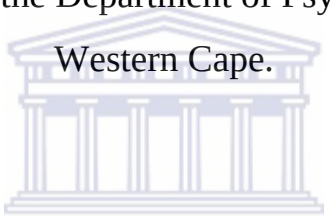
THE ESTABLISHMENT OF EVIDENCE BASED FILTERED INFORMATION ON INTERVENTIONS ADDRESSING THE SUCCESSFUL COMPLETION OF THESIS REQUIREMENTS IN POSTGRADUATE STUDIES.

ABEEDAH HENDRICKS

A full thesis submitted in fulfillment of the requirements for the degree of Master's in Psychology in the Department of Psychology, University of the Western Cape.



Supervisor: Dr. M.R. Smith

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Abeedah Hendricks

KEYWORDS:

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Research productivity

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ABSTRACT

Postgraduate students are assumed to develop the capacity to conduct research independently and to evaluate their own work as internal supervisors through the process of thesis supervision. Research capacity building amongst postgraduate students is evidenced by the successful completion of degree requirements or graduation, but student retention and throughput is a problem. The study aimed to establish an evidence base of filtered information on interventions addressing the successful completion of thesis requirements in postgraduate students. The study design entailed a systematic review that explored published findings about research reporting on capacity building strategies and initiatives respectively. The researcher made the following ethical considerations namely, transparency, non-bias during data extraction and using two independent reviewers to assist the principle researcher and avoidance of plagiarism as the proposed study is project based and a collaborative process, which are essential when using a systematic review approach. The proposed study forms part of a larger parent study, which aims to identify factors that facilitate or hinder research capacity development in postgraduate students and new academics. The present study used an adaptation of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement, which is aimed at improving the reporting of systematic reviews and meta-analysis. Extracted data were subjected to a meta-synthesis, which included descriptive meta-synthesis and theory-explicative meta-synthesis. Eight articles were identified as good quality articles based on methodological rigour. The good quality research identified 1) high quality supervision, 2) faculty modelling, 3) support and 4) protected research time as effective strategies or interventions that stimulate successful completion of the thesis requirement. The use of appropriate theoretical frameworks in understanding supervision was identified as integral to effective strategies. Limitations of the study were identified and recommendations for future research were provided.

DECLARATION

I declare that “The Establishment of Evidence Based Filtered Information on Interventions Addressing the Successful Completion of Thesis Requirements in Postgraduate Studies”, is my own work that has not been submitted before any degree or examination in any other university, and that all sources I have used or quoted have been indicated and acknowledged as complete references.

Abeedah Hendricks December 2014

Signed: _____

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Chapter One

Introduction to the research

This research report will present the systematic review of interventions addressing the successful completion of thesis requirements in post graduate studies. The study will be presented in five chapters where each chapter focuses on a specific aspect. Chapter One aims to introduce the research topic, Chapter Two centres around the literature review, Chapter Three focuses on the research design and methodology, Chapter Four presents the results and a discussion thereof. Chapter Five presents the overall conclusions and recommendations.

1.1 Background: The building of research capacity has been identified as one of the principle aims of research institutes and institutions of higher learning worldwide (ESRC, 2005). Capacity building in research has become increasingly important in developing countries (Fritz & Menocal, 2006) as it plays a pivotal role in moving toward economic development and global competitiveness of the country (Kritzinger & Loock, 2012). Furthermore, research and the capacity to conduct research are particularly important within the South African context as the contribution to knowledge could address the wide range of social needs resulting from the far reaching consequences of the oppressive Apartheid regime (ASSAF, 2010; CREST, 2009). Becher and Towler (2001) explain that research capacity building includes those initiatives that restructure professional learning and such initiatives have been applied directly to postgraduate students as a target group.

Capacity building amongst postgraduate students is evidenced by the successful completion of degree requirements or graduation. The successful completion of postgraduate degrees is dependent on the successful and timeous completion of the thesis component, which focuses on research (DUT, 2014; Lee, 2012). The graduation or throughput rate for postgraduate students within the South African context is less than 15% (Kritzinger & Loock, 2012). The resultant drop-out rate of 85% is considered very high in comparison to first

world countries like the United Kingdom and Australia where a 22% and 19% drop out rate has been reported respectively (Alston, Allan & Bell, 2005). Despite the discrepancy in graduation rates between developed and developing countries, low or reduced graduation rates for postgraduate students have made student retention and throughput a global concern (Mdyogolo, 2012).

In South Africa, issues of retention and throughput amongst postgraduate students are further coloured by the far-reaching consequences of the apartheid regime such as, high unemployment rates, a culture of crime and violence, poverty, poor housing, poor education and lack of resources (John, 2013; Mabin, 1991; Outwater et al., 2005; Sampson, 1999). These issues flowing from the historical background of separate development and disenfranchisement impacted capacity building in terms of access, availability of role models, infrastructural and social support, poor academic support, affordability and resource poverty (ASSAF, 2010; CREST, 2009).

1.2 Problem statement: The high drop-out rate has high cost implications for the South African National Treasury in grants and subsidies to Higher Education institutions without a commensurate return on investment (HSRC, 2008). This could result in reduced funding for postgraduate students that in turn could be a further deterrent for enrolments to pursue postgraduate qualifications. Ultimately, attrition and non-completion of postgraduate studies affect the student, family, research supervisor, society, higher education institutions and the economy. There have been initiatives aimed at promoting student throughput (Pillay & Kritzinger, 2007). These primary studies have not been summarised in a systematic manner to clearly consolidate the body of evidence or literature on this particular topic. This process is imperative as it is difficult to compare primary studies as they are reported in a summative manner and the methodological quality of the respective studies are unknown. Hence, the present study aimed to summarise the evidence base in literature reporting on research

capacity initiatives aimed at postgraduate students in order to identify the efficacy of programmes and elements contributing to research capacity development and research productivity in postgraduate students from good quality research.

1.3 Rationale: The literature examining or reporting on interventions with postgraduate students to facilitate research capacity, as evidenced by successful retention and throughput, is mostly from international studies conducted in developed countries (Devonport & Lane, 2006; Deuchar, 2008; Dickson et al., 2011; Dysthe, 2007; Emilsson, 2007; Ladany, Yoko & Mehr, 2013; Lee, 2008). These references report on primary studies that are difficult to compare without systematic assessment of methodological rigour and coherence that will evaluate the quality of research. Thus, the present study aimed to provide filtered information from the existing body of literature on interventions with postgraduate students to increase or build research capacity.

1.4 The parent study: The parent study recognised that research capacity building has been prioritised as a developmental goal (Pound & Adolph, 2005). One of the contexts in which research capacity building is facilitated, is at institutions of higher learning. Research capacity building plays out in two ways namely 1) staff development with new academics and existing academic staff to become productive researchers and 2) research supervision with postgraduate students as a thesis is a partial requirement of the degree qualification. In the latter, supervisor and student collaboration is necessary for the thesis requirement to be completed successfully. The parent study attempted to identify those factors that facilitate or hinder research capacity development in postgraduate students and new academics. The overall aim of the parent study is to produce a concept map of the elements contained in developing research capacity in postgraduates and new academics at identified institutions in the Western Cape Province. The parent study would identify the elements facilitative of research capacity building from consolidated findings summarised in the literature, the

perceptions of stakeholders involved in the process of facilitating the development of research capacity in target populations, as well as surveys of students' perceptions about their expectations of supervision. The resultant concept map would be refined from data generated in four stages, where each stage is conceptualised as an independent stage with its own methodological elements. Stage 1 included four systematic reviews that will explore published findings reporting on capacity building strategies and initiatives aimed at supervisors, postgraduate students, and new academics, as well as variables impacting completion respectively over a ten year period from 2003 to 2013. Stage 2 entailed the construction of a questionnaire evaluating the various components of thesis supervision that facilitated or hindered the development of the capacity to conduct research independently. Stage 3 involves a full survey with postgraduate students using the newly constructed questionnaire. Stage 4 is a study of stakeholders' perceptions. The results of all four stages will be collated into a concept map. The present study, a systematic review on interventions addressing the successful completion of thesis requirements for postgraduate students, thus formed part of the first stage of the parent study. The parent study (Project 13/10/57- Appendix A) and the present study (Project 14/5/20 – Appendix B) have been registered as bone fide research projects and obtained ethics clearance from the Senate Research Committee at the University of the Western Cape (UWC).

Chapter Two

Literature Review

A brief literature review has been provided as the methodology would include reviewing the literature. Research-capacity building refers to those initiatives aimed at the restructuring of professional learning (Becher & Trowler, 2001). These authors argued that 'research-capacity building' initiatives have also included a systematic effort to promote forms of professional learning which are intended to improve the technical competences of researchers, especially with respect to research methodologies and the techniques of data collection and analysis. McCallin and Nayar (2011) highlighted that in recent years changes in the funding and delivery of research programmes at the university or tertiary level resulted in significant changes to the way in which research supervision is conducted. Pearson and Brew (2010) argued that research education, or training, as it is often termed, is attracting greater scrutiny as research itself gained greater importance in the global knowledge economy. In turn, concerns to improve the effectiveness and efficiency of research supervision are leading to the introduction and extension of programmes for supervisor development (Buys & Louw, 2012; Wojtas, 2004). Hence, the building of research capacity has been identified as one of the principal aims of research institutes and institutions of higher learning worldwide (ESRC, 2005) and these sentiments have been echoed by the World Health Organisation (Nchinda, 2002).

Capacity building initiatives aimed at postgraduate students have been prompted by the challenges of retaining students in higher degree programmes and ensuring their successful completion (throughput). Throughput (that is getting students to graduate) and retention (keeping students from dropping out) have long been issues in higher education all over the world (Braxton, Hirschy & McClendon, 2004). Student attrition (students leaving and not returning) threatens not only the 'reputational benefits' the university gains from

students who complete successfully, but also the economic stability garnered from a consistent student base (Yorke & Longden, 2004). Research into the factors that facilitate or hinder student retention and throughput has been conducted with the following foci on academic challenges (Mdyogolo, 2012; Pillay & Kritzinger, 2007), intra-psychic or psychological factors (Dickson, Moberly, Marshall & Reilly, 2011) and cultural differences (Abiddin & Ismail, 2011; Nilsson, 2007).

Research in sectors such as Health, Education and Social Science has been criticized since the late 1990s as not culminating in a robust body of systematic evidence and conclusions that would provide an adequate basis for the improvement of policy and professional practice (Hargreaves, 1996; Hillage, Pearson, Anderson & Tamkin, 1998; Hemsley-Brown & Sharp, 2004; Guskey, 2002; Oakley, 2000; Tooley & Darby, 1998). The critiques gave rise to wide-ranging debates over the nature of research and the most appropriate ways in which it should be organised (Hammersley, 2002). The critiques further contributed to the adoption of a much more proactive role by governments in the organisation, funding and direction of research and research training in higher education (Rees, Baron, Boyask & Taylor, 2006). What has been happening within educational research is paralleled by developments across the social sciences more widely. For example, Fritz and Menocal (2006) argued that the need for "capacity building" in research has become an increasingly important goal of governments and external agencies in developing countries. Research is particularly important within South Africa, a developing country, as the contribution to knowledge could contribute to redress and social change in a developing democracy (ASSAF, 2010; CREST, 2009). The historical background of South Africa may have a bearing on the retention and throughput of postgraduate students. Abiddin and Ismail (2011) demonstrated that students from previously disadvantaged backgrounds tend to have further distinctive needs to cope with the pressure of a technologically advanced environment

and a system of demands for independent research.

Research on postgraduates in health sciences has focused primarily on clinical supervision or training (Ladany, Yoko, & Mehr, 2013) with a particular emphasis on the working relationship between students and supervisors. The findings indicate that the quality of the relationship, perceived or real, was a significant predictor of success and perceptions of the process as stressful (Smith, 2004; Wadesango & Machingambi, 2011). The impact of personality or psychological factors such as self-esteem, self-efficacy, locus of control, on the working alliance between students and supervisors has also been examined (Axtell & Parker, 2003; Devonport & Lane, 2006). The careful examination of the clinical supervisory process, quality and components has significantly impacted theory and practice resulting in improved retention and throughput (Pillay & Kritzinger, 2007). A similar exploration of the advisory relationship or working alliance between students and research supervisors has been identified as an area for further research and could yield similar results (Sterner, 2007).

As mentioned before, changes in the funding and delivery of research programmes at the university level have, in recent years, resulted in significant changes to research supervision (McCallin & Nayar, 2011; Wilcoxson, 2006). Deuchar (2008) underscored that a combination of the discourse of performativity and structural, organizational and personal barriers could prevent the realisation of effective student-supervisor relationships. Lee (2008) concurs that a conceptual approach towards research supervision is preferable above the functional approach. The conceptual approach focuses on defining the content as it is used as a tool to make conceptual distinctions and to organise ideas during the research process whereas the functional approach centres on project management (Lee, 2008).

More recent literature has begun to explore the changing nature of research supervision especially in doctoral programmes including the concepts contained in supervision (Lee, 2008), supervision styles and candidate needs (Deuchar, 2008), supervision

development (Pearson & Brew, 2010), supervision models (Dysthe, 2007) and supervision groups (Abiddin & Ismail, 2011), as well as the pedagogy of supervision and supervisor duties (Emilsson, 2007). Faculty development including supervisor education, and formalised research training for students have been posited as important strategies for the development of postgraduate research supervision (Emilsson, 2007; McCallin & Nayar, 2011; Wilcoxson, 2006). The appointment of an administrator to monitor the supervision provided to all students, where the progress would be monitored was also strongly recommended (Abiddin & Ismail, 2011; McAlpine & Norton, 2006).

It should be noted however, that the body of literature predominantly focused on clinical supervision (Dickson et al., 2011; Driscoll, 2007; Ladany, Yoko, & Mehr, 2013 refs), which has a different focus compared with research supervision. Supervision refers to the process of monitoring, guiding and critically watching over the supervisee (Lucas, 2006). Clinical supervision is used in counselling, psychotherapy, and other mental health disciplines as well as many other professions engaged in working with people (Driscoll, 2007). Research supervision is used to successfully complete a higher degrees research program within the appropriate time frame (Lee, 2012). Hence, to facilitate the successful completion of the thesis endeavour there is a greater need for literature on effective research supervision, which could enhance the current research supervisory practice and ultimately for students to successfully complete their research and graduate within the designated time frame (DUT, 2014; Lee, 2012).

Research findings have identified intrinsic and extrinsic factors that contribute to increased research capacity (Abbidin & Ismail, 2011; Frantz, 2010). The criticism though is that these factors have been looked at separately and the interplay between them remains an area for future enquiry. The current body of research has begun to explore the effect of psychological constructs on the supervision process (Dickson, Moberly, Marshall & Reilly,

2011), obstacles to completion (Pillay & Kritzinger, 2007), the working relationship between students and their supervisors (Sterner, 2009), as well as personal or intrinsic factors impacting the supervisory relationship (Smith, 2004). The subjective experiences of supervision have also been documented and identified as a problem area (Mdyogolo, 2012; Pillay & Kritzinger, 2007; Sterner, 2009). Students often deregister or complete without feeling confident about their ability to conduct research independently or to supervise research. Similar to the research on clinical supervision, the findings in this area indicate that the quality of the supervisory relationship, perceived or real, was a significant predictor of success and perceptions of the research process as stressful and that individual or intra-psychic factors impact the relationship significantly (Smith, 2004). The research was predominantly conducted abroad and this would suggest that replication of studies with local samples would be important. This is imperative as to avoid errors in generalisation, which are errors in external validity such as errors in the unit of analysis or the ecological fallacy (Babbie & Mouton, 2001; Terrblanche, Durrheim & Painter, 2007). The risk of errors in comparisons and generalisation (external invalidity) is higher when working with primary studies that have not been filtered for methodological quality and coherence (Hannes, 2011). Hence, the process of filtering would reduce the errors in generalisation and address the gap identified in the literature.

The thesis component of postgraduate work is an independent endeavour and is experienced as stressful (Devonport & Lane, 2006). Although supervision is provided, there is tremendous pressure placed on the student to manage it independently (Mouton, 2001). Often postgraduate students have been able to complete all other course requirements, but have not been able to finish their theses. As mentioned before, failure to complete this requirement results in compromised retention and throughput, and has numerous implications at varying levels (Yorke & Longden, 2004; Pillay & Krtizinger, 2007; Sondolo, 2013). In

health sciences, the implications include failure to register as a health professional, negative attitudes to research and publication, loss of income for universities and reputational harm (Yorke & Longden, 2004). Devonport and Lane (2006) reported that the thesis is experienced as most stressful and that an increase of stress is associated with a change in the stressor, personal factors or situational factors. Ineffective supervision, such as a lack of interpersonal attentiveness and a lack of a task-oriented structure (Ladany, Yoko & Mehr, 2013) and the mismatch between the student and supervisor (Abiddin & Ismail, 2011) could act as a situational factor that could increase the perception of thesis work being stressful. Pillay and Kritzinger (2007) reported that 33.6% of practicing psychologists felt that their masters thesis supervision was inadequate and that supervision issues were determining factors in the non-completion of their thesis. Thus research supervision and the experience thereof has become a problem area as evidenced by the growing literature on it.

The literature reporting on strategies or interventions that could be used to facilitate the successful completion of thesis requirements for postgraduate students such as the completion project (Gracy, 2010), the problem-based educational intervention (Davis et al., 2006), peer support (Buissink-Simth, Hart & Van der Meer, 2013), mentoring and advising (CGS, 2008), mainstream interventions, proactive and developmental interventions, relevant interventions, well-timed and appropriate media interventions, collaborative interventions and monitored interventions (Thomas, 2010). These strategies or interventions are aimed at assisting the students to successfully complete the thesis requirements where forging a sense of belonging is central (Buissink-Smith, Hart & Van der Meer, 2013; CGS, 2008; Gracy, 2010; Thomas, 2010). To this end, Frantz (2010) argued that interventions for students must be aimed at skills training, clarifying expectations and identifying barriers to successful retention and throughput. In summary, there is consensus that there is a need for strategies aimed at developing postgraduate students in terms of their capacity to conduct research

independently and effectively to complete their postgraduate degrees and sustained research productivity and supervisory competence respectively (Becher & Towler, 2001; Pound & Adolph, 2005).

There is consensus that the thesis endeavour is stressful (Devonport & Lane, 2006) and there are implications for low student retention and throughput rates, but the income generation and knowledge development could address the wide ranging social issues within South Africa (Kritzinger & Loock, 2012). There have been strategies or interventions aimed at assisting students through this process with the focus on increased output (Buissink-Smith, Hart & Van der Meer, 2013; CGS, 2008; Davis et al., 2006; Gracy, 2010; Thomas, 2010). The effectiveness of or the outcomes of those strategies or interventions have been reported as primary texts. The research tended to use methodologies such as surveys (Mdyogolo, 2012; Thomas, 2010), case studies (Deuchar, 2008; Frantz et al., 2010) or interviews (ESRC, 2005; Green, 2011). The challenge is however that these studies are primary reports, which means that there is no basis for comparison without the evaluation of primary studies for methodological coherence and rigour that would form the basis for meaningful comparisons. Thus there is a need for filtered information in which primary studies reporting on the outcomes of interventions aimed at assisting students to complete degree requirements are evaluated for methodological quality.

The present study attempted to address the need for filtered information in the existing body of literature on the research topic. The process of filtration suggests the use of methodologies suited to secondary research that would provide a higher level of evidence than primary studies. There has been no evidence in the literature of systematic reviews on the research topic, thus the present study aimed to address this gap in the literature as the research topic had not been thought about or conceptualised in this particular way. The

present study attempted to address the conceptual, methodological and contextual gaps identified in the literature by answering the review question.

Chapter Three

Methodology

This chapter presents the methodology of the study, which includes the aims of study, objectives of the study, the research question, research design, inclusion criteria, exclusion criteria, levels of review, method of review, analysis and the ethical considerations of the study.

3.1 Aim of the study: The study aimed to consolidate the literature reporting on strategies or interventions assisting postgraduate students to successfully complete thesis requirements.

3.2 Objectives of the study:

3.2.1 To identify potential records for inclusion in the systematic review.

3.2.2 To screen potential records for eligibility.

3.2.3 To evaluate eligible records for methodological quality.

3.2.4 To perform a meta-synthesis that would address:

3.2.4.1 The target population reached.

3.2.4.2 The efficacy of the strategy.

3.2.4.3 The implementation of the strategy.

3.3 Research question: Which good quality research (assessed for methodological quality) would constitute the evidence base of filtered information on interventions enhancing the successful completion of thesis requirements in postgraduate students?

3.3.1 Which theoretical underpinnings or orientation were used in the strategies or interventions?

3.3.2 What was the scope of the strategies or interventions?

3.3.3 What was the content of the strategies or interventions and the nature of the activities implemented?

3.3.4 Which type of facilitation styles were implemented?

3.4 Research design: This study utilized a systematic review to identify evidence from good quality research, about strategies or interventions addressing the successful completion of thesis requirements for postgraduate students. Khan, Kunz, Kleijnen and Antes (2003) stated that a systematic review is based on a clearly formulated question that identifies relevant studies, appraises their quality and summarizes the evidence. The systematic review could examine evidence based on quantitative and qualitative methodologies (Hemingway & Brereton, 2009). This type of review also provided for a systematic summation of the studies reporting on the content and methodological rigour (Schlosser, 2007). The systematic review allowed the researcher to accumulate and synthesize data from relevant sources, which meet the inclusion criteria to effectively answer the research question (Goldsmith, Bankhead & Austoker, 2007). A systematic review provides filtered information on primary texts that have been assessed along a common denominator evaluating for methodological rigour and coherence (Petticrew & Roberts, 2006). A systematic review is considered to be the highest form of evidence because it evaluates the quality of the study by a process called filtering (Rousseau, 2012). A systematic review is thus deemed appropriate since it is a means of filtration through a systematic process of identifying, evaluating and interpreting all available research relevant to this particular research question (Higgins & Green, 2011; Petticrew & Roberts, 2006).

3.5 Inclusion criteria

Participants: The review only considered interventions or strategies that included postgraduate students as the unit of analysis.

Time period of the review: The proposed study included articles published between 2000 and 2014 (June) for comprehensiveness whilst the parent project only required a ten-year period from 2003 to 2013.

Types of studies: The review included studies that report on the efficacy of strategies

or interventions aimed at supporting students in thesis writing. The eligible studies could use quantitative or qualitative methodologies independently or in combination.

Additional criteria: The articles were available through open access, and the databases in the library of the University of the Western Cape (UWC), full-text, English medium articles.

3.6 Exclusion criteria: Studies that were not available in full text, English medium, open access, and fell outside the designated time period, target group, as well as specified outcomes were excluded from the review.

3.7 Levels of review: The systematic review was conducted at three levels namely 1) identification of potential titles, 2) screening of abstracts and 3) evaluation of full texts for eligibility. The description below includes the strategies and instruments employed at each level.

3.7.1 Identification: The following steps were followed in the retrieval strategy to identify eligible and suitable articles. Firstly, a list of keywords was refined from those identified from a preliminary search of the text words contained in titles and abstract. The initial keywords that were used were: postgraduate students, research capacity building, research supervision, research advising, thesis or dissertation, research requirement. These keywords were tested using the Ebscohost and Sabinet databases. The effectiveness of the provisional keywords were measured by the hits they produced. It also provided synonyms and related search terms to be considered. The refined list of key words was: thesis requirements, postgraduate students, research training, dissertation, postgraduate research, postgraduate studies. The refined key words were combined into three Boolean strings 1) thesis requirements, postgraduate students and research training 2) dissertation, graduate students and postgraduate research, and 3) dissertation, postgraduate students and postgraduate research. Placing words into string searches plays a crucial role in data retrieval

as it filters potential matches, which increases the chance of retrieving relevant data (Frakes & Beaza-Yates, 1992).

Secondly, a comprehensive search using the identified keywords and Boolean strings were conducted across databases available at the University of the Western within the discipline categories identified above. The databases in the UWC library are organized according to disciplines (UWC Library, 2014). Thus the researcher listed the disciplines and the corresponding databases in an attempt to identify a set of core databases and secondary databases across disciplines. Table 1 reflects the distribution of databases per discipline for 1) Health and Education, 2) Social Science and 3) Natural Science. The resultant list of primary and secondary databases is reflected in Table two.

Table 1

Databases per disciplines

Discipline	**Database**
Health	• Academic Search Complete (EbscoHost) • BioMed Central • Cambridge Journals Online • CINAHL (Cumulative Index to Nursing and Allied Health) (EbscoHost) • Cochrane Library • Health Source: Consumer Edition (EbscoHost) • MEDLINE (EbscoHost) • MEDLINE (Pubmed) • Sabinet Reference • SAGE Journals Online • ScienceDirect • SciFinder Scholar

	• SCOPUS
Education	• African Journal Archive • Africa-Wide Information • EbscoHost Web • ERIC • PsychARTICLES • Sabinet Reference • Sage Journals Online • SAGE Research Methods (SRMO) • Teacher Reference Center
Social Science	• Academic Search Complete • Africa Journal Archive • Africa-Wide Information • EbscoHost Web • Project MUSE • SA ePublications • SA Media • Sabinet Reference • SocINDEX
Natural Science	• Academic Search Complete (EBSCO) • Agricola • Cambridge Journals Online • JSTOR • MEDLINE (via EBSCO) • PubMed (BioMed Central) • Sabinet Reference • SAGE Journals Online • ScienceDirect • SCOPUS

	• SpringerLink

Table 1 listed the disciplines and the corresponding databases that allowed for the identification of the core databases and secondary databases across disciplines, which are represented below in Table two.

Table 2

The primary and secondary databases

Primary databases	**Secondary databases**
• Africa-wide NiPAD • Biological abstracts • Biomed central • Cambridge journals online • Cochrane library • Credo Reference • Ebscohost • Google scholar • JSTOR • Pubmed • Sabinet Reference • Sage journals online • ScienceDirect • Scopus • SpringerLink • Wiley Online Library	• Academic Search Complete • African Journal Archive • Afri-Wide Information • Agricola • CINAHL • ERIC • Health source: nursing/academic • Health source: nursing/academic edition • MEDLINE • NEXUS • Poverty monitoring database • PsychArticles • SA ePublications • SA media • Sage research methods online • SocIndex • Teacher reference centre

Thirdly, additional records were identified from the reference lists of included articles and excluded articles that were deemed relevant. Reference mining is useful for identifying additional records (GSU Library, 2014). Additional sources were also included from other relevant sources such as articles that were identified by the research team that could be applicable to the present study.

All potential records were evaluated for suitability to the aims and parameters of the study. Suitable records were identified and included in the next level of the review. The information of all titles that were identified was imported into the Title Summary Extraction Sheet that also documented the recommendation for further inclusion or exclusion (Appendix C).

3.7.2 Screening: The abstracts of articles identified in the previous level, were screened using the inclusion and exclusion criteria of the study. Particular attention was paid to the participants and unit of analysis, time period, outcome measures and availability of full texts. Abstracts that satisfied the inclusion criteria were included in the next level of the review whereas studies that satisfied exclusion criteria did not proceed to the next level. The information of all abstracts that were assessed was recorded in the Abstract Summary Sheet (Appendix D). The outcomes and reasons for exclusion were also recorded. The completed sheets were submitted to the supervisor for verification of accuracy.

3.7.3 Eligibility: The full texts of studies that were successfully screened in the previous level were retrieved and evaluated for methodological quality using a critical appraisal tool. Below is a description of the critical appraisal tool used and the threshold score that was set for inclusion.

3.7.3.1 Critical appraisal tool: The critical appraisal tool for this study was selected taking into account the guidelines for qualitative and quantitative studies published by Letts et al. (2007) and Long et al. (2002) respectively. The critical appraisal tool

developed by Smith, Franciscus and Swartbooi (under review) was used for the full text review. The original tool was developed to assess full text articles on methodological elements and assign scores for the extent to which a criterion is present or reported. The tool was developed to assess various aspects of the methodologies employed in intervention studies namely the purpose, design, ethics, data collection, data analysis, sample, results and conclusion. The tool has three versions for use with 1) intervention studies, 2) general quantitative studies and 3) psychometric studies.

For the purpose of this study, version two of the tool was adapted to evaluate qualitative and quantitative methodologies using one form. This would facilitate ease of administration and provide a comparable basis for evaluating methodological quality. The adapted tool retained the eight subsections of the original scale, but pared down the items to allow each subsection to contribute evenly to the overall score (Appendix E – Critical Appraisal Tool). Each article had the potential to score a total score based on the overall quality of the article that was categorized as either weak (0-40%), moderate (41-60%), strong (61-80%), or excellent (81-100%).

The adapted tool was piloted by the research team working on the parent study to ensure that the tool satisfied both the needs of the parent study and the subsidiary present study. Eligibility for inclusion in the summation was determined by a threshold score set by the primary researcher in conjunction with the supervisor and the research team of the parent study.

3.7.3.2 Threshold score: In order to be included in the review, full text articles had to obtain a threshold score of more than 60% (i.e. “strong”). All full texts articles that satisfied the threshold score were subjected to a data extraction process.

3.7.3.3 Data extraction: Data extraction was done using a self-constructed data extraction sheets (Appendix F, Appendix G, Appendix H & Appendix I) that were

comprised of four tables that were aligned to the proposed analysis and objectives of the study. The tables were presented according to the 1) general description (Appendix F); 2) methodological appraisal (Appendix G); 3) strategy or intervention content (Appendix H) and 4) analysis and results (Appendix I). Appendices F – I are samples of the tables used since the completed tables are lengthy.

3.8 Method of review: At all levels of the review, two independent reviewers were responsible for the evaluation and their findings were documented independently. According to Godfrey and Harrison (2012) using two reviewers ensures methodological validity prior to inclusion of articles and this is consistent with the methodological requirement of systematic reviews (Khan, Kunz, Kleijnen & Antes, 2003). At the conclusion of each level, the reviewers compared their findings and recorded it accordingly. Disagreements that arose were resolved through discussion about the validity of the selected article and impasses were resolved by the supervisor. There were no disagreements that arose and this could be attributed to the clear specification of criteria and work-shopping in the parent team meant that a higher level of calibration was achieved.

Figure 1 is an adaptation of the flow chart recommended in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement that consists of a 27-item checklist and a four step flow diagram aimed at improving the reporting of systematic reviews and meta-analysis (Green & Higgins, 2005; Moher, Liberati, Tetzalaff & Altman, 2009).

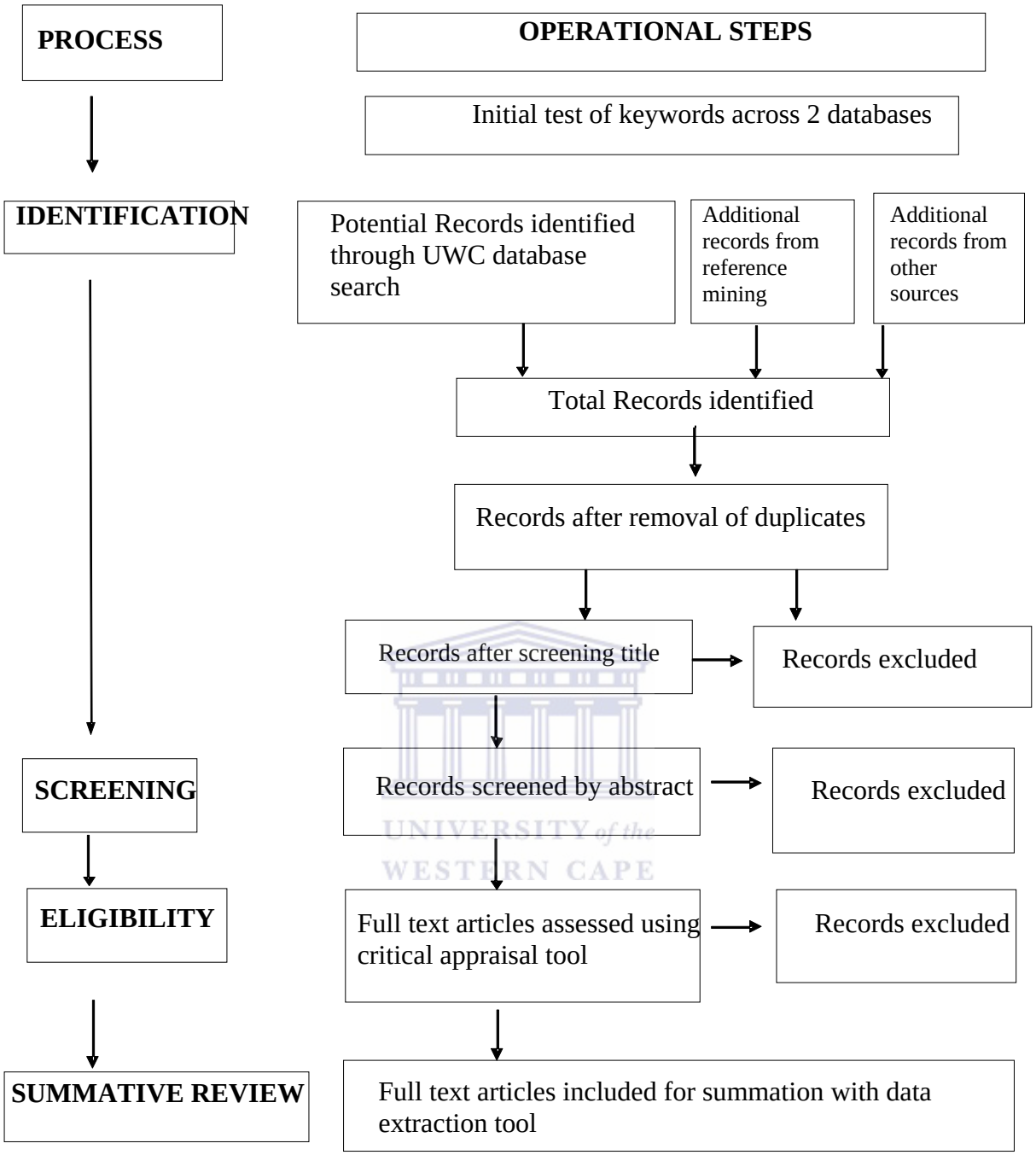

Figure 1. Flow of information through the different steps of the systematic review

3.9 Analysis: Extracted data from the included studies were subjected to a meta-synthesis. Onyskiw (1999) defined meta-synthesis as an attempt to integrate results from a number of different but inter-related studies. Similarly, Walsh and Downe (2005) identified meta-synthesis as a research method for aggregating findings from empirical research. They concluded that meta-synthesis is useful for systematically integrating findings gleaned

from individual studies. There is a growing interest in meta-synthesis as a technique for generating new insights and understanding from health care research (Finfgeld-Connett, 2010; Flemming, 2007; Screiber et al., 1997). The technique has an interpretive, rather than aggregating, intent, in contrast to meta-analysis of quantitative studies. Examples from the literature indicate that some aspects of the technique are not yet fully established (Walsh & Downe, 2005). Despite the contingent nature of evidence gleaned from meta-synthesis and current lack of consensus about some of its aspects, meta-synthesis is an important technique for qualitative researchers and can deepen understanding of the contextual dimensions of health care. Schreiber et al. (1997) concluded that a meta-synthesis can extend knowledge by offering new interpretations of research and the development of new theories.

The generalizability of meta-synthesis findings is enhanced by ensuring validity through systematic sampling, second-tier triangulation, maintenance of well-documented audit trails and the development of multi-dimensional theory (Finfgeld-Connett, 2010). Generalizability of meta-synthesis findings is tentative until successful transference to new situations takes place. Findings from disparate investigations are important and can more readily be used in clinical practice and policy formation. Thus meta-synthesis was appropriate for the present study that aimed to critically evaluate published literature in order to consolidate the body of knowledge. The resultant findings will be more rigorous and in a more suitable format for application to practice.

Sandelowski, Docherty, and Emden (1997) identified three complimentary types of meta-synthesis namely: 1) Theory building that brings together findings on a theoretical level to build a tentative theory; 2) Theory explication that is a way of reconceptualising the original phenomenon; and 3) Descriptive synthesis that provides a broad description of the research phenomenon. Walsh and Downe (2005) emphasized that the choice of meta-

synthesis is dependent on the aim of the study. The analysis for the present study incorporated descriptive meta-synthesis required by the parent project, as well as explicative meta-syntheses to further enhance an understanding of interventions aimed at assisting students with the completion of thesis requirements.

3.9.1 Descriptive meta-synthesis: The descriptive meta-synthesis included three elements: Process results, quality score ranking and data extraction.

3.9.1.1 Process results: The findings at each step of the review were reported in a descriptive fashion. The flow chart presented in Figure 1 was used in a second iteration to demonstrate the findings at each level. This is both conceptually and visually helpful in providing a clear overview of the design elements integrated with the process findings.

3.9.1.2 Quality score ranking: All articles included in the final summation were ranked according to their overall methodological quality score, as well as on the subsections of the critical appraisal tool. This is consistent with the convention in reporting systematic review findings (Downe et al., 2007). Given that the review focused on interventions, the inverse relationship between internal and external validity needed to be considered. The aim of the study was to gain a deeper conceptual understanding of such interventions rather than intervention studies. Thus the methodological rigour might more sensibly be superceded by the details of the intervention for the purposes of generalization, description and theory-explication.

3.9.1.3 Data extraction: The data extracted from articles included in the final summation were reported as part of the descriptive meta-synthesis. The four tables used in the extraction process provided a framework for reporting on the elements of the studies. The aim here was not to describe the articles individually, but to gain an overall comparative sense of the articles in terms of the identified criteria.

3.9.2 Theory-explicative meta-synthesis: The theory explicative meta-synthesis was attempts to produce insights that are more than the sum of the parts (Doyle, 2006). The extent to which a meta-synthesis, theory-explicative meta-synthesis in particular, is synergistic determines the value of the synthesis (Boaz, Ashby, & Young, 2002; Weed, 2005). For the purposes of this study the theory explicative meta-synthesis was conducted according to the three stages outlined by Noblit and Hare (1988): 1) Identifying recurring themes and ideas that is referred to as the reciprocal stage; 2) Identifying themes and ideas that refute the common themes and ideas that is referred to as the refutational stage; and 3) Constructing a statement summarising and expressing new findings that is referred to as the line of argument. The meta-synthesis allows the researcher to build a comparative understanding (Bondas & Hall, 2007; Noblit & Hare, 1988). According to Bondas and Hall (2007), the line of argument involves interpretation, which is constructed to link and explain a set of parts.

3.10 Ethical considerations: Permission to conduct the study was obtained from the Higher Degrees and Senate Research Committees of UWC. The review used published articles considered to be in the public domain and therefore no further permission for access was required. The primary researcher was a registered student at UWC and as such legitimately had access to the library facilities including the databases subscribed to and housed at UWC. Ethics principles for systematic review such as, accurate execution and non-bias, was facilitated in accordance with the recommendations by Wager and Wiffen (2011). Likewise, the distinction between plagiarism and collaboration was maintained given the collaboration within the parent project (Wager & Wiffen, 2011). Collaboration was an important consideration as decisions were made within the broader research team regarding the process and structure of reporting that needed to be similar. This was done to facilitate the translation of the information into the parent study.

Chapter Four

Results & Discussion

This chapter provides an integrated results and discussion section. The chapter has been organized into four sections namely the process results, data extraction, ranks based on methodological rigour and the meta-synthesis. This would allow for the presentation of the results and a discussion thereof.

4.1 Process results: As mentioned before, Figure 1 presented in Chapter Three summarised the process followed in the systematic review. Figure 2 below repeats the flow chart with the results of each step.

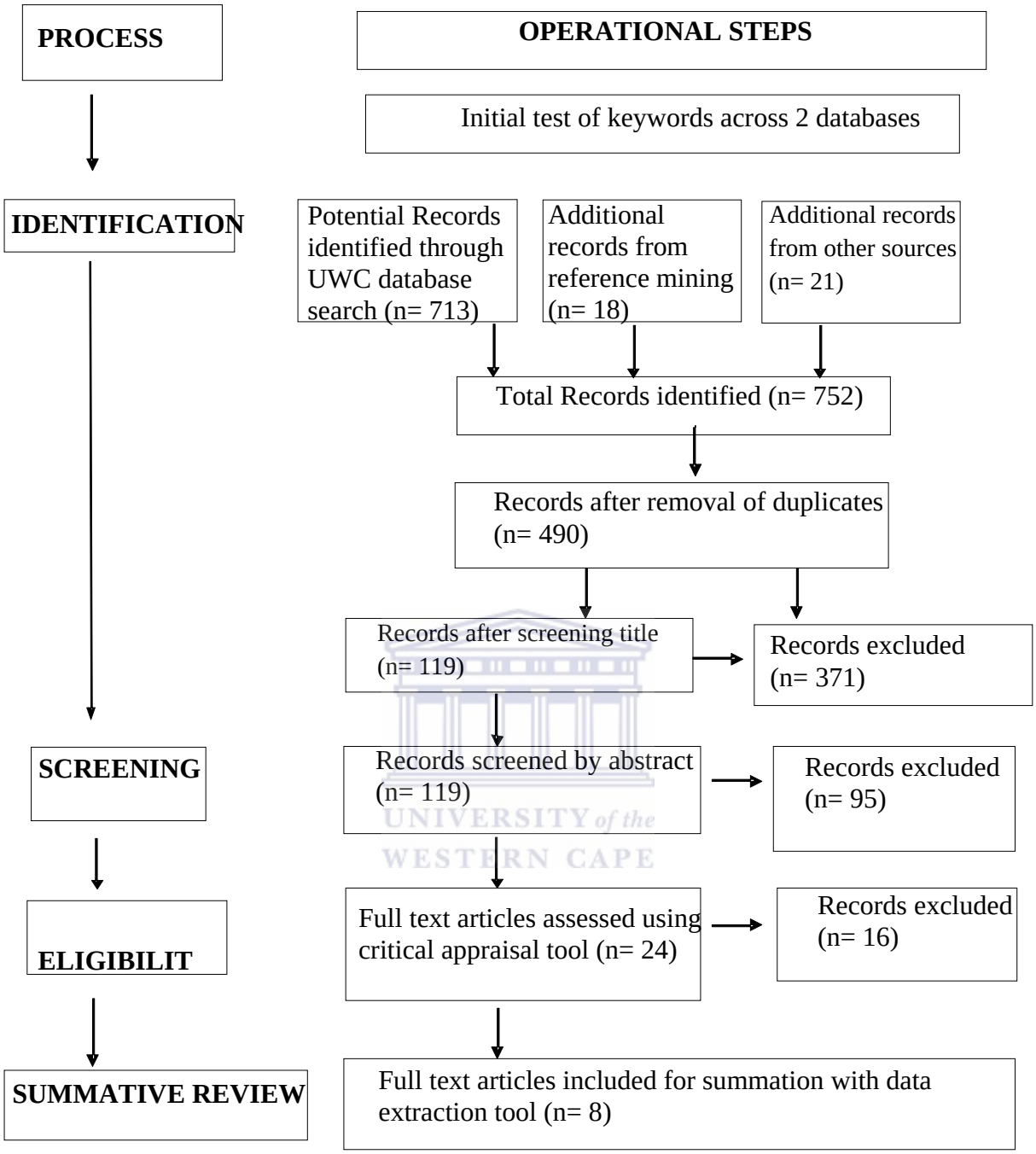

Figure 2. Process results per level and opertaional steps

Step 1: The identification involved a title search across all UWC databases that yielded a search result of 713 potential records. The additional records included titles identified through reference mining, which produced 39 records. The duplicate records were removed and the number of total records decreased from 752 to 490. From these, 119 titles were identified for possible inclusion.

Step 2: During the abstract screening process, 95 articles were excluded and 24 articles were included. The main reasons for exclusions were that the articles did not report on reactive research in other words was not a primary research study (e.g. reviews, commentaries, reflective essays, conceptual articles) or reported on clinical or professional supervision as opposed to research supervision. Studies not addressing the research question, studies with the incorrect target group (undergraduates, learners at school), studies that are not open access and studies with poorly written or inadequate abstracts lacking vital information were other reasons for exclusion.

Step 3: After the critical appraisal process that determined eligibility for inclusion in the final summation, 16 articles were excluded and 24 articles were included. The articles that were excluded scored below 60% with the majority (n = 13) in the moderate range (40-60%) and three articles rated as weak (<40%). One article that was included scored borderline between the moderate and strong range. The article was included as it scored fairly on various criteria apart from the ethics section of the appraisal tool. The decision to include this borderline article was based on the good scores obtained on the other sections that speak more directly to the methodology of the study.

4.2 Data extraction: As mentioned before, data was extracted in four segments namely the general description, methodological appraisal, strategy or intervention content and the 4) analysis and results. Below is a presentation of the extracted data in each segment in tabular form.

4.2.1 General description of the studies: Table 3 below summarises the more general details about the included studies such as, the target groups, geographic locations, aims and the problem statements.

Table 3

General description

Authors	**General description**			
	Target group	**Geographical location**	**Aim**	**Problem statement**
Lambie & Vaccaro	Doctoral students	USA (Universities in Colorado, Florida, Idaho, New York, North Carolina & Pennsylvania)	To determine if there was a relationship between research self-efficacy, perceptions of the research training environment, and research interest in doctoral counselor education students and to determine differences between the three constructs based on the participants' reported year in their preparation program.	Research production and publications are important to the field of counseling because research supports and encourages the scientist-practitioner model and contributes to the body of literature on which counseling practitioners base their services. Research self-efficacy, perceptions of the research training environment and interest in research are essential in developing competent counselor educators in the area of research and scholarship.
Shivy et al.	Doctoral students	USA - Virginia Commonwealth University	To examine the perceptions of the Research Training Environment (RTE) within an APA-accredited counseling psychology program	While research is important, students tend to gravitate toward practice jobs rather than research. These have implications for the field of psychology. PhD-level clinical, counseling, and school psychologists who publish empirical research are rare. This may be attributed to the RTE.
Alak et al.	Internal Medicine trainees (student) and their	Canada - McMaster University	To explore characteristics of the resident, the supervisor, the program and the project that contributed to the successful completion and publication of a resident-led research project.	Barriers that lead to failure of research projects during residency, including lack of motivation, inadequate funding and lack of dedicated research time however; little information is available on the enablers of successful resident research.

	supervisors.			
West, Kahn, & Nauta	Postgraduate students in psychology	USA - Illinois State University	To assess whether learning styles are predictors of self-efficacy and interest in research	Research interest and research self-efficacies are important training outcomes because they are initial milestones in a student's scientific development. Research interest and self-efficacy serve the function of pulling students into the research process, but most students in professional psychology have tended toward low levels of research interest and efficacy.
Schulze	Postgraduate students	RSA – UNISA	The study aimed to determine how postgraduate research students experienced supervisory practices.	A challenge is that students are underprepared for postgraduate research and their self-efficacy is one of the factors that influences study success. Supervision can influence self-efficacy judgments. Supervision plays a crucial role in research development for students.
Bullen & Reeve	Postgraduate students	New Zealand – University of Auckland	To establish the extent to which publication had occurred among students in our Master's in Public Health program since its inception and to identify barriers and facilitators potentially amenable to intervention.	Publishing articles are important in the knowledge economy but there are many barriers that hamper publication of research.
Hollingsworth & Fassinger	Doctoral students	USA – University of Maryland	The study extended the investigation of research training in counseling psychology by exploring the role that faculty research mentoring plays in predicting student research productivity, above and beyond the contributions of the research training environment, students' research self-efficacy, and students' past research attitudes. Five research questions guided our work:	Research plays a crucial role in the knowledge economy but few counseling psychologists conduct research after completing their doctoral requirements despite training in a scientist–practitioner model.

			1. Does the research training environment predict students' research mentoring experiences, their research self-efficacy, or their research productivity? 2. Do students' research mentoring experiences mediate the relationship between the research training environment and productivity? 3. Do students' self-efficacy beliefs mediate the influence of the research training environment on research productivity? 4. Does controlling for students' past attitudes toward research significantly change the relationships between research training environment, self-efficacy, research mentoring, and research productivity? 5. Are relationships between these variables moderated by students' gender or by the scientific stature of their training program?	
Ho, Wong, & Wong	Postgraduate students	Canada – West Coast Universities	To discover what helped and what hindered thesis completion	Thesis or dissertation remains the central requirement of graduate education for most universities as it is a requirement to graduate, yet thesis completion remains a problem for many graduate students.

4.2.2 Methodological appraisal: Table 4 below encapsulates the methodological appraisal of the included studies that focus on the design, participants, sample type, sample size and the instrument used.

Table 4

Methodological appraisal

Authors	**Methodological appraisal**				
	Design	**Participants**	**Sample type**	**Sample size**	**Data collection/instrument**
Lambie & Vaccaro	Quantitative - cross-sectional, correlational research design using surveys	Doctoral counselor education students	Not specified	89	Instruments: 1. Research Self-Efficacy Scale 2. Research Training Environment Scale-Revised & 3. Interest in Research Questionnaire
Shivy et al.	Quantitative – independent t tests (two-tailed)	Doctoral students	Not specified	35	Instruments: 1. Research Training Environment Scale–Revised & 2. The Self-Efficacy in Research Measure
Alak et al.	Qualitative – interview based	Postgraduate students (trainees) and supervisors	Purposive sampling	30	An open-ended, semi-structured interview guide
West, Kahn, & Nauta	Quantitative – correlational	Postgraduate students	Not reported	132	Instruments: 1.Index or learning styles 2.The Interest in Research Questionnaire &

	research design				3.The Self-efficacy in Research Measure
Schulze	Qualitative – using interviews	Postgraduate research students	Purposive sampling	15	An open-ended, semi-structured interview guide.
Bullen & Reeve	Quantitative	Postgraduate students	Not reported	77	A mix of open and closed-ended questions in the questionnaire that This was constructed around 4 domains of enquiry: student socio-demographic characteristics, publication record, perceived barriers, and perceived facilitators to publication. The instrument was pretested and refined with several recent MPH graduate students to identify and eliminate ambiguity and ensure ease of comprehension and a logical flow.
Hollingsworth & Fassinger	Quantitative – multiple regression	Doctoral students	Not reported	194	Instruments: 1.Research Training Environment Scale—Revised 2.Research Mentoring Experiences Scale 3.Self-Efficacy in Research Measure 4.Past attitudes toward research 5.Research productivity
Ho, Wong, & Wong	Qualitative using the critical incident Technique	Postgraduate students	Not explicitly stated but it is inferred that purposive sampling was used.	20	Semi-structured interview schedule

4.2.3 Strategy or intervention content: Table 5 below condenses the strategies or interventions used in the included studies, which contain the theoretical orientation, scope of the intervention, the nature of the activities and the facilitation styles.

Table 5

Strategy or intervention content

Authors	**Strategy/intervention content**			
	Theoretical orientation	**Scope of strategy/intervention**	**Nature of activities (what)**	**Facilitation styles (how)**
Lambie & Vaccaro	Self –efficacy theory, research training environment theory and social cognitive model of interest development.	Counselor education doctoral students in their first, second and third year.	Supervision within the research training environment with the doctoral counselor education programs and reflections on their experiences.	In a group (Doctoral counselor education programs accredited by the Council for Accreditation of Counseling and Related Educational Programs).
Shivy et al.	Research training environment theory & self-efficacy theory.	Doctoral students from first, second and third year.	Supervision and reflection on their experiences.	In a group (research seminar within the APA-accredited counseling psychology program)
Alak et al.	Not reported	Trainees who published at least one research paper based on a project they completed during residency.	Supervision (resident-supervisor)	Individually and within a group.
West, Kahn, & Nauta	Learning styles & self-efficacy theory	Postgraduate students in psychology	Supervision	In a group (orientations, classes, professional seminars, meetings with research teams) or individually (advising meetings, supervision sessions)

Schulze	Self-Efficacy theory , which is an aspect of social cognitive theory	Postgraduate research students who recently graduated	Supervision	Individually.
Bullen & Reeve	Not specified	Students who completed their Master's in Public Health	Supervision	Individually.
Hollingsworth & Fassinger	Not specified (Research training environment and self-efficacy theory - inferred)	Counseling psychology doctoral students in their third and fourth year.	Faculty research mentoring.	Individually.
Ho, Wong, & Wong	Weiner and Wong's attribution models	Postgraduate students who either were in the process of completing their theses or had just completed their theses.	Supervision.	Individually.

4.2.4 Analysis and results: Table 6 below summarises the analysis and results of the included studies that is comprised of the data analysis, empirical evidence and the author's conclusions.

Table 6

Analysis and results

Authors	**Analysis & results**		
	Data analysis	**Empirical evidence/results**	**Authors conclusions**
Lambie & Vaccaro	SPSS (Version	Research self-efficacy: • The mean RSES score was 76.92 (SD = 11.91, range = 42.11	Doctoral students at higher levels of interest in research scored higher in their research self-efficacy than did students at lower

	16.0), using simultaneous linear multiple regression, Pearson product-moment correlations (two-tailed), and analysis of variance (ANOVA).	to 98.16). • A significant correlation was identified between research self-efficacy and scholarly publication experience (r = .39, p < .001). The doctoral students who had published a scholarly work scored at a statistically significant higher level on the RSES than did the students with no scholarly publications, F(l, 87) = 15.84, p< .001. Perceptions of the Research Training Environment: • The mean RTES-R score was 3.15 (SD = .35, range = 2.43 to 4.09), which is consistent with previous research. • An ANOVA indicated that the participants' reported age had a statistically significant influence on their RTES-R scores, F(l, 87) = 15.84, p < .001. Interest in Research: • The mean IRQ score was 3.57 (SD = .81. range = 1.31 to 5.00), which was consistent with previous research • A correlation was identified between interest in research and career aspirations (r= .22, p = .039). • The doctoral students' reported career aspirations did not have a statistically significant influence on their interest in research scores, F(2, 84) = 2.43, p = .095. Year in Preparation Program and RSES, RTES-R, and IRQ Scores:	levels of interest in research. The doctoral counselor education students that reported having a scholarly publication scored at higher levels of research self-efficacy. It may be concluded that doctoral students with higher interest in research and engagement in scholarly writing may promote their level of research self-efficacy and increase their comfort in performing research-related tasks. Students in the 3rd year of doctoral preparation scored at higher levels of research self-efficacy than did 1st- and 2nd-year students necessitate further inspection. The incongruence between the current study's findings and some prior research may be related to difference in the samples, where counseling psychology doctoral preparation programs may have different emphases and curricular requirements than do counselor education programs. Age had a statistically significant influence on the counselor education students' perception of the research training environment were unique because no other studies were found that explored this relationship. The findings also provide a contemporary profile of the average counselor education doctoral student. The findings regarding doctoral counselor education students' research self-efficacy, perceptions of the research training environment, interest in research, and demographic variables offer implications for counselor education: 1) demographics characteristics - counselor education programs need to recruit more diverse students to be a better representation of

		• The ANOVA indicated that the participants' year in their preparation program had a statistically significant influence on their RSES scores, F (2, 86) = 3.39, p = .038, but no influence on their RTES. F(2, 84) = .90. p = .411. and IRQ, F(2, 84) = 1.47, p = .236, scores. • The participants' year in their preparation program was found to be statistically significant, the students in their 3rd year of preparation scored 7.10 units higher on the RSES when compared with students in their 1st year of preparation and 6.02 units higher on the RSES when compared with students in their 2nd year of preparation. Relationship Between RSES, RTES-R, and IRQ Scores: • The linear composite of the predictor variables (RTES-R and IRQ scores) predicted 16.2% (R^ = .16) of the variance in the doctoral students' RSES scores. Fi (2. 84) = 8.12. p = .001. • The Pearson product-moment correlation (two-tailed) analyses supported the results of a statistically significant relationship between research self-efficacy and the interest in research scores (r = .39, *p* < .001). The effect size was small to moderate, with a shared variance of 15.4% • For the doctoral students, scoring at higher levels of research self-efficacy was predictive of higher interest in research scores. • The effect size was small to moderate, with a shared variance	contemporary counseling clients, 2) counselor education programs need to take a more assertive and intentional role in guiding their students in the areas of research and scholarship, 3) counselor education programs integrate activities to promote their students' engagement in the scholarly publication process early in their program of study, 4) faculty research-specific mentoring may provide students with a positive research environment, and the counselor education faculty may act as role models in the research process and provide students with collaborative research opportunities, 5) effective research mentorship, 6) development of doctoral counselor education students' research and scholarship competencies needs to be supported and nurtured in preparation programs where the faculty and systemic climate may promote professional skills, dispositions, and behaviors.

		of 15.4%.	
Shivy et al.	Independent t tests (two-tailed), SPSS for analysis via cluster analysis	Descriptive statistics: • Students' mean score on the RTES–R was 34.9 (SD= 3.1) with a range of 29.5 to 40.2. • On the SERM, students' mean score was 223.8 (SD=29.6), with a range of 178 to 277. • Students mean ratings for the perceived helpfulness of various research experiences were 5.22 (n=19, SD=1.28) for research advisors, 4.96 (n = 14, SD =.91) for research teams, 5.64 (n=16, SD=.95) for the thesis experience, and 4.19 (n= 13, SD=1.36) for the research seminar. • The paired comparison importance data. Importance rankings (and SDs) for the nine RTES–R factors, with a lower rank indicating more importance, as follows: model positive research-oriented attitudes and behaviors, support and reinforce research efforts, get students involved with research early and in an unthreatening, model openness to varied research styles and approaches, help students to learn relevant statistics and design issues, help students to look inward for research ideas, show students that science is wedded to clinical service, show students that all studies are flawed in some ways, and show students that doing research can be partly a social activity. • Two-factor solution of the RTES–R (i.e., interpersonal – instructional) appeared to be represented in the perceptions of	Implications for Evaluation of Research Training: • To encourage other doctoral programs to use formal evaluations to assess student perceptions of their research training. • Using the RTES–R and comparing the results with those from high-impact counseling programs, assured the authors that their research environment did not differ substantially from other top research-training programs in counseling psychology. • Their students had greater senses of efficacy in three of four areas assessed. Implications for students: • Students value being able to succeed (e.g., at thesis and publication; feeling the joy of conducting meaningful research; having the freedom, yet guidance, to explore important research topics). • Students are highly idealistic and want to do meaningful work that will help others, but they become disillusioned with faculty who devalue clinical work, who are cynical and who are motivated mostly by the extrinsic rewards of publication. • Students want to feel valued by their mentors and other faculty.

		students. Inferential statistics: • No significant differences appeared between VCU students' scores (n=19) and scores from students (n = 67) in high-impact counseling psychology programs. • There were significant differences between VCU students' (n = 19) scores on the SERM and scores from Phillips and Russell's (1994) sample. Participant Responses to Open-Ended Questions: • Conducting research and writing papers for publication. • Fostering in students a sense of true collegiality with faculty and showing respect for students. • Conveying excitement, fun, and passion that can be involved in a personally meaningful research experience. • Promoting student involvement in meetings and professional conferences.	• Students ranked "faculty modeling," "positive reinforcement," and "early involvement" as the most important aspects of the training environment. • Although students perceived both interpersonal and instructional factors, the interpersonal factor carried more weight for them. This finding that the interpersonal aspects of the research- training environment were most important to our students suggests that faculty might affect the training environment by attending to the interpersonal climate. • Students seemed to want to experience clinical work, teaching, and research, and yet be free to choose which experiences to pursue. • When students experience a sense of collegiality with advisors, they experience rewards. When students capture the fun, passion, and excitement of research, they are rewarded. • Although researchers generally have focused on the impact of faculty members and not students, student interactions and their contribution to student cognitions certainly are important in the establishment, change, or maintenance of a perceived positive RTE. Implications for teachers of psychology: • Two personal qualities of faculty advisors promote

			student involvement in research: 1) Faculty advisors who are helpful, caring, and involved with students draw them into research & 2) Faculty advisors who are passionate and positive about their research and convey that passion likely will motivate students. • Two faculty constellations of behaviors seem to promote student involvement in research: 1) advisors can effectively attract students to research by involving them early with engaging tasks, participation in research teams, and collaborative projects aimed at producing genuine scientific products such as publications, presentations at scientific, 2) advisors who treat students with respect and collegiality attract students to research. • Advisors can emphasize both the intrinsic rewards of research, such as the joys of discovery, the excitement of accomplishing an important and difficult task, and the extrinsic rewards, including recognition via by-lines and publications and, perhaps, increased resources. • Faculty who showed interest in, and were willing to support, students or who had desirable personality characteristics (i.e., humorous, honest, dedicated, empathic, compassionate, genuine, patient, nonsexist, flexible, and loyal) were seen as good mentors. • Students saw faculty who were uninterested in or unsupportive of students or who had undesirable

			personality characteristics (i.e., rigid, critical, egocentric, prejudicial, pathological, rushed, overextended, disorganized, dishonest, and untrustworthy) were unsatisfactory.
Alak et al.	Data management and analysis (NVivo 9, QSR International Pty Ltd. Version 9, 2010) & thematic analysis.	Six major categories were used to group the sub themes/recurrent concepts: 1) the resident; 2) the supervisor; 3) the project; 4) the research team; 5) the program; and, 6) suggestions for success. Three major themes about successful resident projects emerged: 1) the resident is the project champion; 2) the supervisor ensures feasibility and timeliness of the project; and, 3) limited time is a surmountable challenge for both resident and supervisor. The resident is the project champion: • The research project was viewed primarily as the resident's responsibility. • Residents' motivation was a major determinant of the success of the project. Supervisors ensure feasibility and timeliness of the project: • Supervisors were responsible for ensuring that the scope of the project was limited such that the project could realistically be completed in the available time. • Support is needed by the residents but emphasized the importance of self-directed critical thinking	• Three themes were identified for the successful resident research projects: 1) the resident is the project champion; 2) supervisors ensure feasibility and timeliness of the project; and, 3) successful projects require planning and efficiency. Trainees were motivated by fellowship applications and other career goals, were dedicated to finish and to prioritize the project despite busy clinical schedules. Supervisors were responsible for negotiating deadlines, ensuring that the scope of the project was limited and that the study design was feasible. • Early planning by the residents and the creation of a team of residents and staff with complementary expertise were common among successful projects. • The study identified a key challenge of linking residents with suitable supervisors with and highlighted the fact that no single recipe for success could be applied to all projects. • In addition to confirming several barriers identified in previous reports, the results highlight strategies used to successfully overcome them including the role of an

		• Supervisors' roles included teaching research methods and providing access to statistical support and manuscript editing. • Projects tended to fail when supervisors lacked experience in research and publishing, when they did not adequately vet the topic or study design, or were not perceived as an ongoing source of support. Limited time is a universal challenge that can be overcome: • Limited amount of time available for resident research projects. • Protected research time instituted by the training program was highly valued by residents.	active supervisor and the importance of collaborative research teams. • The findings are particularly relevant as the number of clinician scientists continues to diminish, which may be partly due to research inexperience during medical training.
West, Kahn, & Nauta	Correlation one-sample t tests Independent samples t tests One-way analyses of variance (ANOVAs) Multiple regression analyses	• The mean for research interest was similar to the mean reported among a sample of counseling psychology doctoral students, whereas the mean for research self-efficacy was slightly higher than that reported among a sample of counseling psychology doctoral students. • The correlation between research interest and research self-efficacy was large. • The sample had more of a preference for visual than verbal learning styles. • Correlations among the variables indicated that sequential-global and sensing-intuitive learning styles were positively correlated. • Test revealed that students from school programs had more	• Three of the four dimensions of learning styles were predictive of research interest or research self-efficacy. • The results of this study suggest that students who are more verbal, active, and intuitive learners would be drawn into the research process more easily than would students who are more visual, reflective, and sensing learners. • Research activities such as discussing research ideas, reading journal articles, and writing research reports is largely verbal nature. • Research self-efficacy was predicted by two learning styles namely intuitive learning styles and active learning styles. In addition, students with stronger sensing

		visual learning styles than did students from clinical programs. • The regression analysis predicting research self-efficacy was significant, suggesting that learning styles explain a significant percentage of variance in research self-efficacy. • Two learning styles were significantly predictive of research interest: a more intuitive (vs. sensing) and a more verbal (vs. visual) learning style. • Effect size is medium.	preferences may find it hard to see concrete connections between research and the real world, and this frustration might inhibit the development of research self-efficacy. • Students with more active learning styles had greater research self-efficacy than did those with more reflective styles. • No differences in research interest or research self-efficacy were found between sequential and global learners.
Schulze	The constant comparative method	Intrinsic factors that helped the students to complete their studies successfully: • Intrinsic motivation, self-efficacy includes students' beliefs in their capabilities of activating the motivation for managing the different requirements of a dissertation/thesis. • Knowledge and previous experience, some students attributed their success to their research knowledge and skills obtained through previous studies, or to employment at a research institution such as the Human Sciences Research Council. • Study skills: taking responsibility for learning • Fluency in English Extrinsic factors that helped the students to complete their studies Successfully: • Time	• Students' belief of their SE built through mastery experiences tend to be strong. • High-quality supervisory practices play a crucial role in student throughput. • The findings from this study pointed to a number of flawed practices: 1) many postgraduate students struggle with a lack of basic research knowledge and skills, including language skills. Thus, current admission requirements of students to master's and doctoral degrees need to be looked into and improved., 2) the selection process of supervisors for students also needs to be investigated as some supervisors may be overloaded. Supervisors need quality time so that they can give practical guidance and emotional support without compromising the students' need for independent

		• The working environment • Good supervision • Support from library staff • UNISA workshops • A supportive environment Factors that made it difficult for the students to complete their studies successfully: • Time issues • Lack of skills/knowledge • Poor supervision • Financial constraints	research. Supervisors should consciously serve as positive role models, and provide constructive criticism and stimulate students' critical thinking skills. Prompt feedback and regular contact is essential, 3) institution lacks the required support structures and practices to assist students and to develop their perceived self-efficacy. More interactive workshops could be presented countrywide to improve students' research knowledge and skills. This would also provide more opportunities for research students to interact with their peers. This may provide research students with positive learning experiences and may enhance their self-efficacy. Improved self-efficacy could in turn influence students' efforts and persistence and thus their throughput.
Bullen & Reeve	EpiInfo statistical analysis package & thematic analysis for the open-ended questions	Publication Record: • Total of 34 students (45%) reported submitting at least 1 article for publication • Of the students who submitted 1 article only, 21 (88%) had written articles that either had been published or had been accepted for publication at the time of the survey • Quantitative research was more likely to be submitted for publication than qualitative research. • The male sex was also significantly associated with publication	• Few relatively simple measures could enhance research productivity arising from MPH theses. • Further research should focus on evaluating the effectiveness of these interventions that address the barriers or facilitators we and others have identified; in particular setting an expectation of publication with both students and supervisors, ensuring student support is of a sustained high quality, and identifying funding support. • Many students were willing to write for publication, even with time pressure (due to work in particular) and other

		• Being an international student or having English as a second language conferred no advantage or disadvantage to publication; neither was age at completion of degree nor ethnic group found to be advantageous or disadvantageous. Facilitators and Barriers: • publication was possible at the start of their dissertation or thesis, and this positive attitude showed a significant association with publication success • The majority stated their motivation for writing an article was that it would help their career • Financial support was regarded as a key factor in their decision to write for publication • The most commonly reported barriers to writing an article were lack of time (work & other commitments), lack of support, from staff, and having low confidence in their ability to write an article. • Thematic analysis found: constraints on time, work and family responsibilities, loss of motivation to write because of perceived poor results or loss of interest in topic, the priorities of others, exhaustion, and lack of support from university staff. The vast majority of participants related their challenges to work and family responsibilities. • Encouragement and Facilitation, Provide Practical Support/Group Seminars/Workshops, Supervisors Fulfilling	competing commitments, especially if the expectation is set early on and encouragement and support provided. • An expectation in students that publication of their research is part of their master's research was found to be positively associated with success. • To not actively support publication of good research findings denies useful and timely information being made available to a much wider audience. • Encouragement and support needs to be provided, but in a structured and planned way from the start of the course through to publication. • Intervention should be realistic and ensure that limited resources are protected from being channeled into areas unlikely to be productive.

		Their Role, Increasing the Number of Supervisors are some of the suggestions.	
Hollingsworth & Fassinger	Multiple regression analyses	• Research mentoring experiences as a mediator because the research training environment became a non-significant predictor of research productivity. • Regression supported the mediational hypothesis: Research self-efficacy predicted research productivity, whereas the research training environment coefficient decreased after self-efficacy was partialed out. • Past research attitudes emerged and remained a significant predictor of research productivity despite the addition of research training environment, research mentoring experiences, and research self-efficacy to the regression equation. • A significant interaction term would suggest that student gender acts as a moderator, affecting the strength and/or direction of the relationship between the independent variables. • Similar analyses showed no significant differences based on scientific stature of students' programs (high, medium, or low) in the relationships among research training environment, research mentoring, and research self-efficacy.	• The study supports the role of the research training environment, research self-efficacy, and past research attitudes as direct predictors of productivity. • The data also suggested that students' mentoring experiences serve as an important predictor of research productivity, mediating the relationship between the research training environment and research productivity. • A strong research training environment is most likely to promote strong research mentoring relationships. • The mediating role of research mentoring in the prediction of research productivity suggests that a research mentoring relationship is the vehicle through which the training environment has greatest impact on individual students' research production. • Students' research self-efficacy served as another mediator between the research training environment and research productivity. • The results also showed no difference by gender in the effects of the research training environment on productivity. This result suggests that mentoring plays an equally important role for students, regardless of gender; however. • Students' experiences with faculty research mentors are

			important to students' development as researchers. • A strong research training environment is most likely to promote strong research mentoring relationships. • The mediating role of research mentoring in the prediction of research productivity suggests that a research mentoring relationship is the vehicle through which the training environment has greatest impact on individual students' research production.
Ho, Wong, & Wong	Content analysis	There were 19 facilitating and 17 hindering themes. Facilitating themes included: • students' positive qualities; • support from supervisor, • family and friends; • access to resources; • a supportive and stimulating climate for thesis work and • supervisors' positive qualities. Hindering themes included: • distractions from thesis research; • difficult data related processes; • lack of understanding of the thesis writing process; • and students' and • Supervisors' personal qualities.	• There were 19 facilitating and 17 hindering themes. • The question of how much structure was needed remained controversial. • The students' cultural background might also influence their self-direction or structure in completing academic tasks. • The most frequent hindering theme was "Distraction from thesis research."

From table 3 above it become evident that only one of the eights articles was conducted locally and that postgraduate students were the target population, which suggest that replication with local samples could be beneficial. Table 4 highlights that five articles were quantitative in nature while three were qualitative in nature. Table five illustrated that seven of the good quality articles reported supervision as the strategy or intervention activity where four of the eight articles were facilitated individually three articles were facilitated within a group and one combined individual and group facilitation styles. Table six provided the overall analysis and results of the good quality articles.

4.3 Ranks based on methodological rigour: Table 7 below presents the included studies ranked in descending order based on scores obtained for overall methodological quality and coherence. The table also includes information about how the articles were ranked in the respective subsections of the appraisal tool such as the Purpose, Design, Ethics, Data collection, Data analysis, Sample, Results and Conclusion.

Table 7

Ranking of included articles based on methodological rigour (n = 8)

Ranking	**Refs**	**Quality**	**Subsections**							
			Purpose (5)	**Design (7)**	**Ethics (6)**	**Data collection (7)**	**Data analysis (5)**	**Sample (8)**	**Results (3)**	**Conclusion (4)**
1	Alak et al. (2014)	Strong	1	4	2	5	1	1	1	1
2	Lambie & Vaccaro (2011)	Strong	1	4	4	1	1	3	1	1
3	West, Kahn & Nauta (2007)	Strong	1	1	7	1	7	3	1	1
4	Shivy et al. (2003)	Strong	1	7	4	1	1	7	1	1
4	Bullen & Reeve (2011)	Strong	1	4	4	5	1	2	5	1
6	Ho, Wong & Wong (2010)	Strong	1	2	1	8	7	3	7	1
6	Schulze (2012)	Strong	1	2	2	7	1	3	7	8
8	Hollingsworth & Fassinger (2002)	Moderate	1	7	7	1	1	7	5	1

The top ranking article was published in the Journal of Clinical and Investigative Medicine, which tends to have a specific structure that needs to be followed for publishing (CSCI, 2014). It should be noted that that the articles are an outflow of what the author deems as important and a function of the requirements by the journal (CSCI, 2014). It should be noted that while the article is ranked highest, the methodological soundness of the article may be as a result of the requirement of the journal in which it was published rather than the quality of writing by the author or design. In addition, the decision on what is reported in the articles is also a methodological decision (Wisdom, Cavaleri, Onwuegbuzie & Green, 2012). The top ranked article was qualitative in nature, which inherently requires additional criteria in order to ensure that the research is accepted as being good quality research such as credibility, trustworthiness, reflexivity, respondent validation, saturation and the use of multiple reviewers (Golafshani, 2003). This is referred to as publication bias, which is a bias with regard to what is likely to be published among what is available to be published (Song et al., 2010). This tends to occurs when the publication of research results depends not just on the quality of the research but on its nature and direction (Dickersin, 1990). The top three articles were also ranked in the top position for 5 out of 8 subsections, which highlights that, these articles have good overall methodological quality and coherence. The second and third highest ranked articles were quantitative in nature, which were predominant for the included articles. According to Wyse (2011) quantitative methods provide more structure in terms of data collection. The structure may guide the author's writing, which may improve the overall quality of the article. The quantitative articles ranked higher than the qualitative articles for the data collection subsection.

All of the articles scored equally for the purpose subsection. This may be as a result of the subsection playing a crucial role in providing an understanding to the background and context of the research problem. This subsection was well written in all articles as it framed

the research problem, which highlights the writing ability of the author as Sidik (2005) stated that framing the research problem may be the biggest problem in writing. The article ranked highest for design provided a well formulated research design and a theoretical orientation. The relationship between the design and the aim of the study was clearly and explicitly stated. This is important as the research design provides a structure to assist in the delivery of evidence that is required to address the research problem in a clear and accurate manner (Avan & White, 2001), which may contribute to the overall quality of the article.

In general, the articles did not score high on the ethics subsection. There might be an interaction between type of methodology and extent of reporting on ethics. Qualitative articles may be more likely to report on issues of ethics compared to quantitative articles due to the sensitivity of the topics examined. This should not be understood to mean that ethics are undervalued in quantitative studies. There are many factors that impact the decision to detail information about ethics such as word limits, topics and status of research (exploratory versus confirmatory), as well as design considerations. This decision to omit information about ethics however has a bearing on the overall methodological quality of the article.

The articles scored high for the data analysis section, where 6 out of 8 articles were jointly ranked first. Data analysis and interpretation is an imperative process in transforming the data, as this assists in assessing the outcomes of focus (ICAP, 2014), hence the articles scored high on this subsection. High scoring articles provided clear evidence that the data collected supported the analysis conducted, and convinced that the appropriate methods of analysis were employed.

The articles predominantly scored low for the sample subsection apart from the top ranked article, which nearly reported on all elements related to sampling. The articles generally did not report on the sampling method nor was the sampling choice motivated. Few articles provided an adequate explanation for how the size of the study sample was

determined and those articles that did tended to provide a minimal description. Furthermore, very few articles provided information on techniques used to ensure optimal sample size.

The quantitative articles scored highest for the results subsection compared to the qualitative articles apart from the overall highest ranked article. This could be as a result of quantitative studies having more structure that guides the writing, whereas in the qualitative articles, elements such as saturation and the use of multiple reviewers may not have been explicitly stated and this was where the articles lost points for methodological rigour. The conclusion subsection was well reported in all of the articles, where the main ideas were summarised and the research problem addressed.

It is evident that the manner in which articles are written and what is reported in the article is determined by a range of factors, all of which has implications for methodological rigour and the quality of the article. Decisions such as inclusion criteria, word count, format and structure of specific journals may also affect the quality of the article. In some instances structure seems to contribute toward improving the methodology of the article and improved the ranking of the article. Quantitative studies also tend to have more structure in certain aspects which encouraged reporting of certain subsection more than others. Reporting is ultimately a combination of an outflow of what the author thinks is important and the requirements of the journal in which he article would be published. Despite the instructions to authors stipulating what is required, the author still decides what to report on and what to omit. The information included impacts on the ability of the audience to replicate studies or to evaluate the rigour of the research. Thus the decision about what to report becomes a methodological decision. If the author is focused on dissemination of findings rather than providing sufficient information about the methodology, the ability to evaluate methodological rigour and coherence becomes very difficult. Replication is an important characteristic of research that enables the reported findings to be confirmed or refuted

(Drotar, 2010).

Replication of research is thus a means of testing the reliability or credibility of a finding, and replication entails repeating the research in all its important details (Drotar, 2010; Schafer, 2001). McKubre (2008) further explained that replication is defined in terms of reproduction, where the key test in science is consistency.

4.4 Theory explicative meta-synthesis: As mentioned before, the findings of the theory explicative meta-synthesis will be reported in a manner that reflects the three sections of the analysis proposed by Noblit and Hare (1988) namely, Reciprocation, Refutation and The line of argument.

4.4.1 Reciprocation: Resonates with the general thinking of the existing body of literature. The findings identified four themes namely the 1) effective strategies or interventions; 2) theoretical frameworks; 3) characteristics that facilitate research capacity building; and 4) factors that hinder research capacity building.

4.4.1.1 ***Effective strategies or interventions:*** The strategies or interventions that were reported as effective in the final summation are supervision, faculty modelling, support and protected research time. Below is a brief discussion of the themes with an indication of how it is reciprocative of the literature.

Supervision: The working relationship between the student and supervisor during the research supervision process is crucial in ensuring the timeous and successful throughput of the student (Alak et al., 2014; Schulze, 2012). There are however important considerations that need to be taken into account for the research to be successful such as, matching the student and supervisor (Alak et al., 2014; Schulze, 2012), interpersonal factors between the student and supervisor (Shivy et al., 2003), establishing clear roles and responsibilities (Bullen &Reeve, 2011) and development of the student as researcher (Schulze, 2012). It is of utmost importance that the match between the student and supervisor

is a good fit because they would be working closely together through the research process (Alak et al., 2014), which was identified as being a stressful process (Devonport & Lane, 2006). The finding also suggests that positive interactions between the student and the supervisor facilitate the completion of the thesis endeavour.

Research identified intrinsic and extrinsic factors that contribute to increased research capacity building in students (Abiddin & Ismail, 2011). The findings suggested that overloading a supervisor with students and mismatching the student and supervisor should be avoided to promote positive learning experiences, which would contribute toward successfully completing the thesis requirement. Bullen and Reeve (2011) supported this idea and added that the number of supervisors should be increased, as well as setting the expectation that publication is part of the dissertation process. Similarly, the literature suggests that the quality of the supervisory relationship is a significant predictor of success (Smith, 2004; Wadesango & Machingambi, 2011).

Clarification of roles and responsibilities during the supervision process is another key element, as it allows for the development of understanding in terms of what is expected from the student and the supervisor (Bullen & Reeve, 2011). Alak et al. (2014) illustrated that the student is the project champion where the student's career goals motivated the student to finish and prioritise the research project in order to graduate, despite being busy with other tasks. It was further explained that successful research projects require early planning and efficiency, where the creation of a team of students and staff that complement each other in terms of expertise were found to be a common factor in successful completion of the research project (Alak et al., 2014). This also refers to the supervisor developing the student to become a well-rounded researcher with sound knowledge and research skills (Shivy et al., 2003), while being attentive to the developmental areas of the student so that the supervisor could strengthen and capacitate the student.

The findings suggest that supervisors should take a more assertive and intentional role in guiding their students in research to encourage publication and through building an early supervisory relationship could also promote scholarly writing and increase research self-efficacy in order to successfully complete the thesis requirement and graduate (Lambie & Vacarro, 2011). Literature identified the changing nature of research supervision and supported the findings by suggesting that supervision should be adjusted to meet the student's needs (Deucher, 2008), development of student (Pearson & Brew, 2010), utilisation of supervision groups (Abiddin & Ismail, 2011) to encourage collaboration and the pedagogy of supervision and supervisor duties or responsibilities (Emilsson, 2007). The supervisor should also ensure feasibility and timeliness of the research project, as well as bearing in mind the student's research interest, attitudes toward research and for safeguarding that the student does not deregister or terminate his/her studies prematurely (Alak et al., 2014; Shivy et al., 2003). The literature confirmed that research supervision plays an imperative role in ensuring student retention and throughput (Buys & Louw, 2012; ESRC, 2005; Nchinda, 2002; Wojtas, 2004).

Support: The findings highlighted student support, (including academic support, emotional support and technical support), is essential in reducing the anxiety of students and encouraging throughput. Some students struggle with basic research knowledge and skills, which include language skills (Schulze, 2012) and this affects the student's writing ability and comprehension of articles. Smith (2004) confirmed that the research process is stressful and Sterner (2009) added that students often complete without feeling confident about their ability to conduct research independently or to supervise research. Moreover, Abiddin and Ismail (2011) concurred that students from previously disadvantaged backgrounds tend to have further distinctive needs to cope with the pressure of a technologically advanced environment and a system of demands for independent research.

This is a reality within the South African context due to the consequences of the apartheid regime (John, 2013; Mabin, 1991; Outwater et al., 2005; Sampson, 1999).

Faculty modelling: The findings suggest that faculty modelling was ranked as one of the most important aspects of the research training environment, where interpersonal factors were central and carried a large weighting. For example, Shivy et al. (2003) recommended that through addressing the interpersonal climate, one would be able to enrich the training environment and subsequently increase the throughput rates. The findings also uncovered that helpful, caring and involved faculty members attracted students into research (Ho, Wong & Wong, 2010; Shivy et al., 2003). Similarly, faculty members who were passionate and positive about research were more likely to motivate students to become involved in research and to successfully complete the research process (Shivy et al., 2013).

Protected research time: The findings identified that having protected research time assists students in time management in order to complete the thesis project within the specified time frame. Postgraduate studies tend to incorporate coursework in conjunction with the research project (Yorke & Longden, 2004), which requires dedicated time allocation thus having protected time to work on the research project is beneficial for student as it encourages throughput and graduation.

4.4.1.2 ***Theoretical frameworks:*** The self-efficacy theory and the research training environment theory were the theoretical frameworks that were predominantly used within the good quality research. The theoretical framework within a study is essential as it introduces and describes the theory that explains the research problem and it provides an outline for the study (USC, 2014). These theoretical frameworks included 1) The self-efficacy theory, and 2) The research training environment theory.

The self-efficacy theory: This theory was utilised in four of the six articles that reported their theoretical framework (Lambie & Vacarro, 2011; Shivy et al., 2003; Schulze,

2012; West et al., 2007). Self-efficacy refers to the belief in one's ability to perform a certain task such as conducting research (Bandura, 1977; Bandura, 1986; Bandura, 1994; Ormrod, 2006). Bandura (1986) noted that self-efficacy encompasses more than the ability to execute a task, but rather it involves cognitive processes, behaviour, intrinsic and extrinsic motivations, and social-cognitive maturation. Self-efficacy is enhanced by experiences of mastery that develops through the persistence in subjectively difficult activities (Bandura, 1994; Lambie & Vaccaro, 2011). Thus self-efficacy plays a crucial role in research capacity building for postgraduate students because as they engage in the research process and they master the various skills then they may begin to feel more confident about their research abilities, which could enhance their research self-efficacy (Ormrod, 2006). This in turn could contribute toward increasing the postgraduate students' interest in research and the student would feel more comfortable in engaging in scholarly writing, which could further promote their levels of research self-efficacy and their comfort in performing research-related tasks (Lambie & Vacarro, 2011). Enhancing the student's research self-efficacy contributes to positively to influence the successful completion of the thesis endeavour for postgraduate students, which would boost the throughput rates (Shivy et al., 2003; Shivy, Worthington, Birtel-Wallis & Hogan, 2003; Shulze, 2012; West et al., 2007). Similarly, Devonport and Lane (2006) concurred that self-efficacy, plays an important role in facilitating the completion of the thesis requirement.

Conversely, if students' have a low research self-efficacy then they are more likely to struggle with the research endeavour and thus may be at risk for not graduating, and that in turn adds to the low attrition and throughput rates. The literature highlighted the implication is that it adversely affects economic stability, the contribution to the knowledge economy for the purpose of addressing prevalent issues such as, negative attitude to research and publication, income for the universities and reputational standing of the universities

(Yorke & Longden, 2004; Pillay & Krtizinger, 2007; Sondolo, 2013). These factors further motivate the need to improve the research self-efficacy levels of postgraduate students' in order to improve the likelihood of the students successfully completing the thesis requirements and to graduate.

The findings suggested that research self-efficacy could be predicted by the students' learning styles. Students with intuitive learning styles and active learning styles had greater research self-efficacy compared to students with sensing learning styles and reflective learning styles. This claim could provide higher learning institutions with the insight into how these students should be accommodated and how to match them with supervisors.

The research training environment theory: This theory was utilised in three of the six articles that reported their theoretical framework (Hollingsworth & Fassinger, 2002; Lambie & Vacarro, 2011; Shivy et al., 2003). Gelso (1993) defined the term research training environment (RTE), as "all of those forces in graduate training programs that reflect attitudes toward research and science" (p. 470). The findings reported that effective research training environments encouraged students' excitement and investment in research, as well as amplified their level of research self-efficacy. Students who perceived the research training environment more positively were found to have increased research productivity (Hollingsworth & Fassinger, 2002; Lambie & Vacarro, 2011). Research mentoring was also found to positively contribute to the research training environment (Lambie & Vacarro, 2011), and the students' mentoring experiences are important predictors of research productivity (Hollingsworth & Fassinger, 2002). Faculty mentoring is therefore a critical component within the research training environment (Gelso & Lent, 2000; Hill, 1997) and is part of the research supervision process (Buys & Louw, 2012; Wojtas, 2004). These findings are consistent with the body of literature, arguing that high quality supervision plays a vital role in student throughput (Devonport & Lane, 2006; Ladany, Yoko, & Mehr, 2013; Pillay &

Kritzinger, 2007).

4.4.1.3 ***Characteristics that facilitate research capacity building:*** The findings identified characteristics that facilitate research capacity building in students, which are levels of research self-efficacy, creation of an effective research training environment, learning styles and high quality supervisory practice. The findings reported that enhancing the student's research self-efficacy would positively contribute to the successful completion of the thesis endeavour for postgraduate students, which would boost the throughput rates. Literature confirmed that self-efficacy, is vital in facilitating the completion of the thesis requirement (Axtell & Parker, 2003; Devonport & Lane, 2006). The findings added that younger postgraduate students tend to have a higher level of research self-efficacy, which could be attributed to the younger students having recently graduated from the honours or maters program and may be more technologically advanced. Abiddin and Ismail (2011) endorsed that postgraduate students should be able to deal with the pressure of a technologically advanced environment and a system of demands for independent research.

The findings emphasised the creation of an effective research training environment for postgraduate students in order to promote throughput and graduation, which include diverse recruitment, provision of opportunities for collaborative research, development if the student's research competencies, support and nurturance of the student's professional skills and high quality supervisory practice. Diverse recruitment allows the students to learn from each other's experiences and this could be further encouraged through the collaborative process. Students would then be able to support each other and their positive interactions could promote throughput. Buissink-Smith, Hart and Van der Meer (2013) supported the notion that peer support plays a central role in improving retention and throughput. High quality supervisory practice was found to aid research capacity building in postgraduate students. The findings specified that supervision should include a good fit

between the supervisor-student, the roles and responsibilities should be clarified from the onset, support should be incorporated, positive reinforcement by the supervisor should be incorporated in order to encourage the optimal development of the student's research competencies and skills and faculty modelling should be encouraged to promote interpersonal relationships, which were found to encourage scholarly writing. The literature reciprocated the notion that quality of the supervisory relationship is a significant predictor of success (Smith, 2004; Wadesango & Machingambi, 2011). Additionally, the findings identified that certain student's learning styles are likely to flourish in the research process. It is therefore beneficial that the supervisor should be aware of the student's learning style so that the appropriate and necessary training could be provided to strengthen the student's developmental areas (West et al., 2007).

4.4.1.4 ***Characteristics that hinder research capacity building***: The findings identified factors that hinder research capacity building in postgraduate students including time constraints (Alak et al., 2014; West et al., 2007), lack of funding and financial constraints (Alak et al., 2014; Ho, Wong & Wong, 2010), lack of supervisors to supervise the students and effective supervisory practice (Alak et al., 2014; Bullen & Reeve, 2011; Lambie & Vacarro, 2011; Schulze, 2012; Shivy et al.,2003), lack of student interest (Alak et al, 2014, Hollingsworth & Fassinger, 2002), unproductive learning styles (West et al., 2007), institutional lack of the required support structures to assist students (Schulze, 2012), students' cultural backgrounds and personal qualities (Ho, Wong & Wong, 2010), as well as inability to balance the demands of personal and academic lives (Ho, Wong & Wong, 2010). Lack of time to complete the research requirement was listed also contributing to non-completion (Alak et al, 2014; West et al., 2007), which could be attributed to the fact that the students may not have been provided with adequate structure and guidance by means of supervision (Shulze, 2012) or the students may not have been confident in their ability to

conduct research, thus reducing the students' research self-efficacy (Lambie & Vacarro, 2011; Shivt et al., 2003). These finding was in accordance with the literature that reported the importance of high quality supervision practice (Smith, 2004; Wadesango & Machingambi, 2011) and that the successful completion of postgraduate degrees is dependent on the successful and timely completion of the thesis component, which focuses on research.

Moreover, the findings added that supervisor-student mismatch, misuse of power by the supervisor, students' cultural background, lack of understanding of the writing process and challenges with basic research knowledge and skills, and over-burdened supervisors contribute to hindrances in research capacity building (Alak et al, 2014; Ho, Wong & Wong, 2010; Schulze, 2012). The mismatch in the student-supervisor relationship may be as a result of differing research interest or personality traits (Alak et al., 2014; Schulze, 2012). The supervisor may misuse his/her power by making unreasonable demands on the student, which further hamper the development of the student's research capacity (Ho, Wong & Wong, 2010). The supervisor may also have a high workload, which would decrease the quality of supervision that the students receives and may act as a barrier to research capacity building (Schulze et al., 2012). The lack of understanding of the writing process and challenges with basic research knowledge and skills by students should be addressed during the supervisory process in order to capacitate the student. If this does not occur, the student would have challenges in completing the research endeavour due to limited research capacity. The cultural background of students have been found to have an impact on academic task completion, where Asian students tended to prefer greater direction and structure from their supervisor or faculty compared to Western students who preferred self-direction in academic tasks (Ho,Wong & Wong, 2010).

It was found that a balance should be created between the student's personal and academic lives, where the student is required to focus on academia while simultaneously

continuing to respond to his/her personal life's circumstances (Ho, Wong & Wong, 2010). It is imperative that the student systematically and continually works on the research endeavour, but should also maintain and strengthen meaningful relationships that provide him/her with support. It is possible for the student to neglect personal relationships while completing his/her degree and this may result in isolation (Ali & Kohun, 2007). Part-time students may have to juggle academia, work and their personal lives, which may contribute a significant hindrance to thesis completion (Ho, Wong & Wong, 2010).

Students' personal qualities such as high levels of anxiety from a lack of knowledge and insecurity, frustration, loss of interest, inability to deal with negative feedback, dependence on the supervisor to champion the research project and difficulty with the relationship with the supervisor, have all been found to be a hindrance for research capacity building (Alak et al, 2014; Bullen & Reeve, 2011; Ho, Wong & Wong, 2010; Hollingsworth & Fassinger, 2002; Shivy et al., 2003). The student's inability to constructively deal with frustration, obstacles or negative feedback is illustrative of personal immaturity, which further hinder the progress of the thesis endeavour (Ho, Wong & Wong, 2010).

4.4.2 Refutation: The general literature, however proposed that a lack of funding discourages students from enrolling in postgraduate qualifications or terminating prematurely (HSRC, 2008; McCallin & Nayar, 2011; Rees, Baron, Boyask & Taylor, 2006; Wilcoxson, 2006). One theme was identified that provided a contrary stance compared to the general literature was funding. Ho, Wong & Wong (2010) proposed that constant and continued generous funding to conduct research could be a deterrent or hindrance in the thesis endeavour. It was found that supervisors may acquire the funding for students in order to retain them for as long as possible, which delays their thesis completion but serves as a personal gain for the supervisor. It was suggested that the supervisor would utilise the student

for the supervisors' own research programs rather than encouraging throughput and graduation of the student. The supervisor thus deliberately delays the thesis completion, which could be done by withholding feedback and making further demands on the student such as contributing towards the supervisor's publication output (Ho, Wong & Wong, 2010). This apparent contradiction or refutation of the existing body of literature is quite daunting since at risk students (e.g. students from minority groups based on ethnicity, socio-economic status [SES] and gender) are more dependent on funding. Careful evaluation of this finding underscores that it is not so much funding, but abuse of power and inappropriate use of funding that is a hindrance or poses a risk for student throughput. From the literature, abuse of power has already been identified as a concern (Ho, Wong & Wong, 2010). Additionally, at risk students are less able to assert themselves in the supervisory relationship and become even more vulnerable (Murphy & Wright, 2005). Their failure to complete, compounds racial and gendered stereotypes about ability and affirmative action in postgraduate students (Abiddin & Ismail, 2011; Ho, Wong & Wong, 2010; John, 2013; Nilsson, 2007). Thus it becomes important to have measures in place to monitor the use of funding in a manner that is appropriate and consistent with the conditions of award. In other words, what is refuted is the notion that funding per se is useful and that the signed acceptance of conditions of award will suffice. The recommendation is that proper monitoring and evaluative strategies be put in place and that students understand the recourse available to them when they have a need to challenge any aspect of their experience (e.g. abuse of power) or require advocates to assist them to do so.

4.4.3 Line of argument: Research capacity building has become vital in developing countries in terms of economic development and global competitiveness (Fritz & Menocal, 2006; Kritzinger & Loock 2012). Low graduation rates for postgraduate students have made student retention and throughput a global concern (Mdygolo, 2012), as drop-out rates have

cost implications, affects the student, family, research supervisor, society and higher education institutions (HSRC, 2008). Thus, there is a need for strategies or interventions to facilitate successful throughput and graduation. It is evident that there are strategies or interventions that aim to effectively assist postgraduate students to successfully complete their thesis requirements, which improves the throughput and graduation rates. The strategies or interventions strengthen the research capacity of students to become more proficient in conducting and publishing good quality research, which is evidenced by the successful completion of degree requirements and graduation.

It is in the best interest of the student, the faculty, the higher learning institutions and the government to promote strategies and intervention to assist students through the research endeavour. This is essential in maintaining or boosting the credibility of the institution. Research provides for the opportunity to redress the wide ranging social issues within South Africa and produces more highly skilled professionals in the field of research.

The effective strategies for assisting students through their thesis endeavour would entail an understanding of the four points identified across the studies and these points should become specifically important for supervisors and management systems. First, quality supervision is an effective strategy or intervention that contributes to successful thesis completion, where the roles and expectations are clarified from the onset and the supervisor and student are matched based on compatibility in terms of personality and research interest in order to encourage the optimal development of the student as a researcher. The supervisor should have a manageable workload to render effective supervision and provide the student with timeous and constructive feedback. Good quality supervision was endorsed by six of the eight good quality articles as being imperative in the throughput rates in postgraduate students (Bullen & Reeve, 2011; Ho, Wong & Wong, 2010; Lambie & Vacarro, 2011; Schulze, 2012; Shivy et al., 2003; West et al., 2007).

Second, faculty modelling was also found to encourage successful thesis completion in postgraduate students where appropriate scientific behaviour and attitudes are expressed, which the students are then able to imitate. Five of the eight good quality articles indicated that faculty modelling plays a crucial role on student throughput and graduation (Alak et al, 2014; Hollingsworth & Fassinger, 2002; Lambie & Vacarro, 2011; Shivy et al., 2003; West et al., 2007). Shivy et al. (2003) added that faculty modelling, good quality research supervision and early involvement in the research project important aspects of the training environment.

Third, student support was another effective strategy that was found to promote research capacity building as it strengthens the student's research skills and professional development, while fortifying the student's belief in their research ability. Support includes academic support, emotional support and technological support especially in students from previously disadvantaged backgrounds and part time students who may be juggling other responsibilities and commitments. Supervisors should undergo training and refresher courses on effective supervisory practice to either instil or reinforce good quality supervisory practice. West et al. (2007) further suggested that the learning styles of the students should also be considered as it has a bearing on the type of academic support required to facilitate throughput. Four of the eight good quality articles confirmed that student support is vital in ensuring throughput and graduation (Alak et al., 2014; Bullen & Reeve, 2011; Ho, Wong & Wong, 2010; Schulze, 2012). Student support could be facilitated through seminars and workshops where the students could engage with other students who could be an additional source of support.

Fourth, six of the eight good quality articles supported having protected research time where the student is able to focus predominantly on the research process as to facilitate the successful and timeous completion of the thesis requirement (Alak et al., 2014; Bullen &

Reeve, 2011; Ho, Wong & Wong, 2010; Schulze, 2012; Shivy et al., 2003; West et al., 2007). These strategies and interventions have been found to be effective in research capacity building to enhance throughput and graduation rates.

Theoretical framework: Attempts at facilitating retention and throughput for postgraduate students are more likely to be effective if they are underpinned by a theoretical framework. The research training environment theory and the research self-efficacy theory were found to encourage research capacity building in postgraduate students. The research self-efficacy theory was used in 4 of the 6 good quality articles that reported on the theoretical orientation (Lambie & Vacarro, 2011; Schulze, 2012; Shivy et al., 2003; West et al., 2007). Research self-efficacy is central to research capacity building as it is focused on the student's belief in his or her ability to perform a task such as conducting research and involves cognitive processes, behaviour and motivations. Thus, the student should be encouraged to have early and continuous engagement in research activities to develop mastery and improvement in the student's research self-efficacy. The research training environment theory was used in 3 of the 6 good quality articles that reported on the theoretical orientation (Hollingsworth & Fassinger, 2002; Lambie & Vacarro, 2012; Shivy et al., 2003). The research training environment should create excitement in research, and amplify the student's level of research self-efficacy so that students who perceive the research training environment positively would be more likely to have increased research productivity. An effective research training environment could be facilitated through the establishment of good quality supervision, faculty modelling, student support and protected research time, as these factors contribute in creating that enthusing, optimal research development for students.

Chapter Five

Conclusion

5.1 Conclusion: This study conducted a systematic review on studies reporting on interventions addressing the successful completion of thesis requirement for postgraduate studies between 2000 and 2014 (June). Good quality research exists and it is evident that there is a fair amount of research available, but only eight articles were rated as good quality research based on the methodological rigour of the study as evidenced by the reporting in the manuscript. The systematic review allowed for the summarising of evidence in literature reporting on research capacity initiatives aimed at postgraduate students. In this manner, the efficacy of elements contributing to research capacity development and research productivity in postgraduate students to be identified from good quality research could be identified.

The good quality research identified 1) high quality supervision, 2) faculty modelling, 3) support and 4) protected research time as effective strategies or interventions that stimulate successful completion of the thesis requirement. These strategies or interventions contribute toward the increase throughput and graduation rates. Thus, there are effective strategies or interventions aimed at assisting postgraduate students to successfully complete their thesis requirement through research capacity building initiatives, which play a pivotal role in the establishment of knowledge, the economy and the competitiveness of the country.

The findings identified the following elements as integral to effective strategies: The use of appropriate theoretical frameworks to understand supervision. Students will also benefit from all parties developing an understanding of the characteristics that facilitate and hinder research capacity building whilst making concerted efforts to inculcate or accommodate these respectively.

Generous and continuous funding was identified as providing a contrary stance compared to the general literature, where an opposing view is provided (Bondas & Hall,

2007; Ho, Wong & Wong, 2010). In this instance the supervisor deliberately delays the thesis completion for the supervisor's personal gain, which also supports with the misuse of power by the supervisor.

5.2 Significance of the study: The literature reporting on strategies or interventions to facilitate research capacity building for postgraduate students have mostly been from international studies conducted in developed countries (Devonport & Lane, 2006; Deuchar, 2008; Dickson et al., 2011; Dysthe, 2007; Emilsson, 2007; Ladany, Yoko & Mehr, 2013; Lee, 2008). These references reported on primary studies that are difficult to compare without systematic assessment of methodological rigour and coherence that will evaluate the quality of research. Thus, the present study conducted a systematic review that provided filtered information from the existing body of literature on strategies or interventions to increase the research capacity of postgraduate students. This study was the first to conduct a systematic review on interventions addressing the successful completion of thesis requirements for postgraduate studies. The strategies or interventions could inform policies at higher learning institutions in order to enhance research capacity building initiatives, so that throughput and graduation rates could increase. Capacitated researchers would be able to conduct further research that could address the wide ranging issues within their country that could improve the overall quality of life for the citizens, and contribute to the knowledge economy. This study's results assisted in consolidating the literature reporting on strategies or interventions that facilitate research capacity building in postgraduate studies.

5.3 Limitation of the study: Relevant studies might have been overlooked due to publication bias, but reference mining was employed to reduce the likelihood of articles that may not have been produced by the database search and in so doing increase the yield of the data search. Higgins and Green (2011) describe publication bias as the publication or non-publication of research findings, depending on the nature and direction of the results.

Language bias refers to the publication of research findings in a particular language (Higgins & Green, 2011; Moher et al., 2007). This study only used articles that were published in English, which restricted the search to studies reported in English. According to Kirkham et al. (2010), language bias is an under-recognised problem that has the potential to affect the conclusions of the study. It is therefore suggested that individuals conducting systematic reviews should explicitly address the issue of missing data for their review to be considered a reliable source of evidence (Kirkham et al., 2010). The present study was restricted to three disciplines namely Health and Education, Social Science and Natural Science where other disciplines may have had relevant articles that could have contributed to the findings but they were overlooked, and this is referred to as scope bias.

5.4 Recommendation for future research: This was the first study that used a systematic review on interventions addressing the successful completion of thesis requirement for postgraduate studies, so replication of this study is required for comparisons and to support its merits. Additionally, the studies were predominantly conducted abroad therefore replication with local samples would be important due to the uniqueness of our population. It is therefore recommended that research be conducted locally to test these findings. The present study was limited to three disciplines (Health and Education, Social Science and Natural Science) so future research could involve postgraduate students from other disciplines and the findings could be compared. Future studies could also formulate studies that can build on this research by exploring characteristics in supervision such as combining some of the personal traits and exploring matching.

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Appendix A: Ethics clearance for the parent study

UNIVERSITY of the
WESTERN CAPE

OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH DEVELOPMENT

18 March 2014

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape approved the methodology and ethics of the following research project by:
Dr M Smith (Psychology)

Research Project:	Research capacity building: A concept map of factors contributing to developing research productivity in postgraduate students and new academic staff.
Registration no:	13/10/57

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Private Bag X17, Bellville 7535, South Africa
T: +27 21 959 2988/2948 . F: +27 21 959 3170
E: pjosias@uwc.ac.za
www.uwc.ac.za

Appendix B: Ethics clearance for the present study

UNIVERSITY of the
WESTERN CAPE

OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH DEVELOPMENT

17 June 2014

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape approved the methodology and ethics of the following research project by:
Mrs A Hendricks (Psychology)

Research Project:	A systematic review of interventions addressing successful completion of thesis requirements in post graduate students.
Registration no:	14/5/20

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Private Bag X17, Bellville 7535, South Africa
T: +27 21 959 2988/2948 . F: +27 21 959 3170
E: pjosias@uwc.ac.za
www.uwc.ac.za

Appendix C: Title summary extraction sheet

No.	Author	Date	Title and source	Database	Location (where stored)	Outcome (exclude/include)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						

Appendix D: Abstract summary extraction sheet

No.	Name of study	Type of design	Study population	Instrument used	Outcomes	Quality/ result of study analysis
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						

Appendix E: Critical Appraisal tool

CRITICAL APPRAISAL CHECKLIST FOR A SYSTEMATIC REVIEW

Bibliographic Details	Author	Title	Source

Title		Year

Purpose	**Yes(1)**	**No(0)**
1. Is there evidence that literature has been consulted in providing context or background?		
2. Is there a clear problem statement?		
3. Is there a clear rationale for the study?		
4. Are the aims of the study clearly stated?		
5. Are the aims explicitly related to the problem statement?		

Total points for this section: 5

Study design	**Yes(1)**	**No(0)**
1. Is the theoretical orientation of the study reported?		
2. Was the theoretical orientation described in detail		
3. Is the design of the study reported?		
4. Did the authors motivate their design choices?		
5. Were the elements of the design reported on?		
6. What is the relationship of the design to the aim of the study? a) Minimal to no relevance (0) b) Moderate relevance (1) c) Highly relevant (2)		

Total points for this section: 7

Ethics	**Yes(1)**	**No(0)**
1. Was ethics approval obtained from an identifiable committee?		
2. Was informed consent obtained from the participants of the study?		
3. Have ethical issues been reported on?		
a) Confidentiality?		
b) Anonymity?		
c) Withdrawal?		
d) Informed consent?		

Total points for this section: 6

Data collection	**Yes(1)**	**No(0)**
1. Were data collection methods clearly identified?		
2. Was choice of data collection methods motivated?		
3. Were methods of collection appropriate for the outcomes identified?		
4. For quantitative studies:		
a) Did they report on psychometric properties?		
b) Did they report on psychometric properties of the scale for this sample?		
c) Did the authors report on the type of data produced by the instruments?		
d) Did the instruments produce data that supported the data analysis		
For qualitative studies: Did they report on		
a) Trustworthiness		
b) Credibility		
c) Reflexivity		
d) Respondent validation		

Total points for this section: 7

Data Analysis	**Yes(1)**	**No(0)**

1. Was the method of analysis made explicit?
2. Was the method of analysis motivated?
3. Was the method of analysis appropriate relative to the research question?
4. Were the conclusions drawn appropriate and supported by the data?
5. Were the inferences drawn supported by the type of sampling?

Total points for section: 5

Sample	**Yes(1)**	**No(0)**

1. Was the source population clearly identified?
2. Were the inclusion/exclusion criteria specified?
3. Was the sampling choice motivated?
4. Was the sampling method appropriate?
5. How was the size of the study sample determined?
    a) Not reported (0)
    b) Using threshold numbers (1)
    c) Formulas (2)
    d) Statistical requirements (3)
    e) Saturation (3)
6. Were techniques used to ensure optimal sample size?

Total points for this section: 8

Results	**Yes(1)**	**No(0)**
For Quantitative studies: 1. Were alpha levels reported? 2. Were results correctly interpreted? 3. Were the results clearly linked to the research questions? For Qualitative studies: 1. Was saturation reached? 2. Were multiple reviewers used? 3. Were the results clearly linked to the research questions? Total points for this section: 3		

Conclusion	**Yes(1)**	**No(0)**
1. Was a clear conclusion drawn? 2. Was the conclusion supported by the findings? 3. Were relevant recommendations made based on the findings? 4. Were limitations identified Total points for this section: 4		

Total Score/Score (%) **Score** **Score %**

_____ _____

Weak (<40%)___ **Moderate (41-60%)___** **Strong(61-80%)___** **Excellent (>80%)___**

Overall Appraisal: Include_____ **Exclude_____** **Seek further info_____**

Appendix F: Data extraction sheet for the general description

Authors	General description			
	Target group	Geographical location	Aim	Problem statement

Appendix G: Data extraction sheet for the methodological appraisal

Authors	Methodological appraisal				
	Design	Participants	Sample type	Sample size	Data collection/instrument

Appendix H: Data extraction sheet for the strategy or intervention content

Authors	Strategy/intervention content			
	Theoretical orientation	Scope of strategy/intervention	Nature of activities (what)	Facilitation styles (how)

Appendix I: Data extraction sheet for the analysis and results

Authors	Analysis & results		
	Data analysis	Empirical evidence/results	Authors conclusions