Title: A systematic review of challenges in research supervision at South African universities

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ABSTRACT

Postgraduate students in South Africa and other parts of the world, particularly in developing nations struggle to complete the research component of their studies. According to the National Development Plan (2013) it has become a requirement for South African institutions to play a pivotal role in knowledge production so as to transform South Africa from a resource-based economy towards a knowledge-based economy. In pursuit of meeting this requirement and further to increase subsidy from the Department of Higher Education and Training (DHET), South African institutions of higher learning have been on the drive for recruiting postgraduate students en masse. One of the main problems facing South African institutions is that the number of students enrolled does not correspond to those who graduate at the end of the postgraduate programme study period. This study is a systematic review of literature on challenges in postgraduate supervision and further proposes a possible solution. Five South African institutions of higher learning's postgraduate throughput data is carefully studied and substantiated by previous research on postgraduate supervision challenges at these particular institutions. Study findings present challenges related to research capacity development and burden of supervision at these institutions. Collaborative methods of supervision such as the C.O.S.T.A model are hereby proposed as possible solutions to the current throughput problem in South Africa

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1. ORIENTATION

1.1 Introduction

Knowledge-based economies think of universities as drivers for change and innovation through the work of postgraduate research studies. Currently, South African institutions of higher learning are faced with pandemic of low throughput in the postgraduate levels. As such, enrolments of postgraduate students in all public university system do not correspond with the completion rate. This situation places South Africa as relatively the lowest in higher education completion rates in comparison to other countries. This presents one of the major challenges as investigated in this study.

Postgraduate research is critical in discovery and creation of new knowledge, investigating a phenomenon or providing solutions and strategies across wide contexts in our socio-economic and political landscape. As much as the general trend for postgraduate students is to investigate and write reports as a requirement for partial or wholly for Masters or PhD studies, research plays a vital role in the development of any nation, and institutions of higher learning provide this platform through postgraduate research (Okoduwa, et al., 2018).

Universities are faced with massive pressure from their respective governments "to increase the throughput of postgraduates where there is a need for supervisory guidance in order to produce quality graduates within a shorter period of time than was previously thought possible" (Tintswalo, 2017). Postgraduate supervision and experiences of both supervisors and students demonstrate the quality of supervision at particular universities, which means that

institutions have to continually monitor and improve their supervision programmes.

Research activity in a South African university has thus become a priority, target and a requirement. Research follows a structured, replicable, systematic and universally accepted formal process designed to solve complex problems, to uncover new facts or to explain relationships of variables within a particular context or content range. Research helps to find reliable answers to a problem in a systematic and   objective way. Understanding that "systematic and objective" way presents a lot of problems to most postgraduate researchers who often find themselves faced a paradox, to an extent of giving up on their studies, resulting in the problematic low postgraduate throughput (Bopape, 2018) in South African universities.

1.2 Problem statement

The purpose of the problem statement is primarily to provide effective explication for the primary reasons as to why the researcher undertook to investigate a particular study, as postulated by Rubin and Babbie (2009).

Postgraduate students in South Africa and other parts of the world, particularly in developing nations struggle to complete the research component of their studies as noted by Mutula (2009) and many other scholars. Researchers have further noted that postgraduate research is faced with challenges of "demand, supply, quality and returns on investment" in terms of capacity and meeting beneficiary needs.

The main problem remains that postgraduate students do not complete their studies at institutions of higher learning and as such South Africa is faced with low throughput in the entire high education system. Studies have pointed at the

problems in research capacity and utility. This study seeks to answer the research question as raised in 1.3.3 below and propose a model for supervision.

1.3 Goals, Objectives and Research Question of the study.

1.3.1 Goals

Researchers (Mouton, 1996) have defined the importance of goals in any study simply as concrete and measurable milestones that indicate processes and activities from the beginning to the end of the study. The goal of this study is to describe the magnitude of the problem in research supervision and recommend a possible solution.

1.3.2 Objectives

The objectives of a research study are described by Mouton (1996) as a route to a destination for any particular study. The objectives of this study are:

- To explore general consensus on the root-cause of the challenges in postgraduate research supervision
- To understand the effects of these challenges on the postgraduate students
- To present a possible solution to curb the scourge of the problem.

1.3.3 Research Question

A research question can be defined as a well articulated methodological direction that presents clearly the idea which is a subject of an academic investigation (Stringer, 2007). For this study, the research question was formulated to clearly present a solution for the challenges in postgraduate research supervision. The question formulated is ***"What are the challenges in postgraduate research supervision at South African universities?"***

1.3.4 Rationale and motivation for the study

This study is motivated by the need for a coherent empirical validation of a postgraduate supervision model. Scholars have recognized a vast array of innovative supervisory models that have been proposed, as evidenced by many studies (Delaney, 2009). Of main importance, the number of students from different universities who register with our coaching centre – the Global Centre for Academic Research, have inspired the need to investigate the problem further.

1.4 The significance of the study

This study could:

- Assist to improve the level of morale of postgraduate researchers,
- Provide necessary skills for researchers to undertake their studies,
- Provide necessary engagement between supervisor and students, thereby improving bilateral relations,
- Encourage sound and well-informed scholarship thereby improving knowledge base provision from universities
- Improve throughput within universities and confidence of students
- Improve quality of postgraduate research supervision

2. RESEARCH METHODOLOGY

2.1 Introduction

The purpose of this section is to provide a clear step by step the researcher followed in coming to a conclusion is support of the research question. This study is a qualitative systematic review research that was based on naturalistic ontological paradigm. A systematic literature review is a research method and therefore, it differs from a literature review (Wilson, 2013). Systematic reviews "present a comprehensive summary of research based knowledge that can aid both practitioners and policy makers in decision making" (Brettle, 2009).

Furthermore, the study was descriptive in the beginning in giving a full picture of the phenomena. The research design section clearly depicts methods of investigation the researcher followed.

Extensive literature is available on different research databases explaining the importance and structure of research methodology in academic investigations. Creswell (2009) defines research methodology as a systematic way including all activities the researcher intends to follow in pursuit of solving the research problem. In order to keep the focus and provide a compelling point of departure for further investigations, this study was based on review of literature on challenges of postgraduate supervision and factors that impact on supervision relationships. The study further adopted a pragmatic view that successful supervision refers to a situation whereby the supervisor achieves completion rates as targeted on record time for all those he or she supervised with excellent supervision reports (Gatfield, 2005). This exacerbated a need to propose specific coaching as a model to solve challenges in order to meet requirements of this pragmatic view and in line with the research question of this study.

2.2 Research Design

According to Kumar (2011: 95) a research design is a strategy or an articulate plan of the research study methods that the researcher used in order for answering the key study question. This process includes approaches to the research, strategies, chosen methods including methods of data collection, analysis and interpretation.

The ontological position of the researcher on this topic is a naturalistic intepretivist approach. The researcher pursued a systematic literature review methods, randomly drawing data from published studies in the following databases:

- Mendeley.
- Google Scholar databases.
- UL Space (University of Limpopo)
- Advance He
- SRHE
- CHET

A careful purposive selection of studies was followed for the purposes of presenting the magnitude of the problem and secondly, to support the argument raised in the research question. After studying many published work on the subject, the researcher purposively selected studies reflected in this review and then generalisation made thereafter. The Centre for Higher Education Trust is a good repository for data of higher education in South Africa and the region. Higher education data was retrieved from this repository. The process of including and excluding studies on challenges in postgraduate studies for review in this investigation is depicted in *Table 1* below.

2.3 Method of data collection

Table 1: List of sources and databases where study data was collected

Topic	Citation	Database	Decision	Reasons
Post Graduate Students' Experiences with Research Supervisors	(Wadesango & Machingambi, 2011)	Mendely	Excluded	Could not clearly get the names of the institutions where the study was conducted.
Research supervision experiences of masters in education students at a South African university.	(Ganqa, 2012)	Google Scholar	Excluded	Could not clearly get the names of the institutions where the study was conducted.
Postgraduate supervision at an open distance e-learning institution in South Africa	(Manyike, 2017)	Mendeley	Included	Useful for appropriating research argument.
Research supervision: Perceptions of postgraduate nursing students at a higher education institution in KwaZulu-Natal, South Africa	(Muraraneza, et al., 2016)	Mendely	Included	Useful for appropriating research argument.
The challenge for a historically disadvantaged South African	(Sonn, 2016)	Mendeley	Included	Useful for appropriating research argument.

university to produce more postgraduate students				
Factors influencing the through-put rates of masters students at the University of Limpopo	(Bopape, 2018)	UL SPACE - Theses and Dissertations (Public Administration)	Included	Useful for appropriating research argument.
Attitudes, Perceptions and Barriers to Research and Publishing among Research and Teaching Staff: A Case Study	(Okoduwa, et al., 2018)	Google Scholar	Excluded	Could not clearly get the names of the institutions where the study was conducted.
Perceptions of research structures and service quality within various faculties at Durban University of Technology: staff and students perspective	(Ngibe & Lekhanya, 2016)	Google Scholar	Included	Useful for appropriating research argument.
Postgraduate Research Experience Survey 2017	(Slight, 2017)	Advance HE	Excluded	Could not clearly get the names of the institutions where the study was conducted.
Challenges in Postgraduate Studies:	(Ezebilo, 2012)	Google Scholar	Included	Useful for appropriating research argument.

Assessments by Doctoral Students in a Swedish University				
Supervision of post-graduate students in higher education	(van Rensburg, et al., 2016)	Google Scholar	Excluded	Could not clearly get the names of the institutions where the study was conducted.
A qualitative inquiry into the challenges and complexities of research supervision: viewpoints of postgraduate students and faculty members.	(YOUSEFI, et al., 2015)	Google Scholar	Excluded	Could not clearly get the names of the institutions where the study was conducted
Challenges of research conduct among postgraduate research students in an African University	(Desmennu & Owoaje, 2018)	Google Scholar	Included	Useful for appropriating research argument for an African perspective.
It's A Jungle Out There: Challenges In Postgraduate Research Writing	(Jeyaraj, 2018)	Google Scholar	Excluded	Could not clearly get the names of the institutions where the study was conducted.
The supervision of research for dissertations and theses	(Lessing & Lessing, 2004)			
Common Mistakes Committed and Challenges Faced in	(Manchishi, et al., 2015)	Google Scholar	Included	Useful for appropriating research argument for an African perspective.

Research Proposal Writing by University of Zambia Postgraduate Students				
Postgraduate research supervision: a critical review of current practice	(McCallin & Nayar, 2012)	SRHE (Society for Research into Higher Education)	Excluded	Could not clearly get the names of the institutions where the study was conducted.

This study includes both descriptive and prescriptive research dynamics. In descriptive studies, researchers examine a situation as it is in its current state which is mainly achieved through identification of particular attributes based on observation or exploration of correlations between two or more phenomena (Williams, 2011). The study ends up the a prescriptive argument as a model solution for the problem raised in this study and in pursuit of answer the key question under investigation. Researcher argued that Prescriptive decisions are more focussed with providing methods for "making optimal decisions" while descriptive investigators focus on the methods of decision making (Divekar, et al., 2012). While the researcher found out that there has been a lot of published research on the phenomenon of postgraduate supervision challenges, it became clear that there has not been more solutions forthcoming to curb this problem prevailing as challenges in postgraduate research

3.   PRESENTATION OF RESULTS AND DISCUSSION

3.1 Challenges in Postgraduate Supervision - Global Perspective

3.1.1 Sweden (Europe)

The problem characterised as challenges of postgraduate students with regard to research is a global phenomenon across prominent and less prominent universities alike. A study conducted in Sweden found that students faced challenges in accessing information related to their research and culture shock (Ezebilo, 2012). The study cited lack of preparation for postgraduate studies and poor mentorship. Some students were found to lack confidence in presenting their own work due to lack of guidance and language problems.

3.1.2 Malaysia (Asia)

In another study conducted in Malaysia, the challenges resulting from lack of a formalised research writing structure were investigated; it was found that students were burdened by academic language and concepts (Jeyaraj, 2018). The researcher argued that the findings indicated important needs of students and suggested that attending to these issues could improve timely completion rates and enhance student learning experience.

3.1.3 New Zealand

in New Zealand (McCallin & Nayar, 2012), of which the recommendations of the review were:

- The need to constantly develop faculty through supervisor education
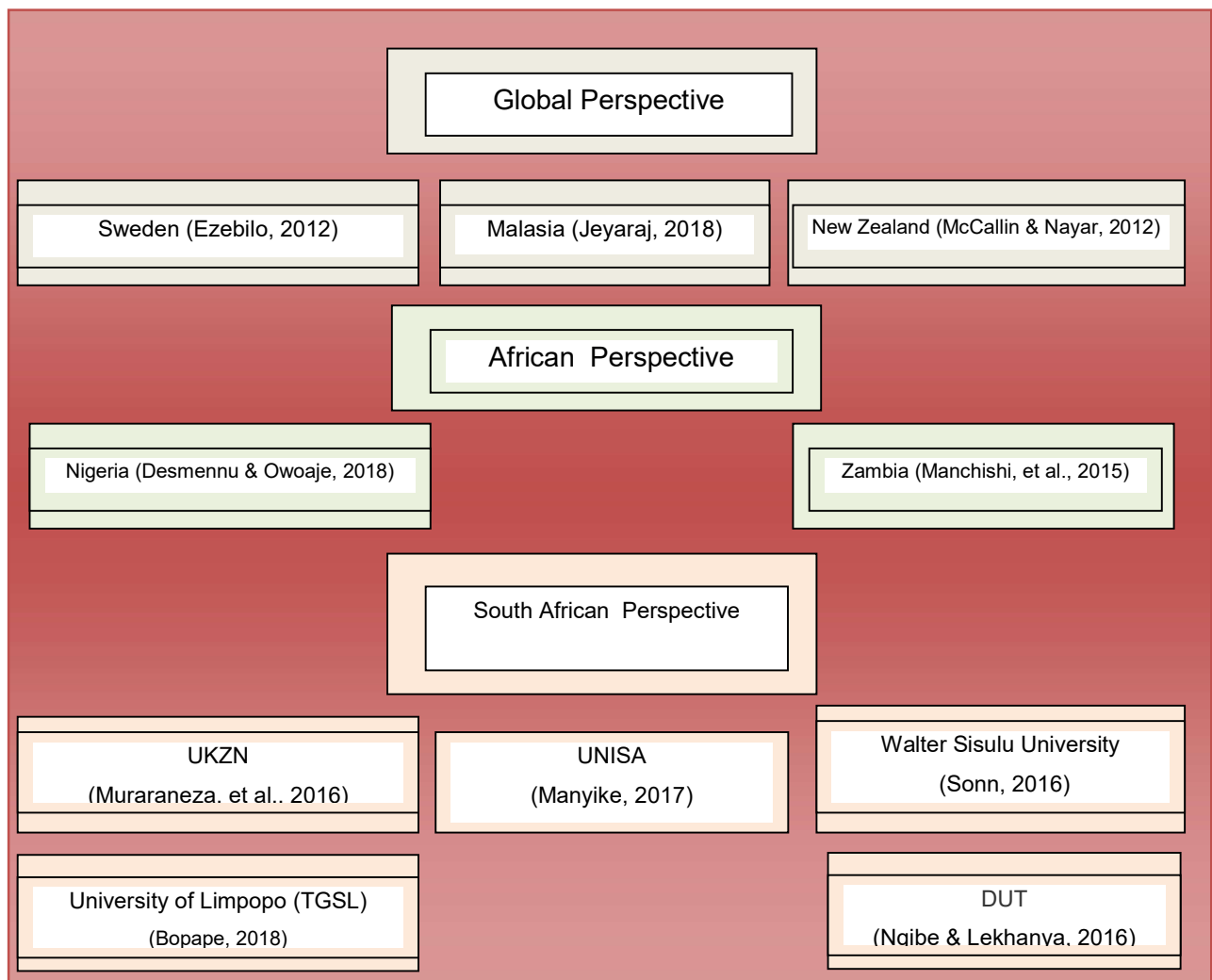- Development of a formal research training programme for students

Figure 1- Global Perspective of postgraduate supervision challenges

3.2 African Perspective

3.2.1 Nigeria

Bringing the debate closer in Africa, another study was conducted in 2018 in Nigeria, focussing on barriers to research and training of postgraduate students at University of Ibadan (Desmennu & Owoaje, 2018). Of the total of 137 sampled

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population (67% were full doctoral students), 91% percent of the respondents indicated a need for training on proposal development while 56% indicated lack of access to research materials.

3.2.2 Zambia

In Zambia, a study was conducted that comprised postgraduate students and their lecturers on challenges regarding postgraduate research supervision (Manchishi, et al., 2015). The study found a plethora of challenges facing students, including but not limited to the following:

- Understand of the contents of a Research Proposal
- Critical Analysis and synthesis of literature reviewed
- Understanding of research language and concepts
- Poor referencing styles and plagiarism
- Unavailability of lecturers for consultation
- Negative feedback from supervisors
- Limited time for proposal writing
- Lack of research materials

3. 3 South African Perspective

In order to comprehend the extent of the problem, it is important to understand structure of the South African higher education system. The higher education landscape is characterised by public and private higher education institutions. Cases studied on this review focussed only on the public higher institutions . The public higher institution sector is made up of 11 universities, 6 universities of technology, 6 comprehensive universities. The list below provides a clear picture of formation of the system, including the size of institutions reviewed.

(a) Category One - Universities

- Large (enrolments of 30 000 and above): UP, NWU, UKZN
- Medium (enrolments of 20 000–29 999): UFS, Wits, UCT, SU,
- Small (enrolments below 20 000): UL, UWC, UFH, RU

(b) Category Two - Universities of Technology

- Large (enrolments of 30 000 and above): TUT
- Medium (enrolments of 20 000–29 999): CPUT, DUT
- Small (enrolments below 20 000): VUT, CUT, MUT

(c) Category Three - Comprehensive Universities

- Large (enrolments of 30 000 and above): Unisa, UJ
- Medium (enrolments of 20 000–29 999): WSU, NMMU
- Small (enrolments below 20 000): Univen, UZ

In this section of the review, the researcher selected studies on the current subject under review from universities as representation of their specific category.

3.3.1 The magnitude of the problem in South Africa

The Higher Education Qualifications Framework (HEQF) introduced a new policy in 2012 compelling and emphasizing the need for all Social Science postgraduate qualifications to have a compulsory 30 credit-bearing research module. This provided a major shift from the traditionally coursework-only Honors and Masters degrees. This required institutions to further prepare themselves in terms of capacity. The National Development Plan (NDP 2013) advocates a critical policy imperative for further growth in the post-graduate throughput. This national imperative requires South African universities to produce more than 100 doctoral

graduates per million. This will transform South Africa from a resource-based economy to be an empowered knowledge-based economy. This requirement has propelled forward-thinking policy makers and academics to recognize the need to focus on increasing enrollments and production of postgraduates students (Thaver, 2013).

To present the magnitude of the problem in South Africa, the researcher purposively selected and scanned five institutions of learning made up of two universities, a large one in Kwazulu-Natal and a small one in Limpopo; two comprehensive universities, an open distance learning (ODL) university and a medium institution in the Eastern Cape and finally a medium university of technology in Kwazulu-Natal.

3.3.2 Enrolment and graduation data of a large university in Kwazulu-Natal

Enrolments	2009	2010	2011	2012	2013	2014	2015	2016
Masters	3957	3932	4046	4418	5164	5448	5826	5991
Doctoral	1141	1173	1286	1626	2113	2453	2798	3044
Graduations								
Masters	690	650	739	797	862	930	1183	852/402*
(Research)	(443)	(437)	(480)	(532)	(614)	(666)	(799)	(853)
Doctoral	159	163	154	177	207	264	338	361/0
(Research)	(159)	(163)	(154)	(177)	(207)	(264)	(338)	(361)

Table 2, UKZN Postgraduate Data (Data Source: CHET, compiled by: King Costa)

Critical data analysis

The table above reflects the academic data in relation to the information required in this study. The research sought to do a comparative analysis of enrolments against those who graduate. According to the UKZN School of Education website (University of Kwzulu-Natal, n.d.), two types of Masters degrees are offered, namely, taught and full research degrees. Both degrees have duration of one

year for full time students and two years for part-time students. A doctoral degree study time ranges between four semesters for full-time students and eight semesters for part-time students.

A closer look at the number of students who enrolled for Master's degrees in 2009 reflects a wide gap when compared to those who graduated in 2010. Approximately 83.6% (3307) of students did not make it through in record time of two years, assuming all had taken a part-time route. Doctoral degrees at UKZN can be completed within four semesters for fulltime students and eight semesters for part-time students. Looking at the period under discussion (2009 -2010), almost 85.7 students who registered for doctoral studies did not complete. Assuming all students who registered for doctoral studies were on part-time studies in this period, only 4.5% completed their studies in 2012.

In 2011, 4046 students enrolled for Masters while 1286 students enrolled for Doctoral studies at the same time. At the end of 24 months, approximately 19.7% of those enrolled graduated, with only 13.1% accounting for notable collective research output for Masters students in 2012. Assuming all students who registered for doctoral studies were on part-time studies in this period, only 20.5% completed their studies in 2014.

In a scenario wherein it could take a student three years to complete their Master's degree, the outcome still remains questionable and unsatisfactory. For instance, assuming that those who enrolled in 2013 completed their degrees in 2015, the outcome would be such that only 22.9% graduated, with only 15.5% accounting for notable collective research output by Master's students in 2015.

A research supervision study conducted in 2012 at the University of Kwazulu-Natal into the perceptions of postgraduate nursing students found that 62.2% of students rated the level of research supervision as moderate on a scale of low to high (Muraraneza, et al., 2016). The researchers note that there is a disparity of relationship between duration of supervision and students' perceptions of supervisor's research capability. The study recommendations were summed up as follows:

- There was a need to include the research module into the curriculum of nurse educators
- There was a need to adopt online research supervision to accommodate all students.
- There was significant lack of guidance in the conceptual development of the research proposal, which led to discouragement, demotivation and theses dropout as postulated by Ssegawa and Rwelamila (2009).

3.3.3 Enrolment and graduation data of a large comprehensive university - Open Distance Learning

Enrolments	2009	2010	2011	2012	2013	2014	2015	2016
Masters	4711	5459	5909	5254	6372	6072	5726	5500*
Doctoral	754	1024	1257	1173	1872	2100	2117	2179
Graduations								
Masters (Research)	373	474	677	831	799	1030	936	655*
	(100)	(89)	(190)	(321)	(342)	(587)	(513)	(655)
Doctoral (Research)	71	55	93	152	201	268	235	296
	(71)	(55)	(93)	(152)	(201)	(268)	(235)	(296)

Table 3: UNISA Postgraduate Data (Data Source: CHET, compiled by: King Costa)

Critical data analysis

Just like an interpretation of the data in the previous table, it is clear that the intake of students is not matching the number of those who complete a programme. A master's programme at this institution's Graduate School of Business Leadership runs for 36 months while a doctoral programme is expected to run for 72 months (UNISA, 2018). Of the master's students who enrolled in 2011, only 14.4 percent successfully completed their degrees in 2011. Conversely, 85% of master's students did not graduate.

In 2013, 13.5% of students who had enrolled for master's degrees in 2011 successfully completed their degrees while 16% of students who had enrolled for doctoral studies successfully completed their degrees. On the reverse, 5110 students did not graduate.

Doctoral students who enrolled in 2009 would have completed their programmes in 2014 as per information on the website (UNISA, 2018). Of the students enrolled on the programme, 35.5% successfully completed their degrees in 2014. A study that looked into the perceptions of supervisors at an Open Distance Learning institution of higher learning, conducted by Manyike (2017) provided the following recommendations :

Workshops be conducted to orientate novice researchers and supervisors. The researcher encourages a "community of practice" to enhance skills transfer from experienced supervisors to novice supervisors.

Introduction of mentorships in postgraduate research for both students and supervisors. The purpose of these workshops will be to enhance relationship building for stakeholders and empower them on research methods.

The institution to establish a dedicated office where students can bring their supervision challenges and also share their successes.

Generally, this study which had supervisors as research participants did not find much problems regarding the perceptions of supervision at institution. However, some of issues raised in this study corroborate studies (Lessing & Schulze, 2003) which suggested training of supervisors in research methods, among others. Another study investigating supervision of doctoral and masters students in the same institution (Roets, 2016) also suggested the need for training and development of research supervisors in content-specific programmes.

However, some researchers undertook a study at the same institution, which provided a completely different view in terms of the magnitude of the problem in the institution in particular with possible generalisation to other institutions. In this particular study (Magano, 2013), the supervision experiences and wellbeing of a PhD student were investigated. This particular student had been on her PhD study for almost eight years and yet the study had found out that only one chapter of the study was ready. The study further found out that the relationship between the student and supervisor was tarnished by "nasty" words to an extent that the student was emotionally affected in the process. In some instances the student mention statements like '*I am even scared to write',* a situation that ended up compromising her self-worth and wellbeing in the process.

3.3.4   Enrolment and graduation data of a medium comprehensive university in Eastern Cape

Enrolments	2009	2010	2011	2012	2013	2014	2015	2016
Masters	309	336	385	351	363	266	305	398
Doctoral	21	32	30	34	48	50	54	56
Graduations								
Masters	14	8	44	45	49	38	49	8/27*
(Research)	(4)	(2)	(10)	(12)	(12)	(10)	(12)	(8)
Doctoral	0	1	4	3	3	8	15	12/0*
(Research)	(0)	(1)	(4)	(3)	(3)	(8)	(15)	(12)

Table 4: WSU Postgraduate Data (Data Source: CHET, compiled by: King Costa)

Critical data analysis

For a typical 2-year master's degree programme, of the students who enrolled in 2009, only 2.6% completed their degrees in 2010. Conversely, approximately 97.4% did not complete their degrees. In 2012 only 11.7% of those registered the previous year completed their master's degree, with a total of 340 students lost in the pipeline.

Assuming students took three years to complete a master's degree, 13.5% of the 2013 cohort graduated in 2015. On the reverse 314 students did not complete their degrees.

A study conducted in 2016 entitled "The challenge for a historically disadvantaged South African university to produce more postgraduate students" noted that the students complete their taught component of the postgraduate in record time but find it hard to complete the research component of their studies

(Sonn, 2016). The study further found out that postgraduate students' problems included:

- Poor relationship between supervisor and students
- Formulating the problem statement
- Proposal writing
- Lack of professional writing skills

Sonn (2016) postulated an inference that some of the reasons attributable to students' struggle to complete degrees lie solely on "inadequate, sporadic or unskilled supervision" at WSU. The problem of delayed response from supervisors affect the students career and academic progress as they cant graduate on time. The study asserts that this diminish the students' sense of achievement, compromising their self worth and wellbeing as in Magano (2013). According to participants in Sonn (2016), the delay indicated the lack of skill on the part of supervisors as also corroborated in other thematic discussions of the results of this study.

Table 5: Throughput rate of BEd (Hons) students since 2009 at one of the institutions' site in Eastern Cape

Year	Number Enrolled	Number Graduated
2007	121	–
2008	195	–
2009	196	152
2010	105	103
2011	72	60
2012	55	48
2013	30	12
2014	30	2
2015	34	2

Source: Sonn (2016)

Table 5 indicates the magnitude of the problem since 2012, the year the Department of Higher Education and Training (DHET) introduced the requirement for postgraduate studies to include a module on research. There is a notable decline compared to the numbers that were enrolled and those that completed in this period. This clearly demonstrates how this institution is capable to deliver coursework component as opposed to research-based components of study programmes.

3.3.5 Enrolment and graduation data of a medium university of technology in Kwazulu-Natal

Enrolments	2009	2010	2011	2012	2013	2014	2015	2016
Masters	300	339	312	468	539	598	752	861
Doctoral	66	84	69	99	123	163	216	322
Graduations								
Masters	68	57	85	63	83	104	138	854/402*
(Research)	(38)	(33)	(48)	(36)	(70)	(91)	(121)	(138)
Doctoral	5	12	14	6	18	18	29	361
(Research)	(5)	(12)	(14)	(6)	(18)	(18)	(29)	(40)

Table 6:DUT Postgraduate Data (Data Source: CHET, compiled by : King Costa)

Critical data analysis

When looking at enrolment stats, of the students who enrolled in 2009 for a two year master's degree, only 19% successfully completed their degrees. Of those who completed their degrees, only 11% accounted to notable research output by the institution. Assuming that it took 3 years to complete a master's degree, only 28.3% successfully graduated, with 16% accounting to the notable institutional research output. Assuming that it takes 4 years to complete a doctoral degree at this institution, only 6% graduated at the end of study period.

A study was conducted in 2016 entitled "Perceptions of research structures and service quality within various faculties at Durban University of Technology: staff and students perspective: staff and students perspective" across six faculties of the university (Ngibe & Lekhanya, 2016). The researchers investigated these perceptions against for service dimensions: reliability, responsiveness, assurance and empathy. The results presented a negative perception from research participants on these quality dimensions, particularly the responsiveness and assurance dimensions.

Most of the problems discussed in this particular study are grounded in poor administration of the research office. According to researchers, poor administration of the research offices within the faculties accounts to low throughput and dropout rates of the postgraduate studies at the institution. This could be one of the explanations to gaps seen in *Table 6* above.

3.3.6 Enrolment and graduation data of a small university in Limpopo

Enrolments	2009	2010	2011	2012	2013	2014	2015	2016
Masters	1659	1798	1771	1743	1654	1612	1169	1214
Doctoral	138	163	193	189	217	249	208	246
Graduations								
Masters	199	244	185	273	321	287	237	138/68*
Doctoral	17	10	17	17	14	25	25	13/13*

Table 7: University of Limpopo Postgraduate Data (Data Source: CHET, compiled by: King Costa)

Critical data analysis

Same as universities reviewed above in this section of the study, there is a poor throughput of both masters and doctoral programmes at this university. Students who enrolled for a 2-year masters programme in 2009 were a record total of 1659 compared to a total of approximately 244 who successfully completed their masters programme in 2012. According to Bopape (2018), some students were given an extension of extra one year to complete their studies. Assuming that all students received this extension in an particular period of study, in this example the researcher picked up 2013 to 2015 period for purposes of illustration, only 14.3% of those who had registered successfully completed their degrees.

As already found within other institutions reviewed, a 2018 study (Bopape, 2018) that focussed only at the university's graduate school of leadership found the following challenges:

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- Academic support inadequate to support postgraduate students. It was recommended that more supervisors be recruited.

- Students were not fully prepared for postgraduate students. This included establishment of their psycho-social support during the period of study.

- The university needs to establish research seminars to empower both students and faculty in a collaborative manner.

- Students need to be capacitated with academic writing standards for their research projects

3.4 Implications of the phenomenon and discussion

3.4.1 Introduction

The overall purpose of this section is to propose the significance of the general field of study and then further identify where a new contribution or solution to the problem could be made. Literature has revealed a number of problems related to the way postgraduate supervision is perceived in institutions of higher learning from a global perspective in general and South African universities in particular.

Scholars have argued that the academic research supervision development has been constrained and impaired by lack of conceptual understanding of what supervision is (Pearson & Kayrooz, 2004). Part of the challenges are emanating from the general tendency to equate postgraduate research supervision with research training and research roles of the supervisor, while others view supervision as constituting teaching (Johnston, 1999).

An in-depth analysis of the cases presented in this paper reveal the problems to be related across institutions in a global perspective with more adverse consequences in Africa. The results of the cases studied in this paper provide a similar trend prevalent at institutions of higher learning in South Africa and

beyond over a long period of time. Problems highlighted, yet not new as there has been so much written on the subject, included:

- Low throughout in universities
- Poor or no preparation of students for postgraduate studies
- Research language barriers – students do not understand research concepts and application in relation to their studies
- Poor supervision – leaving students with no option but to drop out
- Supervision misconceptions
- Poor institutional research support
- Supervisor burden/ backlog and pile-ups
- No or low publishing, thereby making research outputs inaccessible

Literature presents these challenges as general inadequacy that Mutual (2009) summarised as follows:

- Research capacity
- Research productivity
- Research utility

3.4.2 Burden of Supervision

The Council on Higher Education introduced the concept of the 'burden of supervision' is describing a phenomenon whereby supervisors were already burdened with higher numbers of students under their supervision. In this study, this term is used to denote the ratio of postgraduate students to suitably qualified academic stuff at the institutions studies. Ideally, one academic should supervise on average a maximum of three doctoral students per year (Wingfield, 2012).

INSTITUTION	QUAL/ENROL	2009	2010	2011	2012	2013	2014	2015	2016
UKZN	D-Staff	562	588	606	663	688	670	655	667
	Enrolments	1141	1173	1286	1626	2113	2453	2798	3044
	M-Staff	499	493	479	443	445	470	488	491
	Enrolments	3957	3932	4046	4418	5164	5448	5826	5991
UNISA	D-Staff	487	488	469	612	629/	690	732	834
	Enrolments	754	1024	1257	1173	1872	2100	2117	2179
	M-Staff	364	366	372	452	489	533	532	574
	Enrolments	4711	5459	5909	5254	6372	6072	5726	5500*
WSU	D-Staff	54	66	73	70	80	84	79	82
	Enrolments	21	32	30	34	48	50	54	56
	M-Staff	165	188	180	165	190	200	210	206
	Enrolments	309	336	385	351	363	266	305	398
DUT	D-Staff	58	65	73	88	97	112	125	134
	Enrolments	66	84	69	99	123	163	216	322
	M-Staff	203	251	261	279	277	281	291	286
	Enrolments	300	339	312	468	539	598	752	861
UL	D-Staff	156	153	147	132	139	154	139	170
	Enrolments	138	163	193	189	217	249	208	246
	M-Staff	384	346	328	299	322	335	217	214
	Enrolments	1659	1798	1771	1743	1654	1612	1169	1214

Table 8: Burden of supervision demonstration - compiled by King Costa

Table 8 presents a comparative analysis of students enrolment at each institution in relation to number of qualified staff to conduct research supervision at these institutions. According to *Table 8* we see a clear picture of the burden of supervision particularly at all universities and to a lesser extent at WSU. If the minimum time required for supervision is 1000 hours (Wingfield, 2012) for an individual postgraduate student, therefore there is a clear indication of supervision capacity challenges.
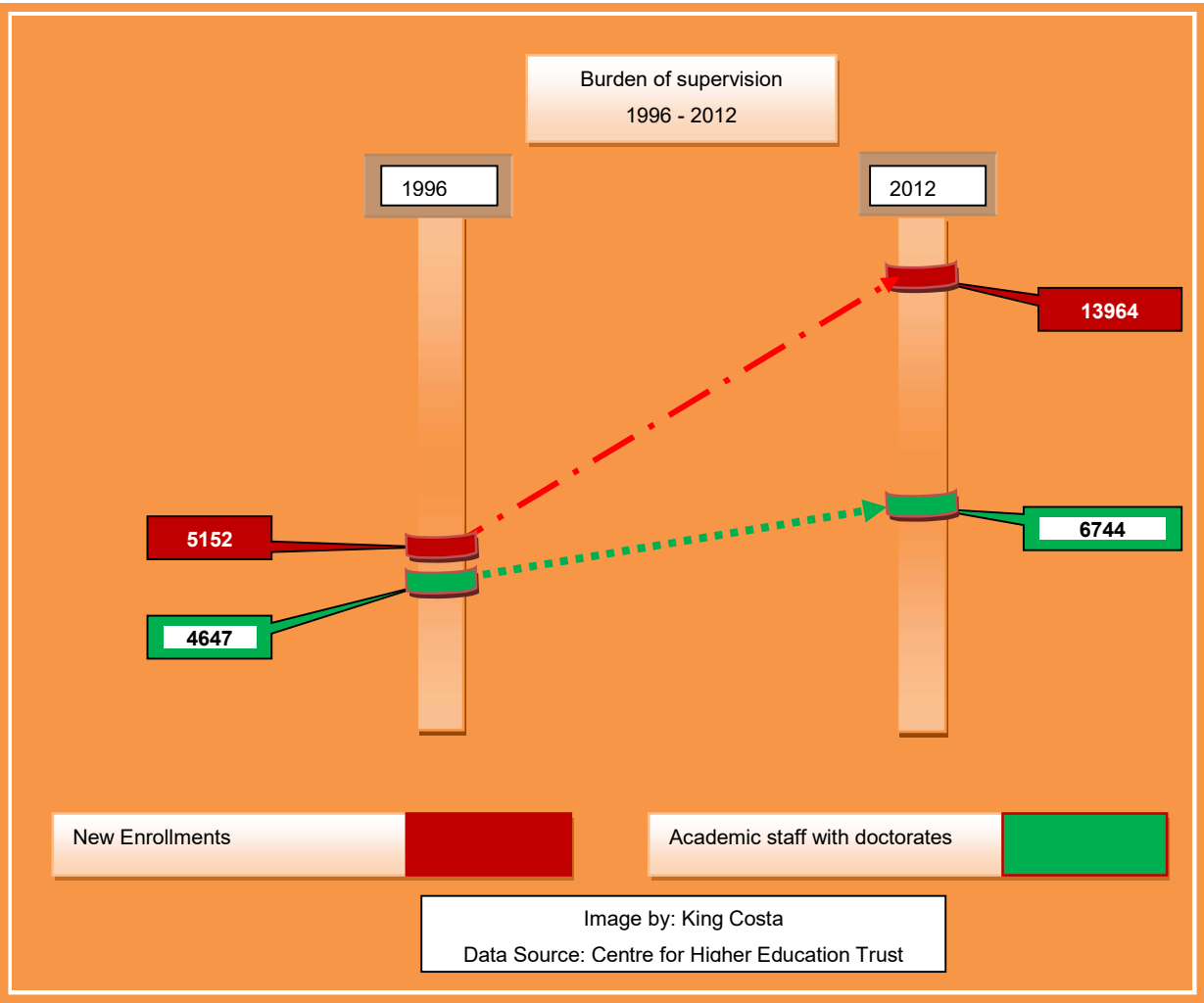

Burden of supervision
1996 - 2012

| 1996 | | 2012 |

5152

13964

4647

6744

New Enrollments

Academic staff with doctorates

Image by: King Costa
Data Source: Centre for Higher Education Trust

Figure 3: Burden of supervision, source: CHET

31

For institutions to be able to provide effective support to postgraduate students, it is critical that they have capacity in terms of numbers of teaching/supervisors with appropriate qualifications. A closer look at *Figure 2* below in comparison with statistical presentation of five institutions reviewed above indicates capacity problems, preparedness of institutions for postgraduate studies and the burden of supervision.   The Centre for Higher Education Trust postulated that in 2012 South Africa had 6744 academics with doctoral degrees against 13964 enrolled doctoral students as depicted in *Figure 3*.

3.4.3 The concept of coaching as a development model

Coaching is widely known as a process whereby one individual helps another to unlock their natural ability; to perform, learn and achieve; to increase awareness of the factors which determine performance; to increase their sense of self-responsibility and ownership of their performance; to self-coach; to identify and remove internal barriers to achievement (MacLennan, 1995).

Whitemore (2002) postulated that in terms of sports coaching, a coach appears to be someone who has accumulated a considerable amount of notable and verifiable experience accumulated over time in a particular field, whose main function is to assist a sports-person identify specific shortcomings in his/her performance and come up with means to deal with those deficiencies.

In certain instances the coach will exhibit himself/herself as a strong disciplinarian who leads, inspires, motivates and often impose his/her will on the coachee. Literature review on this paper has revealed certain similar instances similar to this view. This description of a coach greatly antagonises the current

thinking on the characteristics of a leadership/life coach, business or executive coach (Whitemore, 2002). Many researchers have viewed coaching and mentoring as synonymous with the process of supervision (Lubbe, et al., 2005). Lubbe,at al.,(2005) further stated that the role of the supervisor as mentors is to guide students through all intellectual matters pertinent to their studies including but not limited to:

- Appropriateness of the students' choice of research design
- Articulation of the research problem
- Essentials of quality, rigor and progress in their literature review
- Development of proper theoretical frameworks to enable clear and unambiguous results interpretation
- Related problems related to the research process and final write-up.

Just as coaching in practice involves a contracting period where the coachee seeks the services of the coach, institutions that see coaching as a model for supervision must include the student in the process selection of s supervisor.

3.4.4 The C.O.S.T.A Coaching Model of Supervision

The C.O.S.T.A model is a framework that has been tested by the researcher over a period of 8 months and seen to be providing good results. It has its origin on models like the Collaborative Cohort Model (CCM) which has also been introduced by one of the leading institutions of higher learning in South Africa (Govender & Dhunpath, 2011). It has clearly been established that collaborative methods of supervision tend to have better results.

The C.O.S.T.A model promotes collaboration and collegiality though provision of real-time problem solution in a seminar/workshop based mode where students, sometimes from different universities, come together for a common purpose of understanding research protocols and how these can be applied to their individual studies.

The programme proposes that students attend these sessions, where the first step is to learn about concepts and research language. This is critical as it introduces them to key terminology that will be used in their research projects. This step is not passed until students demonstrate knowledge and understanding of concepts and context of use including content requirements for particular studies. When this is done then the issue of research question is raised before getting to the topic. The topic comes after carefully selecting a research question. This can't be done without understanding literature review.

The advantage of this model is that while using basic principles of coaching, whereby the coachee must find results, it provides support to students in a structured a coherent manner from the coaches/supervisors and fellow students. *Table 9* below presents a 5-step framework of the model for further perusal.

The model is created on evidence of what the researcher empirically observed when they brought students together from different institutions of learning with a sole purpose of implementing the programme (Costa, 2018). The model focuses on spending time with students introducing them to concepts that will be critical in their research projects. As in the case of collaborative cohort model (Govender & Dhunpath, 2011), students and supervisors get together in an interactive workshop where the project leader makes presentation and the rest of the audience interact on these topics. Topics could be concepts or different stages of

the research project. Seminars/workshops are followed up by one-on-one interaction with the student by a supervisor. Student submissions, which are uploaded on an interactive online portal, are then viewed by a team of peers who will submit their findings to the chief supervisor. The process introduces the student to the peer review system.
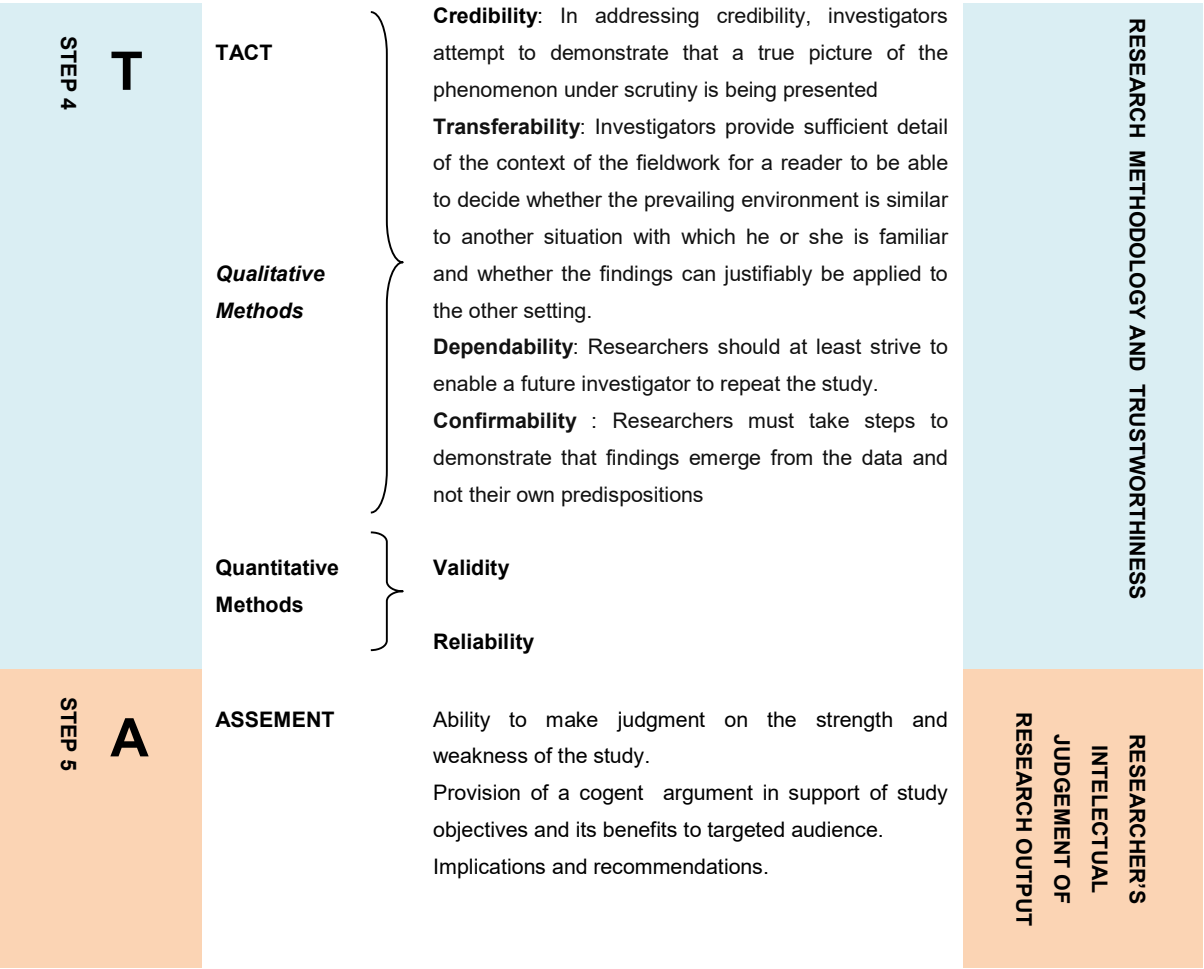
The model eliminates the concept of the popular Master Apprentice Model (MAM) currently practised in most institutions of higher learning. This model is primarily key in bringing most of the challenges investigated in this study across institutions of higher learning.

The C.O.S.T.A model covers five distinct yet important steps. The first step introduces students to research concepts. This is a step of ensuring the students are fully prepared to go through with the research project. This step prompts students to prepare essays for presentations on key concepts and conventions of research methods and methodologies and identify the difference. Through this stage students are taken through a process of question and topic. Philosophical assumptions and their impact on research questions are dealt with, ultimately helping students to prepare a conceptual framework of their chosen studies.

The second and third stage focus on proposal writing, literature review chapter. Ability to present a clear road-map and capturing the whole concept within a proposal is introduced to students. At this stage writing starts and coaching occurs. Reading and writing skills are developed – whereby students are introduced to concepts of critical thinking, synthesis and summarisation as depicted by *Figure 4* below.

Table 9: C.O.S.T.A Coaching Model of Supervision

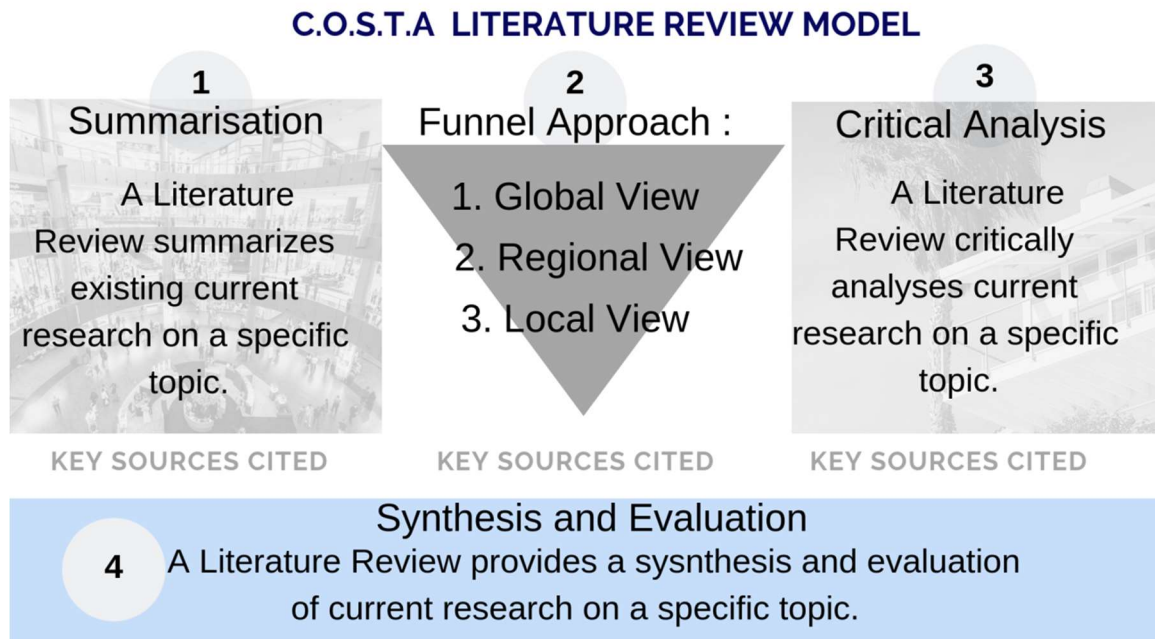| STEP		DESCRIPTOR	APPLICATION	STAGE SIGNIFICANCE	
STEP 1	C	CONNECTION	Connection between the supervisor and the student is critical. The suggested method is the GROW model to determine the preparedness and willingness of the student.	FOUNDATIONAL SKILLS	ESTABLISHMENT OF RESEARCH'S
		CONCEPTS	In-depth introduction to research language and applicable concepts. This cannot be done in one week, it should be a minimum of full three months programme.		
STEP 2	O	OBJECTIVES	This deals with the objective of the project. The student should be able to articulate the following: Introduction, Background, Study Objectives, Assumptions/hypothesis, The Study Significance, Study limitations, Delimitations and Research Question.	(Research Proposal)	RESEARCHER'S INTENTION
STEP 3	S	SITUATION	Thorough assessment of literature on the subject and identification of gaps. Formulation of a Theoretical Framework and Conceptual Framework and knowledge of the difference between the two. Application of Blooms' complex thinking skills (critical analysis, synthesis and evaluation).	RESEARCHER'S AWARENESS OF CURRENT DEBATE	

STEP 4	T	TACT	**Credibility**: In addressing credibility, investigators attempt to demonstrate that a true picture of the phenomenon under scrutiny is being presented	RESEARCH METHODOLOGY AND TRUSTWORTHINESS
		Qualitative Methods	**Transferability**: Investigators provide sufficient detail of the context of the fieldwork for a reader to be able to decide whether the prevailing environment is similar to another situation with which he or she is familiar and whether the findings can justifiably be applied to the other setting. **Dependability**: Researchers should at least strive to enable a future investigator to repeat the study. **Confirmability** : Researchers must take steps to demonstrate that findings emerge from the data and not their own predispositions	
		Quantitative Methods	**Validity** **Reliability**	
STEP 5	A	ASSEMENT	Ability to make judgment on the strength and weakness of the study. Provision of a cogent argument in support of study objectives and its benefits to targeted audience. Implications and recommendations.	RESEARCHER'S INTELECTUAL JUDGEMENT OF RESEARCH OUTPUT

C.O.S.T.A LITERATURE REVIEW MODEL

1
Summarisation

A Literature Review summarizes existing current research on a specific topic.

KEY SOURCES CITED

2
Funnel Approach :

1. Global View
2. Regional View
3. Local View

KEY SOURCES CITED

3
Critical Analysis

A Literature Review critically analyses current research on a specific topic.

KEY SOURCES CITED

Synthesis and Evaluation
4 A Literature Review provides a sysnthesis and evaluation of current research on a specific topic.

Figure 4: Literature Review - created by King Costa

Step four of the model focuses on methodology for collecting data, analysing data and results presentation. Importance of data collection instruments' concept of validity, credibility and trustworthiness are explored. The final stage includes the ability for students to present a cogent argument, conclude the writing of the thesis/dissertation and prepare an article for publication. The other important element of this stage is a mock defence where students are prepared to defend their output through a presentation to a panel of scholars.

4. CONCLUSION

This paper examined the challenges of postgraduate challenges at institutions of higher learning in South Africa and further proposed a C.O.S.T.A model for community of practice as a solution for these challenges. A lot of studies have been conducted on this phenomenon and all findings in these studies point to challenges particularly on the area of research capacity and development. Challenges presented on this paper are real and South African institutions need to look at pragmatic ways to improve the situation. The numbers of students enrolled at any given year during the period under review do not correspond with those who graduate. Based on the current challenges that require capacity for institutions to be able to provide effective supervision, which currently remains impossible due to the ratios of students to supervisor at these institutions, the researcher concludes by suggesting the following:

- Institutions need to include research curriculum in postgraduate studies
- Institutions need to take a closer look at previous and current studies on challenges of postgraduate studies, and seek methods of dealing with these
- Institutions need to increase research capacity at postgraduate level
- Institutions should adopt collaborative models of supervision such as the C.O.S.T.A for research students

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