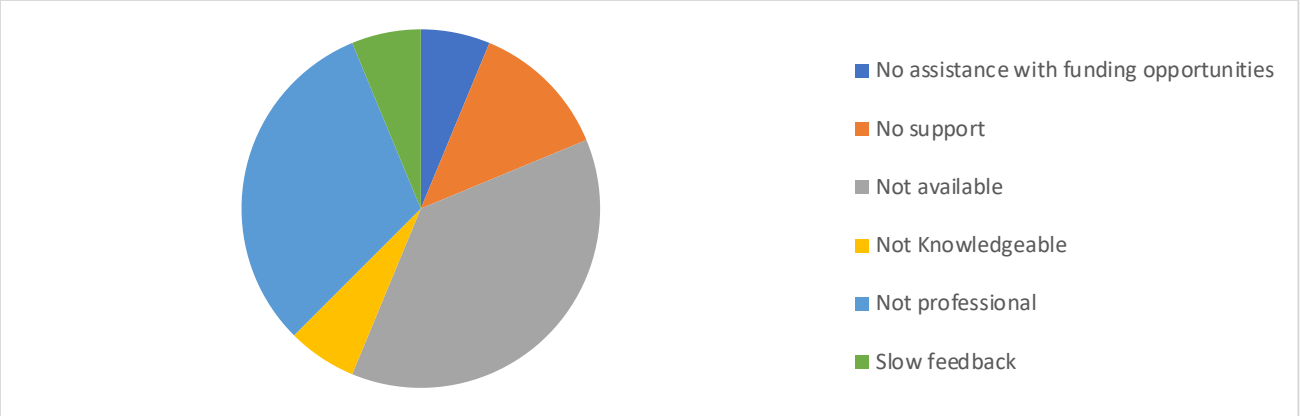


Figure 31: Explanations for negative supervision experiences

As opposed to positive experiences with supervision, most postgraduate students who did not have good experiences with supervisors mentioned that it was due to the unavailability of their supervisors (n=6) or unprofessionalism (n=5) in their approach. Some complained that some supervisors just did not provide support (n=2).

Participants also reported their experiences with mentorship in the figure below.

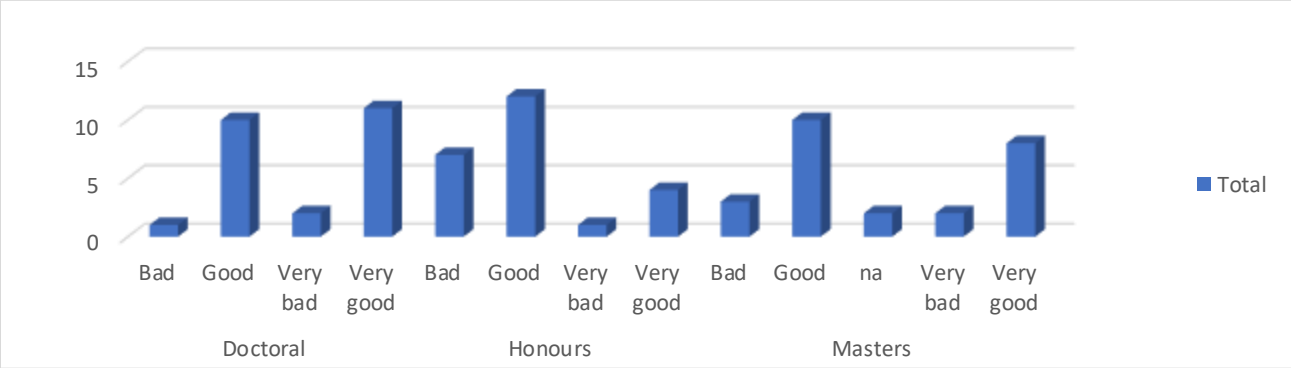


Figure 32: Experiences on mentorship

The figure above indicates that most doctoral participants had very good (46%) and good (42%) experiences with their mentors, whereas most masters (40%) and honours (50%) participants reported that they had good experiences with their mentors. Some Doctoral (13%) and masters

(20%) participants were dissatisfied with their mentors. However, at the honours level, the number of dissatisfied students was significant (29%).

Participants were then asked to briefly explain their experiences of mentorship above. Those who mentioned that their experiences with mentors were positive highlighted the following:

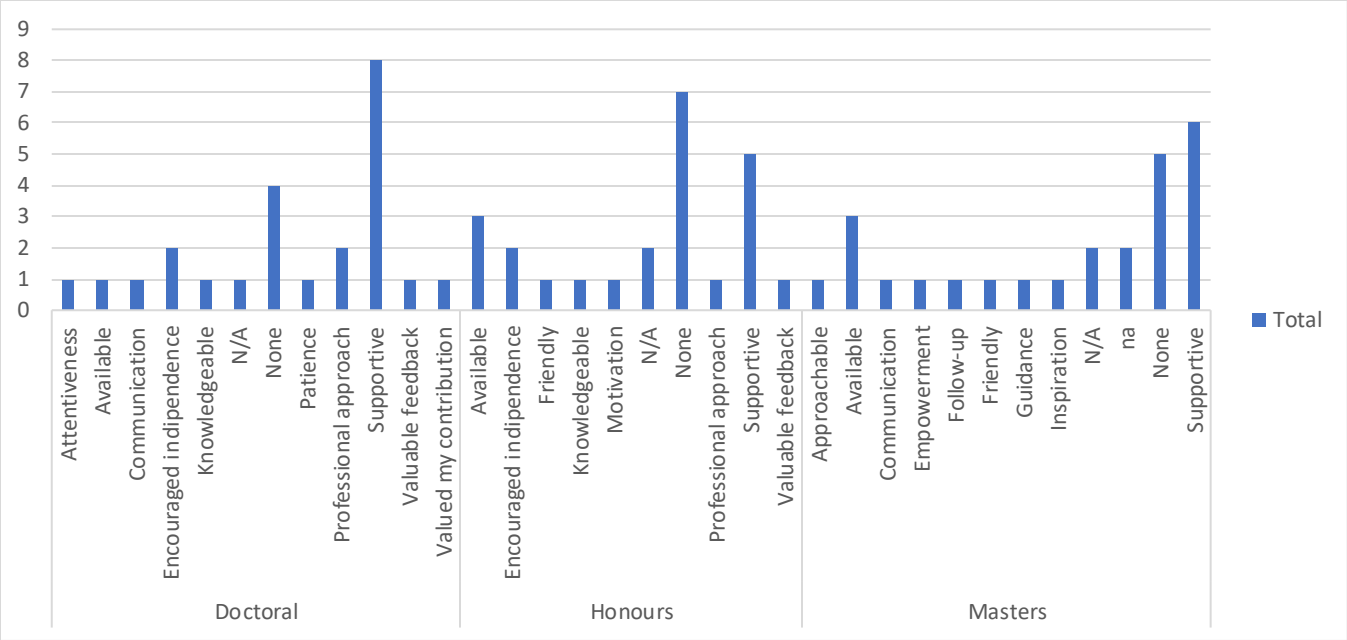


Figure 33: Explanations for positive mentorship experiences

The figure above indicates that most participants (26%) who were satisfied with the mentorship experience valued the support that mentors provided. At the doctoral level, some enjoyed that their mentors encouraged them to be independent and that they had a professional approach when they worked together. Some masters and honours students valued that their mentors were available when they needed them. Other positive experiences include that mentors were: attentive, motivating, knowledgeable, communicated, patience, offering valuable feedback, friendly, empowering, approachable, good guides.

It is worth mentioning that there were a lot of participants (32%) who did not enjoy mentorship, either because they did not have mentors or the experiences were bad. Since this data was quantitative, not enough information could be provided as probing was limited.

v. Authorship and co-authorship

Issues of authorship and co-authorship are often crucial, especially, in studies where more than one researcher have contributed to the research, whether in full, partially or to some extent. It is mainly about the recognition of the researcher in the work that has been done; and it may cause conflicts between researchers if it is not properly discussed and there are agreements from the onset. Research participants were asked how issues of authorship and co-authorship were handled in their universities. Here were their responses:

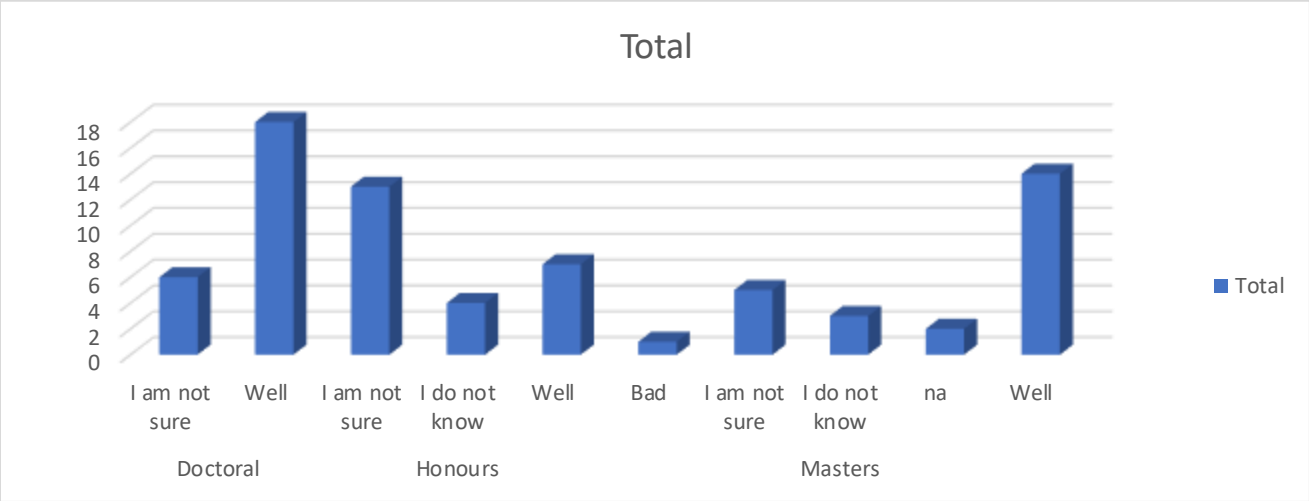


Figure 34: How universities handled issues pertaining to authorship and co-authorship

The figure above shows that the highest number of participants (n=39) at all study levels reported that issues of authorship and co-authorship were handled well by universities. This was followed by those who were not sure (n=24) and those who did not know (n=7). Only one (n=1) participant at masters level reported that issues of authorship and co-authorship were handled badly.

2.11 Section I: Building Elements of Sustainability and Continuity (Principle 6)

In this section, participants were asked if their universities had a policy which ensured research sustainability and continuity. This question speaks to the issue of established researchers supporting and working alongside emerging researchers, this is also referred to skills transfer and can help universities in succession planning. The following were participants' responses:

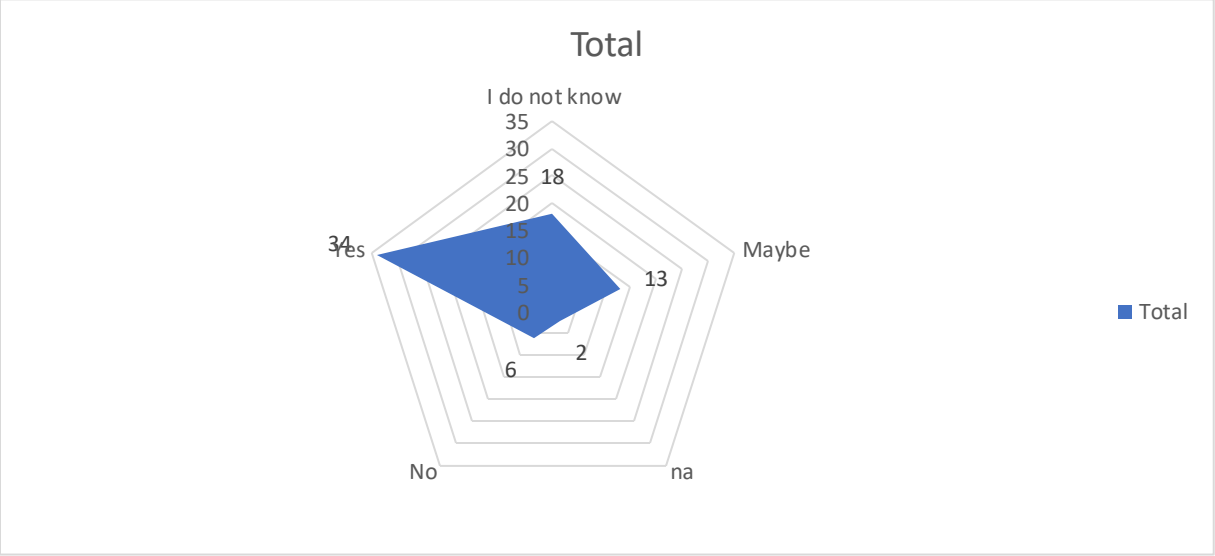


Figure 35: Views on policy for research sustainability and continuity in universities

The figure above indicates that majority (47%) of postgraduate students mentioned that their universities had a policy on research sustainability and continuity, while some did not know (25%), others were just not sure (18%). A few (8%) mentioned that their universities did not have such policy while others did not respond to the question (2%).

The section also ended by asking participants a general question of what would make their postgraduate journey easier and successful if they were to register at a South African public university in future. This question is very crucial as it provides the way forward in terms of the sustainability and continuity of the university, particularly for postgraduate students; it also informs universities which areas they should focus on in the improvement of postgraduate studies. although this question was more of a qualitative nature, one was able to collect this data in a

quantitative manner. The following is the summary of participants' responses in no particular order:

Table 8: What would make postgraduate studies easier?

What would make Postgraduate studies easier?	**Doctoral**	**Masters**	**Honours**
Identifying a committed supervisor	7	10	19
Understanding of methodology	0	1	0
Faster Ethics clearance process	2	0	1
Improvement of access to funding	12	8	10
Allocation of effective mentors	2	3	5
Focusing more on research quality and not regulation time	1	0	0
Quality proposal prior to registration	1	0	0
Learning how to write research proposal	1	0	0
Smooth registration	1	0	0
Good research culture	1	0	0
Availability of resources and facilities	2	2	2
Having NRF-Rated researchers in the faculty	1	0	0
Opportunities for international collaborations and exchanges	1	0	0
Departmental and Deans' support	1	0	0
Supportive and good research environment	1	0	0
Good policies supporting researchers	1	2	0
Needs analysis for postgraduate students	1	0	0
Easy process for purchasing research materials	1	0	0
Support that encourages peer learning and support.	1	0	0
Project management skills	0	1	0
Postgraduate manual	0	1	0
Research/ dissertation workshops	0	1	0

I will take a Course work for quicker completion	0	1	0
Student protection from intimidation by superiors	0	1	0
Research conferences	0	1	0
An efficient postgraduate office	0	1	0
Availability of equipment	0	1	0
Effective clearance of funds to speed up research	0	0	1
Emotional Support	0	0	1
Professional code of conduct in writing	0	0	1
Access to webinars and conferences	0	0	1
Offer more research workshops	0	0	1
Taking ownership of your research	0	0	1
University staff passionate about RCD	0	0	1
I would not register again	1	0	0

The table above indicates the different factors that would make the postgraduate studies journey easier. Majority of participants who responded to this question highlighted the availability of funding and a committed supervisor as the most important in making their postgraduate journey easier. A few also highlighted faster ethical review for research proposals and availability of resources and facilities. Although the factors indicated were many, one doctoral participant indicated that they would not register again for postgraduate studies, the participant did not indicate the reason (s).

At the masters level, most participants highlighted that their postgraduate journey would be easier if they have committed supervisors and access to funding opportunities; a few would like mentors to be allocated to them. Amongst other factors indicated, one masters participant highlighted the issue of project management skills as important too.

At the honours level, participants indicated that a committed supervisor and funding opportunities would make their postgraduate studies easier, while a few highlighted the allocation of mentors as

crucial. Interesting was one honours student who mentioned that taking ownership of research would make their studies easier.

3. Chapter summary

This chapter focused only on presenting data and breaking it down to aid understanding. The profiling of the research participants is crucial for the reader to first understand the background of the former postgraduate students who completed the questionnaire. Research participants were 73 (n=73) in total, which included 24 doctoral participants (n=24), 25 masters participants (n=25), and 24 honours participants (n=24).Most of these participants did not skip questions unless it did not apply to them. This was also avoided by ensuring that some of the questions were mandatory if a participant ticked a certain answer. However, there were two participants who skipped some of the mandatory questions, since the questionnaire notified respondents of the missed questions before candidate could submit it; One can only attribute the reasons for non-completion to the technical or network challenges they may have had.

Recruitment of study participants and data collection took ten weeks. Although the aim was to reach 72 participants, 73 questionnaires were collected in total. This is because the study used referral as a recruitment method, which is not easy to control. To protect the privacy and the right to anonymity for the universities, the researcher left out their names. However, in ensuring representativity, during data collection the researcher was able to know which research participants represented which university. No data was collected from Sol Plaatjie University and the University of Mpumalanga. The questionnaire was able to address the main objective (research aim) of this study as well as its four objectives; it was also able to implement the theoretical framework used in this research. The questionnaire ended with a question which may provide a way forward for postgraduate studies in terms of what they require in order to make their postgraduate trajectory easier.

CHAPTER FIVE: DATA INTERPRETATION AND DISCUSSION

1. Introduction

The preceding chapter focused on data presentation and analysis. This chapter will interpret the data presented in the previous chapter, and will discuss the findings and possible implications of such data. This chapter will also answer if data presented was able to answer study objectives.

This study was an assessment for Research Capacity Development in institutions of higher learning of South Africa. Cooke's framework for evaluating research capacity building was used as a theoretical framework. Therefore, since there is currently no tool to measure RCD in higher education, this chapter will also bring forth discussions around whether RCD in South African universities can be implemented according to Cooke's framework. As mentioned, the questionnaire used to collect data was long because this was an assessment; all relevant questions which were needed to assess RCD in higher education had to be asked. Data interpretation and discussion has therefore focused on each aspect of the data presented; however, it is in data discussion that this study will establish if the aim and objectives of this study were met and how.

2. Data Interpretation and discussion

This section brings a clear understanding of the data presented in chapter four as well as the discussion. The same sequence and sections used in the data analysis will be used to present a clear flow of interpretation and discussion.

2.1 Section A: Background Information

i. Study population

Table one of this study has indicated that honours participants were 24 (33%), masters participants were 25 (34%) and doctoral students were 24 (33%). Demographics such as age, gender, race were not considered in this study as Research Capacity Development concerns all postgraduate students regardless of demographics.

ii. Research methodology course (REME)

Based on data reported, majority of South African public universities introduce research methodology to undergraduate students. This ensures that students have a basic understanding of what research is about and what to look forward to, should they enroll for postgraduate studies. Although 25% of participants reported that they were not enrolled in the course during undergraduate studies or prior to postgraduate studies, this did not affect degree completion. Only twelve participants in this study (16%) did not complete their degrees; however, from this number, only two postgraduate students who did not complete their degrees were not enrolled in research methodology during their undergraduate studies. Table below illustrates:

Table 9:Relationship between the research methodology course or module during undergraduate studies and degree completion

REME and degree completion (N=73)	**%**
Participants enrolled in REME during undergraduate studies.	75
Participants who were not enrolled in research methodology	25
Participants who did not complete their degrees	16
Participants who did not complete degree and were not enrolled in REME during undergraduate studies.	3

The table above indicates that the non-completion of postgraduate degrees may not be attributed to the REME enrollment during undergraduate studies in South African public universities. Therefore, there may have been other challenges that led to the non-completion of their degrees

between 2010 and 2020. The issue of non-completion of degrees has been a problem in South Africa. According to MacGregor (2009), South Africa has to address issues pertaining to the low postgraduate graduation rates so that the country can be in a position to be able to compete globally.Once more, in Kritzinger and Loock (2012), it is indicated that between 2006 and 2010 in one of the open distance universities in South Africa, masters and doctoral headcount targets were not met although there was a positive impact. The throughput rate was also not met, with positive impact only at the masters level. Masters and doctoral students seemed to be completing on record time, but the dropout rate was high.

iii. Participants' study levels and year of registration

In this study, data was collected from participants who were registered between the years 2010 and 2020. It did not matter if they completed their degrees or not, however, they were supposed to have had a research exposure and have had to develop a research proposal. The study ended up with the students representing each of the years it was recruiting for, although this number was not evenly distributed. This means that in some years, there were more students recruited than in others. For example, at the honours level, fewer students who were registered in 2011,2012 and 2013 were recruited, however, there were more honours students recruited in 2018. This is because, recruitment of participants did not aim to include a certain number of participants per each year, the study was only interested in the representation of study levels i.e. that each study level (honours, masters and doctoral) must be represented per institution.

iv. University regulation time

Based on the responses given during the study, the majority of students understood that there is a regulation time to complete studies; no one indicated that they did not know. The regulation time is the period set to complete a degree for each study level. For example, an honours degree is usually a one-year degree. However, some institutions offering such degrees on part-time basis may allow students to complete it in two years. There are also institutions that allow students to

go for the third year, provided that an application for extension with valid reasons is submitted and approved by the departments.

v. <u>What made it easy and difficult to complete postgraduate studies</u>

In this study, of the factors that made it easy to complete studies, the majority highlighted the following, starting with the factors which were mentioned more frequently.

- Supervision Support
- Dedication/determination
- Hard work
- Funding availability
- Time management

Interestingly, funding availability, time management and family support were significant at the doctoral level. This may suggest that a doctoral degree is expensive and that it requires more family support as it can be more emotionally taxing than the lower degrees. Hard work was mostly mentioned by honours participants while some masters students highlighted dedication and determination as one of the factors that made it easy for them to complete their studies. It is therefore permissible to mention that although there are many factors that can play a role in motivating or supporting postgraduate students, the above-mentioned factors play a huge role in postgraduate degree completion; the most important factor being supervision.

Participants who reported that they did not complete their degrees mentioned the following as their reasons for non-completion of their studies:

- Difficulties in getting clearance to collect data;
- Taking long to replace supervisor;
- Lack of funding;
- Lack of academic writing skills;
- Supervisor delaying student progress;

- Financial challenges; and
- Personal reasons such as falling pregnant, poor health and starting a family.

The factors reported above suggest that the following research areas to be strengthened within the university:

- Increased supervision support;
- Increased access to funding opportunities;
- Improvement in the ethical clearance process of research proposal;
- Management of supervision replacement and
- Training on academic writing skills.

In terms of personal reasons that may delay postgraduate studies, it is unfortunately not possible to predict that one will fall ill during their studies. Some students get hospitalized for longer periods during their studies. As I mentioned before, some universities allow for an extension of university regulation time based on valid reasons provided by the student, e.g. a period of a long illness

vi. Percentage of research conducted

In this study.it was also observed that the majority of doctoral (96%) and masters (52%) participants indicated that they conducted 100% research projects, however, the majority of honours participants conducted 40 to 50% of research. This may be attributed to the fact that the honours degree serves as an entry level in research; it is an entry into post graduate studies where students are introduced to the world of research in a practical manner. At the same time, there are other modules honours students must still complete, apart from the mini research project.

vii. Research completion time

Research completion time is not equal to completion time for the degree. It refers to the time it took to conduct research from start to finish. It does not necessarily include the time from registration to graduation. However, for students registered for full research, there is a thin line between research completion time and degree completion time as these students have no coursework to focus on. Therefore, research completion time may equal degree completion time for these students.

This study revealed that most doctoral participants (58%) took approximately three to four years to complete their research, whereas 17% took two years. Most masters participants (28%) took two years to complete their research. However, the masters percentage was not as significant as there were still a significant number of participants (16%) who took 3-4 years to complete masters research. Similarly, there were a lot of masters students (16%) who also did not complete their research.

In terms of the honours participants, although the majority of students took three to six months and others took one year to complete their research, there were still a lot of participants (17%) who did not complete their research.

This data draws attention to the honours and masters students in universities as it seems they are somewhat at a risk for not completing their research; this means that universities need to strengthen the factors mentioned above in order to support these students. Such factors are: increased supervision support, increase access to funding opportunities, improvement in the ethical clearance process of research proposal, management of supervision replacement , and training on academic writing skills. The Academy of Science of South Africa (ASSAF)'s consensus report published in 2010, indicated that in South Africa:

- on average, 1 039 doctoral students graduated per year from 2000 to 2007;
- an average of 7 163 masters students graduated per year from 2000 to 2007.;
- average time to complete a doctoral degree was 4.8 years; and
- only 26 doctoral graduates are produced per year per million people in South Africa.

According to Kritzinger and Loock (2012), these data indicated poor supervision for postgraduate students in the country. Although these data were long collected, it also indicates that South Africa comes from a history of underperformance in terms of postgraduate strengthening; this contributes another reason why this study is relevant.

2.2 Section B: Role players, tools, benefits and beneficiaries of Research Capacity Development

Questions in section A above were formed in order to create rapport for participants; to create a profile for these participants. However, in this section, I needed to know what are the role players, tools, benefits and beneficiaries of Research Capacity Development in South African public institutions of higher learning. The questions asked at this section are crucial as they set a trajectory for the rest of the sections which are aimed at assessing Research Capacity Development. This section provides some answers to objectives of this study which were to:

- explore the South African Research Capacity Development for postgraduate studies at the honours, masters and doctoral levels;
- identify the key role players in Research Capacity Development in South African institutions;
- identify the activities and tools for Research Capacity Development in South Africa; and
- explore the extent to which Research Capacity Development initiatives have benefitted previously registered postgraduate students in South African public universities.

Therefore, in discussions, care will be taken to ensure that I state if any of the objectives were met by each section and if Cooke's (2005) Framework for evaluating research capacity building was used in each section.

- **Role players for Research Capacity Development (Source of support)**

This section answered the second objective of this study which was to identify key role players of research capacity development in South African public universities. It is important to highlight that the 'human capital' is the crucial element of research capacity development . Lee& Kuzhabekova (2019, p. 351) refer to the human capital as "the default level of capacity development". This basically means that there will be no research without people who are willing to conduct research. The 'human capital' requires various kinds of support in order to conduct meaningful research that responds to local issues and debates. This study asked participants who

their source of support was during their postgraduate studies. Although there is a significant number of participants who indicated that fellow students and family members supported them during their studies, majority of participants indicated supervisors and co-supervisors as their most source of support during their studies. This number is notable at the doctoral and masters levels.

This data means that student supervision is of essence in postgraduate studies. Although researchers such as Kasprowicz , Chopera, Waddilove, Brockman, Hunter, Kilembe, Karita, Gaseitsiwe, Sanders and Ndung'u (2020) have associated the lack of research outputs in Africa with poor supervision, participants in this study who have benefitted from supervision proved otherwise. Kritzinger and Loock (2012) also indicated that the challenge of low throughput rates is a result of poor supervision.

The notion above is supported by data on the 'kind of support' students received during their postgraduate studies. Majority of students indicated that they received research supervision the most. Emotional support was also mentioned more than financial support. This draws attention to the idea that although research funding is crucial, perhaps studying at a postgraduate level is emotionally taxing. Therefore, there is a need to strengthen the mentoring and counselling services within South African institutions.

- **Are institutions of higher learning in South Africa implementing RCD?**

Data indicates that South African public universities are implementing RCD. Only four students indicated that their universities did not implement RCD, or they were not sure or they did not know. They stated the following reasons:

- "I was struggling with funds"
- "Limitations to research capacity rollout has to do with limited institutional and funder capacity to conceptualize impactful interventions and often limited funding that is normally once off and project based".
- "I am not sure"

- "I think the department does not have vision of investing in its students w.r.t quality research"

The reasons mentioned above do not necessarily suggest that RCD was not implemented altogether; for example, the fact that the student had challenges with funding, or the department had no vision of investing in its students may require more probing for students to elaborate in order to understand what they meant and how that makes them believe that their institutions did not offer RCD.

This section made it possible for this research to answer the first objective for this research, which is to explore the South African Research Capacity Development for postgraduate studies at the honours, masters and doctoral levels. Should the majority of students mentioned that public universities in South Africa did not implement RCD, this research was going to take a different angle as all of the objectives were not going to be met. For example, it was not going to be possible to identify the key role players in Research Capacity Development in South African institutions; to identify the activities and tools for Research Capacity Development in South Africa; and to explore the extent to which Research Capacity Development initiatives have benefitted previously registered postgraduate students in South African public universities.

However, there is a saying one often hears which states that 'no research is bad research', which means that whatever findings a study discovers, such findings are crucial to know or to be noted. Another researcher may find such findings useful to build onto more discoveries that may advance knowledge or improve lives. For example, this study findings therefore would have mainly suggested that South African public universities do not implement RCD, the recommendations would have indicated that public universities need to start implementing RCD in order to ensure that sufficient support is provided to postgraduate students during their studies.

As it was indicated in chapter 4, there were twelve (n=12) participants (3 doctoral, 5 masters and 4 honours) in this study who reported that they did not complete their studies (Table 4 under the participants' profile). When comparing data on those who did not complete their studies (n=12),

one also wanted to confirm if there is a correlation between the non-completion rate for students, lack of support, and if their institutions implemented RCD. Table 5 illustrated this.

In that table, it was established that there is no link between post graduate students non-completion of studies and the implementation of RCD. This data is supported by data in Table 4 which is about the reasons for not completing postgraduate studies; in that table, participants who did not complete their studies never indicated that their non-completion was also attributed to the fact that their universities did not implement RCD.

2.3 Section C: Activities and tools for Research Capacity Development

This section is relevant in meeting the third objective which is to identify the activities and tools for Research Capacity Development in South Africa. Since the majority of students indicated that the public universities they were registered with implemented RCD, it made sense to look closely on the RCD activities and tools.

There is a relationship between activities and tools for RCD. An RCD activity in postgraduate studies is that which the university offers in order to support postgraduate students, e.g. research workshops; while the RCD tool is that which the university use to implement RCD activity, e.g. in order to support students financially, universities may offer bursaries to postgraduate students. Although RCD activities and tools do not mean the same thing, they may be used interchangeably as they refer to an overall " support" offered. For example, if a postgraduate student is offered a bursary, this turns out to, be that they have been supported; one may also mention that I was offered funding, which still means they were supported to complete their studies. For the purpose to provide an easy flow, this study used the term 'activities' to refer to both activities and tools for RCD. This section also answers how data collected relates to Cooke's Framework for RCB.

- **RCD activities offered to postgraduate students in South African public universities**

This study revealed the various kinds of RCD activities which were offered to postgraduate students in public higher education institutions. In the questionnaire, participants were allowed to tick more activities; they were also given an opportunity to add more activities which were not listed in the questionnaire. The following were Research Capacity Development activities; these were ranked from the most mentioned activity to the least mentioned activity. Some activities were grouped together, as they were mentioned by a similar number of participants.

Table 10: RCD activities per study level

Doctoral (n=24)	**Masters (n=25)**	**Honours (n=24)**
Research workshops	Research methodology course and research workshops	Research methodology course
Research methodology course	Thesis or dissertation writing workshops or retreats	Research workshops
Thesis or dissertation writing workshops or retreats	Data analysis workshops	Thesis or Dissertation writing retreats
Seminars	Research conferences	Research support groups and research networking sessions
Research conferences and data analysis workshops	Research networking sessions	Research conferences
Research networking opportunities	Webinars and funding workshops	Seminars
Webinars and support groups	Collaboration opportunities	Funding workshops
Funding workshops	Research support groups	Summer school, research collaboration platform

Research support groups	Winter school	-
Collaboration opportunities and summer school	-	-
Tuition fee, research colloquia, Four Annual doctoral weeks, research writing retreats and accommodation during workshops	-	-

The table above means that postgraduate students at each level were offered more or less the same RCD activities. However, some activities were offered more at some study levels than the others. For example, data analysis workshops were offered at doctoral and masters levels only. Although there is a possibility that data analysis as a topic may have been included in the research methodology course or other research workshops, universities may need to consider introducing data analysis workshops to honours students so that it forms part of their basic research knowledge, even if their curriculum does not have a full research project as one of their modules. However, a proper need analysis may best assist in the decision for which RCD activities to prioritize at each study level.

- **How long RCD activities offered to postgraduate students took?**

In chapter four, the majority of participants (*n=28*) reported that most RCD activities took 2-5 days; this was followed by activities that took one hour to a day (*n=27*). Very few participants (*n=7*) mentioned that some activities took two to three weeks and others, a month. Since RCD activities are different in purpose, structure and content this automatically makes the mode of delivery different as well. Many factors must therefore be considered prior to the implementation of each activity. This means that some activities may take longer than others to implement. Other factors to consider may include the availability of postgraduate students, the university calendar, budget implications and the availability of resources in general as well as COVID-19 regulations.

Based on these findings, it is appropriate to mention that there is a need for a formalized strategy for Research Capacity Development. Such guidelines must be approved by the Department of Higher Education and Training.

- **Was time allocated to RCD activities enough?**

It was crucial in this study to learn about participants' viewpoints on time allocated for RCD initiatives; that is to say, if they thought it was enough or not. This is because since they are the expected beneficiaries of RCD, they are best suited to provide such feedback. However, the limitation in this question is that it was generalized and it was not activity-based. Participants, therefore, reported an average estimate on how long all RCD activities took. In future research, a question of this nature will be beneficial if asked per activity indicated by participants.

Regardless of these limitations, data collected demonstrated that the majority of students (67% doctoral participants, 52% masters participants, and 54% honours participants) indicated that time allocated to RCD initiatives was sufficient for them. Since the study was not qualitative in nature, another limitation in this question was that one could not ask why some participants thought time allocated to these activities was sufficient. There are also participants who mentioned that time allocated to RCD activities was not sufficient.

- **Research activities which benefitted postgraduate students <u>the most</u>**

This question was crucial to this study as it provides a way forward in terms of what postgraduate students need the most in RCD. It also addresses objective four of this study which is to explore the extent to which RCD initiatives have benefitted postgraduate students in South African public universities.

The research methodology course has proved to be the most valuable in laying the foundation for the research trajectory as presented in the figure 16 from page . This was followed by the research workshops and the thesis or dissertation writing retreats. Future RCD strategies must take into consideration these aspects. Let us not forget that there were few participants (7%) who indicated they did not benefit from any RCD mostly because their institution did not offer them such activities. Although there could be explanations or other reasons why such students did not experience RCD, for example, students missed communication or they did not attend. It is therefore important for universities to ensure that students are not left out in RCD. It is recommended that they use global communication strategies within the university whereby all emails for students are grouped together to make it easy when sending communication to all students. However, if students prefer to use their own email addresses and not the ones offered by universities, this may cause challenges in communication.

- **Research activities which benefitted postgraduate students <u>the least</u>**

As with the previous question, this question is crucial in directing universities to which RCD initiatives are not most beneficial. Most participants indicated that there was no activity which benefitted them the least, although some (14%) and (10%) mentioned that research workshops and research support groups respectively benefitted them the least. This indicates that most participants benefitted from RCD initiatives offered by universities. However, it is also important to not be ignorant of those who did not benefit much from research workshops and other activities, a closer look should be paid to why some postgraduate students did not benefit that much from these workshops.

It is therefore crucial to conduct evaluations for each activity as soon as it is offered. However, there are other activities whose benefits may not be captured immediately. For example, a student may have attended the data analysis workshop and found it to be well delivered, however, it is in the actual practice that the student can figure out if the workshop was indeed beneficial to them or not.

- **Research activities which did not benefit postgraduate students <u>at all</u>**

Majority of participants benefitted from RCD offered by universities. This is a good indication, it shows that universities are mostly on the right track when it comes to RCD, although there were certain challenges here and there. The recommendations of this research will provide a way-forward.

- **Other RCD activities postgraduate students <u>wished</u> they participated in**

Apart from the activities mostly mentioned such as the thesis writing retreat, data analysis workshop, research methodology course etc., in this question, postgraduate students also indicated that they are in need of the following:

1. <u>Team work</u> -they indicated they need group work, research group for support and motivation, frequent meetings between (co)-supervisor and student, research networking, etc.;
2. <u>Policy-related information</u>- they indicated a need of research policy education with regards to their studies;
3. <u>Career-related support-</u> they mentioned assistance with registration with professional bodies in their field, presentation and public speaking skills training, mentorship, job and career strategies, and lastly
4. <u>Emotional support-</u> they indicated mental health and coping with pressure at an honours level, mentorship, to have a present supervisor etc.

Although not many students mentioned these activities, however, all these additional activities are an indication that RCD need to be coupled with other supportive activities which will make the postgraduate journey easier if not just bearable.

2.4 Section D: Building Skills And Confidence (Principle 1)

Apart from the above-mentioned support that some students indicated they needed as part of RCD, From this section to section I, they were also asked questions which were meant to explore RCD

but also assesses RCD according to Cooke's framework for evaluating RCB. As evident in the above section, data supports that RCD activities must be coupled with other activities and this Framework focuses on determining if RCD is sufficient in institutions, not forgetting that RCD exists in a policy environment.

- **Additional skills training offered**

In sections above, we learned that universities are building skills and confidence in research by offering workshops and other activities to postgraduate students. In this section, participants indicated that they were also trained and skilled in other aspects such as: presentation skills, project management skills, computer skills, monitoring and evaluation training, training on using reference tools and library services. It is not clear if these other training activities were offered only to postgraduate students or to all students registered in universities. Therefore, I cannot argue that these activities were meant for RCD support or not. What is important is that they were offered.

- **Opportunities to practice skills learned**

Some participants were offered platforms to practice the skills they learned in the trainings mentioned above. Such opportunities include research seminars, tutoring opportunities, applying skills at work, literature searches for research and practical sessions. Some participants (n=12) did not have opportunities to practice what they had learned. Perhaps this means that the additional training offered to students in higher education should be needs-driven and that those who are provided training should have opportunities to practice the skills they learned. This means that students will then attend workshops related to their career choices so that they are able to implement what they learned. It is possible; however, that some skills learned were still beneficial, but students had not yet found platforms to practice them. For example, some participants indicated that they implemented their skills at work. With high unemployment rates in South Africa, it is plausible to mention that perhaps some participants were still looking for employment opportunities where they can practice what they learned.

2.5 Section E: Research That Is 'Close To Practice' (Principle 2)

This section focused on two aspects: if participants thought or believed that the research they conducted was 'close to practice' and exploring students' perceptions about the issue of research culture in universities. This was done with the view to establish if research was valued and encouraged.

- **Research that is 'close to practice'**

In terms of conducting research that is 'close to practice', I learned that majority of postgraduates students believed that the studies they were conducting improved or they were meant to improve lives of communities. Studies they conducted had several solutions they brought fourth such as food and safety policies, environmental solutions, the improvement of technology, and majority of these were focusing on local government improvements and also health solutions. Therefore, research conducted in public institutions of South Africa is 'close to practice', even though few other participants were unsure and some did not answer.

- **University research culture**

The same number of participants that indicated that their research was 'close to practice' also indicated that research in their institutions was valued. This shows that public universities in South Africa value research as a field. It would aid this data to find out why participants believed their institutions valued research and how they promoted it.

2.6 Section F: Support Linkages, Partnerships And Collaborations (Principle 3)

Towards the end of section C, one learned that there are other aspects that must be added to RCD in higher education, those include activities that enhance team work, education on research or postgraduate policy, career-related support and emotional support. Again, in the RCD activities that benefitted participants, research collaborations and networking sessions were part of the package. This study further revealed that those who were part of the research teams or

collaborations benefitted from them. Since the majority of those who indicated that they were not part of the groups or teams or collaborations were at the honours level; this indicates that the formation of these activities may be more important at the masters and doctoral levels.

Of the activities that form part of team work, research partnerships and collaborations were mostly mentioned, followed by support groups. This data supports that RCD should incorporate elements of team work and emotional support . This will also assist students to network and derive a feeling that 'they are not alone'. There may be a relationship between research completion and research team/groups, that is a topic for another day. Kasprowicz *et al.* (2020) also indicated that in Africa, there are more tangible success stories with regards to current collaborations in research; however, these can only bear more fruit when Research Capacity Development is run, managed and owned by Africans. This is due to the following :

- "Research [will be] more aligned to and addressing key local scientific and health challenges;
- Enhanced local ownership of activities;
- New opportunities for skills building and developing of local scientists and staff;
- Increased and improved research outputs including more first and last author papers;
- Recommendations from African-led studies may resonate more and lead to better uptake by local policy makers; and
- More opportunities for senior African scientists to act as role models" (Kasprowicz *et al.*, 2020, p. 3).

2.7 Section G: Developing Appropriate Dissemination (Principle 4)

- **Dissemination strategy and funding opportunities**

As indicated in Chapter four, RCD must promote dissemination of research to peer reviewed publications, through presentations in conferences and other platforms such as local symposiums,

seminars and research days. In terms of developing appropriate dissemination, in this study, it was learned that majority of participants (75% doctoral; 60% masters) indicated that their universities had dissemination strategies, and some (47%) also mentioned that their institutions had funding opportunities for the dissemination of study results. Universities can still work more around this aspect as there were still participants who either did not know, were unsure or mentioned there were no plans around dissemination strategies and funding opportunities for that. Data in the study reveals that it is the honours students (figure 24 of chapter four) who mostly were not aware of the dissemination strategies, this suggests also that issues of results dissemination should form part of the orientation or induction of postgraduate students.

- **Protection of intellectual property**

Protection of Intellectual Property (IP) is very important in research as novel ideas are developed and one may want to protect their ideas from theft. All postgraduate student's research projects are their ideas. However, in academia, one cannot guarantee that ideas may not be stolen, especially those ideas with financial gains. In this study, one learned that most participants were aware of the IP measures in place at their universities. Again, we should not ignore those who did not know and those who were not sure if there were measures in place to protect their IP.

2.8 Section H: Investment In Infrastructure (Principle 5)

An RCD plan with no resources or infrastructure will not be successful. It is important to note that issues of infrastructure are broad. Some of the issues that form part of the research were given due respect and are discussed in this section. These include: issues pertaining to whether or not participants were involved in other research projects, issues pertaining to the mentorship and supervision of postgraduate students as well as issues of authorship and co-authorship. Observation shows that the infrastructure of the university is how the institution has been set-up to support research.

- **Availability of resources**

In this study, data indicated that the majority of students who needed research resources found them. However, in this question one learned that the word 'resources' is too broad and it may mean anything that is needed for research in this context, therefore, this question was not clear and the results therefore may not be easy to interpret. Some students may have responded referring to funding, some may have thought of library materials, while others the availability of laboratories and equipment.

- **Availability of funding**

Unlike the question on resources above, the question asking about funding was straightforward. There is a saying that says 'money makes the world go around'. Well, the same sentiments can be shared in research because money makes a lot possible. Many studies including this one require funding. The amount of research funding needed is determined by the research approach, methodology and data collection techniques chosen to be used for the project. Although the efforts should be to minimize the costs, at times researchers do not have a choice but to require funding for their studies.

For postgraduate studies, tuition fee can be considered a research cost, as one has to be a registered student first prior to being considered a 'student'. However, other funding opportunities may choose to only fund 'actual' research costs, travel costs, living cost or tuition. There are also those scholarships or grants which cover all fees; an example of this is in the DSI-NRF Postgraduate Student Application and Funding Framework for Funding in 2022 Academic Year of the NRF (2021). NRF's honours, masters and doctoral scholarships have various categories of funding which depend on whether students are funded at the full cost of study (FCS) or the partial cost of study PCS). According to the NRF (2021), those who qualify for FCS obtained an average of 75% or higher in their previous degree and are financially needy as per the financial means test conducted; those who qualify for PCS have obtained an average of 65% in previous degrees. The following table indicates the differences:

Table 11: Annual NRF allowances applicable for full cost of study (FCS) and partial cost of study (PCS) for honours, masters and doctoral students

Category	Funding per level of Postgraduate Study[1]					
	Honours		Master's		Doctoral	
	FCS	PCS	FCS	PCS	FCS	PCS
Living and Transport allowance (Rand)	12 000 pa	n/a	30 000 pa	n/a	48 000 pa	n/a
Food allowances (Rand)	27 000 pa	n/a	27 000 pa	n/a	27 000pa	n/a
Maximum Accommodation allowance (Rand)[2]	53 350	53 350	64 020	64 020	64 020	64 020
Maximum Tuition Fees (Rand)[3]	52 350	52 350	41 880	41 880	31 410	31 410
Maximum (Rand)	**144 700 pa**	**105 700 pa**	**162 900 pa**	**105 900 pa**	**170 430 pa**	**95 430 pa**
Electronic study Device allowance (Rand)[4]	10 000	n/a	10 000	n/a	10 000	n/a
Maximum Assistive technology device (Rand)[5]	20 000	n/a	20 000	n/a	20 000	n/a

1. The allowances per category will be reviewed on an annual basis subject to the agreed CPI-linked sector-wide increases and alignment with the *Guidelines for the Department of Higher Education and Training Bursary Scheme for Students at Public Universities*.

2. Accommodation fee will be capped and paid as per invoice. Limited to maximum cost of the equivalent university owned accommodation at a particular institution. Students accommodated in private rental accommodation must also provide proof of a valid lease agreement**.**

3. Tuition fee will be capped and paid as per invoice. Tuition fee is the agreed institutional fee for the actual programme of study. Registration fee to be included in the tuition fee allowance. Qualifying NRF funded students in possession of a provisional award letter are not required to pay an upfront registration fee.

4. The electronic study device allowance will be provided as a once-off allowance for the duration of the postgraduate studies.

5. The Assistive technology device allowance will be only for students with disability.

Source: NRF (2021, p. 11)

In this study, this section of funding asked students if they had financial support for research in their universities and which funding opportunities assisted them during their research. It should be noted that further questions on funding such as how much funding they received and if it covered all costs related of their research were not asked, this could have shed more light in terms of how much funding was awarded to participants. While the majority of participants indicated that there was financial support at their universities, there was a worrying 44% which indicated there was no financial support. This means that a considerable number of students may have had financial challenges during their studies. This may cause a lot of challenges which may lead to slow throughput rates and increased dropout levels.

Another question related to funding was that of the source of funding participants received in their studies, majority highlighted the NRF as the funder. This data may suggest that South Africa's funding for postgraduate studies is mostly from one agency and that there is a need to open up more channels for postgraduate studies funding. As indicated above, the NRF's current funding Framework (2021) targets those with poor backgrounds and the higher achievers; it also does not fund students who are working, and it is also age-specific. Although the NRF has its own mandate to achieve which may be attributed to ensuring that young researchers who may contribute to the knowledge economy for longer are produced and also basing their funding model to the idea that higher achievers are most likely to complete their studies on regulation time; this means that there will be 'the missing middle' who will be left out by the system. Other funding opportunities should aim at closing that gap as being of certain age and a higher achiever in your undergraduate studies does not necessarily equate to being a good researcher.

- **Participation in other projects**

Participating in other activities or projects may expand the knowledge of postgraduate students as they gain other skills which may include team work, presentation, writing, laboratory, negotiation skills etc. In Cooke' (2005) framework, principle one indicated that these kinds of skills improved the confidence of a researcher. In this study, it was learned that the higher the degree, the more

researchers participate in other research-related or academic activities such as tutoring and working with other researchers in laboratories or other research projects. This may be due to the seniority of the study level, or the length of exposure to the research or academic sphere; it may also be attributed to the skills doctoral students may have gained during the other postgraduate levels and also the networks they may have formed along the way. There may be other reasons of course which may be explored by qualitative questions.

This study revealed that more than half of doctoral participants were participating in other projects or activities such as tutoring, analyzing data in their workplace, managing research, and writing of research outputs . Participants indicated that in these kinds of activities, they worked with other colleagues, including researchers from other departments, universities, international students or researchers, with supervisors etc. This data confirms that team work or collaborations cannot be excluded in RCD. This statement is also supported by data which indicates that those participants who participated in other projects or activities benefitted from them. The table below indicates:

Table 12: Benefits for being in team work or collaborations

• "Being in another institution/environment"	1
• "I gained laboratory experience"	1
• "My interpersonal skills have improved"	1
• "My research knowledge and skills have improved"	22
• "My Writing skills improved"	4

Although there were other participants who did not enjoy working in other activities or projects, the majority of students benefitted from them as indicated above. Some participants complained about such activities being time-consuming, too long to complete, unfriendly collaborators etc. However, this does not mean they did not gain any skill in those engagements.

- **Supervision and mentorship**

Data in this study has indicated that postgraduate students rely mostly on their supervisors and Co-supervisors for postgraduate support. Most participants also indicated that their institutions had a policy structure for supervision and mentorship. Since this study was not qualitative in nature, one could not ask for more information in terms of the content of such policies. Some postgraduate students could not differentiate between supervisors or mentors because they had the 'all-in-one' experience whereby their supervisors were also mentors. However, some indicated that supervision and mentorship mean one and the same thing, and that these terms can be used interchangeably.

When this study asked participants to define supervision and mentorship, the study learned that most participants in general described a supervisor as someone who 'guides and shows the way' and they are 'project specific'; whereas mentors are the ones that 'guides but walk with you' and they are 'long term' as they also focus on the overall 'career' of the students. However, there were those who could not differentiate between the two. Data in chapter four indicated that there is a thin line between a mentor and a supervisor, the most important factor is that they all provide the much-needed support in postgraduate studies.

In terms of the actual experiences with their supervisors, figure 29 indicated that although most postgraduate students had good, and very good experiences with their supervisors or mentors, there are still some of those who had bad and very bad experiences (17%) with their supervisors and mentors. Those who had bad or very bad experiences indicated that their supervisors were either not available, not professional, provided slow feedback, not knowledgeable, were not supportive and did not assist with funding opportunities. The graph also suggests that an improvement in supervision will definitely assist; especially, at the honours level. The honours level is an entry level for postgraduate research; students at that level may not know what to expect and mostly do not know the practical side of research, therefore, support is most needed.

Most of the participants who were happy with supervision alluded these experiences to their supervisors' availability. This means that it is of great importance to postgraduate students when

supervisors avail themselves to them when they need them. Some students indicated that they had good experiences with supervisors or mentors as they also were hardworking, and motivated themselves. This may suggest that for one to have a positive experience with supervision and mentorship, they also must be willing to work hard and stay determined.

In terms of mentorship experiences, while the overall 21% of participants were not happy with the mentorship experiences, majority indicated that they had good or very good experiences. Most of those who had bad experiences were at the honours level. Therefore, this study suggests improvements in that area. Most participants who were satisfied with the mentorship experience valued the support that mentors provided. Other positive experiences include that mentors were attentive, motivating, knowledgeable, communicative, patient, offering valuable feedback, friendly, empowering, approachable and good guides. Visagie & Maritz (2009) in Maritz and Visagie (2011), mentioned that there is a need to develop a mentoring framework to provide a support structure which paves the way for fostering the nurturing and development of emerging researchers. The same applies to the next generation of researchers; a framework is needed to shape the mentoring of postgraduate students.

- **Authorship and co-authorship**

Research outputs are the backbone of research. In research, one learned that 'if it is not documented, it did not happen'. Therefore, research outputs are the ones that indicate what transpired and what we can learn from that specific report. Researchers are; therefore, recognized mainly because of their contributions in research, although issues of student supervision, community engagement play a role in building their profile.

This means that being an author in a research article, manuscript and book is crucial. At times, researchers have to work together to conduct research in a form of a collaboration. That means they also have to work together when writing a research output. However, even though they may have worked together, their contribution may not be the equal, even their responsibility towards

the write-up of an output may not be equal. Challenges come when there is no agreement on who should be the first, second, third …or last author. University policies or regulations on issues of authorship and co-authorship are often crucial to address the differences between researchers.

In this study, participants were asked how their universities handled issues pertaining to authorship and co-authorship. Although more participants thought these issues were handled well by universities, there were still many participants who were not sure and those who did not know how these were handled. Since these two issues are the essence of research, the issues should be of importance to postgraduate students and should form part of the induction process so that they are aware of them from the onset.

2.9 Section I: Building Elements of Sustainability and Continuity (Principle 6)

Issues of ensuring sustainability and continuity are often management concerns in a university. However, postgraduate students should know that their involvement in research will enable universities to be able to have enough human resources to achieve the sustainability and continuity of the university. The succession plan of an institution ensures that younger researchers are adequately trained by older researchers to ensure continuity and sustainability. Universities should therefore have a policy on sustainability and continuity for succession planning.

In this study, participants were asked if the universities they studied at had a policy which ensured research sustainability and continuity. Majority said yes, but a significant number of students also answered 'no' or that they did not know. The inference drawn on the basis of this ism that although universities may have these policies, they need to inform postgraduate students so that they know how they fit into the plan. However, I am not certain if this is an area which should be of focus in RCD, particularly in postgraduate studies. It may be an area of focus to emerging and established researchers as the succession plan is actively implemented at their levels; this is because it is usually an established researcher who trains an emerging researcher in order to ensure that there are always established researchers in a university. My view here is that, although postgraduate

students are the future emerging and established researchers, they are not directly affected by issues pertaining to succession planning.

- **What would make the postgraduates' journey easier?**

In wrapping up this section and the questionnaire, the last question asked to research participants was to provide a way forward by describing what would make their postgraduate studies easier if they were to register in South African public universities. This question has brought about numerous reactions which ranged from ' a committed supervisor' to 'I will not register again' ; however, the majority of participants indicated the following as the most important in their postgraduate journey, which I will call the top five RCD needs in postgraduate studies :

i. A committed supervisor,
ii. Improved access to funding,
iii. Effective mentors,
iv. Availability of resources and facilities, and
v. Good policies to support researchers.

The framework for RCD should therefore consider the above-mentioned needs for postgraduate studies. In support of the above,Sawyerr (2004) mentioned that "An enabling environment with reasonable incentives, relevant research skill sets, reasonable time allocations between teaching and research, mentoring of emerging faculty, collaborative opportunities, facilities and adequate infrastructure is necessary to facilitate success in research (Mlitwa and Rapoo 2016, p. 2302).

2.10 Can RCD in public universities of South Africa be assessed using Cooke's Framework for evaluating RCB?

This study learned that Cooke's framework for evaluating RCB may be implemented in academic research. However, the framework needs to be adjusted and be simplified to fit RCD for postgraduate students in higher education. This suggests that DHET should have a general

framework which guides all institutions on how RCD must be implemented in all researcher levels. Then, based on that framework, universities can have own policies and standard operating procedures for the implementation of RCD. The framework for RCD should direct universities on:

- the definition,
- personnel structure,
- activities,
- resources,
- implementation and
- assessment of RCD.

This study also learned that each institution may need to conduct a need analysis to learn what their research community need in relation to RCD activities. In sections below, we demonstrate how each principle of the Framework was implemented in this study based on the findings.

a. Develop skills and confidence (Principle 1)

The study was able to assess this aspect by asking participants if they were offered any RCD activities, which trainings they were offered by universities, and if they benefitted from them. The majority of participants indicated various trainings were offered to them which were research-related, e.g. research methodology and also some trainings which were supportive to their research career such as presentation skills. Therefore, this principle is relevant and therefore can be implemented in South African public universities.

b. Ensure that the research is 'close to practice' (Principle 2)

As indicated above, the study also asked participants if their research was aimed at bringing solutions to some of the challenges in the country or communities. Majority of participants indicated that their research was 'close to practice' ;this may mean that universities may have had

a strategy to ensure that research conducted by postgraduate students was niche-related. This principle was achieved in this study and is relevant to RCD in postgraduate studies.

c. Support linkages, partnerships and collaborations (Principle 3)

The issue of support linkages is concerned with whether or not postgraduate students were exposed to other opportunities that linked them to further support systems that advanced their knowledge and skills or that further supported them during their studies. As it was indicated in section F, participants indicated that they realized the need for further support in areas such as education on policy-related matters, career and emotional support. Participants who were in certain partnerships or collaborations also indicated that they greatly benefitted from them. This illustrate that principle 3 of Cooke's (2005), was achieved in this study. Issues of policy education in research also acknowledge that RCD is implemented in a policy environment.

d. Develop appropriate dissemination (Principle 4)

A question about dissemination of study results was posed to postgraduate students. Although there were students who were aware of dissemination strategies of their universities, there were others who either did not know or were uncertain about them. In applying Cooke's framework, it became evident that there is a need for improvement in this area, as it seems like universities were not really empowering postgraduate students with information on the dissemination of study results.

The other limitations were due to the quantitative nature of this study, probing was limited. This may also be due to the absence of the evaluation tool for RCD, which makes this area of RCD not much of a focus area. It then emerges that the idea that this Principle is crucial in RCD as it has been indicated that research outputs are the backbone of research; therefore, postgraduate

students must be informed about the platforms available to disseminate research outcomes e.g. symposiums, webinars and any other support related to their studies.

e. Investment in infrastructure (Principle 5)

We have learned in this study that infrastructure is broad in terms of its definition, and is a necessity in RCD. This study asked several questions related to this aspect which included: the availability of resources, other research projects, issues pertaining to the mentorship and supervision of postgraduate students, as well as how issues of authorship and co-authorship were addressed. In South African public universities, this principle was implemented to some extent even though universities were not using Cooke's framework in measuring their RCD.

However, the study learned that this principle is too broad and universities may define it differently. Therefore, it must have a universal definition and all RCD activities should be properly explained to ensure that they are addressed in the implementation plan or SOP. This takes us to the idea that an RCD framework should be developed and be approved by DHET to ensure that universities are on the same page in terms of implementation and evaluation procedures. According to the Oxford Dictionary, the word 'infrastructure' means the elementary physical and organizational structures and facilities such as buildings , roads , power supplies, which are needed for the operation of a society and enterprise. There is a need of a DHET-approved definition of infrastructure in the research field.

f. Build elements of sustainability and continuity (Principle 6)

Although some postgraduate students indicated that their universities had plans on the sustainability and continuity of institutions in terms of research, this study could not establish relevance of these aspects in postgraduate students. It was also hard to introduce more questions which could measure the sustainability and continuity by asking postgraduate students. Therefore, principle 6 of Cooke's framework may not assist much in assessing RCD for postgraduate

students; it may be more relevant to established researchers as they are the ones to ensure they impart knowledge to the lower categories of researchers to ensure sustainability and continuity.

2.11 Development of an evaluation tool for RCD in academia

i. Criticism of Cooke's framework for evaluating RCB

As it might have been noted, Cooke's framework for evaluating RCD is a good tool in its own right and may be working well in the practice field. However, it has certain shortcomings in terms of its implementation in academic institutions, particularly for postgraduate research. It may be implemented well for researchers at a high level as all of the principles can be answered well by researchers at emerging or established levels. However, it bears the following criticism:

- Some of its aspects do not apply to postgraduate studies

  The framework was chosen because it is integrated, it includes various aspects of RCB and does not ignore that RCB takes place in a policy environment. However, the framework includes a lot of aspects that need to be focused on and be measured. For example: it requires that the evaluation focus on the individual, team, organisational and supra-organisational levels for each of the six principles. Some of the levels do not necessarily speak to postgraduate students; especially, at the supra-organisational level. This makes it impossible to implement at that level.

  Principle six of the framework (Building elements of sustainability and continuity) also does not fit well in the evaluation of RCB in postgraduate students. It is only relevant to higher level of researchers; especially, established researchers.

- Lack of guidance

  While it may be possible to measure the other principles, no guidance is provided as to what it means if the other principle or level cannot be measured due to the fact that such

information may not be found from the RCD group being assessed, i.e. does it mean that RCB is insufficient or average? For example: in this study it became evident that it was not easy to measure principle six (Build elements of sustainability and continuity) in postgraduate students as the questions that could be asked were more relevant to higher levels of researchers.

No guidance was provided as well in terms of the implications of the framework in cases where certain principles are not met at specific levels. A point to illustrate this is "should one learn that principle one is implemented well at an individual level because postgraduate students were receiving skills they require in their postgraduate studies, but at the team level they were never exposed to activities which expose them to team work and collaborations; does that mean RCB has failed? The Framework should have been developed alongside a scorecard or standard operating procedures (SOP) so that it is easy to obtain guidance on how it can be practically implemented. It would be helpful to have a clear guidance in this regard.

- <u>It does not list RCB activities and resources required</u>

Although the framework was designed for health care practice, it does not include the activities that should form part of RCD; rather, it explains it in terms of what needs to be included at each principle and levels. For instance, in principle one, it is mentioned that training is needed, there is no list of trainings to form part of the evaluation. The framework may be difficult for a new institution if activities and resources are not stated exhaustively. Although it was mentioned that a needs assessment is required prior to the implementation of RCD, it is also crucial for the university to know what they should cover in their needs assessment. A solution for smaller universities would be to benchmark with other institutions with more years of experience. For an example, SPU may benchmark with UJ and UCT.

- It is too broad and therefore requires a long time to implement

Cooke's framework for RCB is broad in terms of what it covers, from principle one to principle six. What makes it broad is that each principle must be applies in various levels It is a tool to evaluate the RCD for the whole institution. Since this study focuses only on postgraduate students, it makes it overwhelming as it has too much levels to cover. It also requires too much time to evaluate. Since RCB is ongoing and there is new intake of students each year, RCD in postgraduate studies requires assessment or evaluation each year or when need be in order to ensure that there is improvement in each year and that the university continues to offer relevant RCD to postgraduate students. Therefore, the evaluation process should be streamlined so that it is not perceived as cumbersome.

- It does not have a principle that provides psychological and emotional support

The Framework is good in terms of providing researchers with the research knowledge, exposure to teamwork and collaborations and supportive infrastructure. However, it leaves out the important aspect of psychological and emotional support. This study has demonstrated that these aspects are crucial in research support. This is because the research journey; especially, at postgraduate level can be psychologically or emotionally taxing. The framework for RCD must include the psychological and emotional support as a principle. The principle can be measured at individual, team and organisational levels in postgraduate students. At higher levels of researchers, the principle can still be measured at supra-organisational level, to evaluate how universities plan to care for their researchers in these aspects; especially, now that researchers are working during the pandemic.

ii. The way forward

The above criticism of Cooke's Framework makes it clear that there is a need to develop a Framework or tool to assess RCD in postgraduate studies. The tool should speak to all principles

mentioned above. However, principle number six must be replaced by 'Psychological and emotional support for researchers'. The assessment tool must be realistic and must be relevant in achieving RCD. The tool must also ensure that it achieves RCD at the various study levels and also at the various kinds of capacities (individual, team, organisational) as indicated in Cooke 's framework for evaluating RCB.

As it was highlighted, RCD takes place in a policy environment. It was also noted above that some RCD activities are more important in certain study levels than others. For an example, an honours student may need the research methodology course more than the doctoral student. This is because the doctoral student has probably completed the course at the honours level or they are now more experienced as they are at a higher study level. This makes evaluation for RCD complex. According to Bamberger, Vaessen, and Raimondo (2015), complex interventions must be reflected upon as they are influenced by finances, time, political and data constraints. Another factor to think through is the fact that RCD is mostly subjective in nature. It is not easy to know the exact reality when measuring issues such as satisfaction of students with research support. However, some elements of it can be complemented by quantitative data such as the number of research outputs universities produce, the number of workshops and postgraduate throughput rate.

In terms of the political constraints, RCD may be affected by issues such as management structures, students protest, the lack or poor management etc. It goes without saying that the availability of resources is the most determinant of RCD. Therefore, it is crucial to develop assessment tools which consider all these aspects, and which are needs-driven.

It is important; therefore, to mention that the RCD assessment tool should be a guide but not the bible for universities. This means that an SOP should be developed, which will enable universities to amend their ways of implementing RCD each year as per needs assessment. For an example: Principle one of Cooke's Framework talks to the training of researchers; in 2019, there was no COVID-19 and workshops were mostly delivered in classroom settings. Training of students on how to use meeting platforms such as Zoom, Microsoft Teams, Blackboard etc. were not important, however, from 2020, these trainings are crucial for researchers. Therefore, although the

principle one remains as a guide to achieving RCD, the way it is implemented must speak to the current needs of students. Therefore, when developing a complex tool such as the one for RCD, one requires to make use of a variety of theories such as the ones mentioned in Connel and Kubsch (1998):

1. ***Theories of change***

Weiss (1995) in Connell and Kubsch (1998) defined the theory of change as a theory which focuses on the 'how' and 'why' an intervention works. It was further argued that in the implementation of theories of change, for an institution to approve an intervention, there must be an agreement that the tool will be:

- Plausible-does evidence and common sense support that if activities are implemented will lead to the anticipated results? ;
- Doable-will the resources including the economic, human, technical, organisational be available to implement the intervention? ,and
- Testable-is the theory of change specific and complete enough to make it possible to measure?

2. ***Realist interventions***

According to LaFond & Brown (2003), these highlight the importance of a 'setting' and the 'mode of delivery'. This is crucial because not every university is the same geographically, environmentally and delivery of RCD for each university will be needs-driven and require specific methods of delivery. Therefore, it is of utmost importance to know what will work, why it will work, for whom and under which circumstances.

3. ***Contribution analysis***

Contribution analysis focuses on what will the intervention contribute to rather than just 'causing' the results. The issue of analyzing contribution of capacity-related interventions was also

highlighted in LaFond and Brown (2003). They insist that for one to analyze capacity, a monitoring and evaluation tool is needed. They then differentiated between capacity assessment and monitoring and evaluation of capacity in the table below. In their view, which is agreeable with, capacity assessment is more of the first step prior to developing an intervention, while M & E focuses more on measuring change. In the next section, the researcher has developed an assessment tool which can be used to assess RCD for postgraduate studies.

Table 13: Differences between capacity assessment and capacity monitoring and evaluation

Capacity Assessment	**Capacity monitoring and evaluation**
Purpose: diagnostic or descriptive; defines constraints	Purpose: predictive, for accountability or comparisons, gauges results
Measures gap between actual and desired performance	Measures results or progress toward desired results
Findings are used for internal purposes (design and planning)	Findings are used for internal and external purposes (management, accountability)
One time measurement	Often uses repeat measurement
Action oriented	Action, analysis and accountability oriented
Looks broadly at existing situation	Uses conceptual frameworks to discern relationships between variables

Source: LaFond and Brown (2003, p. 4)

As indicated above, in monitoring and evaluation, a conceptual framework is developed in order to distinguish relationships between that which is measured (variables). It appears crucial to have a conceptual framework even in capacity assessment. The reason for this is that it brings the whole picture of what needs to be done, why, how, and indicates what should be achieved. In Marjanovic *et al.* (2017), the framework is referred to as the logic model and it is developed at the beginning of the evaluation. In Marjanovic *et al.* (2017), the logic model was developed with the overall objective for the evaluation, as well as objectives for each activity, in the end, the evaluation becomes a high-level tool which highlights all experiences of the programme, in this case, RCD. In the end, the logic model will assist in learning the commonalities and differences in each

intervention or activity. The logic model which Marjanovic *et al.* (2017) developed included the following:

a. What is measured;
b. What is invested or resources to be used;
c. What will be done to accomplish the goal or objective;
d. What is produced or what are the direct results, and
e. What are the longer-term impacts you wish to achieve.

iii. An assessment tool for Research Capacity Development in postgraduate studies

As indicated above, it is best to have a guide for evaluating RCD in postgraduate students only, as some aspects or RCD may not be applicable for all levels of RCD. Alternatively, one may develop an overarching framework, but be specific which aspects of it will apply to postgraduate studies and which ones will best fit the other levels of researchers. In the next discussions, an assessment tool for RCD in postgraduate studies is formulated. In this tool, one takes into consideration the lessons as well as the various theories and tools learned during this research.

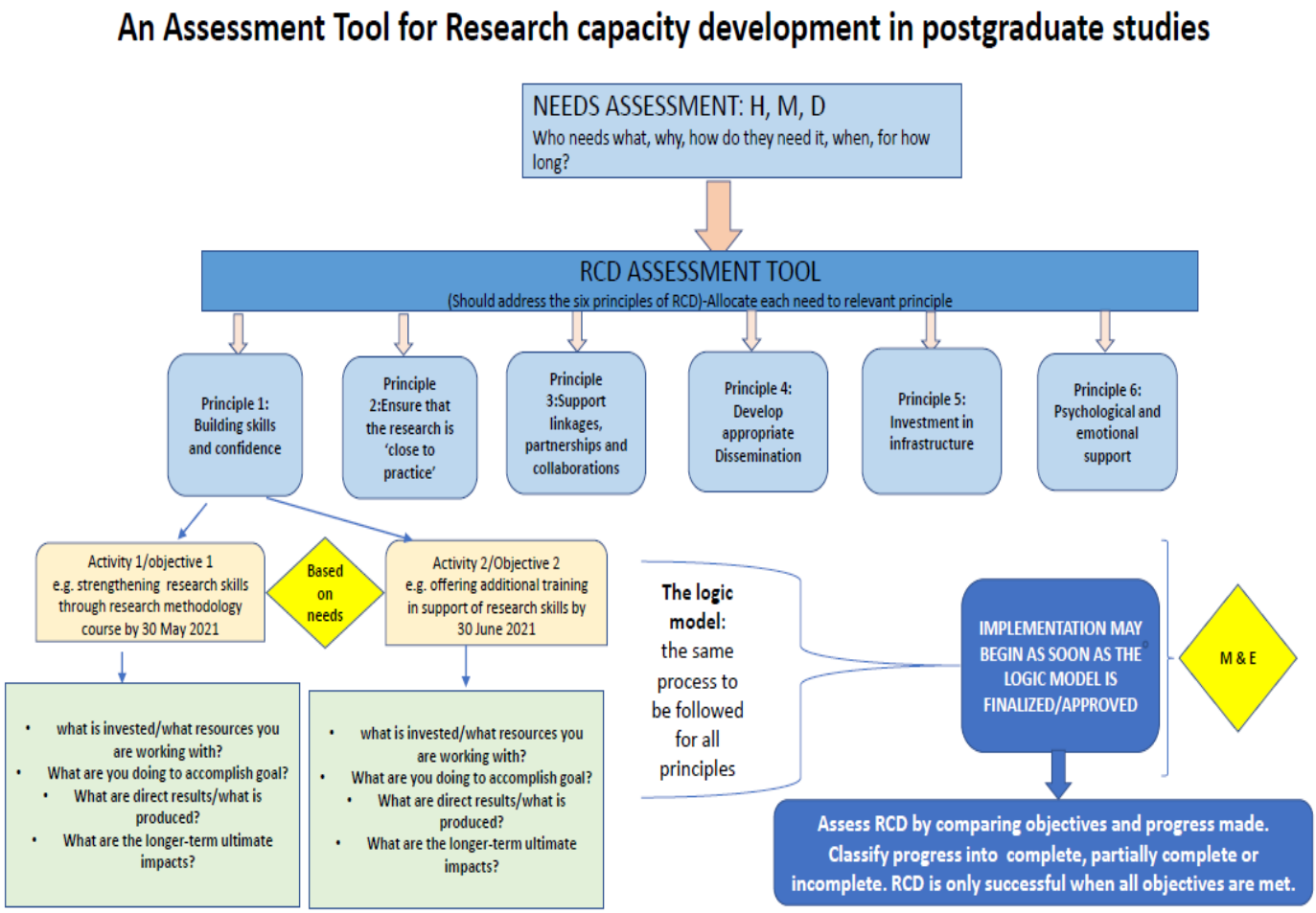


Figure 36: An assessment tool for Research Capacity Development in postgraduate studies

The figure above illustrates an assessment tool for Research Capacity Development in postgraduate studies. The Oxford dictionary defines the term 'assessment' as an opinion or a judgement about someone or something that has been thought about very carefully. By very carefully, it is meant that what is being assessed has been thoroughly planned by paying attention to potential danger, error or harm. With that in mind, the following are the five steps in the RCD assessment process:

Step 1: Conducting needs analysis

The assessment must begin with the needs assessment or analysis which is to be conducted in each year or per semester depending on the strategy for the university. In this step, the needs for postgraduate students at the honours (H), masters (M) and doctoral (D) study levels must be assessed. This is to ensure that the RCD strategy for the university is needs-driven or will be solving existing challenges for postgraduate students. Various methods may be used to collect data on postgraduate needs such as survey questionnaires, in-depth interviews, suggestion boxes etc. However, in choosing the method for data collection, one needs to consider the time it may take to complete the assessment and resources required for the assessment to take place. It is important to assess the needs per year, semester or as and when the need arises, since postgraduate needs may also arise during the course of the year. It then becomes evident that RCD needs to be included in the financial planning of the universities.

Step 2: Allocate each identified need to the principle (s) of RCD

The needs assessment must keep in mind the principles of RCD so that in the end, what is implemented is RCD and not any other programme. The following scenario illustrates this point better. During needs assessment, a survey to students which asks what students need to be trained on to support their research, some students may indicate training relevant to RCD (e.g. publication writing workshop) or irrelevant to RCD .An example could be, a masters student in music may request training on how to invent a new musical instrument; it is therefore the duty of the RCD personnel to align such training with the principles of RCD. Although RCD supports innovation, inventing a new musical instrument is not a research skill which can be provided in RCD. For needs identified which are not RCD-related, the RCD personnel may decide to note those needs and inform the relevant departments so that they are aware of them and may figure out how to best address them.

Step 3: Develop the logic model for each principle per identified need

It is possible that the needs identified do not address all but certain principles of RCD. As indicated above, the aim of aligning needs with principles is to ensure that the needs that are being addressed by the RCD programme are indeed relevant to the programme. In this third step, we conceptualize the programme by ensuring that it is:

- Plausible-do evidence and common sense support that if activities are implemented, this will lead to the anticipated results? ;
- Doable-will the resources including the economic, human, technical, organisational be available to implement the intervention? And
- Testable-is the theory of change specific and complete enough to make it possible to measure?

This step will determine if the programme will be practical or not. In the table above (differences between capacity assessment and capacity monitoring and evaluation), the conceptual framework is implemented under that monitoring and evaluation section. However, one finds it useful to include under capacity assessment, as it provides direction in terms of whether or not 'change' will take place. The assessment process does not only take place after implementation, it begins from the onset of the programme, as one can only measure what they understand. In cases of an external assessor, an SOP must have been developed in order for them to understand the process followed.

Step 4: Implementation, monitoring and evaluation

In this step, the personnel in RCD ensures that the objectives are met by implementing the RCD plan as per the logic model. This is a crucial stage, as it ensures that the needs in research support for postgraduate students are met. The implementation phase goes hand-in-hand with the monitoring and evaluation to measure if the programme is going according to plan. Challenges identified during the programme are to be mitigated as soon as possible so as to ensure progress. This is not an easy step as some challenges may lead to the postponement of activities or cancellations. For example: protests in universities, budget cuts, staffing challenges, changes in

certain policies such as the supply chain and finance, etc. may affect the implementation process. Challenges faced and lessons learned during the implementation phase must be documented for future improvement.

Step 5: Assess the programme by comparing the objectives and progress made

The last step in the assessment process is that of determining if progress has been made during the implementation phase. This is measured by comparing the objectives with progress. The assessor can classify progress into completed, partially completed or incomplete. RCD is fully achieved when all objectives are met. A way forward must be indicated based on the assessment of the findings. Since there is intake for new postgraduate students each year, the RCD assessment process must be initiated once more.

3. Chapter summary

This chapter focused only on interpreting data and discussing the findings for this study. Data interpretation and discussion focused on each aspect of the data presented; however, it is in data discussion that this study established if the aim and objectives of this study were met and how.

The main findings for this research are around the issues of supervision, mentoring and the psychological and emotional support during postgraduate studies. In this study, the majority of students indicated that they are mostly supported by their supervisors and or co-supervisors. They also indicated that they have had good experiences with supervision and mentorship during their studies. However, participants also have indicated the needs for the psychological or emotional support which suggests that postgraduate studies may be psychologically or emotionally taxing. Although this was not indicated by the majority of students, this is one important factor which cannot be ignored as it affects the well-being of students. Since most universities have counselling services on campuses, RCD personnel may work with the counselling departments within universities to achieve this principle.

The chapter also followed Cooke's framework to evaluate RCB in order to learn if the tool can be used in RCD in South African public universities. Although the framework is borrowed from the practice field, it is implementable in RCD in academia, to some extent. Principle six of the framework is more relevant to higher levels of researchers, and not postgraduate students. It; therefore, becomes imperative to take into consideration the findings for this study, Cooke's framework and the various theories to come up with an assessment tool for RCD which can be implemented at universities in the South African context.

The new assessment tool excluded principle six of Cooke's framework for RCB which is about ensuring sustainability and continuity in the university and replaced it with the psychological and emotional support. This is because issues of sustainability and continuity are more relevant in higher levels of researchers and that what is more important is for postgraduate students to have better experiences and sufficient support during their studies. The assessment tool developed focused on ensuring that the RCD needs for postgraduate students are met by way of needs assessment, conceptualization, implementation, monitoring and evaluation so that they assessment can then take place. Through the conceptualization phase in the new tool developed, relevant resources needed for the implementation can be properly identified and the programme takes off knowing that it will be possible to implement. All objectives of this study were met.

CHAPTER SIX: SUMMARY, CONCLUSION AND RECOMMENDATIONS

1. Introduction

This last chapter is a summary of what the study was about, the limitations, main findings and recommendations. The chapter will also bring the recommendations for future research; instead of 'chapter summary' , this chapter will wrap up this study by discussing conclusion remarks.

2. Overview of the study

The main objective of the study was to assess Research Capacity Development in postgraduate studies in South African institutions of higher learning. The focus for this study was the public universities of South Africa. In order for the study to achieve the main objective, the following were its subsidiary objectives:

a. To explore the South African Research Capacity Development for postgraduate studies at the honours, masters and doctoral levels.
b. To identify the key role players in Research Capacity Development in South African public universities.
c. To identify the activities and tools for Research Capacity Development in South Africa.
d. To explore the extent to which Research Capacity Development initiatives have benefitted previously registered postgraduate students at the public universities in South Africa.

The rationale for this study was based on explanations below, which were discussed in different chapters of this study:

- Research 'puts the country in the map'. This statement means that it is through the country's own discoveries that the foundation for development is laid.
- Higher education institutions train the first lines of researchers who are called the next generation of researchers, i.e. postgraduate students;

- Majority of postgraduate students in South Africa register to further their studies in public universities as compared to private institutions;
- Research Capacity Development should be seen as one of the cornerstones of a functioning higher education institution, as it develops postgraduate's knowledge in research, strengthens their skills and support their research trajectory;
- Since established researchers were once postgraduate students, RCD in postgraduate studies becomes more crucial;
- Little is known about RCD in academic institutions of South Africa. There is also less literature around the subject;
- Literature also does not indicate how RCD has been assessed or evaluated in the past, if at all;
- It is; therefore, imperative to learn if public universities of South Africa have been implementing RCD, how they have been implementing it, and what can we learn from such practices;
- Although university staff may have answers for these questions, they are not the target recipients; hence this study focused on postgraduate students as the main beneficiaries of RCD, and finally,
- The study assessed RCD in all public universities except in SPU and UMP. The basis for this was the assumption that these universities may not have enough postgraduate students as they are fairly new; during recruitment, no postgraduate encountered was from any of these universities.

3. Limitations of the study

The following limitations of this study were discussed in chapter one:

- Since this study is on Research Capacity Development, it would be beneficial to also interview relevant management/representatives from the universities and Department of Higher Education of and Training (DHET), so that they can provide information on what universities and government are doing or have done to contribute to Research Capacity Development of higher learning institutions.

- Research Capacity Development is inclusive of research infrastructure, therefore funding agencies are a relevant target for this study, again, due to time limitations, one had to rely on literature and survey data.

In addition to these limitations, it should also be noted that:

- The COVID-19 pandemic was one of the limitations. The study was initially designed to be qualitative in nature; however, since qualitative interviews and focus group discussions take longer to complete, the study was changed to be quantitative in nature to limit physical contact which may increase COVID-19 infections , and to also limit data or airtime costs, in case one was to interview participants through online platforms or using phones.
- Due to time limitations for a masters degree, the study sampled only three former postgraduate students per university at the honours, masters, and doctoral levels. Therefore, generalization of study results may not be defendable.
- Although this study targeted former postgraduate students who were registered between 2010 and 2020, it should be noted that it is possible that a lot has changed over the years prior to 2020. For example, fewer activities may have been implemented in 2010 as compared to 2017. However, due to the small sample size, it would not be justifiable to compare the trend of RCD implementation between 2010 and 2020. A different approach with a bigger sample would be needed to measure such trend; relevant university staff members employed during such periods would also need to be interviewed so that they make the measurement of the trend meaningful. University research reports would also need to be reviewed to compare the trend and to understand how RCD has evolved over the years.
- It would have been interesting to also compare RCD practices before and after COVID-19.
- This study only assessed RCD in public universities; private universities were not included. It would have been beneficial to also compare how private institutions handle issues pertaining to RCD in South Africa.
- Since data was not collected from SPU and UMP, the study could not yield results on how RCD is implemented in young universities such as these.
- The study only used survey questionnaires to collect data, qualitative data would have closed so many gaps in terms of understanding certain sections of this study. For example,

it would have catered for concerns such as why certain RCD activities were considered more beneficial than others?

4. Summary of the major findings and recommendations from the study

The following section brings the major findings of this study and their recommendations in no particular order. It is important to highlight that the entire section managed to generally respond to the first and last objectives of this study; these were to explore the South African Research capacity development for postgraduate studies at the honours, masters and doctoral levels and to explore the extent to which research capacity development initiatives have benefitted previously registered postgraduate students at the public universities of South Africa. When addressing each finding, the section will also indicate which study objectives have been met through these findings as well as suggest a possible way-forward or recommendations.

4.1 South African public universities are implementing RCD

This finding enabled this research to answer the first objective which is to explore South African RCD for postgraduate studies at the honours, masters and doctoral levels. If this study learnt that South African institutions were not implementing RCD, it would have been hard to explore the subject matter. Furthermore, this finding opens more gateways of inquiry into RCD as various studies on RCD in higher education may emerge.

South African universities should continue to implement RCD to support postgraduate students and researchers within institutions. This will subsequently increase postgraduate throughput rates of universities and limit the dropout rates for postgraduate students. Universities will also contribute towards the achievement of the country's targets as per the National Development Plan (NDP) of 2030. According to the plan (2012), for South Africa to stay globally competitive, it needs to produce more than 5000 doctoral graduates per year, most of which must be in science, engineering, technology and mathematics. According to the National Research Foundation (2017),

increasing the number of graduates will subsequently lead to increased high-end skills; which are the drivers in launching a knowledge-based economy and for stimulating new knowledge for socio-economic development. In agreement, Schulze (2014) also indicated that obtaining a doctoral degree is crucial in higher education as the degree is expected to produce new knowledge which highly contributes to the knowledge economy of the country. Therefore, implementing research capacity development in universities contributes to the promotion and advancement of the knowledge economy of the country.

4.2 Research methodology is the backbone for Research Capacity Development in postgraduate studies

This finding partially responds to the third objective of this study which was to identify activities and tools for RCD in South African universities; research methodology is one of the activities or tools for RCD. It also responds to the last objective which is to explore the extent to which Research Capacity Development initiatives have benefitted previously registered postgraduate students at the public universities in South Africa.

This study learned that majority of postgraduate students who were registered between 2010 and 2020 in public universities of South Africa were enrolled in a research methodology course or module (REME) during their undergraduate studies. The study has noted that research methodology forms the backbone for Research Capacity Development in postgraduate studies; therefore, efforts should be made to ensure that the course stays relevant and it is introduced during undergraduate studies, from first year level so that students develop interests in research at an early stage and that they gain a basic understanding of research concepts. The course may be broken down into research modules per each study year.

The research methodology course can serve as an introduction to research but also as a recruitment tool to postgraduate studies. Postgraduate students' enrollments are fairly low in South African

universities, including in private institutions. The figure below contains 2016 data on the proportion of students enrollments. Although not all undergraduate students are expected to further their studies, it is crucial to increase postgraduate students in higher education as they eventually become established researchers in future.

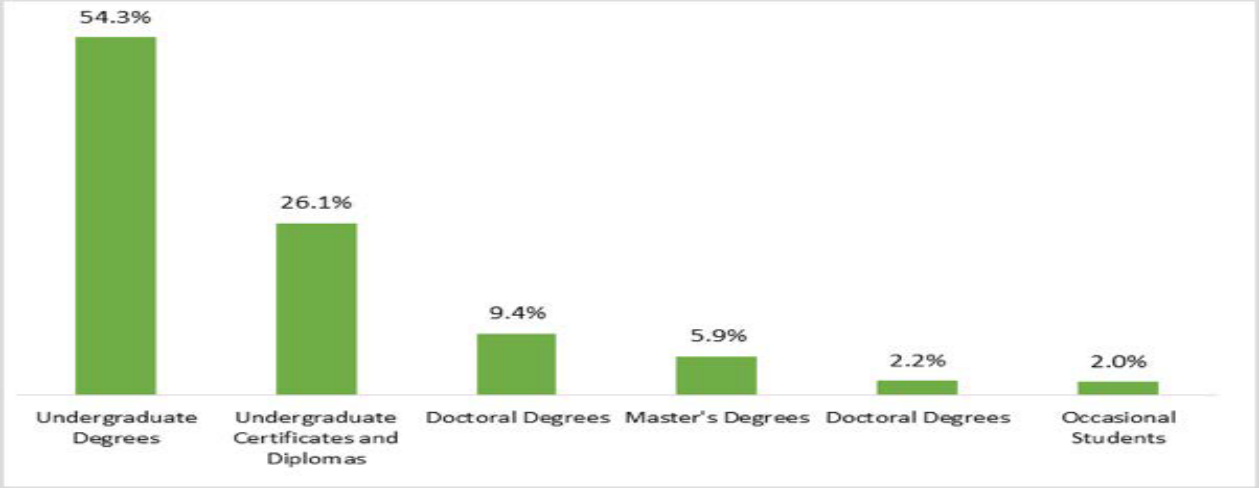


Figure 37:Proportion of students enrolled in public HEIs by qualification type,2016

Source: DHET (2016, p. 23)

The figure above depicts that more than 80% of students are enrolled in undergraduate degrees, certificates, diplomas and occasional studies. Postgraduate students only made less than 20% of total enrollments in 2016. As this study has also noted, there are some postgraduate students who do not complete their studies due to various reasons such as lack of funding and personal problems. Therefore, there is no guarantee that all enrolled postgraduate students will complete their studies.

In comparing the proportion of postgraduate students between public and private institutions in the same year, the Statistics on post-school education and training in South Africa in DHET (2016) has indicated that there was no major difference as more than 90% of private institutions' enrollments were for undergraduate students. If the country is to increase the number of active researchers, it is therefore recommended that recruitment should begin at the undergraduate level, by introducing research methodology modules, so that students become interested in research at an early stage and they develop an understanding of research concepts sooner.

In this study, issues of demographics were not considered as Research Capacity Development is for all registered students. However, in this study , one also learned that if South Africa is serious about developing its own researchers, other issues such as enrolling younger students so that they still have more years to contribute to the knowledge economy of the country come into play. Another factor is that of international versus South African enrollments in South African universities. Recent data indicated in Van Schalkwyk, Van Lill, and Cloete (2021) shows that in our South African universities, four out of every ten registered doctoral students were international students in 2019. The figure below also gives a picture of how doctoral enrollments in public universities looked like in 2005 and in 2019.

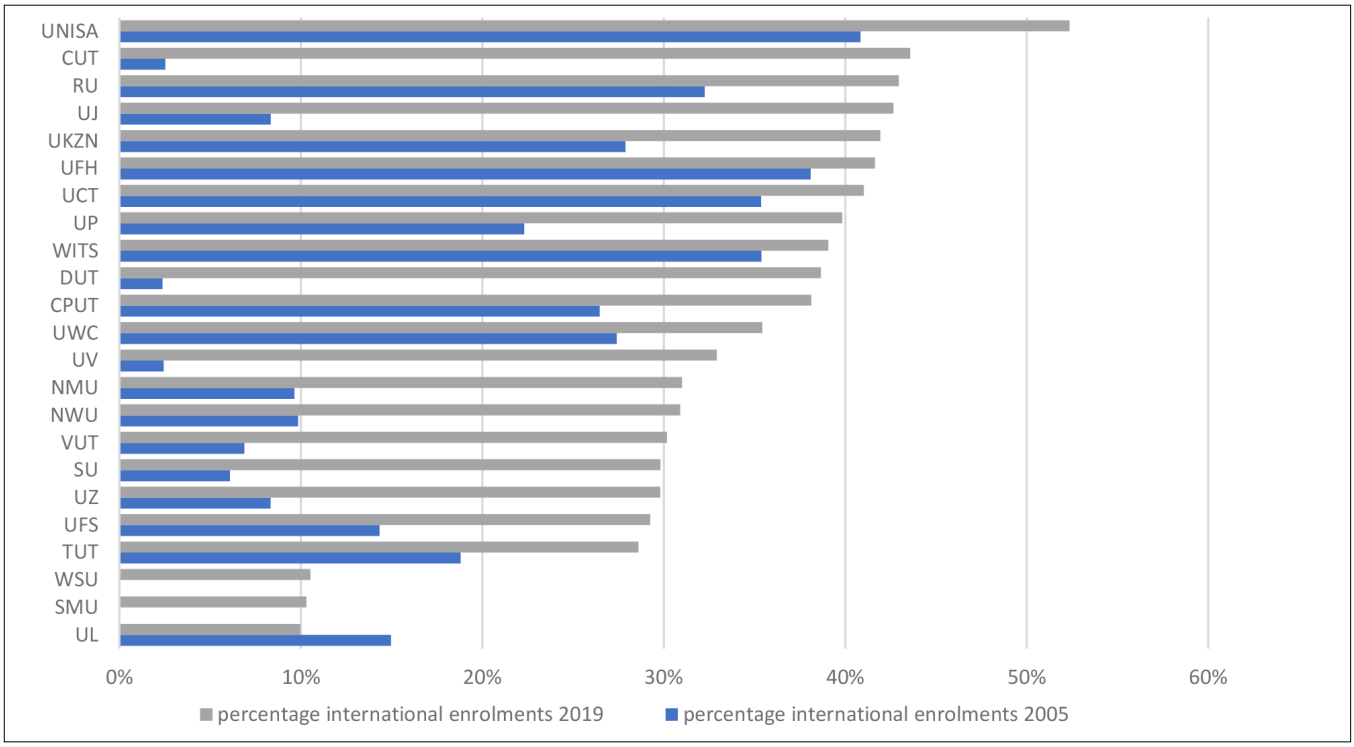


Figure 38: Doctoral enrollments in public universities in 2005 and 2019

Source: Van Schalkwyk *et al.* (2021, p. 5)

The figure above indicates that UNISA enrols the highest number of international students; in fact, more than half of their doctoral students were international students in 2019. Also, about 40% of doctoral enrolments in South Africa were in biggest universities (UKZN, UCT, UP and Wits). This

encourages brain circulation in research, however, a critical glance at this trend suggests that it would not be ideal for South African universities to comprise of international students in majority. Therefore, there is a need of more recruitment for South Africans to embark in research.

It also makes sense that since majority of students are undergraduate students and 'research puts the country in the map', the country should therefore target the undergraduate students to stimulate research interests and to increase the number of postgraduate enrollments. My presupposition is that students who learn about research at an early stage may face less difficulties in postgraduate studies as compared to students who are introduced to research at the postgraduate level. This may lead to lower dropout levels, increased throughput rates and may contribute to student satisfaction.

4.3 The non-completion of postgraduate degrees may not be attributed to the REME enrollment during undergraduate studies; and there is no link between non-completion of studies and the implementation of RCD.

The finding examines the relationship between the research methodology course or module with non-completion of degrees in higher education institutions as well as non-completion of degrees with the implementation of research capacity development in HEIs. The finding basically further addresses findings 4.1 and 4.2 above and it aids this section in responding to the first and third objectives of this study which are to explore the South African Research Capacity Development for postgraduate studies at the honours, masters and doctoral levels and to identify the activities and tools for Research Capacity Development in South Africa. When this section touches on issues pertaining to resources and sources of support, it is responding to the second objective of this study which is to identify the key role players in Research Capacity Development in South African public universities.

There were some participants who reported that they did not complete their research. However, this study discovered that the non-completion of postgraduate degrees may not be attributed to the REME enrollment during undergraduate studies or the implementation of RCD in South African public universities. Therefore, there may have been other challenges or reasons that led to the non-completion of degrees.

In in this study, it was reported that factors that made it difficult for postgraduate students to complete their studies include: difficulties in getting clearance certificates to collect data; taking long to replace supervisor; lack of funding; lack of academic writing skills; supervisor delaying student progress; financial challenges; and personal reasons such as falling pregnant, poor health and starting a family. Although not much can be done to alleviate personal challenges, more attention should focus on alleviating the rest of these factors as they amount to the issue of student satisfaction.

My view on this is that, students can only flourish when they feel a sense of satisfaction with university systems; when they have knowledge and skills and when they have supporting resources. Systems may include issues of supervision allocation, the supervisor-student relationships, policies that support postgraduate studies, smooth research ethics application processes and quicker feedback etc. Below, we explain some of the factors that lead to student satisfaction which may result in increased throughput rates and less dropouts.

a. Knowledge and skills

These may include issues such as knowing what is expected of students in terms of the entire postgraduate journey, having research knowledge, knowing where to get resources, and having skills to conduct research. According to Alam, Alam, and Rasul (2013), the following skills are required by postgraduate students to ensure that there are no delays in the completion of their studies:

1. Generalist skills,
2. Self-reliant skills,
3. Group or team skills and
4. Specialist skills.

Generalist skills are skills acquired prior to postgraduate studies such as time management, writing skills, computer skills etc. Self-reliant skills are skills that give postgraduate students the confidence that they can rely on themselves to conduct research and related activities, such skills

may include time management skills, coping mechanisms, self-discipline etc. Group or team skills are those skills that enable students to be able to work with others in their postgraduate studies, for example: interpersonal and communication skills. The specialist skills are those skills which enable students to perform other tasks in their research, such as data analysis, literature searches and scientific writing. In this study, it was also learned that of the factors that made it easy for postgraduate students to complete studies, majority highlighted the following, starting with the factors which were mentioned more frequent: supervision support, dedication or determination, hard work, funding availability and time management. Dedication, determination and hard work are examples of self-reliant skills.

Postgraduate students therefore have to have a combination of these skills in order to progress well in their studies. Although some skills are attained during undergraduate studies, RCD in postgraduate studies also addresses them through RCD programmes and activities.

b. Availability of resources and support

Postgraduate students require support and resources such as tuition, research funds, library support, and good supervision and mentoring. All of these factors may lead to student satisfaction which may ensure that students complete their studies on regulation time, thereby alleviating or minimizing dropout rates. In a study conducted in Australia by Alam *et al.* (2013) it was learned that the role of a supervisor in postgraduate studies plays a very important part in ensuring the overall satisfaction of students, in retaining students and in ensuring postgraduate throughput. In their study, they asked students several questions such as:

" 3. Are you satisfied with the supervision and support by your supervisor?

4. Have you received adequate academic support in 1st year of your candidature?

5. Are you satisfied with the level of support you received from your supervisor at the beginning of your program?" (Alam *et al.*, 2013, p. 880).

In their report (2013), Over 80% of students highlighted that they:

- expect their supervisors to guide them in their studies;

- would like to have supportive and professional relations with their supervisors, and
- would be happy if their supervisors provided them constructive criticism in their research.

Therefore, although there are many factors that may contribute to students satisfaction, the issue of strengthening supervision in postgraduate students is more crucial. In fact, this study found that supervisors and co-supervisors are the most important source of support for postgraduate students. This means that universities are to ensure that they appoint diligent supervisors who will have time for students and who will also be their pillar in their entire research process.

The supervisor availability factor cannot be overemphasized. Schulze (2014) mentioned that students' relationships with their supervisors are the most crucial in establishing their identities as researchers. It is during the student supervision that supervisors model how it is like to be a supervisor or researcher. This study has also revealed that postgraduate students valued the fact that their supervisors were available when they needed them most. The study by Alam *et al.* (2013) also confirms that the availability of supervisors assists in ensuring the progress of students in their research . Their study indicated that " Most students prefer to have research meetings with their respective supervisors weekly or fortnightly. Students who have meetings monthly with their supervisors are generally unhappy with their supervisors" (Alam *et al.,* 2013, p. 879).

If universities are to implement a sound RCD , amongst other strategies , they should ensure that the following areas are incorporated: supervision support, students are encouraged to stay dedicated, determined and to work hard, students are offered funding support and are taught how to manage their time. This may be addressed through research support groups and mentoring as well as supervision support.

4.4 Honours and masters students may be at higher risk for dropping out from their studies

In exploring Research Capacity Development, this study learned that although the majority of postgraduate students were able to complete their research, there were still worrying numbers (16% masters and 17% honours) who did not complete their research. Although some did not complete due to unforeseen circumstances such as illnesses and the lack of funding in the process,

this finding is calling for universities to focus more on these study levels and come up with strategies to curb non-completion of research which leads to increased drop-out levels.

In the new tool developed in this study which is for the assessment of RCD in institutions of higher learning, the issue of needs assessment could not be overemphasized. It is crucial to assess students' needs timeously so that they are offered the necessary support that can assist them to complete their studies and on record time. Assessing needs of students and responding to these needs will ensure students stay on course until they complete their studies; in turn, this will assist the country to respond to the demands of specialized skills and innovation which according to Alam *et al.* (2013) have been caused by globalization, highly competitive economies and issues in the management of services

4.5 Emotional support was more emphasized than financial support

This finding was able to touch on the second objective which speaks to the identification of key role players in RCD. This study discovered that although research funding is crucial, studying at a postgraduate level can be emotionally taxing. Therefore, there is a need to strengthen the mentoring and psychological services within South African public institutions. This need may be worse at this particular time of this study as the country is battling COVID-19.

As a way forward, this study proposes a programme which will be referred to as the **Holistic Care and Support Programme (HCSP)** will be recommended .

The word ' holistic' was purposefully chosen. This is because RCD in itself is broad and it affects a lot of areas as much as it is affected by a lot of factors. RCD does not operate in silo. It was also mentioned in Waldrop (1994, p. 60-61) that "The real-world demands a more holistic approach. Everything affects everything else, and one has to understand that whole web of connection". The HCSP comprises of various activities, which must be needs-driven. A proper needs assessment must be done. However, the programme must offer support to both students and academic staff in order to create balance and encourage team work, hence 'holistic'. Below we discuss the various activities that should form part of the HCSP.

a. A formal Student mentoring programme (SMP)

The concept above refers to a formal mentoring programme which is well structured, with a memorandum of understanding between the mentors and mentees. Although mentoring was not the most highlighted issue as many viewed it as supervision, it is a tool that can be paired with supervision. According to Murray and Owen (1991) , mentoring is when a more skilled or experienced individual is paired with an individual who is less skilled or experienced individual with agreed-upon goals which are to ensure that the less skilled or experienced individual develop and grow certain competencies.

The programme may be implemented in two ways:

1. Senior-to-junior student mentorship: this is where senior students mentor one or two junior students, e.g., a doctoral student may mentor one masters and one doctoral student while masters students may mentor one or two honours students. Students should not be allocated too many mentees to support as they also have their own studies to focus on. This activity can assist students to complete their studies with little or no struggle as they will have someone who will walk the journey with them. In this relationship, junior students may be able to open up to senior students regardless of their study disciplines. Mentees should identify senior students based on their aspirations in their studies and careers. They may look for qualities such as: hard work, determination, study discipline, organizational skills etc. Since a doctoral degree is the highest level in postgraduate studies, they should be mentored by academic staff or postdoctoral fellows.

2. Staff-student mentorship: this is where a staff member mentors student (s) to help them cope better with postgraduate studies and also to guide them in career development. Staff members may also mentor students, particularly students who do not have student mentors. In de Vries, Webb and Eveline (2006) three roles of mentoring were listed, namely:

    - " psychosocial support (e.g., acceptance, confirmation, counselling, friendship),
    - instrumental/career support (e.g., sponsorship, exposure and visibility,

coaching, protection, challenging assignments) and

- role modelling (appropriate attitudes, values and behaviors)".

These roles are crucial in postgraduate studies, and they fit well with the other activities in the HCSP.

b. Psychological and Social programme (PSP)

The mentorship programme must be supported by a strong and confidential psychosocial support situated at the student support department. These can be designed to fit the needs for postgraduate students and staff.

c. 'Speak up' campaigns

In order to create awareness that encourages postgraduate students to speak up, campaigns may assist. These campaigns on campuses should aim to promote student well-being and to 'open up' when they are not coping. In these campaigns, speakers from various disciplines may be invited; these may include: psychologists, social workers, health care workers, the police, students, etc. At least one campaign per semester should be done at a university to raise awareness.

d. Postgraduate support groups (PSG)

These may take place once or twice a month. These provide a forum where students meet to discuss their progress and challenges. While progress will be celebrated, other students may suggest ways to cope with some of the challenges reported, helping each other to find solutions and making other students feel motivated.

e. Staff support group (SSG)

Here, academic staff supervising and mentoring students discuss their progress, as well as challenges they are faced with. In this manner, they are able to assist each other on how to best deal with certain challenges. These may be held once a month.

f. Staff debriefing sessions (SDS)

Observation shows that, it is only a healthy lecturer who can teach, supervise and mentor students well. Efforts must; therefore, focus on ensuring that academic staff are healthier; especially, emotionally. This is because they work with various students with different challenges and needs. They also have their own personal challenges which they face on day-to-day basis, these may be worsened by COVID-19. Universities may hire psychologists and make them available to render one hour debriefing sessions with each academic staff member per month. In these sessions, staff are encouraged to speak about whatever challenge they are facing or affecting progress in their work. The psychologist may assist in facilitating change and development for staff.

In a nutshell, the HCSP programme can be a stepping stone in ensuring increased postgraduate throughput rates and decreased postgraduate dropouts. The challenges with the HCSP programme are that:

1. It may have budget implications.

Although there may be a manager or main coordinator who ensures that these take place as scheduled, students and staff can be requested to rotate roles in coordinating these programmes; these makes them 'own' these activities and also helps in minimizing the costs for the university. Most of these activities may be implemented online as well in order to minimize costs and encourage participation as some postgraduate students or staff may not have time to travel to the venue; it is important to note that some postgraduate students have jobs and families.

2. It requires an evaluation tool.

It is important that the programme has its own evaluation tool which will assess progress. I propose the monitoring and evaluation tool or logic model which forms part of the RCD tool developed in this study. Each activity in the programme must have its objectives. From the objectives, the logic model is applied, and it asks the following questions:

- What is invested/ what resources one is working with?
- What one is doing to accomplish their goal?
- What are the direct results/ what is produced?
- What are the longer-term ultimate impacts?

Regardless of the challenges, each university must boast the Holistic Care and Support Programme, especially since the country is battling COVID-19. Many people in general are living with anxiety and a variety of challenges, which are at times emotional, financial and or socioeconomic.

4.6 Some RCD activities were offered more in other study levels than others

This section directly responds to the first objective of this study which was to explore RCD in HEIs. It also touches on the third objective which aimed at identifying the activities and tools for RCD. In terms of Research Capacity Development activities or tools, postgraduate students at each level were offered more or less the same RCD activities; among others were research workshops, research methodology course, thesis/dissertation writing retreats etc. However, students at the honours level between 2010 and 2020 did not mention the data analysis workshops as one of the activities offered to them. However, these were offered at doctoral and masters levels.

This suggests that RCD is not a one size-fits-all practice, it must therefore be guided by the needs assessment. The issue of needs analysis in Research Capacity Development cannot be overemphasized. In their qualitative study on assessing the capacity for conflict and health research , Achi , Honein-Abouhaidar, Rizk, Kobeissi, Papamichail, Meagher, Ekzayez, Abu-Sittah and

Patel (2020), relied on needs assessment to be able to conduct the SWOT (Strength, Weakness, Opportunities, and Threats) analysis to conflict and health research capacity building in Lebanon.

Another issue relating to RCD activities is that of content in the various courses and trainings. Although there may be other out-of-cycle activities for postgraduate students, one cautions that there is a need to standardize the regular research- related workshops that postgraduate students attend to ensure that postgraduate students at each university are learning similar set of courses with similar content in terms of research skills development and strengthening.

4.7 Research Capacity Development activities differ in purpose, structure, and content

Like in the above section, this finding directly responds to the first objective of this study which was to explore RCD in HEIs and also touches on the third objective which aimed at identifying the activities and tools for RCD.

This finding revealed that RCD activities will differ in purpose, structure and content, therefore many factors must be considered prior the implementation of each RCD activity; some of them may take longer than others to implement. To stay relevant, a needs analysis should be conducted; which will assist in determining what should be the content, structure, mode of deliver and length for each activity. For an example: Shahzad *et al.* (2020) mentioned that since the COVID-19 discovery, the higher education system had no choice but to find other ways to ensure that education continues; since then, e-learning is the main driver of education. From this example, we can learn that RCD must adapt to contextual, environmental and global changes. The structure of the modules will therefore be different and must be designed in a manner that it reaches the audiences, captures their attention but mostly responds to their needs. This suggests that RCD implementers will need to be more creative in designing research capacity initiatives.

The country is also not so stable in terms of COVID-19 regulations, as these depends on the risk alert stages. Therefore, it is crucial to either choose an online platform as the mode of delivery or

to choose hybrid, whereby a few number of postgraduate students may be accommodated at a venue, while others attend online. Another option would be to record sessions and upload them online so that targeted audiences may access them at the time that is convenient to them. All-in-all, RCD must ensure that support is available in a manner that is convenient to postgraduate students.

4.8 There is a need for a formalized strategy for Research Capacity Development

Once more, this finding directly responds to the first objective of this study which was to explore RCD in HEIs and also touches on the third objective which aimed at identifying the activities and tools for RCD.

Data collected from this study calls for a formalized strategy for Research Capacity Development in a way of ' guidelines'; there seems to be a lack of structure in the implementation of RCD, each university doing what they can to develop and enhance research skills and knowledge. Such guidelines must be approved by the Department of Higher Education and Training. These will guide institutions in terms of what is expected in the strengthening of research in public higher education. Easton (1991) in Amini (2021) suggested three solutions to the contemporary research problems: (i) Interdisciplinary training of scholars (ii) Teamwork (iii) Development of a general theory. These scholars also suggest that in addition to the training of scholars, universities must collaborate to ensure impact in research development. A general theory that can work to answer contemporary research problem is also necessary. A holistic approach will be needed to ensure Research Capacity Development in higher education. According to Ackland (1994) in Amini (2021), the importance of the holistic approach includes:

* "variety of information, data and ideas relevant to the subject matter;

* involvement of people with wide variety of life and theoretical perspectives;

* inclusion of all relevant academic disciplines;

* promotion and facilitation of holistic attitude, thinking and understanding as well as

* recognition of interconnection and integration of different pieces of information"

The National Plan for Higher Education (2001) had the following five goals in order to ensure transformation of the system in general:

- To provide increased access to higher education to all irrespective of race, gender, age, creed, class or disability and to produce graduates with the skills and competencies necessary to meet the human resource needs of the country.
- To promote equity of access and to redress past inequalities through ensuring that the staff and student profiles in higher education progressively reflect the demographic realities of South African society.
- To ensure diversity in the organisational form and institutional landscape of the higher education system through mission and programme differentiation, thus enabling the addressing of regional and national needs in social and economic development.
- To build high-level research capacity to address the research and knowledge need of South Africa.
- To build new institutional and organisational forms and new institutional identities through regional collaboration between institutions

It is commendable that the plan included building research capacity as its fourth goal in order to sustain research. According to the White Paper of the Department of Education (1997), to sustain research in South Africa, the country needs to increase postgraduates' outputs, increase research outputs, withstand existing research capacity and strengths, produce new centres of excellence in various niches, ensure the promotion of collaborations and partnerships in postgraduate studies and to ensure synergy between the national research strategy and the national system of innovation. In my view, all these priorities can be realised if universities themselves can hold the higher education responsible by working towards achieving these priorities. The higher education on the other hand needs to deploy resources that will ensure that universities are geared to achieve these goals. In other words, there has to be combined efforts between the policy-makers and the implementers.

4.9 Postgraduate students may benefit from other kinds of support and skills

Participants also indicated that they need the following in order to be productive in their studies: team work, policy-related information, career-related support, and emotional support. The issue of emotional support was emphasized in the last sections. Therefore, efforts should also focus on educating postgraduate students on how to form collaborations that work. Universities also should ensure that postgraduate induction addresses issue of university policies which are relevant to postgraduate studies. Career guidance and support are other crucial aspects which may be addressed by mentoring programmes and by ensuring that the student support department encompasses a unit that focuses on career-related support. This will complement the mentoring programmes. Again, all these kinds of support must be monitored to ensure that they are meeting their objectives. This section to some extent assists in responding to the third objective which was to identify the activities and tools for Research Capacity Development in South Africa.

4.10 The new tool developed in this study provides a way forward in the assessment of RCD

This finding responds to the first three objectives of this study which were to explore the South African Research Capacity Development for postgraduate studies at the honours, masters and doctoral levels, to identify the key role players in Research Capacity Development in South African public universities and to identify the activities and tools for Research Capacity Development in South Africa.

In assessing the study results by using Cooke's framework for RCB, it was discovered that only five principles are implementable in postgraduate students; these are principles one to five. The last principle on sustainability and continuity is more implementable in higher levels of researchers. Therefore, this called for an assessment tool to be developed for postgraduate students so that RCD is implemented in a way that works for them.

The tool developed in this study provides a way-forward in the assessment of RCD in public universities in South Africa. It includes the following processes: needs assessment for students in all study levels, aligning needs identified with the six principles of RCD to ensure validity (the

sixth principle being the psychological and emotional support), conceptualization process, implementation which is monitored and evaluated, and lastly, assessment of RCD by comparing the objectives and progress made. The assessment tool can be implemented at any given time during the year. The tool and its activities in itself determine the kind of staff needed in RCD . Universities may develop Standard Operating Procedures (SOPs) on how to implement the RCD strategy for the university and use the tool to assess their strategy.

5. Recommendations for future research

In this section, we discuss the recommendations for future research. These are future-oriented and are the suggestions of what other researchers may focus on in future in order to advance knowledge in RCD, postgraduate studies and in higher education. Below are the recommendations for further research:

i. What makes students not to complete their studies?

Participants who did not complete their studies never indicated that their non-completion was also attributed to the fact that their universities did not implement RCD. Future research should focus on an in-depth understanding of what makes students not to complete their studies.

ii. The need for DHET-approved guidelines on RCD implementation

There is a need for formalized guidelines for Research Capacity Development. Such guidelines must be approved by the Department of Higher Education and Training. Therefore, future research must focus on assessing current RCD strategies in order to learn what has been working and what can be done to inform an overarching guidelines, strategy or protocol which can be used as a tool to guide all institutions. This will promote uniformity of education in South Africa. These guidelines must also include aspects on how RCD can be assessed as measuring impact is the new normal.

iii. Understanding emotional needs for postgraduate students

As indicated above, the issue of emotional support has been highlighted in this research which suggests that the postgraduate journey can be emotionally taxing. This may be due to the fact that more time is required to focus on studying than other aspects of life. Although time management skills and self-discipline may assist in improving the situation, it is recommended that future research focus on exploring this aspect as it may assist universities to develop better strategies on how to improve their services, particularly now that the world is faced with the COVID-19 pandemic.

iv. How to best establish the mentoring programme for researchers?

Future research could also focus on how to best establish a mentoring programme for postgraduate students or researchers in general. Where does one begin? Although it may sound simple, this is a mass programme which requires expertise, resources and a proper design.

6. Conclusion remarks

This study was crucial in building a body of knowledge around Research Capacity Development in higher education. As it was mentioned several times, Research Capacity Development is a new field which has its own challenges such as that it has less literature, it is not assessed timeously, it is a long process requiring more time, it is defined differently, some of its interventions are broad and may be interconnected, and that there is no common framework or tool for evaluating RCD in higher education institutions.

As noted in the data presentation and interpretation chapter, this study was also crucial as the data collected speaks volume in terms of an understanding of RCD activities which worked, and those that did not work. The study also highlights the importance of a need assessment prior to any implementation each year or semester, depending on the context of the university. In the end, this study has made a significant contribution in terms of what postgraduate studies is all about; what

students require support on in order to graduate on time and to proceed to contribute to the knowledge economy.

The study also brought about a tool for assessing RCD in South African public institutions. This tool is crucial as it has considered the other theories used in the conceptualization of programmes, and it also utilized data collected in this study as well as the lessons learned to design a tool with steps to follow in order to assess RCD. The developed tool works in a cycle as it recognizes that students needs are dynamic and that in each year there are new postgraduate students enrolled in each university.

As one of the recommendations, the study also suggested a new programme called the Holistic Care and Support Programme which ensures postgraduate students and academic staff are well taken care of so that they perform their work optimally, and that they are not working in silo. This enhances students on-the job satisfaction; which can lead to increased throughput rates for postgraduate students and less dropouts. Apart from the limitations of the study which range from the regulation time for this thesis to COVID-19 restrictions, the study reached its aim and all objectives.

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APPENDICES

Appendix 1: Ethical clearance certificate from the College of Human Sciences Research Ethics Review Committee, University of South Africa.

UNISA university of south africa

COLLEGE OF HUMAN SCIENCES RESEARCH ETHICS REVIEW COMMITTEE

24 March 2021

NHREC Registration # :
Rec-240816-052
CREC Reference # :
41671996_CREC_CHS_2021

Dear Fulufhelo Malamatsho

Decision:
Ethics Approval from 24 March 2021 to 24 March 2024

Principal Researcher: Fulufhelo Malamatsho (41671996@mylife.unisa.ac.za)
Supervisor/s: Dr Thoahlane Thoahlane (Thoahlane@webmail.co.za)

Title: ***An assessment of research capacity development in institutions of higher learning: a case study of the former postgraduate students at the honours, masters and doctoral levels in South Africa.***

Degree Purpose: Masters

Thank you for the application for research ethics clearance by the Unisa College of Human Science Ethics Committee. Ethics approval is granted for three years.

The ***Low risk application was reviewed on the 14 December 2020 and amended on the 24 March 2021*** by College of Human Sciences Research Ethics Committee, in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the College Ethics Review Committee.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the

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confidentiality of the data, should be reported to the Committee in writing, accompanied by a progress report.

5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data require additional ethics clearance.
7. No fieldwork activities may continue after the expiry date **(24 March 2024).** Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

*The reference number **41671996_CREC_CHS_2021** should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Yours sincerely,

Signature :

Prof. Ilse Ferns
CHS Ethics Chairperson
Email: fernsi@unisa.ac.za
Tel: (012) 429 8210

Signature : PP

Prof K. Masemola
Exécutive Dean : CHS
E-mail: masemk@unisa.ac.za
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Appendix 2: Approval from the Research Permission Sub-committee of the Senate , University of South Africa

UNISA university of south africa

RESEARCH PERMISSION SUB-COMMITTEE (RPSC) OF THE SENATE
RESEARCH, INNOVATION, POSTGRADUATE DEGREES AND
COMMERCIALISATION COMMITTEE (SRIPCC)

6 April 2021

Decision: Research Permission Approval from 6 April 2021 until 31 October 2021

Ref #: 2021_RPSC_009
Ms. Fulufhelo Malamatsho
Student #: 41671996
Employee #:

Principal Investigator:

Ms. Fulufhelo Malamatsho
Department of Development Studies
School of Humanities
College of Human Sciences
41671996@mylife.unisa.ac.z; 012 521 5171; 076 364 9995/082 614 1582

Supervisor: Dr T Thoahlane, thoahlane@webmail.co.za, 0833953424

AN ASSESSMENT OF RESEARCH CAPACITY DEVELOPMENT IN INSTITUTIONS OF HIGHER LEARNING: A CASE STUDY OF FORMER POSTGRADUATE STUDENTS AT THE HONOURS, MASTERS AND DOCTORAL LEVELS IN SOUTH AFRICA

Your amended application regarding permission to involve Unisa staff, students and data in respect of the above study has been received and was considered by the Research Permission Subcommittee (RPSC) of the UNISA Senate, Research, Innovation, Postgraduate Degrees and Commercialisation Committee (SRIPCC) on 26 March 2021.

It is my pleasure to inform you that permission has been granted for the study. You may request ICT to assist as a gatekeeper and send an online survey by e-mail to former postgraduate students at honours, masters and doctoral level to participate in the study until 24 responses per study group has been received.

The personal information made available to the researcher(s)/gatekeeper(s) will only be used

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for the advancement of this research project as indicated and for the purpose as described in this permission letter. The researcher(s)/gatekeeper(s) must take all appropriate precautionary measures to protect the personal information given to him/her/them in good faith and it must not be passed on to third parties. The dissemination of research instruments through the use of electronic mail should strictly be through blind copying, to protect the participants' right of privacy. The researcher hereby indemnifies UNISA from any claim or action arising from or due to the researcher's breach of his/her information protection obligations.

You are requested to submit a report of the study to the Research Permission Subcommittee (RPSC@unisa.ac.za) within 3 months of completion of the study.

Note: The reference number **2021_RPSC_009** should be clearly indicated on all forms of communication with the intended research participants and the Research Permission Subcommittee.

Kind regards,

08/04/2021

Prof Lessing Labuschagne – Chairperson
Email: llabus@unisa.ac.za, Tel: (012) 429-6368

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Appendix 3: Study information leaflet and Informed Consent

Title:
An assessment of Research Capacity Development in institutions of higher learning: a case study of the former postgraduate students at the honours, masters and doctoral levels in South Africa.
Degree: Master of Arts (MA) Development Studies

Student Names: Ms. Fulufhelo Malamatsho

Student Number: 41671996

University: University of South Africa (UNISA)

Supervisor: Dr Thoahlane Ephraim Thoahlane

1. Information Leaflet

A. Introduction

My name is Fulufhelo Malamatsho. I am a registered Masters student in Development Studies in the Department of Development Studies, University of South Africa. I am conducting research titled "An assessment of Research Capacity Development in institutions of higher learning: a case study of the former postgraduate students at the honours, masters and doctoral levels in South Africa" under the supervision of Dr Thoahlane. I invite you to participate in this study.

Before you agree to participate, it is important that you read and understand the following explanations of the purpose of the study, the study procedures, benefits, risks, discomforts, and your right to withdraw at any time.

Should you decide to participate in the study, I will ask you to read the Informed Consent Form. Once you have understood the form, I will ask you to click 'Yes' if you agree to participate in

the study, if you do not agree, I will ask you to click 'No'. I may ask you questions in order to ensure you understood the study. Please feel free to ask me any question related to the study.

B. Study information

Research Capacity Development is the process for promoting research through the advancement of researchers' knowledge, linking researchers to research resources, and uplifting the research environment in order to achieve world-class research, skilled researchers and quality research environment.

The main objective of the study is to assess Research Capacity Development in postgraduate studies in South African institutions of higher learning. In order for the study to achieve the main objective, the following are its subsidiary objectives:

a. To explore the South African Research Capacity Development for postgraduate studies at the honours, masters and doctoral levels;
b. To identify the key role players in Research Capacity Development in South African institutions;
c. To identify the activities and tools for Research Capacity Development in South Africa; and
d. To explore the extent to which Research Capacity Development initiatives have benefitted previously registered postgraduate students at the public universities.

C. Inclusion criteria

You are invited to participate in this study because you either indicated that you:

i. Are a previously registered postgraduate students at the honours, masters and doctoral levels;
ii. Registered and studied at the public university for at least 12 months;
iii. Have registered for the honours, masters or doctoral degree between the years 2010 and 2020; and

iv. If willing to participate, you will sign a consent form by ticking a "yes" box to indicate you agree to participate.

v. Have been exposed to some research element of postgraduate studies (e.g. developing a research proposal)

D. Exclusion Criteria

If you do not meet the above-mentioned criteria, you are not eligible to participate in this study, thank you for showing interest.

E. Study expectations

In order to achieve the aim of the study and its objectives, I will ask you questions which are related to your studies at a public university in South Africa.

F. Confidentiality

All information collected in this research will be treated as confidential. I will protect your information to the best of my ability. Your name nor the name of your university will not be included in any of the study reports. Once you agree to participate in the study, I will issue you a participant number, which I will use to replace your name. Universities will also be given Pseudonyms of codes. This study will lead to a full report referred to as a dissertation which will enable me to meet the requirements of a Masters degree in Development Studies. Data collected will be stored for 10 years, unless the Ethics Committee advise otherwise; after this period, data will be destroyed.

G. Benefits

There are no direct benefits for participating in this research. However, this study will close a knowledge gap in the implementation of Research Capacity Development in South African academic institutions. The conclusion and recommendations generated from this study may contribute to the application of best Research Capacity Development practices in South African institutions of higher learning at the honours, masters and doctoral levels.

H. Risks and discomforts

There are no risks for participating in this study. Some questions may make you feel uncomfortable. I request that you remain as comfortable as possible as there are no right or wrong answers.

I. Rights and responsibilities

You have rights to information, respect, confidentiality, and privacy. Should you find questions that are uncomfortable to you, you may decide to take a break, skip them or discontinue participation. You will not be penalised for this. Should you decide to discontinue participation, I may ask if I can use the information you would have provided me at that time; should you disagree, I will destroy all information.

J. Reimbursement

On receipt of your responses on the survey questionnaire, you will receive a 1 (one) Gigabyte of data on your preferred network to thank you for your time spent in completion of the survey. Data will be sent to your cell phone number which you will be requested to provide. Your number will only be utilized to send data and not for any other reasons in the study. Should you not wish to share your cell phone number, an airtime will be bought which is equal to the amount you would buy data with in your preferred network.

K. Research Results and Contact Information

Should you wish to access results or you have questions or concerns related to this research, you may contact the Researcher, Ms Fulufhelo Malamatsho at 41671996@mylife.unisa.ac.za, cell phone number 076 364 9995 or the research Supervisor, Dr Thoahlane Ephraim Thoahlane at thoahlaneth@gmail.com.

2. Informed Consent

After reading the above information leaflet, do you have questions?

Do you wish to participate in the study?

- Yes
- No

If your answer above is ‘yes’, please continue with the survey questionnaire. If your answer is ‘no’, you are not allowed to participate in the study. Thank you for your time.

Appendix 4: Survey Questionnaire

Dear Participant,

Thank you for showing interest in this research. Before you proceed, kindly read the information leaflet on the following link: *(Link to be provided)* before you continue to answer questions. After reading the information leaflet (which explains the aim of the study, study expectations, confidentiality, benefits, risks and discomforts, rights and discomforts) and you agree to participate in this study, kindly click "Yes" below and continue to answer the questions that follow. If you do not agree to participate, kindly click "No" and discontinue with the questionnaire.

Consent:

After reading the Information leaflet in the link provided above, do you wish to participate in this study?

- ☐ Yes
- ☐ No

Please Note: If your response is no, please do not participate in the study. Thank you for your time.

Survey questionnaire

Section A: Background questions

1. Were you registered for postgraduate studies at a South African public university between 2010 and 2020?
   - ☐ Yes
   - ☐ No (Discontinue your participation)
2. If yes, in which level of study were/are you in? (If you studied for more than one degree, please respond based on the last postgraduate degree you registered for)
   - ☐ Honours
   - ☐ Masters
   - ☐ Doctoral
3. In which year did you register for your postgraduate degree? (please enter the year)

_____

2. According to university's regulation time, how long is/was your degree?
   - □ 1 year
   - □ 2 years
   - □ 3 years
   - □ 4 years
   - □ 5 years
   - □ Other (Please specify)
3. Did you obtain your degree?
   - □ Yes
   - □ No
   - □ I am awaiting results
4. If your answer is yes, what made it easy for you to complete? (Answer in one sentence) _____
5. Reasons for not completing your degree: (Tick all that apply)
   - □ Lack of funding
   - □ Challenges with supervisor
   - □ I got tired
   - □ Research is not for me
   - □ I feel I am in the wrong field
   - □ Lack of family support
   - □ I need time to rethink my career
   - □ I am taking a break
   - □ Emotional challenges
   - □ Other (Please explain) _____
6. How much research did you conduct in your studies?
   - □ 5-10% of my studies
   - □ 10-20% of my studies
   - □ 20-30% of my studies
   - □ 40-50% of my studies

- 50-90% of my studies
- Full research degree

7. How long it took you to complete your research?
   - 3 Months
   - 6 months
   - 1 year
   - 18 months
   - 2 years
   - 3 years
   - 5 years
   - Other (please indicate) _____

Section B: Role players, tools, benefits and beneficiaries of Research Capacity Development

8. Who supports/ed you during your studies (Tick all that applies)?
   - Supervisor
   - Head of Department
   - School Dean
   - Research administration staff
   - Librarian
   - Co-supervisor
   - Fellow student
   - Colleague (at work)
   - Family member
   - Other (Please indicate) _____
9. What kind of support do you/did you receive?
   - Research funding
   - Financial support for studies
   - Personal financial support
   - Emotional support
   - Research supervision

- Life coaching/mentoring
- Other (Please indicate) _____

10. Is/did your university implementing/implemented Research Capacity Development?
    - Yes
    - No
    - I am not sure
    - I don't know
11. If not, why do you think your university did not implement Research Capacity Development?

    _____
12. If yes, what research capacity initiatives did the university offer you? (Tick all that apply)
    - Research workshop
    - Research methodology course/module
    - Thesis/dissertation writing retreats
    - Summer school
    - Data analysis workshop
    - Research collaboration platform
    - Research networking sessions
    - Research conference
    - Research collaborations
    - Research networks
    - Webinar
    - Seminar
    - Research funding workshops
    - Research support group
    - Other(s) (Please indicate) _____
13. On average, how long did these Research Capacity Development initiatives took?
    - 1 hour -1 day
    - 2-3 days
    - 4-5 days
    - 2-3 weeks

- 1 month
- 2-3 months
- 4-6 months
- 1 year
- Other_____

14. Was the time allocated for these initiatives enough?
    - Yes
    - No
    - I don't know
15. If not, how much time would have been sufficient? (Please type in responses)

    _____
16. Are there other Research Capacity Development initiatives you wished you took part in?
    - Yes
    - No
    - I don't know
17. If yes, which Research Capacity Development initiatives did you wish to take part in? (Please enter your responses) _____
18. How long should these Research Capacity Development initiatives be? Please enter your responses) _____
19. In your postgraduate studies, do/did you need certain resources/tools for research purposes?
    - Yes
    - No
20. Were you able to find these resources?
    - Yes
    - No
21. If so, where did you access them? (Please enter response)

    _____
22. (If No above) What was/were the reason (s) you did not find resources to assist you with your research? (Please enter response) _____

Section C: Activities for Research Capacity Development

23. What Research Capacity Development initiatives benefitted you most at the university?

- ☐ Research workshop
- ☐ Research methodology course/module
- ☐ Thesis/dissertation writing retreats
- ☐ Summer school
- ☐ Data analysis workshop
- ☐ Research collaboration platform
- ☐ Research networking sessions
- ☐ Research conference
- ☐ Research collaborations
- ☐ Research networks
- ☐ Webinar
- ☐ Seminar
- ☐ Research funding workshops
- ☐ Research support group
- ☐ Other(s) (Please indicate) _____

24. Which Research Capacity Development initiatives benefited you the least?

- ☐ Research workshop
- ☐ Research methodology course/module
- ☐ Thesis/dissertation writing retreats
- ☐ Summer school
- ☐ Data analysis workshop
- ☐ Research collaboration platform
- ☐ Research networking sessions
- ☐ Research conference
- ☐ Research collaborations
- ☐ Research networks
- ☐ Webinar
- ☐ Seminar

- Research funding workshops
- Research support group
- Other(s) (Please indicate) _____

25. Which Research Capacity Development initiatives did not benefit you at all?
    - Research workshop
    - Research methodology course/module
    - Thesis/dissertation writing retreats
    - Summer school
    - Data analysis workshop
    - Research collaboration platform
    - Research networking sessions
    - Research conference
    - Research collaborations
    - Research networks
    - Webinar
    - Seminar
    - Research funding workshops
    - Research support group
    - Other(s) (Please indicate) _____
26. Reasons for not benefiting you:
    - Not enough information provided
    - Insufficient content
    - Irrelevant content
    - Did not find time to take part
    - Expensive to participate in
    - Venue too far for me
    - Lack of technological device to access (laptop, smart phone etc)
    - Lack of internet access (network challenges)
    - Lack of data/internet

- Lack of transport fare
- Not invited
- Other (please specify) _____

Section D: Building Skills and Confidence

27. Apart from Research Capacity Development activities, are/were there any training for postgraduate students at your institution?
    - Yes
    - No
    - I don't know
28. Which training?
    - Communication training
    - Presentation skills
    - Management training
    - Computer training
    - Monitoring and evaluation
    - Project management
    - Other (please specify) _____

34. After training, are there opportunities to apply knowledge and skills learned?
    - Yes
    - No
    - I don't know
35. What kind of opportunities?
    - Research seminars
    - Practical work completion
    - Tutoring opportunity
    - Other (Please specify) _____

36. Is there any financial support for conducting research?

- Yes
- No
- I don't know)

37. Which funding is/was available? _____

Section E: Research that is "close to practice"

38. Do you think that the research you conduct/conducted contributes to the improvement of the lives of the community?
    - Yes
    - No
    - I don't know
39. What contribution does your research make? (Please explain in 1 sentence) _____
40. In your view, is/was research at your university valued?
    - Yes
    - No
    - I don't know
41. In your view, does/did your university promote research?
    - Yes
    - No
    - I don't know

Section F: Support linkages, partnerships and collaborations

29. In your studies, are/were you part of a research team?
    - Yes
    - No
30. If yes, what activities were your research team involved in?
    - Conduct experimental work
    - Support group
    - Research partnership/collaboration

- Study group
- Other (Please indicate) _____

31. Would you say the research group benefits/benefitted you?
    - Yes
    - No

Section G: Developing appropriate dissemination

42. Does/did your university have a dissemination strategy/plan/policy?
    - Yes
    - No
    - I don't know
43. Are/were there platforms for research dissemination?
    - Yes
    - No
    - I don't know
44. Are/were there funding opportunities to support the dissemination of research outcomes?
    - Yes
    - No
    - I don't know
45. Are/were there measures in place to protect the intellectual property for postgraduate students?
    - Yes
    - No
    - I don't know

Section H: Investment in infrastructure

46. Apart from the honours/masters/doctoral project, are there/were there other research projects you are/were participating in? (If no, skip to Section I)
    - Yes
    - No
47. What kind of projects? (Briefly explain in one sentence)
    - Conducting laboratory experiments
    - Conducting focus group discussions

- Conducting interviews
- Writing a research article/manuscript/book
- Other (Please specify) _____

48. With whom do/did you work with?
    - Fellow students
    - With researchers from other departments
    - With students/researchers from another university
    - With International students/researchers
    - With my supervisor
    - Other (please specify) _____
49. What did you like about working in these projects?
    - My interpersonal skills have improved
    - My Writing skills improved
    - My research knowledge and skills have improved
    - I enjoyed being in another institution/environment
    - I gained laboratory experience
    - Other (please specify) _____

50. What did you NOT like about working in these projects?
    - Too long to complete
    - Not relevant to my field
    - I did not learn a new skill
    - Too much information in a short period
    - The collaborators were not friendly
    - I did not have enough time to focus on the project(s)
    - Other (please specify) _____

51. Now, let us talk about mentorship and supervision. Does/did your university have a structure/policy in mentoring and supervision?
    - Yes

- No
- I don't know

52. In your postgraduate studies, would you say your supervision experience was:
    - Good
    - Very good
    - Bad
    - Very bad
53. What made it good/very good/ bad/very bad (briefly explain in one sentence) _____
54. Does/did your university have a policy on the completion of postgraduate studies on regulation time?
    - Yes
    - No
    - I don't know
55. How does/did your university handle issues such as authorship and co-authorship?
    - Well
    - Bad
    - I don't know

Section I: Building elements of sustainability and continuity

56. Is/was there a policy on ensuring research continuity and sustainability at your university?
    - Yes
    - No
    - I don't know
57. If you were to register for postgraduate studies at a South African public university, what would make your postgraduate journey easier and successful (Briefly explain your answer in 2 sentences) _____

Interviewer: Thank you for participating in this study and for your time.