Supervisor coaching of PhD students in the Faculty of Health Sciences University of the Witwatersrand

A research report submitted by

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management Business Executive Coaching (MMBEC).

Wits Business School

February, 2017

ABSTRACT

This study determined the supervision experience of PhD students in the Faculty of Health Sciences at the University of Witwatersrand. The extent of coaching behaviours was assessed. Other supervision behaviours that were determined and aligned with coaching were: research academic support, personal and autonomy support, behaviours to support self-efficacy and satisfaction with the supervisor. Supervision of PhD students is important to the Faculty of Health Sciences at the University of the Witwatersrand as it aligns to the universities strategic goals. A review of the literature revealed a dearth of literature on coaching and supervision. There are a few articles emerging that assess the impact of coaching within supervision. Autonomy of PhD students is linked to facilitation and the mentoring role and the supervisors' ability to adapt and be flexible. These skills are linked to coaching and coaching may be a key part of the supervisors' style. Coaching and supervision are recognised as potentially important elements in PhD post graduate supervision and success.

To determine the extent of coaching, a cross sectional, correlational survey using a structured questionnaire was used. Data collection was undertaken using an online web-based platform that allows for the design, capture and analysis of data (REDCAP). The questionnaire comprised validated statements per phenomena in the areas supervisor availability and satisfaction, academic, personal, coaching and autonomy support and student self-efficacy. Descriptive statistics were used to determine the extent to which each phenomenon was experienced. Each section was tested for internal reliability and correlations established across all measures.

All students registered for a PhD for more than six months in the Faculty of Health Sciences were invited to participate in the study. There was a thirty-two percent return rate. Low to moderate levels by participants in coaching behaviours, personal support, supervisor availability and research academic support were experienced. Satisfaction with the supervisor showed low to moderate levels while self-efficacy and autonomy support had high scores. All components of supervision correlated with each other with the exception of autonomy support and self-efficacy. This lack of relationship may point to students finding their own forms of support outside the

supervisor. Specific relationships were apparent between supervisor behaviours and coaching and satisfaction with supervision.

This study is the first to establish supervisory behaviours including coaching in the Faculty of Health sciences at the University of the Witwatersrand. Given the low to moderate levels of supervision behaviors experienced in this study, all supervision behaviors need to be enhanced. The results show linkage to coaching approaches in providing satisfaction with supervision received. Provision of personal support through coaching may lead to gaining autonomy, self-efficacy and student growth.

DECLARATION

I, Hellen Myezwa (student number 0414816J), declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfillment of the requirements for the degree of Master of Management Business Executive Coaching (MMBEC) at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

Hellen Myezwa

Signed at ……

On the ……Day of……2017

ACKNOWLEDGEMENTS

- I would like to acknowledge my **supervisor Dr Hilary Geber for** her wisdom, guidance, support, hard work and encouragement. I have continued on my journey of learning.
- **To my MMBEC** classmates who became my friends through this journey.
- To all the **staff** in the Wits physiotherapy department for all your help, especially Witness Mudzi for carrying my load.
- Special thanks to School of Therapeutic Sciences and our HOS for **providing** adequate funding for this study.
- **Adedayo Tunde Ajidahun for** your assistance with data collection, follow-up and identification of participants.
- **To my family especially Archie** thank you for your support and patience throughout this journey.

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CHAPTER ONE

1. INTRODUCTION

1.1. PURPOSE OF THE STUDY

The purpose of this research was to determine the experience of supervision of PhD students in the Faculty of Health Sciences and to align these experiences to coaching practices as described in the literature. The research sought to determine which coaching and other supervision behaviours such as supervisor support, research academic support, personal support autonomy and support for self-efficacy all of which were considered related to PhD supervision satisfaction.

1.2. CONTEXT OF STUDY

The current research plan for the University of the Witwatersrand clearly states the need to improve supervision capacity. Two closely related aims are to increase numbers of staff with Phds and to enhance throughput of postgraduate students (University of the Witwatersrand, 2013). The Faculty of Health Sciences at the University of the Witwatersrand as part of its strategic aims has planned in alignment with the University goals. Supervision of post graduate students has been widely published with focus on the roles and responsibilities of the supervisors and the experience of supervised students (Mouton, 2007; Baptista, 2011).

Some studies have looked at the experiences, views and expected outcomes of postgraduate supervision. Coaching as part of supervision or an adjunct to it has been reported to result in positive experiences (Geber, 2010). The Geber (2010) study included a deliberate coaching effort. Some of the positive outcomes were self-discovery, a sense of belonging, self-assertive, coping with negative feedback, self-management and being more productive. Supervision without specific coaching component was also reported on and revealed problems where students felt there was a lack of communication and

in particular, no positive communication, a dearth of expertise on the content under study and power conflicts (Geber, 2010; Ismail, Majid, & Ismail, 2013; Sidhu, Kaur, Fook, & Yunus, 2013).

Similarly, the Bogna doctoral programme (Baptista, 2011) states components important to doctoral research. Competencies and roles of supervisors are cited as important attributes against the backdrop of institutional culture, professional and discipline specific characteristics that will inevitably influence doctoral programmes. However in the literature, roles and responsibilities are not generically or specifically defined (Baptista, 2011). Literature on supervision focuses on what should be included in supervision models and less on how the supervision process is experienced (Mouton, 2007). Supervision quality has been put in the spot light given the increasing numbers of enrolling graduates. Baptista (2011) in her analysis of the European doctoral programme states that supervision has changed with the process becoming more demanding. In her reflection on the main challenges facing doctoral supervision currently, she asks the question “what are thus the competencies that are asked of doctoral students and supervisors as well as teams, so they can meet and achieve high quality levels in the doctoral process and product?” (Baptista, 2011).

A review of the literature on supervision of higher degree students revealed a variety of studies ranging from a theoretical review of the literature, descriptive studies exploring both student and supervisors’ perspectives and a few intervention studies (Moses, 1984; Carr, Lhussier, & Chandler, 2010; Kirton, Straker, Brown, Jack, & Jinks, 2011; Sidhu et al., 2013; Sidhu, Kaur, Fook, & Yunus, 2014). Reports from the literature indicate that 20-50% of students are dissatisfied with supervision processes experienced (Moses, 1984; Sidhu et al., 2013). In contrast a large study conducted in Australia indicated better satisfaction with supervisory process with seven out of the eight items surveyed on student satisfaction with supervision process scoring highly (Abdullah & Evans, 2012). A recent study examining student experiences in Malaysia reported moderate satisfaction (Sidhu et al., 2013). The number of

supervisors involved influenced the level of satisfaction with students that had more than one supervisor reporting satisfaction. Of interest were the factors students considered affecting their satisfaction with supervision. Three categories of factors were evident and these were personality, professional related issues and organisation matters. Table 1.1 below outlines the specific factors found from several sources (Heath, 2002; Lee, 2008; McCallin & Nayar, 2011; Boehe, 2016).

Table 1.1: Factors Affecting Supervision Process and Outcomes for Post Graduate Students

Category of Factors	**Specific Factors Related to Supervision Process**
Personality	Positive working relationship with supervisor, supervisor that is friendly, motivating energising and motivational. Clash in personality related to age, culture, language, effective communication, decision making and working attitude.
Professional	Inadequate knowledge of the subject matter on the part of the supervisor, no research interest, playing an effective role in identifying suitable reading, data analysis and research methodology.
Organisational	Supervisor too busy, no management of students, inadequate knowledge on rules of submission, timely submission, guidance and availability.

These factors can be further situated as part of a broader conceptual analysis as shown in Figure 2.1 (Heath, 2002; Lee, 2008; McCallin & Nayar, 2011; Boehe, 2016).

Schools and departments within universities have developed supervisor training courses to counter student perceived problems. The supervisor training has focussed on the process of supervision and included the amount of supervision, process of selecting topics approach to supervision i.e. individual versus group frequency of meetings, personal relationship with students. Other topics included in supervisor training revolve around the preparation of thesis, examination process, student selection, role of the HOD or HOS, supervision as part of teaching and training required by students prior to embarking on their

post graduate studies (Moses, 1984; Ismail et al., 2013; Sidhu et al., 2013). Not many of the studies focussed on how results were obtained through these various components of supervision. The study by Geber (2010) referred to the internal coach who in her programme was not the supervisor. The coaching intervention undertaken was effective in the PhD programme however the coaching process was undertaken as an external process to the supervision process (Geber, 2010). This raises the question about the efficacy of embedded coaching. In this case, embedded coaching refers to coaching as part and parcel of the supervision process. Apart from one study that Geber and Bentley (2012) undertook in the Faculty of Health Sciences, no literature could be found that examines coaching as part of supervision and it is not known how much of it is already taking place if at all. Ultimately the questions asked include: can the supervisory process be enhanced by understanding coaching practices and concepts already embedded in supervision as experienced by students and theoretically what type of coaching and which skills should be enhanced?

Supervision quality is debatable but one aspect that is clearly identified as contributing to the outcomes is the supervisors' attributes and consequent style (Boehe, 2016). Several studies have looked at supervision experiences with the main outcome being to outline the roles of supervisors and the student experience. One of the solutions that have been promulgated has been the need to support students. Geber (2010) has done this by including a component of external coaching. The question is how much of what the postulated supervision practice is actual coaching in practice. Given the reduced funding to higher education institutions another question is tabled: "Is it possible to enhance what already exists in terms of coaching practice within the current supervision practices at the Faculty of Health Sciences at the University of the Witwatersrand"? A proxy indicator for this would be how the students experience supervision and further examination of how this experience aligns to being coached and coaching practices. This is especially important given that

coaching is defined as a process that unlocks potential and involves a process of learning (Whitmore, 2010).

Some research has been undertaken on student supervision and coaching experiences in the Faculty of Health Sciences University of the Witwatersrand (Geber & Bentley, 2012). However, no study has been done to establish what the experiences of supervisory practices are for PhD students in the Faculty of Health Sciences which is an important starting point. Once established the experiences have the potential to be examined for alignment to coaching practices conceptually. As such, supervision training may include a raised awareness of the need to consciously include coaching practices and to the advantage of putting into practice coaching practices.

1.3. PROBLEM STATEMENT

1.3.1. Main Problem

Post graduate student completion and for this study the PhD student throughput is an important part of the university goals (University of the Witwatersrand, 2013). One of the most important elements that contribute to student throughput and completion is supervision in terms of its availability and quality (Lee, 2008). In studies that sought to establish student and supervision experience the quality and extent of supervision was identified as an important factor (Pole, Sprokkereef, Burgess, & Lakin, 1997; Haksever & Manisali, 2000; Heath, 2002). It has been postulated that the supervisor provides an important role in coaching and mentoring students (Pearson & Brew, 2002; McCallin & Nayar, 2011). Pearson and Brew (2002) points out that developments towards producing an autonomous graduate and one who is able to function in the work place call for the identification of coaching and mentoring roles for supervisors is an important in the context of supervision. By its very definition coaching involves a series of activities that aim to develop and improve an outcome and may contribute to coping (Passmore & Fillery-Travis, 2011) Self-efficacy is considered an important concept in academic achievement (Bong & Skaalvik, 2003). Overall, Deane, and Peterson (2011) refer to the need for students to

attain self-efficacy in research related activities and have assessed the effect of specific supervision activities on students' research self-efficacy. In this study, support for the student from the supervisor relates to academic activities, supervisor availability, support for personal issues and coaching practices. The experience of students had not been examined for the extent to which the tasks that would constitute coaching are taking place in the Faculty of Health Sciences supervision practices. This study assessed the experience of students in the Faculty of Health Sciences in terms of academic, personal, coaching and autonomy support. Supervisor availability and resultant student self-efficacy and satisfaction with supervision was also established.

1.3.2. Sub Problems

The first sub-problem was that the supervision experience of PhD students in the Faculty of Health Sciences (in terms of academic, personal and autonomy support provided by supervisors in addition supervisor availability and coaching practices) is unknown.

A subsection to this problem was: the student's level of self-efficacy was unknown.

The second sub problem was: the level of satisfaction with all the different aspects of supervision experience was unknown.

The third sub problem was that the extent to which the experience of supervision behaviour including coaching, academic, personal and how autonomy support influences student self-efficacy and satisfaction was unknown. Therefore the research questions are outlined below.

Research Questions

The research questions are therefore:

- What are the current supervision experiences of PhD students in the Faculty of Health Sciences at the University of the Witwatersrand in terms

of supervisor availability, coaching practices, academic, personal and autonomy support provided by supervisors?

- The second research question is how satisfied are PhD students with their supervision experience?
- The third research question is what factors influence their level of satisfaction and attainment of self-efficacy?
- The final research question is to what extent do the different supervisor behaviours influence the outcomes of student satisfaction and their attainment of self-efficacy?

Therefore, the objectives of the study were:

1. To determine the extent of academic, personal and autonomy support experienced by students
2. To establish the extent of coaching practices experienced by students
3. To establish the supervisors' availability
4. To establish the student's level of self-efficacy.
5. To establish the level of satisfaction with all the different aspects of supervision experience.

1.4. SIGNIFICANCE OF STUDY

To determine to what extent supervision behaviour including coaching, academic, personal and autonomy support influences student self-efficacy and satisfaction with supervision.

There are many assumptions about what works in terms of supervision for doctoral students. Cultural and contextual differences certainly influence the "how" question for supervision in terms of how it is received and perceived by students (Evans & Stevenson, 2010). What is needed by each student is unique to the student and should be negotiated and discussed between the student and supervisor (Pearson & Brew, 2002). Supervisors are expected to have a blend of skills that allow them to handle relationships and diversity (Holdaway, Deblois, & Winchester, 1995). To understand how to improve the skills and quality of supervision it is important to understand student

experiences. Furthermore, alignment of these experiences to the kind of supervision provided and to identify gaps in the skills required to meet the areas where supervision is not optimum. The Faculty of Health Sciences has in the past provided an array of skills related courses for post graduate support but had not examined how students are experiencing supervision. Lee (2008) recommended the need to explore student experiences against the concepts identified through supervision of research and identify if the experience of the student covers all or one or two of the concepts. An examination of how the concepts of coaching align to the supervision experiences could be used to inform supervisor training, refinement and development.

The study could provide additional guidance to the Faculty of Health Sciences on how to strengthen supervision in its different doctoral programmes. Evidence on effective guidance in supervision, may potentially benefit the University for the Important Output Goal of post graduate through-put in the long run and better supervision for the students undertaking PhD studies.

1.5. DELIMITATIONS OF STUDY

- Post graduate doctoral students from the Faculty of Health Sciences were approached for inclusion in the study.
- Students who have been registered for six months or more were included in the study.
- Graduates who qualified in the last year were also invited to participate in the study
- The study utilised a predominantly quantitative approach and only focussed very narrowly on the qualitative aspects. This allowed the researcher to draw on previous work using similar instruments in this area of study and undertaken in other parts of the world.

1.6. DEFINITION OF TERMS

Coaching	:	**Coaching** is explained as “a human development process that involves structured focused interaction and the use of appropriate strategies tools and techniques to promote desirable and sustainable change for the benefit of the coached individual” (Cox, Bachkirova, & Clutterbuck, 2014).
Mentoring	:	**Mentoring** has been defined as a relationship between two people in which one person has greater experience and or expertise teaches and counsels the other to develop professionally (Morrison-Beedy, Aronowitz, Dyne, & Mkandawire, 2001).
Supervision	:	“A knowledge and relational process which takes place in the encounter between doctoral student and supervisor” (Franke & Arvidsson, 2010).

1.7. ASSUMPTIONS

In the context of this study current students and students who have recently completed their PhD studies were included. The assumption was that they would reflect on current past and present experiences. An important assumption is that as mature students these participants have already defined and located what the PhD study meant for them.

1.8. STRUCTURE OF THE REPORT

Chapter 1

Chapter 1 introduces and contextualises the research. A detailed outline of the purpose, context and significance of the study are presented. Delimitations, assumptions and definitions relevant to this research have been provided in this section.

Chapter 2

Chapter 2 reviews the existing literature in the field to provide an evidenced based summary of the topic and a critical review of what has been previously researched. A conceptual framework outlining the concepts pertinent to this research topic is provided. Thereafter the chapter reviews the literature on the elements and types of supervision as well as the experience of supervision by

both students and supervisors. The supervisors' role is examined and finally the link to coaching and coaching within supervision. A second part of the literature review gives a detailed review of coaching as a concept how it is defined and the elements that are included.

Chapter 3

An outline of the research methods and underlying assumptions are given in chapter 3. A detailed description of the design, paradigm and data collection and statistical analysis and interpretation methods used in undertaking the research are explained. The inclusion and exclusion criteria of the participants are provided. Validity and reliability of the instrument is described and the results of the pilot study. Limitations of the research and how they were countered are also described in this chapter.

Chapter 4

The results of the study are presented. Results are organised in terms of the components of supervision studied as well as in answer to the objectives of the study.

Chapter 5

The results are discussed in chapter 5. The researcher critically evaluated these results within the context of existing literature and critical analysis. Results were compared to evidence found in the literature review presented in chapter 2 as well as further literature that responds to results pertinent to the study context.

Chapter 6

In chapter 6, conclusions are drawn from the results and discussions. The researcher addresses the problem statements and discusses the implications this research may have on supervisors, future training of supervisors and support needed within the faculty of health sciences. Recommendations for future research are suggested.

A list of references is included. The appendix provides details on ethics approval the research instrument, and detailed analysis that provides further information for the reader.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. INTRODUCTION

Relevant literature on supervision and coaching is included in this review. The search engines used for this review were the Cochrane Library, EBSCO HOST (Academic Search Complete, CINAHL, ERIC, Science Direct, SAGE, Pub Med and Google scholar. All articles from 1995 were reviewed. In addition, important relevant articles prior to this are included. The key words/phrases used to obtain the relevant articles were supervision, post graduate students, PhD, supervisory style, supervision experiences. A conceptual framework to guide the literature review was outlined as follows:

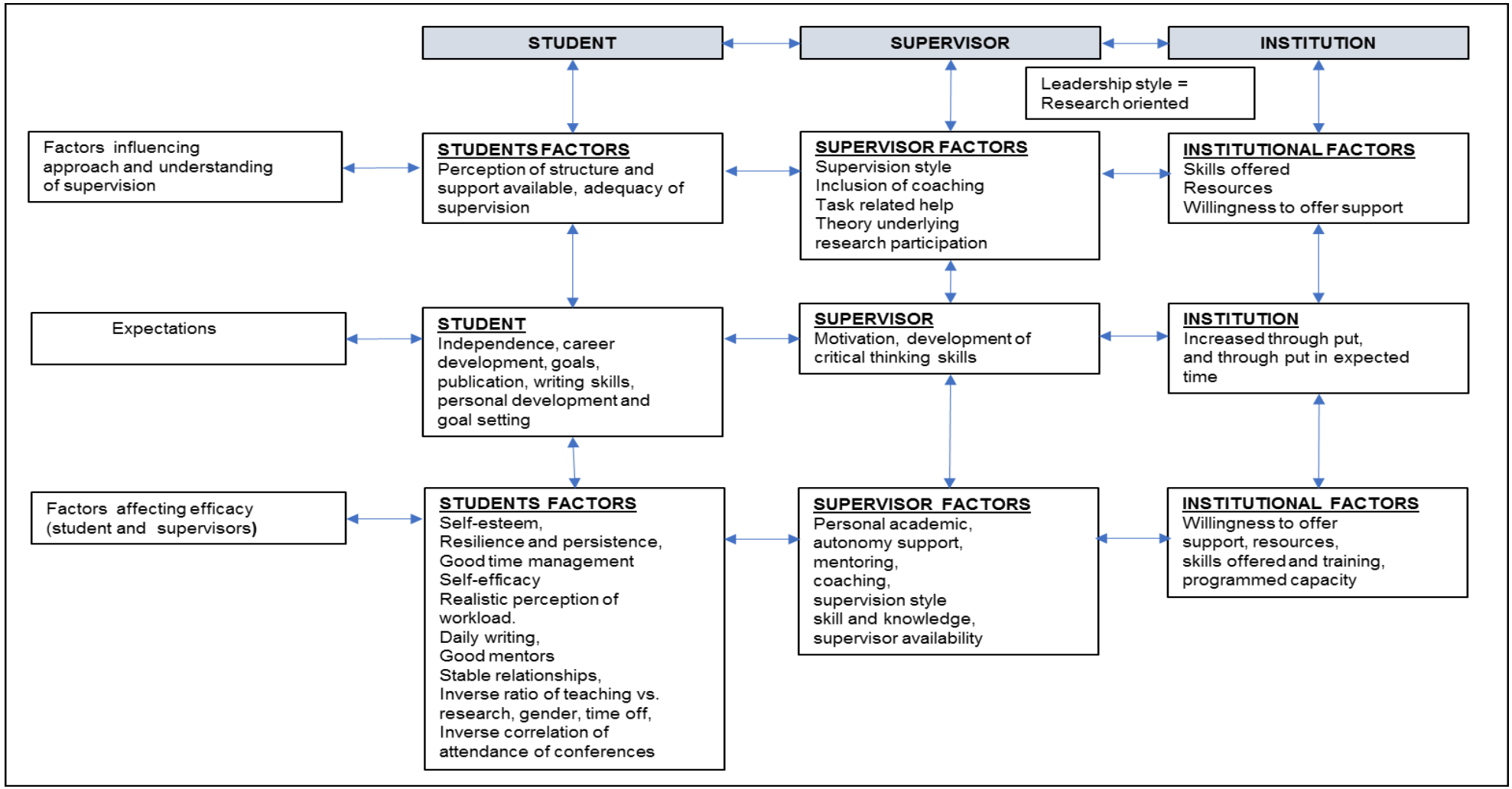

Figure 2.1: Conceptual Framework: Factors Influencing Outcomes of Supervision

2.2. BACKGROUND

This literature review outlines the key components of student supervision. The elements and types of supervision are outlined and an overview of the types of research literature on supervision is outlined in Table 2 in three separate sections Tables 2.1-2.3. The literature on the experiences of students and supervisors is also reviewed examining the key outcomes such as type of supervision, underlying concepts and pedagogy of supervision, specific experiences of students. The role of the supervisor is also examined through the literature and finally the link to coaching. Studies that have included coaching specifically as part of supervision have been reviewed. Specific coaching literature that is aligned to student supervision is reviewed in detail in part two of the literature. Included is the role of the institution.

2.3. SUPERVISION AND SUPERVISION EXPERIENCES OF DOCTORAL STUDENTS

Supervision is not necessarily defined in all the literature reviewed. The meaning and the elements of supervision are discussed in detail in most of the literature (Gatfield, 2005; Evans & Stevenson, 2010; Franke & Arvidsson, 2010; Boehe, 2016). In all the discussions of supervision are key elements implied in the definition such as that it involves a relationship (Boehe, 2016). Project management is also seen as part of supervision thus including the need for management of both the student and the process. Research supervision is referred to as a relationship between supervisor and student where learning, knowledge and relationship are central to the process (Franke & Arvidsson, 2010).

It is postulated that there are different types of supervision for different students and that different models have been put forward though with little evidence of which ones work best (McCallin & Nayar, 2011). Three models suggested are the traditional model, group supervision which could also be the cohort model and the mixed model (Govender & Dhunpath, 2011; McCallin &

Nayar, 2011). The traditional model is the one on one didactic model involving the supervisor and the student. Group supervision involves the supervisor and more than one student thus creating relationships between the supervisor and the student and the student with other students. The cohort model brings a group of students together in a very structured way. The mixed model is a combination of the other models with the inclusion of online and IT resources (Govender & Dhunpath, 2011; McCallin & Nayar, 2011).

Within each of these models the elements of research supervision remain the same. A host of studies have been undertaken to establish student supervision needs and supervisor attributes. The bulk of studies are of a qualitative nature using a phenomenological approach with a few quantitative studies. A preliminary literature search for systematic reviews in student supervision revealed only one scoping review that focussed on interdisciplinary doctoral research (Vanstone et al., 2013). A search of four data bases has not yielded a systematic meta-synthesis of the predominantly qualitative research. There are a few but not as many quantitative studies in post graduate and doctoral supervision. Table 2 is shown in three tables namely: Tables 2.1, 2.2, 2.3, for the sake of clarity and summarising a lot of information. These three tables outline some studies undertaken to establish student and supervisor experiences that have been reviewed so far.

Table 2.1: Key Outcomes and Objectives from Studies on Student Supervision

Author and Year	Type of work	Context and Aim	Key Outcomes
Moses (1984)	Theoretical	A description of supervision around student problems.	Supervision styles and elements of supervision (inductive and deductive). Problems reported by students (personality professional and organisational).
Pole, Sprokkereef, Burgess, and Lakin (1997)	Phenomenological (Interviews) as part of an existing project	To determine the extent to which student needs and their development in their research progression	Trajectory of student experience from early middle and late stages of supervision (highlighting intellectual, practical and orientation aspects). Problems between supervisors and students and the extent to which supervision should take place.
Haksever and Manisali (2000)	Questionnaire survey	To assess supervision requirements using a supervision framework	Overall supervision requirements (personal indirect and direct help. Key outcome-Need for adaptable supervision strategy.

Table 2.2: Key Outcomes and Objectives from Studies on Student Supervision (Cont)

First Author and Year	Type of work	Context and Aim	Key Outcomes
Pearson and Brew (2002)	Scholarly	Describes a framework to supervisor development	Defines supervision training and the education process Pedagogical theories (learning through self-awareness). Locates the need (political & economic) pressure to address supervision and the factors that influence it. Outlines post graduate skills from the students' perspective (specialist, generalist, self-reliant and team) introduces the role of mentoring and coaching in supervision. Includes dimensions of research (domino to journey) finally outlines a supervision course outline.
Lee (2008)	Phenomenological (Interviews)	To identify concepts of research supervision	Concepts identified included functional, emancipation, critical thinking, emancipation, developing relationships. **Nb**. influence of the supervisors' own experience on their supervision process.
Lee and Green (2009)	Exploratory qualitative study (group discussions)	Exploring supervisor perceptions and experiences of research supervision process within professional doctorate programme	Key themes supervision style not adapted, pragmatism (students wanting focussed professional guidance vs. research guidance, broken discourse independence and facilitation (autonomy vs. guidance in critical thinking), partnership and equality, posturing, supervision and professional issues .

Table 2.3: Key Outcomes and Objectives from Studies on Student Supervision (cont.)

First Author and Year	Type of work	Context and Aim	Key Outcomes
Overall, Deane, and Peterson (2011)	Quantitative survey	The extent to which student academic support, personal sand autonomy support was associated with self-efficacy and satisfaction with supervision	Academic and personal support was associated with better satisfaction with research supervision. Friendliness and being supportive psychologically did not result in high levels of confidence and self-efficacy.
Govender and Dhunpath (2011)	Intervention research (exploratory study	To explore the experiences of students in a PhD cohort model	High quality input allowing benefits such as pacing, sharing of common experiences, using cohort as a resource, given a voice, autonomy growth, creation of intellectually stimulating environment. Negative experience – seminars in data collection phase less useful, too many supervisors, tension with supervisors.
McCallin and Nayar (2011)	Scholarly literature review	Analysis of key issues influencing PG supervision	Outlined the research context including funding, completion rates and increasing enrolment). Faculty issues and supervision pedagogy and models of supervision (traditional group and mixed models).

Table 2.4: Key Outcomes and Objectives from Studies on Student Supervision (Cont)

Orellana, Darder, Pérez, and Salinas (2016)	Cross sectional study	Exploring the nature of supervisory relationships and supervision elements form the student and supervisor perspective	Students and supervisors in this study differ in perceptions of need. Supervisors apply indirect intervention supervision style with autonomy as an important outcome. Students look for the supervisor to be the facilitator, teacher and supporter while the supervisor views themselves as the critic, freedom giver and supporter and director. Students need for autonomy does not stand out
Tian and Singhasiri (2016)	A qualitative exploratory interpretive case study design	Explores the use of power in communication between supervisors and supervisees in face to face dialogue	Supervision process presents an opportunity for knowledge transfer in spite of the different philosophical approaches social constructionism versus power relations proposed by Foucault. The supervision dialogue allows empowerment of the PhD student
McCulloch, Kumar, van Schalkwyk, and Wisker (2016)	A document audit examining excellence in supervision	Examines national codes of practice and frameworks and the concept of excellence in supervision and makes recommendations on new ways of thinking about research excellence	Key points- supervisor contributes to excellence and the input of a single individual contributes to the complex outcome of the completion of a doctoral thesis. It is difficult to define excellence in supervision because of complexity however one of the key criteria of excellence is the ability to be adaptive and flexible in the facilitation of the doctoral students learning. There is need for clarity regarding a supervisors role especially if there is team supervision

Many different elements emerge from the array of literature that is available on doctoral student supervision and related literature. Four major themes emerged from all the literature reviewed namely supervision styles and concepts and components associated with supervision. Students' experiences, expectations and the facilitators and barriers of successful supervision are also clearly discussed in much of the literature. The outcomes are synthesised in the discussion under elements of research in the next section.

2.3.1. Attributes of Post Graduate Students and Factors Affecting their Success

The purpose of postgraduate supervision is to produce an independent scholar competitive in the knowledge area, who is capable of navigating the research arena in his or her area of specialisation and management the work space (Pearson & Brew, 2002; Franke & Arvidsson, 2010). Students attributes that are prized are out lined by Pearson and Brew (2002) as the ability to problem solve and display good thinking skills in a broad rather than narrow orientation. PhD Students should be able to initiate and transfer knowledge and technology. Pearson and Brew emphasise the ability to communicate effectively and work in different team and work contexts (Pearson & Brew, 2002).

Related to the attributes, Doctoral Students are expected to attain a range of skills in their PhD journey. Among the skills are communication and presentation, good work practices and collaboration skills, information technology, technological skills, manufacturing practices intellectual property management, translation of knowledge to new areas, practical skills and knowledge, understanding of broader literature, skills in scientific method, statistics design and modelling and handling as well as laboratory practice (Pearson & Brew, 2002). This list of skills has been categorised into four components specialist, generalist, self-reliant and group team skills such as communication (Pearson & Brew, 2002)

Factors that are considered as contributing to student success are the availability and quality of supervision (Heath, 2002). The availability of supervision and time allocation by the supervisor is challenged by the changing environment where there are growing numbers of students but diminishing or static numbers of experienced supervisors (Heath, 2002).

Related to the availability is the student – supervisor relationship with appropriate and effective communication (Haksever & Manisali, 2000). In his study using a questionnaire to establish the students view point in an engineering field. Haksever and Manisali (2000) identified three categories of factors related to supervision that affect the students' possible success. Personal help, indirect help and direct research related help. Therefore, the student may require under personal help aspects unrelated to research as well as general support, motivation, logistical support in obtaining accommodation or transport. Indirect support includes the provision or facilitation of contacts and initial help in literature identification and searching. Finally direct help and support involves the crux of research skills such as methodology integrity, critical analysis and precise direction of the research (Pole et al., 1997; Haksever & Manisali, 2000).

Of interest are added dimensions of support factors that emerge depending on the model of supervision used (Govender & Dhunpath, 2011). Other support factors include formation of communities of practice that help reduce feelings of isolation. In Govender and Dhunpath (2011) study, the need to build confidence and the opportunities created to have a voice and build autonomy are clearly enunciated and have been supported in other literature (Manathunga & Lant, 2006; Franke & Arvidsson, 2010; McCallin & Nayar, 2011) as important for successful development of a scholar in the supervision process. The supervisors' role in autonomy support is stated as important (Manathunga & Lant, 2006).

2.3.2. Supervisors Characteristics, Development and Roles

For a supervisor to be competent it is proposed that supervisors develop beyond their technical skills and expand their leadership and education skills (Pearson & Brew, 2002). Being adaptable and not stuck to one model is encouraged and to do the supervisor must understand research and supervisory practice. Being adaptable and understanding research and supervisory practice is important because curriculum outcomes which include learning outcomes in differing contexts, institutions and disciplines have to be negotiated (Pearson & Brew, 2002). The authors propose one of the most important steps is for supervisors to reflect on their conceptions of research and based on studies by Brew (2001) propose dimensions of research conception (Brew, 2001; Stubb, Pyhältö, & Lonka, 2012). The framework proposed by Brew (2001) relates to what the research supervisor perceives as research supervision and what meaning they give to their conception of research. Four categories of what is perceived are the domino, layer, and trading and journey conception. These four categories lie on a continuum and relate to what the researcher views as immediate and in the forefront ranging from:

1. Domino elements in a linear fashion comprising a series of tasks, where the focus is on solving external problems;
2. Layer elements with ideas that have a hidden meaning, but still focussing on external problems and the researcher is separated from the process and focussing on a series of theories;
3. Trading – is where elements related to products that are linked together in relationships of recognition and reward and this makes the researcher more present and focussing on production. The researcher focuses on data analysis and its meaning but the researcher is still absent from the focus of awareness and finally;
4. Journey-personal issues and dilemmas that the researcher has become aware of and linked to his or her career, in this domain the researcher focuses on the data being analysed. In this case the researcher is focussed inwards

paramount is the concept of awareness leading to career transformation. In the end the researcher is transformed (Pearson & Brew, 2002; Lee, 2008). The second layers to the identified dimensions are the dimensions of scholarship. This is again illustrated by a continuum but distinct category of structural dimensions:

- Quality conception: where the important overt activities are attention to the details of accuracy, footnoting, critical thinking rigor and perfectionism. In this case scholarship is interpreted in how professionalism is demonstrated.
- Preparation conception: in this case background literature and related literary activities provide context to the research. The preparation for research is demonstrated by literature.
- Creating conception: background literature and the new knowledge and discovery and this is related to the belief that new knowledge is fitted into pre-existing knowledge
- Integrating conception: this dimension includes the literature, new knowledge and additionally concern with dissemination and teaching. The extension of dissemination contributes to knowledge translation and making a contribution to society.
- Research conception: in this dimension the confusions and ideas for the institutions policies and ideas are in the forefront. Making sense of the puzzlement of ideas contributes to making sense of scholarship. Scholarship is equated to research and viewed as being a standalone and useful concept on its own.

These conceptions of research are seen as cross cutting and influencing research at every level (Lee, 2008). Other frameworks and conceptions have been described in the literature. One proposed by Lee (2008) delineates the supervisor's actions, knowledge and skills as well as the student's reaction. Lee (2008) developed this framework by examining the literature and interviewing 12 supervisors, and two PhD students. Furthermore, she

undertook a focus group discussion with PhD students to enrich the data. Similarities in the frameworks have not been overtly compared in the literature.

The three dimensions are described for each role under the dimensions of functional roles, such as rational progression through tasks and align to a project management professional role and directing. Enculturation is aligned to the dimension of layer and integration, as described in the framework described by Pearson and Brew (2002). It focuses on becoming a member of the research community and the supervisor takes on tasks such as gate keeping. Critical thinking is seen as one of the central elements in a research supervision framework. Interesting aspects are outlined by Lee (2008) such as the cultural orientation of critical thinking proposing that it is a western tradition. Lee outlines the key elements of critical thinking as identifying the problem and linkages and revealing interpretations that inform the solution and the answer. Emancipation is closely linked with facilitation and a mentoring role and is closely related to the final aspect of this framework relationship development (Lee, 2008).

Relationship development and the impact of poor relationships are expanded upon. The interviews revealed that poor match in styles and character. The interviewees all alluded to the need to a good relationship and identified in the interviews were a variety of strains. In summary, the key theme that emerged was the tension between profession and personal roles where the supervisors concern with quality contradicted the students wish to finish. The perception between dependence and independence on the part of the student was tested across the five elements mentioned earlier of function, enculturation critical thinking, emancipation and relationship with a continuum across these five elements that define the professional role on the functional end and personal self on the relationship development (Lee, 2008). There is still much research to be done in establishing what approach to research supervisors apply. The author concludes that students report the use one particular approach while

supervisors see themselves as flexible and thus the hypotheses that there may be a chasm between espoused and lived theory (Lee, 2008).

The issue of flexibility is topical in the literature (Boehe, 2016). Reasons for the need for flexibility outlined are the mismatch between student and supervisor goals and outcomes, diversity of post graduate students, driving motivation for undertaking doctoral studies and supervision styles (Bendix Petersen, 2014; Boehe, 2016). It is postulated that no single supervisory style is suitable for all research situations and thus contingency factors are proposed as part of the solution to research success. The contingency approach seems to revolve around the interplay between environment, management and performance variables (Boehe, 2016). The key characteristics of supervisors outlined in the literature are the ability to teach, guide and supervise. In addition must be able to role model the doing of research tasks and understand the pedagogy of supervision (McCallin & Nayar, 2011). Other characteristics include intelligence, good listening skills, having a positive attitude about themselves and being a good listener (Haksever & Manisali, 2000; Bucky, Marques, Daly, Alley, & Karp, 2010).

All the characteristics of the supervisor influence their supervision style and where they put emphasis, Overall et al. (2011) proposes that a combination of supervisor behaviours that encourage student autonomy, academic competency and less on nurturing.

2.3.3. The Supervisors' Role of Coaching and Mentoring

Several authors outline the role of the supervisor as giving supervision, teaching support and guidance. Some literature expands on how supervision has changed with the supervisor needing to pay closer attention to time and project management (Halse & Malfroy, 2009). It is clearly stated that the role of the supervisor should go beyond learning technique (Pearson & Brew, 2002). To attain expert performance and develop proficiency and know-how

requires strategies such as coaching (Pearson & Brew, 2002). Mentoring in learning how to network and elevating ones scholarship and education experience has been assigned to the domain of mentoring (Pearson & Brew, 2002). Mentoring has been seen as important for skills required to cope with differing contexts, cultures and placements (Johnson, 2002). Mentoring and coaching is implied in many scholarly articles but only the work done by Geber, Bentley and Visser has conducted interventions on coaching in post graduate and specifically doctoral supervision (Geber, 2010; Geber & Bentley, 2012; Geber & Visser, 2012; Geber, 2013).

Mentoring and coaching are discussed separately and Pearson and Brew (2002) quote Collins et al (1989 pg. 457) and interpret coaching as set in a "*core set of methods designed to help the student acquire an integrated set of cognitive and metacognitive skills".* They describe particular skills as modelling, scaffolding and fading. It is acknowledged that coaching may not only be dependent on the supervisor. Coaching definitions seem to refer to the attainment of skills, improved performance and personal development (Baron & Morin, 2010). Geber (2010) refers to developmental coaching in a study where a coaching project was implemented to enhance academic progress.

In the general literature on coaching, there are many definitions of coaching that are offered. Each definition places emphasis on one aspect of benefit from coaching namely: human development (Palmer & Whybrow, 2014), performance (Kilburg, 1996), producing results (International Coaching Federation, 2016), effectiveness (Rogers, 2012), meaningful communication for promoting success (Worldwide association of business coaches 2007). Whitmore (2010) refers to unlocking a person's potential.

Bresser and Wilson (2010) states that at the heart of coaching, is empowerment through guided learning, improved performance and personal

growth. The perceived benefits of coaching are outlined as increased motivation , heightened self-awareness, goal attainment personal and organisational performance, attainment of work life balance, decision making and the ability to manage change (Neenan & Palmer, 2001; Bresser & Wilson, 2010; Godskesen & Kobayashi, 2016). Griffiths (2005) includes the ability to communicate better, problem solve, better reception of feedback and more effective thinking strategies, better clarity of what they want increased self-discovery, confidence and self-expression (Griffiths, 2005).

General there is a dearth of literature on coaching specifically in doctoral education (McCarthy, 2012). A recent study on coaching as part of doctoral supervision distinguished two pedagogies for doctoral education. A pedagogy of support and provision and one which is considered a sociocultural view (Godskesen & Kobayashi, 2016). The sociocultural view is described as one where the student navigates his environment, identifies resources and very self-directed against the view that the support and provision approach is considered as potentially viewing the student as incompetent and needy (Godskesen & Kobayashi, 2016). The student who does not possess these skills may need support and guidance to sharpen and develop them and several studies have demonstrated how these potentially existing skills can be enhanced by using approaches such as coaching. One of the approaches to coaching that may cater for doctoral student supervision is developmental coaching.

By definition developmental coaching is the interaction between two people, often a manager and employee aimed at helping the employee to learn from her job and promote development (Hunt & Weintraub 2002 p.5 quoted in Cox et al., (2014, p.p.220). In a programme that focuses on MBA students' awareness and competency in coaching, the term developmental coaching has been described relative to how MBA students are prepared for coaching roles (Hunt & Weintraub, 2004). The behaviours that managers who have a

propensity to coach were described by people working under managers as having:

- the ability to elicit in students' self-development and self-discovery.
- constructive ways to develop and offer solutions.
- listening skills and creating opportunities to conduct coaching interviews often and push subordinates to perform within realistic standards while creating opportunities for performance (Hunt & Weintraub, 2004).

Furthermore, Hunt and Weintraub (2004) outline essential skills for monitoring the employee such as skills for assessing opportunities to improve, interviewing to manage the coaching interaction, giving feedback for sharing observations and proposing suggestions. In essence the literature on supervision alludes to these same skills of monitoring progress, encouraging standards, encouraging personal growth and enhancing self-esteem (Moses, 1984; Haksever & Manisali, 2000; Lee, 2008; Lee, 2009; Carr et al., 2010; McCallin & Nayar, 2011). Kearns, Gardiner, and Marshall (2008), tested a cognitive behavioural coaching intervention to address what they identified as defeating and self-sabotage behaviours. Some of the behaviours were described as busyness, disorganisation, perfectionism and procrastination. All behaviours showed improvement except that of relationship with the supervisor.

In South Africa, Geber (2010) describes the outcomes of intervention studies where coaching was added to postgraduate research work. The participants found the addition of coaching useful and reported benefits in increased publications and presentations. They reported the availability of unbiased listener and perspective useful. Regular meetings and the opportunity to deal with critical incidences were of benefit. Self-development skills such as improved self-awareness, dealing with resultant guilt and better time

management was also experienced and reported. Similar results were also reported in other external coaching interventions implemented in other faculties (Geber, 2010; Geber & Visser, 2012). The model of coaching implemented by Geber (2010) was effective but expensive. A subsequent programme was piloted in the Faculty of Health Sciences termed coactive coaching (Geber & Bentley, 2012). Tangible outcomes for the participants depicting effectiveness were an increase in publications and presentations and completion of their studies. Reported improved skills in time management, stress reduction, alignment of self-awareness and research goals were more difficult to measure. In Godskesen and Kobayashi (2016) study, they analysed the outcomes of coaching intervention carried out in a doctoral programme and identified several benefits that aligned well with the literature. Benefits such as a heightened self-awareness, improved relations and ability to confront and solve problems, build relations and their own self efficacy was enunciated.

Apart from these studies very little could be found that elaborates on coaching in post graduate and doctoral supervision apart from the work done by Geber and colleagues. The next section of this literature is reviewed for models of coaching that have elements that align with the elements of supervision. Cognitive apprenticeship in psychology seems to be aligned to the term academic support which is used in supervision (Deuchar, 2008). On the other hand developmental coaching has been aligned to developing the young professional or learner (Laske, 2003).

One interesting concept that has been linked to student self-efficacy is autonomy support. Autonomy support may be a concept closely linked to coaching as it implies encouraging decision making and self-directed behaviour by the student (Overall et al., 2011). All definitions reviewed refer to coaching as a process or relationship that seeks to attain learning and development and are related to performance in a specific context (Spence & Grant, 2007; Passmore & Fillery-Travis, 2011). Several authors have mentioned coaching and mentoring as part of supervisors remit (Lee, 2008;

McCallin & Nayar, 2011; Boehe, 2016). No literature has been found that expands on what this means for a supervisor

A review of the literature to inform the elements of coaching and answer the question: “what constitutes coaching?” revealed a selection of coaching behaviours, attributes and skills (Grant, Cavanagh, & Parker, 2010). Empathy, listening skills, an ability to display credibility, confidence and integrity were among the attributes listed. In addition the skills of probing and challenging, the ability to share one’s experiences, maintain boundaries while preserving confidentiality and being flexible in one’s work schedule are also explained (Hall, Otazo, & Hollenbeck, 2000; Grant et al., 2010). Other elements of coaching competency are outlined in the European mentoring and coaching council competency framework and are outlined under eight domains namely: self, values and coaching approach, cognitive skills, domain specific knowledge expertise and focus, process of coaching, communication skills and facilitating professionalism and practice building (Grant et al., 2010).

Currently there is demand for an increased knowledge worker (Candy, 2000) and concomitant increase in post graduate education in particular PhD education has resulted research focussed on this area. Findings have shown that the time taken to completion, enrolment patterns of students and funding models have changed putting pressure on the issue of postgraduate supervision (Gill & Burnard, 2008). Post graduate supervision has therefore been examined in terms of funding, institutional and policy factors, enrolment and type of students and availability, type and quality of supervision (Franke & Arvidsson, 2010; Geber, 2010; McCallin & Nayar, 2011; Boehe, 2016).

2.4. CONCLUSION OF LITERATURE REVIEW

This literature review reveals that the area of supervision has been studied and published on extensively. The review reveals student supervision models and many student and supervisor factors that affect the two players individually and collectively. The factors are categorised into student

supervisor and institutional factors and furthermore into personal academic and general academic institutional factors. Pedagogical questions are also raised and proposed frameworks and concepts outlined. Importantly supervision is described as needing adaptation in order to provide adequate and appropriate supervision. Coaching and mentoring are acknowledged as tasks the supervisor should and is assumed to be carrying out. Four intervention studies that included coaching in the South African context, Europe, Australia's and one in China were reviewed for their results. No literature was found that looked at student experiences in the health science setting or examined it for application of coaching practices and specifically the extent and type of supervision support given.

CHAPTER THREE

3. METHODOLOGY

A simple survey approach was used for this study (Cresswell, 2003). The research questions put forward were aimed at eliciting the extent and type of supervisory support given to PhD students based on a predetermined and previously validated research tool. One aspect of the tool also determined the extent of self-efficacy attained by the PhD students. This research aligned with the positivist approach where the research is trying to establish the extent of the predetermined phenomena using a survey instrument.

3.1. RESEARCH PARADIGM

A quantitative research paradigm (Cresswell, 2003) was predominant in this study. This approach aligns to the post positivist approach that aims to examine the variables associated with supervision and coaching. Data was gathered that is presented statistically depicting frequencies and inferential statistics. The research tool is constructed such that it uses a Likert scale. Predetermined concepts of supervisor support, student satisfaction and student achievement and research self-efficiency were taken from a study conducted by Overall et al. (2011). The extent of attainment of each of these concepts is measured to establish the level achieved therefore measuring how much of particular behaviours are experienced. Being able to measure these experiences is a proxy indicator of the behaviours of supervisors. Being able to quantify these behaviours may enable the faculty to see where the gaps exist and to what extent supervisors are practising coaching behaviours and by implication what training is needed.

3.2. RESEARCH DESIGN

The study comprised a cross sectional, correlational survey using structured questionnaires (Thomas, 2013). The research problem called for establishing PhD students' experience of supervision in terms of the phenomena: academic, personal and autonomy support. Self-efficacy and the extent of this experience were also established. To do this a survey was undertaken using a

questionnaire (Leedy & Ormrod, 2012) placed on an online platform. The concept of “level” indicates measurement and thus a survey approach was best suited to the problem as it measured the incidence of variables in this given population. The advantage of a survey interview is that it is relatively easy to administer especially if internet based technology is used. Sending the questionnaire via email had the perceived advantage of reaching respondents across an extended geographical area relatively easily. The disadvantage is that the return rate may be low as it is easy for people to say no when not face to face (Moule, 2015).

3.3. POPULATION AND SAMPLE

3.3.1. Population

The study population included all students registered for a PhD within a large South African University with sizeable Health Science Faculty. The sample frame was obtained from the Dean of research once permission was obtained from the Dean of the faculty (Appendix D). PhD students from the Schools of Clinical Medicine, School of Therapeutic Sciences, School of Physiology, School of Anatomical Sciences and School of Oral and Dental Sciences were invited to participate in the study.

3.3.2. Sample and Sampling Method

All students that are currently registered for more than six months were invited to participate in the study. Therefore purposive sampling (Leedy & Ormrod, 2012) was employed.

Inclusion criteria

Any student registered for a PhD for more than six months.

Any newly graduated PhD student (within 12 months of graduation).

Exclusion criteria

Any student registered for a PhD for less than six months.

Sampling method

Consecutive sampling was applied. A list of registered students was obtained from the faculty with the respective emails. Students were approached via email and reminders were sent at two weekly intervals for three months. Data was collected for a total of seven months.

Sample size calculation

Using the EPI programme the sample size was calculated using the following assumptions (Naing, Winn, & Rusli, 2006):

Size of the population = Total PhD students enrolled (450).

The expected frequency of the coaching and supervision behaviour factor (coaching practices and supervision behaviours) in this study is 50% and the worst case frequency based on the result furthest from the rate expected is 35% of the population at different confidence intervals is shown in Table 3.1

Table 3.1: Sample Size Calculation at Confidence Intervals 90-99.99%

Confidence Interval	**Study Sample**
90%	27
95%	37
99%	59
99.99%	108

The study therefore aimed to collect data from all participants and obtain a minimum of 59 participants which would attain a confidence level of 99%.

Table 3.2: Profile of Respondents

Registered Student	**Number to be sampled**
A PhD student who has been enrolled for 6month and more	421
A PhD student who has completed his/her study in the last year	51
School of therapeutic sciences	74
School of clinical medicine	111
School of anatomical sciences	30
School of physiology	34
School of Oral Health science and Dental medicine	1

3.4. THE RESEARCH INSTRUMENT

The questionnaire used in this study was adapted from a questionnaire developed and used by Overall et al. (2011) (Appendix A). The questionnaire is a closed questionnaire. Part A outlines the demographic data of the participants. Elements included age, gender, primary area of study, school of registration, type of registration, date of registration, number of supervisors, gender of supervisor, supervisors' primary area of interest and academic position of supervisor. Students were also asked if they attended PhD support groups with their supervisors.

Part two of the questionnaire required the participants to complete the measures about their primary supervisor and rate the level on a three point Likert scale. The questionnaire was designed on Red Cap. Demographic variables were captured in part A to describe the sample in terms of age gender and area of study. The supervisors' details were captured to ascertain their years of experience and area of expertise. Supervisor support comprises three main areas academic, personal and autonomy support, and coaching behaviours as experienced by the students. Resultant student self-efficiency was assessed by asking the students how confident the students are in performing research tasks The students satisfaction was assessed using a number of items such as " I feel satisfied with the way I am supervised" (Overall et al., 2011).

3.5. PROCEDURE FOR DATA COLLECTION

Once a list of emails was obtained the letter of information and consent was pasted into the red cap platform and sent to the PhD student and anyone newly graduated and within a year of graduation. Redcap automatically emailed and invited the student to participate in the survey by availing a link to the questionnaire. Once the student accessed the questionnaire they can complete the questionnaire. Red Cap can automatically save and give feedback to the student indicating that the questionnaire has been completed and their results will be shared with them as soon as the survey closes and the results have been analysed.

3.6. DATA ANALYSIS AND INTERPRETATION

The data was analysed using descriptive statistics to establish the extent to which the phenomenon was experienced. Each section was tested for internal reliability and correlations established across all measures as illustrated in Table 3.3.The data was analysed to meet the specific aims and objectives of the study (Leedy & Ormrod, 2012).

Table 3.3: Data Analysis Table

Objective	Variable and Type of Data	Data Analysis Test and Outcome (Boone & Boone, 2012)
To determine demographic and study details	Age Gender Type of study Supervisor characteristics (gender and experience).	Frequencies Measures of association with dependent variables
To establish supervision experience of PhD students in the Faculty of Health Sciences (in terms of academic, personal and autonomy support provided by supervisors) in addition supervisor availability is assessed.	Ordinal data – Academic support Autonomy support Supervisor availability personal support	Frequencies and mode Test for variability using principle component analysis
To establish the student's level of self-efficacy.	Self-efficacy questions	Frequency and mode Test of reliability
Examine what aspects of this experience links to coaching and mentoring practices.	Supervisor coaching behaviours	Frequency and mode Tests of reliability Test for association and correlation Multiple regression to test interaction between concepts.
Establish the level of satisfaction with all the different aspects of supervision experience.	Level of satisfaction	Frequency and mode Tests of reliability using Cronbach's alpha Test for association and correlation Multiple regression

3.7. LIMITATIONS OF THE STUDY

This study was conducted via an electronic survey. This method has the advantage of speed and convenience. However, the disadvantage is the lack of personal contact which makes it easy for the participant to ignore the invite. The concepts under study have been informed by literature and thus lived

experiences of post graduate students. The disadvantage of a quantitative study is that it limits the researcher to the phenomena that have been identified and the researcher cannot explore any emerging phenomenon further.

3.8. VALIDITY AND RELIABILITY

3.8.1. External Validity

The tool used in this study was adapted from a study done in New Zealand (Overall et al., 2011). The tool was developed using appropriate literature and was validated using expert opinion and consensus. The tool was adapted and coaching behaviours added. The same methodology of deriving the different elements from the literature has been used. Validation was attained by consulting with experts in research and coaching (Bork, 1993). The coaching behaviour components were sent to the supervisor Dr Hilary Geber and other experts Dr Alison Bentley and Dr Kerrin Meyers. Additionally the coaching behaviours were compared to those outlined in the literature (Grant et al., 2010; Fazel, 2013; Langan, Blake, & Lonsdale, 2013; Cox et al., 2014; Palmer & Whybrow, 2014).

3.8.2. Internal Validity

The tool was developed using appropriate literature and was validated using expert opinion and consensus. The tool was adapted and coaching behaviours added. The same methodology of deriving the different elements from the literature was used. Content Validation was attained by consulting with experts in research and coaching.

3.8.3. Reliability

Reliability was tested using internal consistency measures (Santos, 1999). Ten participants in the pilot were asked to score the questionnaire twice with a one week interval between the first and second attempt. Internal consistency was determined using a test of reliability Cronbach's alpha (Gliem & Gliem, 2003).

3.9. TEST FOR NORMALITY

The Shapiro Wilk test for normality rejected the null hypothesis ($p<0.05$). Therefore, non-parametric tests were used to measure central tendencies and associations in this study.

Table 3.4: Test for Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Age of Respondents	0.12	76	0.01	0.95	76	0.01

3.10. DATA ANALYSIS

Spearman correlation coefficient and Mann Whitney U tests were used to determine the associations between dependent and independent variables as appropriate while measurement of central tendencies of mean, median and range were used to describe the population. The Cronbach Alpha was used to measure the internal reliability of the questionnaire. Principal component analysis with the varimax rotation component matrix was done to computer a summary of the factors for each of the domains. The Eigenvalues and the loading of the factors were reported and the various factors analysis coefficient were used for further inferential statistics. P-value was set at 0.05.

3.11. CONCLUSION

Chapter 3 outlined the processes undertaken to complete this research. The questionnaire was adapted from Overall et al. (2011) questionnaire. Literature was reviewed to identify additional specific coaching behaviours which were added to the questionnaire. The questionnaire was piloted for feasibility and understanding. Changes were made to the wording of statements in the introduction to the different sections based on comments made by the pilot group. The questionnaire was loaded fully on to the redcap platform. Redcap

is a web-based application that allows for design and capture of data. Once collected the data was exported to SPSS for analysis.

The analysis included descriptive, correlation analysis and adapted regression analysis to test relationships and explanatory variables in terms of supervisor satisfaction, self-efficacy and coaching behaviour. The tool was subjected to analysis using principle component analysis to test its construct validity and the extent to which each element contributed to the concept in question. The results of the data analysed are presented in Chapter 4.

CHAPTER FOUR

4. RESULTS

4.1. INTRODUCTION

The study was conducted in the Faculty of Heath Sciences at the University of the Witwatersrand. The study sought to answer the following objectives:

1. To determine the extent of academic, personal and autonomy support experienced by PhD students.
2. To establish the extent of coaching practices experienced by students.
3. To establish the supervisors' availability.
4. To establish the student's level of self-efficacy.
5. To establish the level of satisfaction with all the different aspects of supervision experience.
6. To determine to what extent supervision behaviour including coaching, academic, personal and autonomy support influences student self-efficacy and satisfaction with supervision.

The results are presented in four sections. The first section is a description of the study participants and their demographic characteristics. The second section presents the measures of supervision namely: research academic support, supervisor availability, personal support, autonomy support, research self-efficacy, coaching behaviours and satisfaction with the supervisor. The third section presents the results of the principle component analysis which tests the extent of contribution of the different elements within each component and the overall concept being tested. Finally, the last section presents the results for tests of correlation and relationship between the different measures.

4.2. SECTION ONE: DESCRIPTION OF THE STUDY PARTICIPANTS

All registered PhD students in the Faculty of Health Sciences and those who had recently qualified in 2015 and within a year of the study, were invited to participate.

Table 4.1: Sample Frame: Faculty of Health Sciences - Invited Participants

School	No of Registered Students (N)	No who Qualified between May 2015-May 2016 (N)
School of Anatomical Sciences	30	6
School of Clinical Medicine	111	15
School of Oral Health Sciences	1	0
School of Pathology	83	14
School of Physiology	34	2
School of Public Health	88	7
School of Therapeutic Sciences	74	7
Total	421	51

The response rate to the Red Cap survey is shown in Table 4.2

Table 4.2: Response Rate

Emails	Number of Students
Total emails sent	472
Total number of active emails	399
Total number of questionnaires returned	121
Incomplete questionnaires	45
Total number of complete questionnaires used	76

The total number of students and newly qualified PhD graduates on record in the Faculty of Health Sciences was 472. The total number with active emails that were obtained was 399. Three hundred and ninety-nine emails were sent out and of these nineteen were returned to sender leaving a total of 380 emails received by PhD students and graduates. The number of questionnaires returned was 121, being a return rate of 32%, and 76 (%) could

be used in the study. The demographic information of all respondents is outlined in Tables 4.3 and 4.4.

4.2.1. Demographic Information

Participants in this study had a mean age of 40.6 (±10.3) years. The median age was 46 years old. The mean time of registration was 31.7 month and the median time (28.2) of registration was 31 months. The demographic characteristics of the participants in the study are described below in Tables 4.3 and 4.4.

Table 4.3: Demographics of the Participants (n=76)

Characteristics	**N**	**%**
Gender		
Female	52	68.4
Male	24	31.6
Department		
Therapeutic Sciences	31	40.8
Public Health	19	25.0
Clinical Medicine	11	14.5
Pathology	5	6.6
Anatomy	4	5.3
Physiology	4	5.3
Type of Registration		
Full time	28	36.8
Part time	48	63.2
Study Type		
Qualitative	8	10.5
Quantitative	26	34.2
Mixed	42	55.3
Attendance of PhD Support Group		
Yes	23	31.1
No	51	68.9

The highest representation of participants was from Therapeutic Sciences followed by Public Health. The majority were female 68% (52) (68.4) registered part-time 63.2% (n=48) and with an average age of 40.6 (10.3). The majority did not attend a support group.

Table 4.4: Supervisor Characteristics

Characteristics	**n**	**%**
Gender		
Female	**44**	**57.9**
Male	31	40.8
Number of Supervisors per Student		
Two	18	24.3
Three	42	56.8
Four	14	18.9
Type of Supervision		
Individual	53	71.6
Group	8	10.8
Both	13	17.6

Most of the students were female and had up to three supervisors with the majority being individually supervised.

4.3. SECTION TWO: MEASURES OF SUPERVISION EXPERIENCES AND BEHAVIOURS

This section presents the results of the items used to assess supervisor supervision support, which includes research academic support, supervisor availability, personal support, autonomy support, coaching behaviors' and how the PhD students experienced these behaviours and efforts. Student outcomes such as research self-efficacy and satisfaction with the supervisor are also reported.

4.3.1. Descriptive and Internal Reliability of Measures

The results of the supervision questionnaire were tested for internal consistency. The mean scores of each of the supervision concepts and their concepts were averaged to obtain the mean. A Cronbach's alpha was calculated to establish the correlation coefficient of each concept obtained.

Table 4.5: Internal Consistency across the Measures of Supervision Satisfaction

Domain	Mean	SD	Variance	Cronbach's Alpha
Research academic support	3.92	2.14	0.03	0.96
Supervisor availability	3.58	2.52	0.03	0.95
Personal support	3.79	2.54	0.01	0.98
Autonomy Support	6.05	1.27	0.06	0.89
Research self-efficacy	5.30	1.42	0.12	0.85
Coaching Behaviours	3.69	2.05	0.02	0.96
Supervisor satisfaction	3.84	2.23	0.03	0.96

The results showed that all the elements had internal consistency.

4.3.2. Research Academic Support

Table 4.6: Research Academic Support Information of the Participants (n=76)

Research academic support, n (%)	Not at All	Somewhat Confident	Completely Confident
	n (%)	n (%)	n (%)
Provides/provided clear expectations and goals that I need to achieve	31 (40.8)	15 (19.7)	30 (39.5)
Helps/helped me plan and manage the different research tasks I have to complete	30 (39.5)	20 (26.3)	26 (34.2)
Helps/helped me to construct timelines and deadlines to ensure I complete tasks on time	21 (27.6)	30 (39.5)	25 (32.9)
Gives/gave me good, practical advice regarding how to plan and conduct my research	28 (36.8)	18 (23.7)	30 (39.5)
Offers/offered suggestions about how to find the resources I need	27 (35.5)	17 (22.4)	32 (42.1)
Gives/gave me guidance to find relevant literature and research materials	27 (37.5)	20 (27.5)	25 (34.7)
Seeks/sought information that will help me with my thesis	26 (34.2)	26 (34.2)	24 (31.6)
Teaches/taught me the technical knowledge and skills that I need to complete my research	32 (42.1)	20 (26.3)	24 (31.6)
Spends/spent time helping me learn the skills I need to complete my research	30 (39.5)	21 (27.6)	25 (32.9)
Provides/provided practical assistance when I need help conducting research tasks	30 (39.5)	22 (28.9)	24 (31.6)
Helps/helped me develop good writing skills	33 (43.4)	16 (21.1)	27 (35.5)

In the eleven elements comprising research academic support, 32 to 40% of participants felt confident that they received adequate academic support while more 28%-43% did not feel they received academic support. Nineteen to thirty nine percent were somewhat confident. Of note is that the supervisor support was highest in offering suggestions about how to find the resources needed,

while developing good writing skills was the area where the least support was experienced.

4.3.3. Supervisor availability

The extent of supervisor availability as perceived by participants is shown in Table 4.7 below.

For analysis, the questions 5, 7, 9 and 10 were reverse coded. The normal coding for the study was 1, 4 and 7 (strongly disagree to strongly agree) and it was reversed into 7, 4 and 1 (strongly disagree to strongly agree).

Table 4.7: Supervisor Availability n=76

Supervisor Availability n (%)	**Strongly Disagree**	**Neither Agree nor Disagree**	**Strongly Agree**
	n (%)	**n (%)**	**n (%)**
Sets aside uninterrupted time to meet with me about my research	38 (50)	13 (17.1)	25 (32.9)
Is always available to answer any questions I have	35 (46.1)	10 (13.2)	31 (40.8)
Responds to my queries or requests for help within a reasonable time frame	38 (50)	13 (17.1)	25 (32.9)
Provides me with prompt feedback whenever I submit written work to him/her	36 (47.4)	17 (22.4)	23 (30.3)

The results highlight that 50% of participants experienced supervisor support in two of the four elements: namely setting uninterrupted time and responding to queries within a reasonable time. In the other two (availability to answer questions and provision of prompt feedback) just under 50% of students reported under supervisor availability that supervisors were not available. Notably over 30% of the respondents felt their supervisors were available.

4.3.4. Personal support

Table 4.8 outlines the results of the personal support given by supervisors and experienced by PhD students.

Table 4.8: Personal Support Experienced by PhD Candidates (n=76)

Personal Support n (%)	Strongly Disagree	Neither Agree or Disagree	Strongly Agree
	n (%)	n (%)	n (%)
Behaves warmly towards me when discussing my research and or any problem I am experiencing	37 (48.7)	6 (7.9)	33 (43.4)
Expresses understanding and empathy when I experience difficulties	32 (42.1)	16 (21.1)	28 (36.8)
Listens and respond to any concerns I have	34 (44.7)	10 (13.2)	32 (42.1)
Is friendly supportive and approachable	38 (55)	7 (9.2)	31 (40.8)
Comforts and reassures me when I am feeling down	32 (42.1)	18 (23.7)	26 (34.2)
Compliments me and makes me feel good about myself and my work	35(46.1)	15(19.7)	26(34.2)
Shows me that they respect and value me	36 (47.4)	13 (171)	27 (35.5)
Reassures me that I will be able to successfully complete my research	34 (44.7)	13 (17.1)	29 (38.2)
Makes me feel that I have the ability to do well	33 (43.4)	12 (15.8)	31 (40.8)

Between 42% (32) and 55% (38) of the participants did not agree that they experienced personal support while 34% (26) to 43% (33) felt they received personal support in the supervisors' different behaviours.

4.3.5. Autonomy Support

Table 4.9 outlines the extent of autonomy support given by supervisors and experienced by the study participants

Table 4.9: Autonomy Support (n=76)

Autonomy Support n (%)	Not at All	Somewhat Confident	Completely Confident
	n (%)	n (%)	n (%)
Encourages me to ask questions	4 (5.3)	19 (25)	53 (69.7)
Encourages me to be open about my own ideas and any issues that concern me	6 (7.9)	15 (19.7)	55 (72.4)
Listens to how I would like to do things	3 (3.9)	23 (30.3)	50 (65.8)
Welcomes my input in discussions and treat my ideas with respect	2 (2.6)	14 (18.4)	60 (78.9)
Provides me with choices and options	4 (5.3)	20 (26.3)	52 (68.4)
Encourages me to work independently	1 (1.3)	13 (17.1)	62 (81.6)

The results showed that a large majority of 66%(50) to 81%(62) of the participants were confident that they were experiencing autonomy support behaviours from their supervisors.

4.3.6. Research Self-Efficacy

Table 4.10 outlines the perceived self- efficacy among the study participants.

Table 4.10: Perceived Research Self-Efficacy (n=76)

Research Self-Efficacy n (%)	Not at All	Somewhat Confident	Completely Confident
	n (%)	n (%)	n (%)
Confident with research procedure to collect data	2 (2.6)	30 (39.5)	44 (57.9)
Confident with data analysis (understanding and interpreting my data)	9 (11.8)	39 (51.3)	28 (36.8)
Confident with my writing (editing, logical, flow, logical and succinct).	2 (2.6)	40 (52.6)	34 (44.7)
Confident to write a research article	6 (7.9)	30 (39.5)	40 (52.6)
Confident to integrate my research through generating researchable questions and synthesize results with current literature	4 (5.3)	30 (9.5)	42 (55.3)

The extent of perceived research self- efficacy is high with more students scoring being somewhat confident and completely confident.

4.3.7. Coaching Behaviours

The extent of coaching behaviours is shown in Table 4.11 below.

Table 4.11: Coaching Behaviours (n=76)

Coaching Behaviour n (%)	Strongly Disagree	Neither Agree or Disagree	Strongly Agree
	n (%)	n (%)	n (%)
Non-directive guidance allowing growth, control and responsibility on my part	30 (39.5)	24 (31.6)	22 (28.9)
Asks/asked questions to lead me to self-discovered answers and does not/did not always tell me what to do	31 (40.8)	24 (31.6)	21 (27.6)
Targeted/target all efforts at obtaining defined goals.	25 (32.9)	28 (36.8)	23 (30.3)
In collaboration with myself offer/offered constructive ways to develop and offer solutions when I asked	31 (40.8)	20 (26.3)	25 (32.9)
Practices/practised listening skills and creating/created opportunities to conduct coaching sessions often.	27 (35.5)	25 (32.9)	24 (31.6)
Encourages/encouraged thoughts that enhance performance	32 (42.1)	25 (32.9)	19 (25)
Facilitates/facilitated self-awareness of underlying barriers	25 (32.9)	31 (40.8)	20 (26.3)
Creates/created opportunities for performance in effective thinking and research behaviours	25 (32.9)	34 (44.7)	17 (22.4)
Directs/directed all efforts at defined goals	34 (44.7)	22 (28.9)	20 (26.3)
Works/worked with me to find solutions for my developmental needs	31 (40.8)	22 (28.9)	23 (30.3)
Listens/listened empathetically and discussed my concerns in depth	33 (43.4)	20 (26.3)	23 (30.3)

In terms of coaching behaviours, a range of 22% (17) to 32.9 (25) felt they experienced coaching behaviours from their supervisors while 33% (25) to 45% (34) did not. Students in a similar percentage range of results, 26% (20) to 45%(34) were not sure of their coaching experience in different behaviours.

4.3.8. Satisfaction with Supervisor

The level of satisfaction with the supervisor is shown in Table 4.12

Table 4.12: Supervisor Satisfaction (n=76)

Supervisor Satisfaction n (%)	Strongly Disagree	Neither Agree or Disagree	Strongly Agree
	n (%)	n (%)	n (%)
I feel satisfied with the way I am/was supervised	32 (42.1)	16 (21.1)	28 (36.8)
My supervisor is much better than other supervisors	26 (34.2)	28 (36.8)	22 (28.9)
My supervisor is much better than other supervisors	27 (35.5)	23 (30.3)	26 (34.2)
My supervisor is close to ideal	33 (43.4)	14 (18.4)	29 (38.2)
I have the supervisor I wanted	32 (42.1)	16 (21.2)	28 (36.8)
If I did it over I would want a different supervisor	27 (35.5)	9 (11.8)	37 (48.7)
There are many aspect of supervision I am unhappy with	30 (39.5)	9 (11.8)	37 (48.7)
I wouldn't do as well if it weren't for my supervisor	28 (36.8)	28 (36.8)	20 (26.3)
I could do just as well without my supervisor	25 (32.9)	26 (34.2)	25 (32.9)
I would be better off with a different supervisor	27 (35.5)	20 (26.3)	29 (38.2)
I feel lucky I have the supervisor I have	32 (42.1)	17 (22.4)	27 (35.5)

In terms of supervisor satisfaction, the results ranged from 26% (20) to 49%(37) in different behaviours were satisfied with their supervisor while 33%(25) to 43%(33) felt they were not satisfied.

4.4. SECTION THREE: PRINCIPAL COMPONENT ANALYSIS (PCA)

Principle component analysis was undertaken to determine which elements contributed to the overall concept. The principal component analysis was done using a varimax rotation and the result for each of the domains is outlined below in Tables 4.13 to 4.20 The process involves determining locations along each component (or eigenvector) which are then associated with values across all variables. This association between the components and the original variables is called the component's eigenvalue. The line of best fit is measured by the percentage variance (Abdi & Williams, 2010).

4.4.1. Research Academic Support

Table 4.13: Factor Analysis - Research Academic Support Concept

Component	Initial Eigenvalues		Rotated Component Matrix	
	Total	% of Variance	1	2
*Provides/provided clear expectations and goals that I need to achieve	7.64	**69.5**	0.87	0.22
*Helps/helped me plan and manage the different research tasks I have to complete	1.02	9.3	0.81	0.37
*Helps/helped me to construct timelines and deadlines to ensure I complete tasks on time	0.54	4.9	0.81	0.23
*Gives/gave me good, practical advice regarding how to plan and conduct my research	0.37	3.3	0.69	0.52
*Offers/offered suggestions about how to find the resources I need	0.31	2.8	0.72	0.49
*Gives/gave me guidance to find relevant literature and research materials	0.27	2.5	0.74	0.47
**Seeks/sought information that will help me with my thesis	0.25	2.3	0.52	0.73
**Teaches/taught me the technical knowledge and skills that I need to complete my research	0.21	1.9	0.40	0.83
**Spends/spent time helping me learn the skills I need to complete my research	0.17	1.5	0.27	0.89
**Provides/provided practical assistance when I need help conducting research tasks	0.13	1.2	0.31	0.88
*Helps/helped me develop good writing skills	0.10	0.9	0.69	0.50

Eleven items assessed academic support. Varimax rotation revealed two factors namely factor 1 and 2 represented 93.2% and 6.9% of the variance of the concept.

Elements marked* formed a category to represent academic support related to the research process while element two marked ** formed a category related to technical support. Both elements formed a key component of academic support.

4.4.2. Supervisor Availability

Table 4.14: Factor Analysis – Supervisor Availability Concept

Component	Initial Eigenvalues		Component Matrix
	Total	% of variance	
Sets aside uninterrupted time to meet with me about my research	3.47	86.8	0.91
Is always available to answer any questions I have	0.24	6.0	0.94
Responds to my queries or requests for help within a reasonable time frame	0.20	5.1	0.96
Provides me with prompt feedback whenever I submit written work to him/her	0.09	2.1	0.91

Supervisor availability accounts for 86.8% of variance. Four factors assessed for supervisor availability revealed that all four components contribute to supervisor availability.

4.4.3. Personal support

Table 4.15: Factor Analysis – Personal Support Concept

Component	Initial Eigenvalues		Component Matrix
	Total	% of variance	
Behaves warmly towards me when discussing my research and or any problem I am experiencing	7.67	85.2	0.94
Expresses understanding and empathy when I experience difficulties	0.44	4.88	0.92
Listens and respond to any concerns I have	0.28	3.06	0.94
Is friendly supportive and approachable	0.19	2.06	0.94
Comforts and reassures me when I am feeling down	0.17	1.87	0.85
Compliments me and makes me feel good about myself and my work	0.11	1.20	0.93
Shows me that they respect and value me	0.09	0.94	0.93
Reassures me that I will be able to successfully complete my research	0.04	0.47	0.91
Makes me feel that I have the ability to do well	0.03	0.35	0.94

Personal support accounts for 85.2% of variance. All nine factors contribute to personal support.

4.4.4. Autonomy Support

Table 4.16: Factor Analysis for Autonomy Support Concept

Component	Initial Eigenvalues		Component Matrix
	Total	% of Variance	
Encourages me to ask questions	3.66	61.0	0.67
Encourages me to be open about my own ideas and any issues that concern me	0.79	13.2	0.86
Listens to how I would like to do things	0.69	11.4	0.90
Welcomes my input in discussions and treat my ideas with respect	0.43	7.1	0.83
Provides me with choices and options	0.26	4.3	0.65
Encourages me to work independently	0.18	3.0	0.74

Autonomy accounts for 61.0% of variance. All six components contribute to autonomy support.

4.4.5. Self-Efficacy

Table 4.17: Factor Analysis for Self-Efficacy Concept

Component	Initial Eigenvalues		Component Matrix
	Total	% of Variance	
Confident with research procedure to collect data	3.12	62.3	0.77
Confident with data analysis (understanding and interpreting my data)	0.68	13.5	0.76
Confident with my writing (editing, logical, flow, logical and succinct).	0.51	10.2	0.82
Confident to write a research article	0.40	7.9	0.80
Confident to integrate my research through generating researchable questions and synthesize results with current literature	0.30	6.0	0.79

Self-efficacy accounts for 62.3% of variance. All five components included contribute to autonomy support.

4.4.6. Coaching Behaviour

Table 4.18: Factor Analysis for Coaching Behaviour Concept

Component	Initial Eigenvalues		Component Matrix
	Total	% of Variance	
Non-directive guidance allowing growth, control and responsibility on my part	7.73	70.3	0.77
Asks/asked questions to lead me to self-discovered answers and does not/did not always tell me what to do	0.73	6.6	0.79
Targeted/target all efforts at obtaining defined goals.	0.64	5.8	0.80
In collaboration with myself offer/offered constructive ways to develop and offer solutions when I asked	0.45	4.1	0.88
Practices/practised listening skills and creating/created opportunities to conduct coaching sessions often.	0.35	3.2	0.78
Encourages/encouraged thoughts that enhance performance	0.32	2.9	0.87
Facilitates/facilitated self-awareness of underlying barriers	0.24	2.2	0.84
Creates/created opportunities for performance in effective thinking and research behaviours	0.19	1.8	0.89
Directs/directed all efforts at defined goals	0.17	1.5	0.82
Works/worked with me to find solutions for my developmental needs	0.12	1.1	0.87
Listens/listened empathetically and discussed my concerns in depth	0.08	0.7	0.89

Coaching behaviour accounts for 70.3% of variance. All eleven behaviours of coaching contribute to the coaching behaviour concept.

Table 4.19: Factor Analysis for Supervisor Satisfaction Concept

Component	Initial Eigenvalues		Component Matrix
	Total	% of Variance	
I feel satisfied with the way I am/was supervised	8.08	73.5	0.93
My supervisor is much better than other supervisors	0.62	5.7	0.83
My supervisor is close to other supervisors	0.54	4.9	0.87
My supervisor is close to ideal	0.41	3.8	0.93
I have the supervisor I wanted	0.38	3.5	-0.81
If I did it over I would want a different supervisor	0.27	2.4	0.74
There are many aspect of supervision I am unhappy with	0.21	1.9	-0.92
I wouldn't do as well if it weren't for my supervisor	0.19	1.7	0.75
I could do just as well without my supervisor	0.15	1.3	-0.83
I would be better off with a different supervisor	0.08	0.7	-0.84
I feel lucky I have the supervisor I have	0.07	0.7	0.96

Supervisor satisfaction accounts for 73.47% of variance. All eleven components contribute to the concept of supervisor satisfaction. The negative values require that the analysis be reversed.

4.5. SECTION FOUR: RELATIONSHIP BETWEEN DEPENDENT AND INDEPENDENT VARIABLES

4.5.1. Correlation between Demographic Variables and Supervision Domains

Table 4.20: Correlations between Demographic Variables

Characteristics	Coaching Behaviour		Supervisor Satisfaction		Self-Efficacy	
	r_s	**p-value**	**r_s**	**p-value**	**r_s**	**p-value**
Age	-0.09	0.91	-0.19	0.09	-0.08	0.52
Registration	-0.01	0.91	-0.14	0.24	0.18	0.12
Number of supervisors	-0.07	0.58	-0.02	0.87	0.05	0.65
	U*	**p-value**	**U**	**p-value**	**U**	**p-value**
Gender of student	555.5	0.44	446.0	0.05	348.5	0.00**
Gender of supervisor	596.0	0.35	616.0	0.48	601.5	0.38
Type of registration	633.0	0.67	598.0	0.43	541.0	0.15
PhD support	535.5	0.55	495.5	0.29	533.0	0.53

* **Mann whitney U** ** **p-<0.05**

Table 4.20 shows correlations between demographic variables and supervision domains and the difference in outcomes when tested between the different genders, type of registration and whether they received PhD support or not.

A weak but significant correlation was evident between age and supervisor satisfaction implying that with increasing age, the level of supervision satisfaction reduced. No differences were detected in the values obtained for the different genders of both the student and supervisor for the coaching behaviour and supervisor satisfaction.

4.5.2. Correlation between the Supervision Measures

All the different components of supervision measured in this study were tested for correlation using Spearman's correlation coefficient and the results are shown in Table 4.21.

Table 4.21: Correlations Across all Measures of Supervision

	Academic Support (I)	**Academic Support (II)**	**Supervisor Availability**	**Personal Support**	**Autonomy Support**	**Self-Efficacy**	**Coaching Behaviour**	**Supervisor Satisfaction**
	r_s (p-value)	**r_s (p-value)**	**r_s (p-value)**	**r_s (p-value)**	**r_s (p-value)**	**r_s (p-value)**	**r_s (p-value)**	**r_s (p-value)**
Academic support (I) (Process related tasks)	1							
Academic support (II) (Technical related)	0.02(0.84)	1						
Supervisor availability	0.72(0.00)**	0.40(0.00)**	1					
Personal support	0.73(0.00)**	0.46(0.00)**	0.81(0.00)**	1				
Autonomy support	-0.11(0.36)	-0.14(0.25)	-0.18(0.12)	-0.16(0.17)	1			
Self-efficacy	0.01(0.92)	-0.03(0.80)	0.04(0.73)	-0.00(0.97)	0.18(0.13)	1		
Coaching behaviour	0.71(0.00)**	0.45(0.00)**	0.76(0.00)**	0.88(0.00)**	-0.18(0.12)	-0.03(0.77)	1	
Supervisor satisfaction	0.71(0.00)**	0.42(0.00)**	0.79(0.00)**	0.86(0.00)**	-0.17(0.14)	-0.03(0.82)	0.84(0.00)**	1

**** p-<0.05**

All the components of supervision correlated significantly with each other except for autonomy and self-efficacy which did not correlate with any of the other components of supervision.

4.5.3. Correlation between the Domains

Further analysis was undertaken for the self-efficacy component. This component was analysed using the individual components of the concept because the PCA illustrated that each element contributed equally to the concept of research self-efficacy. This was in line with findings found in the literature (Overall et al., 2011).

Table 4.22: Factor Analysis Research Self-Efficacy Academic Support

	Initial Eigenvalues		Component Matrix
Component	Total	% of variance	Extraction
Writing research article	1.59	79.48	0.89
Research integration	0.41	20.52	0.89

Correlation between the disaggregated self-efficacy measures are shown in Table 4.23.

Table 4.23: Correlation of all Measures and Self-Efficacy

Spearman's Correlation	Data Collection	Data Analysis	Logical Writing	Research Integration++
	r_s (p-value)	r_s (p-value)	r_s (p-value)	r_s (p-value)
Data collection	1			
Data analysis	0.55 (0.00)*	1		
Logical writing	0.53 (0.00)*	0.50 (0.00)*	1	
Research integration	0.51 (0.00)*	0.52 (0.00)*	0.68 (0.00)	1
Academic support 1	0.02 (0.87)	-0.04 (0.70)	0.10 (0.39)	-0.07 (0.58)
Academic support 2	0.07 (0.57)	-0.02 (0.90)	-0.11 (0.36)	-0.08 (0.51)
Supervisor availability	0.08 (0.51)	0.05 (0.65)	0.06 (0.62)	-0.05 (0.69)
Personal support	0.11 (0.34)	0.03 (0.81)	0.01 (0.93)	-0.11 (0.33)
Autonomy support	0.13 (0.27)	0.13 (0.25)	0.10 (0.38)	0.23 (0.05)
Supervisor satisfaction	0.05 (0.65)	-0.02 (0.90)	0.02 (0.87)	-0.09 (0.42)
Coaching behaviour	0.07 (0.54)	-0.02 (0.87)	0.03 (0.83)	-0.15 (0.20)

++ (ability to generate researchable questions, synthesise results with regard for current literature).

None of the disaggregated measures correlated with all the other measures included in supervisor behaviours. The only correlations were with the different components of research self-efficacy behaviours.

4.5.4. Association between the Domains using Linear Regression

Table 4.24: Supervisor Satisfaction - Unadjusted and Adjusted Regression Model

Supervisor Satisfaction	Univariate Regression			Stepwise Regression		
	B	CI	p-Value	B	CI	p-Value
Academic support 1	0.75	0.60-0.91	0.00*	0.17	0.03-0.31	0.02
Academic support 2	0.40	0.18-0.61	0.00*	0.09	-	0.13
Supervisor availability	0.84	0.71-0.96	0.00	0.15	-	0.15
Personal support	0.90	0.80-0.99	0.00*	0.52	0.31-0.73	0.00
Autonomy	-0.17	0.40-0.05	0.13	-0.02	-	0.73
Self-efficacy	-0.07	0.30-0.16	0.56	-0.06		0.24
Coaching behaviour	0.87	0.76-0.99	0.00*	0.29	0.08-0.50	0.01

*Significant at 0.05

Academic support 1 and 2, personal support, supervisor availability, coaching behaviour correlate with supervisor satisfaction and when tested in the multivariate regression only academic support personal support and coaching behaviour are stronger predictors of supervisor satisfaction.

Further analysis was undertaken to determine the interaction between the concepts that showed association in the regression model. The high and low points were calculated using the mean + standard deviation as ‘high’ and mean – standard deviation as ‘low’. Figure 4.1 shows the interactions

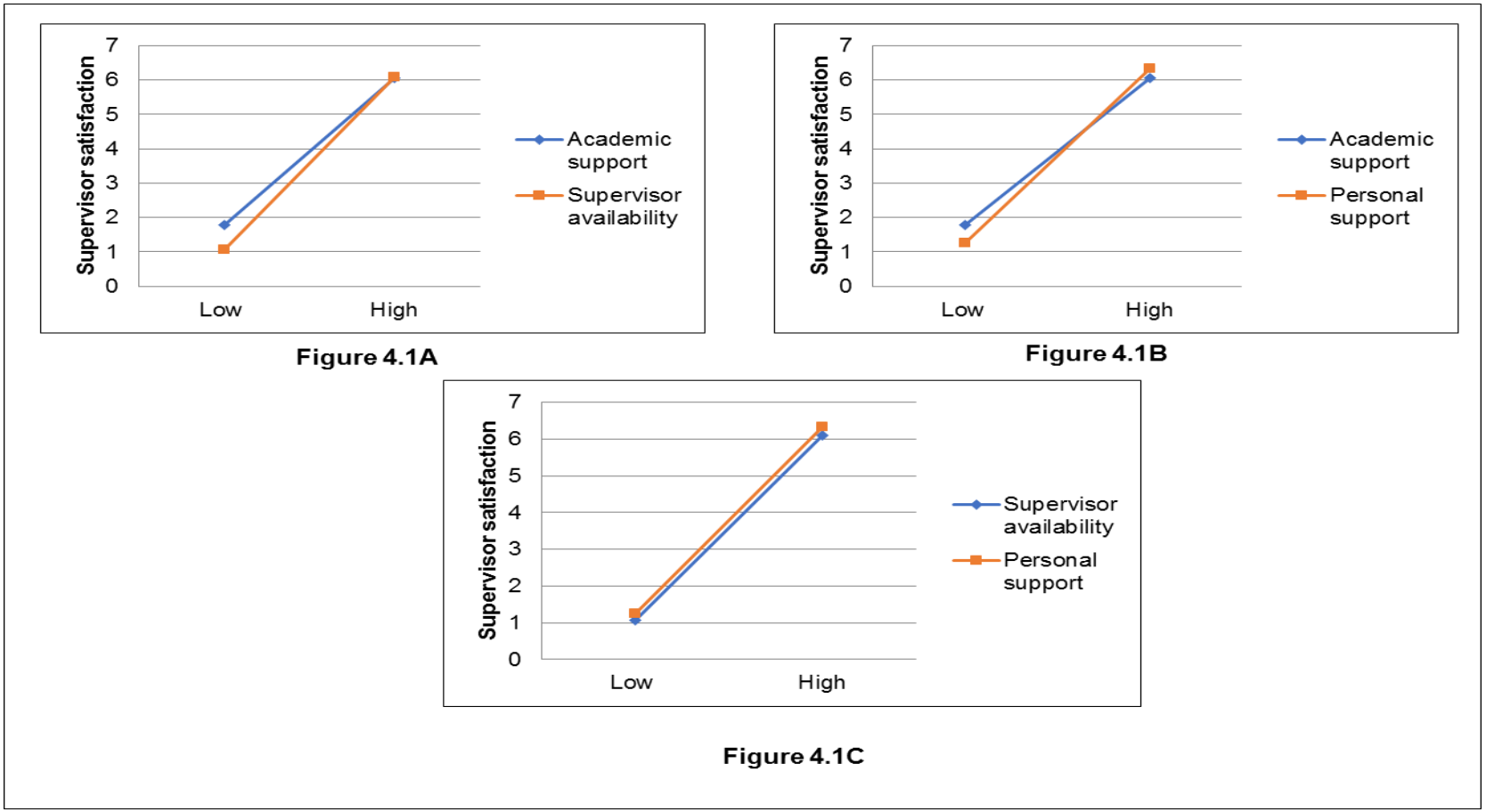

Figure 4.1: Shows the Interaction of Supervisor Availability, Academic Support and Personal Support on Supervisor Satisfaction

Figure 4.1A shows that a high level of academic support and supervisor availability correlates with supervisor satisfaction and interact with each other. Similarly, high academic support and personal support correlate with supervisor satisfaction and interact with each other. However, supervisor availability and personal support correlate with supervisor satisfaction but do not correlate with each other.

Table 4.25: Coaching Behaviour - Unadjusted and Adjusted Regression Model

Coaching Behaviour	Unadjusted			Step Wise Regression		
	B	CI	p-Value	B	CI	p-Value
Academic support 1	0.73	0.57-0.89	0.00	0.11	-	0.17
Academic support 2	0.44	0.23-0.65	0.00	0.07	-	0.18
Supervisor availability	0.80	0.67-0.94	0.00	0.07	-	0.53
Personal support	0.89	0.78-0.99	0.00	0.54	0.31-0.77	0.00
Autonomy	-0.17	0.39-0.06	0.13	-0.01	-	0.88
Self-efficacy	-0.05	0.28-0.18	0.56	-0.03	-	0.62
Supervisor satisfaction	0.87	0.76-0.99	0.00	0.39	0.16-0.61	0.00

Using coaching as an outcome variable, Academic support 1 and 2 , personal support , supervisor availability, supervisor satisfaction correlate with coaching significantly when tested in a multivariate regression personal support and supervisor satisfaction were the stronger predictors of coaching .

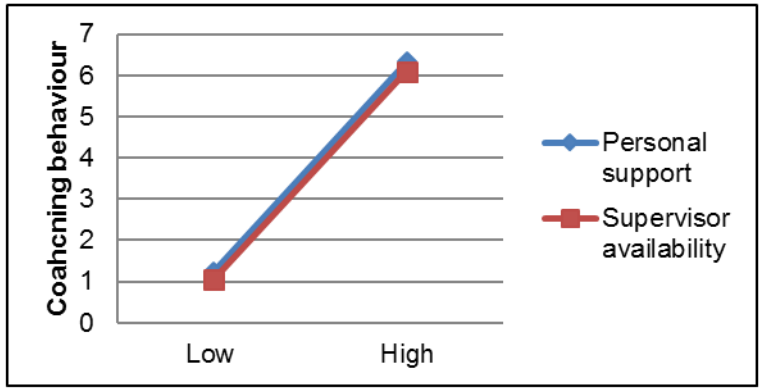

Figure 4.2D

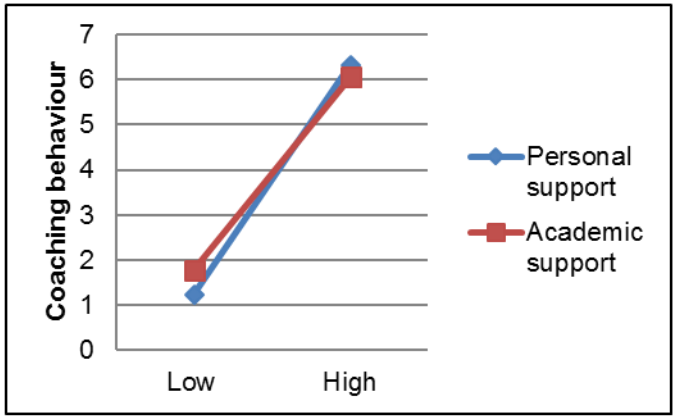

Figure 4.2E

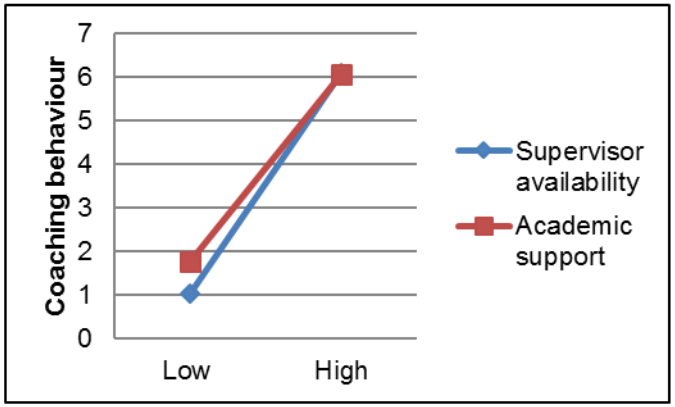

Figure 4.2F

Figure 4.2:(D-F): The interaction of Supervisor Availability, Academic Support and Personal Support on Coaching Behaviour

Figure 4.2D illustrates that high personal support and supervisor availability correlated with high coaching behaviour but have no correlation with each other. Figure 4.2E shows correlation of high academic and personal support with high coaching behaviour. Academic and personal support as well as academic support and supervisor availability interacts with each other.

4.6. CONCLUSION

The study had a 32% return rate using an internet based survey platform. The majority of participants were female with an average age of 40. The results are from seven schools that were invited to participate albeit with under-representation in four of the seven participating schools in the faculty of health sciences.

The extent to which supervisor behaviours are experienced by PhD students in the faculty of health sciences is moderate with calculations of means ranging from 3.58-3.92 from a possible total of seven for supervisor availability, coaching behaviours, personal support, supervisor satisfaction and research academic support. Only autonomy support and research self-efficacy scored 6.05 and 5.30 respectively.

None of the concept measures for supervision presented with an overwhelming majority of responses in the category of strong agreement or complete confidence. The percentage range for all the measures with the exception of self-efficacy and autonomy was between 22% and 48%. Less than half of participants felt completely confident. Self-efficacy and autonomy enhancing behaviours ranged between 39% to 58% and 68% to 82% respectively. However, of concern is that a sufficient number of respondents remained in the on the fence or unsure.

Correlation testing revealed relationships between academic support and all measures of supervision concepts (supervisor availability, personal support, coaching behaviour and supervisor satisfaction). Supervisor availability correlated with coaching and personal support as well as supervisor satisfaction. Coaching behaviour correlated with supervisor satisfaction. Self-efficacy and autonomy support did not correlate with any of the measures.

Principle component analysis revealed that all behaviours chosen for each supervision concept contributed to the overall concept except for academic support. The results of the study are presented and discussed in chapter 5.

CHAPTER FIVE

5. DISCUSSION

5.1. INTRODUCTION

Chapter 5 discusses the results of the data collected and the analysis based on the research question and the aim and objectives of the study. The first aim of this study was to establish the supervision and coaching practice experience of PhD students in the Faculty of Health Sciences at the University of the Witwatersrand. The second aim was to establish the interaction between identified concepts of supervision such as academic, personal and autonomy support, coaching and resultant or existing self-efficacy and autonomy.

The study sought to answer the following specific objectives:

1. To determine the extent of academic, personal and autonomy support experienced by students
2. To establish the extent of coaching practices experienced by students
3. To establish the supervisors' availability
4. To establish the students' level of self-efficacy.
5. To establish the level of satisfaction with all the different aspects of supervision experience.
6. To determine to what extent supervision behaviour including coaching, academic, personal and autonomy support influences student self-efficacy and satisfaction with supervision.

5.2. DEMOGRAPHIC PROFILE: STUDY PARTICIPANTS AND SUPERVISORS' CHARACTERISTICS

The Faculty of Health Sciences at the University of the Witwatersrand has a total of 421 registered PhD students in 2016. This study obtained a 32% response rate from an online survey over a period of six months. The study used the usual methods to boost response rate for online surveys. Methods included reminders on line, provision of the URL in the email as well as frequent reminders given in person by appealing to the research coordinators and students that were invited to participate directly at general meetings and during courses were employed. The final response rate was obtained after several prompts and although low is acceptable in terms of accepted rates (Nulty, 2008). A study among PhD candidates in Maastricht obtained an even lower response rate of 17% in spite of attempts to

enhance the response rate (Woolderink, Putnik, van der Boom, & Klabbers, 2015). Several other mechanisms to prompt responses could be applied in future research. Nulty (2008), proposes mechanisms such as also providing rewards, assist students in understanding how to give constructive criticism and create surveys that seek constructive criticism.

Of interest is that the PhD student body is mostly female (68%) undertaking part time studies and the mean age is 40 (±10.5). The majority of studies being undertaken were quantitative studies. The mean age was much older than the students cited in (Devos et al., 2015) whose average age was 28 (±-5). However the mean age was similar to another South African study on doctoral students that attained an average age of 41 years with a range of range 35 to 45 years (Mouton, Boshoff, & James, 2015). It is important to note the under-representation of PhD students in the following departments: clinical medicine (15%), pathology (7%), anatomy (5%) and physiology (5%). In personal communication with the research office in an attempt to enhance the response rate, it became apparent that non-response to research through survey efforts is a known trend among post graduate students in the Faculty of Health Sciences. One of the indicators of PhD study success is the time taken to completion (Mouton, 2007; Mouton et al., 2015). In this study cohort, the mean duration of registration was within the university's ideal time to completion of four years. However, there were a few students who had exceeded the four year limit.

5.3. STUDENT EXPERIENCE OF SUPERVISION

The overall aim of this study was to establish the PhD student experience of supervision and coaching in the Faculty of Health Sciences. The students' experiences did not reflect a perfect picture. A perfect picture would have reflected high mean scores of each of the measured concepts (namely academic research support, personal, coaching and autonomy behaviour support, student self-efficacy, supervisor availability and supervisor satisfaction) as well as high percentage scores of each of the concept components. The mean scores were lower than those found in the study in which the design and use of the supervision questionnaire used in this study was reported (Overall et al., 2011). The results of each concept and its subcomponent will now be discussed in detail.

Only 30% and less of PhD students experienced coaching behaviours and its different components in the Faculty of Health Sciences. A range of 33%-48% reported they did not experience the various coaching elements included in the coaching component. The calculated mean of coaching behaviours could be viewed as moderate. The results on coaching behaviours could not be compared with similar results as no studies could be found that assessed the coaching component quantitatively. These results indicate the need to deliberately enhance coaching behaviours among supervisors especially if the institution believes in the added value of coaching. Based on their practical experience many institutions have already introduced coaching as part of their support package for post graduate students (Godskesen & Kobayashi, 2016). The benefits of coaching in the other areas of practice like management, and the workplace have been outlined. Some of the benefits include better problem solving, thinking strategies, improved motivation, increased self-awareness, achieving goals, decision making and communication (Grant, Curtayne, & Burton, 2009; Bresser & Wilson, 2010; Cox et al., 2014). Understanding the extent to which coaching is taking place in any post graduate programme is therefore important. At this Faculty of Health Sciences coaching is not a structured support and in the past has been implemented as a once off project (Geber, 2010; Geber & Bentley, 2012). Their project involved the provision of a coach in addition to the supervisor over a period of eight months. The programme clearly demonstrated that coaching was beneficial for participants in terms of a better understanding of their PhD programme, gaining writing skills, managing stress, setting goals, work-life balance and completion of the PhD programme. Budgetary constraints in the current economic conditions may require a more cost effective and perhaps mainstreamed approach to coaching within post graduate and PhD programmes. This may involve training supervisors to coach more effectively. A mainstreamed approach where the supervisor plays a coaching role may be contentious given that most authors have recommended including coaching as part of supervision. A coach provides a safe space for discussion of concerns in particular if an outside coach is used (Pearson & Brew, 2002; McCallin & Nayar, 2011; McCarthy, 2012). A recent study (Tian and Singhasiri 2016) studied supervisory talks and reported that supervisory talks create teaching and learning spaces that are empowering for both the student and the supervisor. Examples typical of coaching dialogue were given in this qualitative study perhaps illustrating how easily one can coach within supervisory conversation.

The benefits of coaching have been clearly identified (Kearns et al., 2008; Cox et al., 2014; Godskesen & Kobayashi, 2016). Programmes that specifically tested coaching interventions identified outcomes that aided PhD or post graduate completions as well as making the PhD process more effective with better coping (Kearns et al., 2008; Geber, 2010; Geber & Bentley, 2012; Geber & Visser, 2012; Godskesen & Kobayashi, 2016). From an evaluation of individualised systemic coaching intervention, Godskesen and Kobayashi (2016) demonstrated that coaching within doctoral supervision was effective in helping to improve a sense of progress, illuminate new reflections and constructively change behaviour. These behaviours have the potential to be influenced by supervision activities under academic research, personal, and autonomy support, many of which are linked to coaching. The extent to which supervision availability, research academic support, autonomy support, coaching behaviours themselves and personal support were established in this study and will be discussed. In addition, self-efficacy enhancing behaviours in research and supervisor satisfaction are also discussed.

Student Experience of Supervisor Availability

Central to supervision is the availability of the supervisor. Supervisor's availability in the Faculty of Health Sciences is not ideal with only 30% completely agreeing that they found their supervisor available. The calculated mean for supervisor availability was moderate with half of participants in two out of the four elements (setting uninterrupted time and responding to queries within a reasonable time) feeling unsupported. In a study by Mouton (2007) over a third of supervisors expressed the frustration of not being able to give adequate attention to students. Qualitative data in many studies related to doctoral supervision alluded to this aspect being problematic especially in relation to available capacity for supervision (Backhouse, 2009; Mouton et al., 2015). Mouton et al. (2015), study on the nature of doctoral supervision highlights the lack of capacity in terms of experienced supervisors against a growth in numbers of doctoral students in South Africa. The resultant overload on experienced productive supervisors impacts on their availability for students (Mouton et al., 2015). A high level of supervisor availability has been shown in studies that sought to establish how students experienced supervision (Kearns et al., 2008; Overall et al., 2011). It is important for supervisors to be cognisant and ensure academic support is clearly structured and available. Where

supervisor support is high the development of independent and rigorous research competency which gives the graduate more credibility is evident (Geber, 2010; Geber & Bentley, 2012). Being accessible and helpful supervisors are attributes most appreciated by post graduate students (Devos et al., 2015; Askew et al., 2016).

Students Satisfaction with Supervisor

Linked to supervisor availability is supervisor satisfaction. In my study supervisor satisfaction also scored moderately at 3.84 out of a possible seven. Although this study did not explore how students viewed their relationship with the supervisor, it did explore supervisor satisfaction which could be a proxy for relationship with the supervisor. Questions included in this section relate to feelings of satisfaction, judgement on whether the supervisor is ideal and if the student is unhappy with their current supervision. Unfortunately, almost half (49%) of students polled felt if they were to do their PhD over they would want a different supervisor and there were many aspects of their supervision with which they were unhappy. Many authors cite the significance of relational issues in student supervision (Hopwood, 2010). One of the reasons attributed to relational problems is the unequal relationship, which is by nature hierarchical and creates a dependency of the student on the supervisor (Woolderink et al., 2015). A different perspective that strengthens motivation and certainty which is possible through a coaching approach is worth considering. Coaching encourages a relationship of equality, empowerment and enhancing existing potential (Rogers, 2012). Important skills on the part of the supervisor for matching with PhD students are skills such as empathy, communication and coaching (Woolderink et al., 2015).

It is unsurprising that such a high percentage feel unsatisfied with their supervision as the predominant pedagogy for research supervision in the Faculty of Health Sciences is of a sociocultural view. In this sociocultural paradigm, the student is expected to navigate his environment, identify resources and be more self-directed. Students in this paradigm are self-organising, take up learning opportunities as they arise, use their own networks and relations within the broader environment thus creating a distributed network (Manathunga, 2005b; Godskesen & Kobayashi, 2016). Perhaps this situation calls for this Faculty of Health Sciences to assess its current pedagogy and consider purposely using a combination of approaches, the

current one and one that promotes support and provision (Lee & Green, 2009). This may be especially true where students are new to the environment and are unfamiliar with existing networks for example. Further research is needed into the use of supervisors as coaches and comparing this with the use of external coaches. All coaching intervention related research albeit sparse, points to the positive benefits of coaching post graduate students (Kearns et al., 2008; Geber & Bentley, 2012; Gu, He, & Liu, 2017).

One of the important aspects to consider is that doctoral supervision and coaching are linked by the common foundation of adult learning. Coaching is important because of the pressure to complete doctoral studies on time (McCarthy, 2012). The pressure is further exacerbated by the need to meet funding demands (Mouton, 2007). Coaching by its nature has the benefit of improving potential and learning capacity as well as change (Griffiths & Campbell, 2009; Whitmore, 2010). The need for change or enhancement of potential may be in all the elements that have been shown to improve student efficiency as well as supervision satisfaction (Overall et al., 2011). Furthermore McCarthy quotes the Australian Qualifications Framework and states that for students to reach doctoral standards they need to apply knowledge and skills to demonstrate autonomy, authoritative judgement, adaptability and responsibility as an expert practitioner and scholar (McCarthy, 2012). It is therefore important to establish the most effective process for delivering sustainable coaching in any particular context.

Student Experience of Research Academic Support

Another important concept in the supervision literature is research academic support. After the principle component analysis process, designed to test which behaviours contributed to the concept of academic research support, the results categorised academic research support into two components. One component relates to tasks concerned with support for the research process and the other with support for research technical skills.

Support for academic research process, referred to assistance with activities that involve the logistics of research such as setting goals, planning, clarifying and setting time-lines, direct teaching of technical skills and helping with tasks such as writing skills and related research tasks. The extent of academic research

processes and technical support was low. Students who were not confident that they experienced these behaviours had a range of 32% to 40% of respondents. Among all the respondents up to 39% were unsure and from those who are unsure, it is difficult to know which category of the final result they belong to. It is possible that they could be among those who were either confident or not confident that they experienced these supportive academic behaviours. Future research may need to explore why students could not definitively say they experienced academic research support for process or technical support without doubt. Lee (2008) quotes Pearson and Kayrooz (2004) definition of supervision as a "series of tasks and responsibilities that can be clustered and operationalised. The series of tasks included expert coaching, facilitating, mentoring and reflective practice)". This view is further explained by Lee as being underpinned by what the supervisor adopts as his supervision style. Research academic support lends itself to elements of what Lee (2008), calls *"a functional approach*". The moderate results obtained with regard to academic support in my study are lower than those reported by Overall et al. (2011). Most literature alludes to the need for supervisors to provide academic research support and enunciates its importance for research outputs, student completion, self-efficacy and attainment of student autonomy (Haksever & Manisali, 2000; Johnson, Lee, & Green, 2000; Pearson & Brew, 2002; Kearns et al., 2008; Mouton et al., 2015). If students are supported academically they not only develop self-efficacy but autonomy and are able to make decisions and work independently for timely completion.

Student Experience of support in Developing Autonomy

A concept important for student completion is student attainment of autonomy (McCarthy, 2012; Godskesen & Kobayashi, 2016). Interestingly the results from this study showed the highest mean and percentages of the different components of autonomy support and self-efficacy. This is in spite of all the other concept areas not scoring as high. In a study by Kearns et al. (2008) behaviours that are related to building autonomy and self-efficacy improved among doctoral students after the implementation of cognitive behavioural coaching. Similar to this study, autonomy support and self-efficacy obtained higher averages in a study undertaken among 216 graduate students in China and New Zealand (Overall et al., 2011; Gu et al., 2017). Gu et al. (2017) studied the relationship between a supportive supervisory style which referred to autonomy, academic and personal support and creativity in

graduate students (Gu et al., 2017). Gu et al. (2017) reports a mediating effect of the directive supervisory approach and student creativity. Overall et al. (2011) reported that autonomy supported was associated with greater research self-efficacy. Three particular types of support are proposed as enhancing autonomy support (Devos et al., 2015). The first is the creation of opportunities for students to make their own choices within proposed activities. A second form of support is the use of informational and non-controlling language and finally understanding that they value the students' perspectives and state of mind (Devos et al., 2015). All three of these behaviours align with coaching competencies and principles such as listening, valuing the client and allowing for choice (Wales, 2002).

There is a tension between being supportive and enabling autonomy (McCarthy, 2012). Doctoral students are expected to attain a level of thinking abstraction and comprehension that goes beyond what they had before. Wisker (2012) proposes that dialogue with supervisors moves beyond acquiescence and synthesis but proposes that this dialogue is similar to coaching (Wisker, 2012). Coaching is a process where the coach does not function as the expert and will not direct the process or give input on the content. In the process of coaching, a coachee is facilitated to take responsibility, become aware of their own abilities, gaps and skills sets. A heightened awareness of these issues allows the coachee to consider their options and make choices (Whitmore, 2010). As such a coachee who has been affirmed, has ownership of his decisions will more likely follow-through and achievement of their goals (Hunt & Weintraub, 2004; Geber, 2010; Rogers, 2012).

Central to the coaching process is the use of questioning to allow coachees to process their situation. Insight and awareness is attained through processing issues and concerns that have been illuminated through questioning and listening (Rogers, 2012). Supervisors often give answers and perhaps an awareness of questioning skills is a useful endeavour in their training. Questions can be asked to establish goals related to completion of the PhD project which have important links to motivation (McCarthy, 2012). Similarly, questions can be used to raise awareness of the PhD students' level of commitment.

A lack of clarity of issues was identified as one of the key reasons why PhD students fail to make progress and "Get stuck". Coaching approaches in particular

will assist with naming the issue (Stoltzfus, 2008). Naming the issue is important in that if the supervisor or student ignore problems through misplaced diplomacy, embarrassment or guilt they will only extend these problems or make them worse (McCarthy, 2012). Another important element of coaching that contributes to development of both self-efficacy and autonomy in PhD students and ultimately the quality of their of supervision, is feedback (McCarthy, 2012). Feedback is an important element of coaching that helps enhance awareness within a person and therefore it is an important aspect of support in supervision (Rogers, 2012; Devos et al., 2015). In explaining the types of support that will facilitate or frustrate "need satisfaction" in students, Devos et al. (2015) explain that a structured versus chaotic approach will yield better results. A structured approach refers to the clarity of information that is provided to students, guidance with on-going activity and provision of constructive feedback. Interestingly these behaviours are outlined in the concept of academic support both process and technical.

One of the recommendations given as feed-back in writing up research is the use of coaching to allow the student to self-edit and recognise patterns of mistakes in writing (Kearns et al., 2008). Obviously, there is a need for balance as proposed by Devos et al. (2015) who found from their study on supportive practices that supervisors were more successful when they "got their hands dirty" by reading and offering in-depth feedback on the subject. Although autonomy support as mentioned earlier was experienced by many of the PhD students included in this study, one may ask the question: "***is the felt support for autonomy because of an inadvertent, non-directive approach forcing the student to find their way or is it because of a deliberate conscious process of coaching and supervision?"*** Future research may need to examine if experienced autonomy support in the Faculty of Health Sciences is a deliberate effort or a needed intervention. This is especially because of the low number of students generally less than 30% who experienced, academic support, coaching behaviours, personal support and were satisfied with their supervision.

Student Experience of Personal Support

Personal support, pastoral care and concern for students have been cited as important for doctoral students by both students and supervisors (Ives & Rowley, 2005). Personal support scored a lower mean than that reflected in Overall et al.

(2011) study and was associated with supervisor satisfaction and availability, coaching behaviour as well as academic support related to process and technical skills. The elements that were sought under personal support concern not only an empathetic and understanding attitude but the ability to listen, affirm, reassure, compliment, respect, value in relation to research work and allow choices for the student. Such qualities enhance motivation for the PhD candidate (Woolderink et al., 2015). McCarthy (2012), in her literature review on coaching and PhD supervision proposes that coaching will assist a student's quality of thinking. In so doing various coaching techniques in particular listening, asking incisive and appropriate questions will expose self-limiting beliefs, students' tendency to overgeneralise in their interpretations and a propensity to discount interpretation they do not believe in. Problems expressed by doctoral students are often ill defined and may be the key obstacle hindering self-direction (Godskesen & Kobayashi, 2016). The ability to share the problem with people who can help could also be inhibited (Kearns et al., 2008). Personal support through coaching may explore the problems that candidates have illuminated. Coaching approaches such as solution focussed coaching (Cox et al., 2014) have the potential to increase a PhD candidate's confidence and ability to solve problems. Indirectly these efforts may impact autonomy support, research self-efficacy and growth in research.

A range of supervision and post graduate study problems that are typical for PhD students have been outlined in the literature (Manathunga, 2005b; Sambrook, Stewart, & Roberts, 2008). Of particular interest to coaching is the self-handicapping tendency of students (Kearns et al., 2008). Some of the listed self-limiting behaviours include overcommitting, busyness, perfectionism, procrastination disorganisation, not putting in effort and choosing performance debilitating circumstances (Kearns et al., 2008). In response to these behaviours Kearns et al. (2008) used cognitive behavioural coaching to test the effect on these behaviours. The results showed improvements in time management, planning and asking for help all of which are self-management skills and can be categorised as personal support. PhD students may be prone to self-handicapping behaviours such as procrastination which may be overcome through coaching. (Manathunga, 2005b) proposes that cognitive, affective and social concepts must be addressed in order to overcome difficulties associated with procrastination. As illustrated by a supervisor from Minia University in Egypt who said "The PhD student here in Egypt faces

numerous problems," and that they need help to solve them. "Unfortunately, many supervisors do not bother, and end up adding one more hurdle in the student's way" (Cyranoski, Gilbert, Ledford, Nayar, & Yahia, 2011).

As an example Godskesen and Kobayashi (2016) used coaching in a systemic and reflective model and helped students to concretise ill-defined problems. When compared, both studies Kearns et al. (2008) and Godskesen and Kobayashi (2016) used coaching to facilitate students to set goals and put structure to their doctoral studies, confront problems, raise awareness and challenge beliefs. The value of applying coaching approaches more deliberately is further cemented by the clear interaction there is in the behaviours required for supervision as shown by the correlations and regression results in this study. These results show that there is a clear relationship between coaching and academic and personal support as well as satisfaction with supervision.

Further analysis was conducted to test for relationships and interaction between the different behaviours ascertained and as experienced by PhD students. A weak but significant relationship was evident between age and satisfaction with the supervision. This result differs from Overall et al. (2011) study where no relationship was found in their cohort. Age has been noted before in supervision literature as impacting supervision satisfaction (Lee, 2008; Boehe, 2016). It is unsurprising though that with increasing age there is increasing dissatisfaction as older students may be more experienced and less accepting of advice or direction that is not clear or well considered. Additionally, older students may have more competing interests such as social responsibilities that may impact their performance.

In the univariate analysis all elements of research academic support correlated (moderate to strong) significantly with each other and this relationship is well understood within the PhD research supervision literature (Overall et al., 2011). These concepts (availability of the supervisor, coaching behaviours, personal support and satisfaction with the supervisor) are logically linked and therefore the results only serve to confirm this, and the relationships point to the need of supporting students in these tasks. For example, correlation of coaching behaviours and personal support may suggest that if coaching behaviours are applied the students may feel that they are supported in personal issues. In turn the correlation

between all the different support elements and supervisor satisfaction indicates that these behaviours are linked to positive results.

Interactions between supervisory behaviours and supervision outcomes

Unlike Overall et al. (2011) study that found interactions between autonomy support and self-efficacy with other supervision behaviours, my study did not. The lack of interaction between all these supervisory behaviours and research self-efficacy and autonomy support is an interesting finding and may suggest that students in the Faculty of Health Sciences are obtaining their assistance from the wider network and not from the supervisors alone. They could also be obtaining their support from faculty coursework and peer coaching. This in itself is not a negative situation and has even been encouraged in the literature as it moves away from pedagogy where the supervisor and student operate in what (Manathunga, 2005a) refers to as the private space and a pedagogy of colonial engagement. The idea of obtaining support from other sources is not new and has been discussed in the supervision literature (Manathunga, 2005b; Cribb & Gewirtz, 2006), however it is also evident in studies seeking student experiences that supervisors do not necessary encourage this collaborative approach (McCallin & Nayar, 2011; Mouton et al., 2015). Coaching has the potential to encourage the student as one of the coaching outcomes includes exploring one's resources for good outcome. Further research is required to understand where students obtain their support and if these naturally occurring avenues can be adopted as mainstream support. Furthermore, through coaching students can be facilitated to seek the resources they need.

When the regression model was used with both coaching behaviour and supervisor satisfaction as outcome variables, personal support remained as a predictor for both. The need for personal support points to the need for a thoughtful combination of effective supervision that combines rigorous feedback on different aspects of research as well as provision of support, empathy and encouragement (Manathunga, 2005a). Personal issues are difficult to handle for both the student and the supervisor. Students often see discussion of personal issues as a sign of weakness and having an attitude of complaining (Manathunga, 2005b). A coaching environment would be an appropriate and safe environment to facilitate tackling personal issues. One can therefore see how tackling personal issues may impact supervisor satisfaction. A different but interesting finding reported in Overall et al.

(2011) study is that supervisors who provide a high level of personal support but low autonomy support produced students that were less confident in their research skills. This calls for a greater balance of supervision behaviours as personal support is associated with supervisor satisfaction and may be associated with other important outcomes such as self-efficacy, motivation, a positive research experience and ultimately research skills. In my study, high personal support interacted with academic support, but not supervisor availability, but correlated with supervisor satisfaction. Interaction with autonomy support was not tested in this study as was done in Overall et al. (2011) study as my study showed no relationship with any of the other behaviours assessed.

Further analysis into the interactions between different supervisory behaviours using stepwise regression, placed emphasis in terms of influence on different supervisory behaviours to what was outlined in the literature (Overall et al., 2011; Gu et al., 2017). For example, when the impact on supervisor satisfaction was assessed through regression analysis, only academic support, personal and coaching behaviours remained as interacting to influence supervisor satisfaction. When coaching was used as an outcome only personal support and supervisor satisfaction remained as interacting to influence coaching behaviours.

Personal support remained common to both outcomes of felt satisfaction with supervision and coaching behaviours. This finding is interesting, and is in contrast to the position put forward Gu et al. (2017) and Overall et al. (2011) reported that supervisors who provided high personal support but low autonomy support produced students that were less confident in their research abilities. They however, countered the logical notion of not providing personal support by proposing that personal support may indirectly provide an environment where students seek help and therefore promote research self-efficacy. The need for personal support may be contextual and Overall et al. (2011) proposes that students who face greater difficulties and are less able, need more personal support. On the other hand, students with more skills and perform better, elicit autonomy promoting responses from supervisors. It is difficult to interpret the results from this study without further research on the students' past experiences, as self-efficacy is influenced by past experiences and contextual factors.

Further analysis also illustrates that personal support in my study had no relationship with supervisor availability but interacted with personal support and correlated with high coaching behaviours and supports the results of the univariate and regression analysis. These interactions when interpreted point to the hypothesis that PhD students in the Faculty of Health Sciences are obtaining support from other sources other than their supervisors. Again, it is plausible to make the proposal that this in itself is not negative and an understanding of the exact sources of support and their reasons may be helpful. Information on sources of support would help strengthen positive experiences that produce results and reduce negative experiences that create a sense of dissatisfaction with supervision within the Faculties context and ultimately may influence throughput in the Faculty's doctoral programme. An explanation of the influence of contextual factors is best illustrated by Gu et al. (2017) who proposes that Chinese students do well with both directive and non-directive supervisory styles because of their culture of collectivism which supports the students' utmost respect and obedience for authority. This position results in the students following directives to the letter and achieving results.

Both Gu et al. (2017) and Overall et al. (2011) propose that supervisors need to find a balance in supervision that encourages students to think and act autonomously while providing some guidance on how to complete research tasks. Gu et al. (2017) focussed on what he termed creative self-efficacy and proposed that supervisors should consider their supervisory style. He proposed improving graduate self-efficacy first through a more directive supervisory style then focus on intrinsic motivation in a more non-directive manner.

After conducting a study to determine the expectations, experiences and opinions of both students and supervisors Woolderink et al. (2015), recommends good practices that they suggest would improve the PhD trajectory. Some practices and steps described have elements that are akin to the coaching process. The steps include explicit discussion and a written record of mutual expectations and responsibilities. Additionally, regular follow-up and appraisal of relationship and communication with the PhD team, tailoring of supervision style to the specific candidate and a consciousness of how the PhD trajectory is impacting the candidate. Coaching in this study was not practised to a large extent with a third of

the students experiencing coaching behaviours and some of the closely related behaviours were not at an optimal level. Behaviours closely related to coaching were personal support and academic support, which included research processes as well as technical related processes. It may be prudent to deliberately target coaching practices that will enhance supervisor availability, research academic support and personal support. Although this study showed good results for self-efficacy and autonomy support there is room for improvement. It is important to assess the source of felt autonomy support and self-efficacy and furthermore if the process is a positive one. This is because the results from this study point to the students obtaining their support from external sources which may be why just over a third reported they were satisfied with their supervision.

The concept academic support "1" referred to tasks that related to the research process. In the regression model with supervisor satisfaction, the concept of academic support related to process tasks remained a strong predictor of supervisor satisfaction. Literature supporting the need for the provision of support in research process tasks are Devos et al. (2015), Gu et al. (2017) and Manathunga (2005b) who back the need for structured supervision, clarity and guidance on goal planning and execution. Facilitation of goals can be enunciated through the use of coaching models like GROW (goal, reality, options and wrap up) (Whitmore, 2010), CLEAR (contracting, listening, exploring, action and review) (Rostron & van Rensburg, 2009) and Integral models (Wilber, 1997). All these models will develop purpose, clarity and awareness for the student as well as build and support student autonomy and self-efficacy.

Supervisor behaviours tested for their Contribution to Overall Supervision Behaviours

The different supervision behaviours included in this questionnaire were assessed for their contribution to the concept under study. All the behaviour elements named under the concepts namely supervisor availability, personal support, autonomy support, self-efficacy and supervisor satisfaction contributed to each concept. The results compared well with the results reported by Overall et al. (2011). Similar to Overall et al. (2011) study, research academic support demonstrated a split in behaviours depicting two distinct behaviour categories. Coaching behaviours which were included in my study were not part of Gu et al. (2017) or Overall et al. (2011)

study and could therefore not be compared. All elements of the chosen behaviours for coaching contributed equally to the concept of coaching. Interestingly non - directive guidance allowing for growth, control and responsibility accounted for 70.3% of the variance (accounts for as much of the variability in the data) suggesting that this is an important aspect of coaching and contributes to its fruition. These coaching questions could therefore be used for future studies that assess or test coaching interventions.

5.4. CONCLUSION

This study sought to establish the extent of different supervisory behaviours and coaching behaviours among supervisors. The results show that these behaviours are not predominantly felt by the majority of students. One would say the level at which they are felt and experienced is moderate. However, the level of perceived student self-efficacy and autonomy support is encouragingly high. The processes that result in high self-efficacy and autonomy support may not be as a result of supervision in this Faculty of Health Sciences but may be a product of both student ability and institutional support. This may indicate that the doctoral student is navigating their way through the doctoral journey not fully supported by the supervisor. There may be potential for improved student outcomes, through- put rates and research outcomes and skills development if coaching was deliberately included Coaching would enhance the ability to provide a balanced supervisory style that includes both the students' ability to navigate their research environment as well as taking advantage of the opportunity to provide a more supportive supervisory style. Many opportunities for coaching are present and evident in some of the supervision elements in this study and in this discussion many points for coaching opportunities have been included in the discussion.

CHAPTER SIX

6. CONCLUSION AND RECOMMENDATIONS

This study investigated the supervision experience of PhD students in the Faculty of Health Sciences (in terms of academic, personal and autonomy support provided by supervisors) as well as supervisor availability and coaching practices. The extent to which supervision behaviour including academic, personal and autonomy support influences student self-efficacy, coaching, and satisfaction with supervision was also established. The study cohort had a majority of female students whose duration of study was 2.8 years (±2.35) with a mean age of 40 and undertaking quantitative studies. The study attained a response rate of 32%.

The extent to which PhD students in this study experienced coaching behaviours was moderate with most behaviours scoring below 45%. Similarly, the extent to which all supervisor behaviour was experienced in terms of academic research support and personal support had a range of 40 and 55% respectively. Supervisor availability also scored below 40% in most behaviours.

Of interest is the higher level (65-82%) at which autonomy support behaviours were experienced by PhD students. Apart from autonomy support all the other behaviours scored at a low to moderate level. Surprisingly and of interest, in spite of these results the students reported their self-efficacy as fairly high and comparable to previous studies. The elements of autonomy support behaviours ranged from 36% to 58% and the mean was 5.30 (±1.42) comparable to similar studies in the literature. On closer examination, in spite of the high self-efficacy, many students were not confident of their self-efficacy. This may indicate students were not sure of their own self efficacy or how to assess their own self efficacy.

Our findings have some similarity with two studies found in the literature that used the same study tool. Both studies scored higher than ours in the areas of academic support for research skills and process, personal support, supervisor availability and satisfaction with supervision. The areas of autonomy support and self-efficacy had similar results although we could not compare the range of percentages as the authors did not report on them. The question still remains; is the felt autonomy support as a result of deliberate effort on the part of supervisors or as a result of

support from external faculty activities in the form of courses and informal peer support. Related to this are the different interactions that were evident in my study compared to previous studies. No relationship was evident between autonomy support and self-efficacy and other supervision behaviours while other interactions were similar. The same explanation for other existing avenues of support could hold true and may need to be explored in future research.

The implications of our research results on the extent of these supervision behaviours are discussed in as far as they influence student self-efficacy in research, supervisor satisfaction and coaching behaviours. Many of the influences are supported by different interactions, hypotheses and relationships found in previous work on postgraduate supervision. Previous research and literature illustrate the importance of the different concepts and their elements studied in this group of PhD students. For example, the link between support of academic research processes and technical skills, autonomy support and self-efficacy was made very clearly. The potential and linkage to coaching approaches in providing and facilitating these supervision behaviours in a manner that builds efficacy and autonomy as well as research outputs as clear goals is outlined and discussed. Students, like coachees in the process of coaching could have potential unlocked in attaining the required outcomes of PhD study and enhance supervision outcomes. Additional benefits such as gaining clarity on issues of concern may also ensue. Inter-linkages such as personal support through coaching may lead to autonomy support, self-efficacy and student growth as was found in Godskesen and Kobayashi (2016).

6.1. RECOMMENDATIONS FOR FUTURE RESEARCH

Based on the results of this study and the dearth of literature to inform future interventions in the area of PhD supervision in the Faculty of Health Sciences and any efforts towards the systemic inclusion of coaching, the following areas are recommended for future research and consideration by research programme coordinators.

- Supervisors' understanding of coaching and their existing coaching competencies commonly known and practiced by supervisors in the Faculty of Health Sciences.

- Conduct further studies on supervision experiences including coaching periodically
- The extent to which supervisors are ready and willing to coach and engage in coaching practice with PhD students.
- Exploration of students' past experiences and the relation of these to self-efficacy because past experiences and contextual factors influence self-efficacy.
- Explicit studies on factors influencing student satisfaction with supervision, sources of student support and specific behaviours that are supportive of autonomy in both the supervisors and in the general research environment.
- Longitudinal coaching intervention studies to test the effect of coaching using external coaches and a study of supervisors as coaches, building on the work done by Geber (2010) and Geber and Bentley (2012).
- Research programme coordinators should look at the evidence for the inclusion of coaching and its impact on research satisfaction and outcomes.

Research programme coordinators should assess the extent and level of training of all supervisors in coaching and its relation to supervision practices.

Recommendations for PhD Supervisors

- Supervisors would be advised based on the results of this study to get regular feedback from their students about their sense of self development, self-efficacy and awareness of the students' personal issues.
- Supervisors should assess their level of availability and contract clearly with the students about contact time and giving feedback.
- Supervisors should be reflective of their supervision approach and use of skills such as mentoring and coaching.

6.2. LIMITATIONS OF THE RESEARCH FINDINGS

The study findings may not be generalized to all students undertaking PhD studies as they were collected form one university albeit with one of the largest health science faculties. The response rate though acceptable according to the literature could have provided better results if the sample was larger. The challenge of non-response among PhD students in the Faculty of Health Science is a curious one especially given that these are people engaged with research and so could be more empathetic to the vagaries of research.

The study obtained data from the students only and not from the supervisors to corroborate and even compare the results of the students versus the supervisors. Research that includes supervisors' perspectives is required. The data are also based on retrospective events and future research may take a more longitudinal approach.

Another limitation of this study and studies that used the same tool to determine supervision behaviours is that it is designed using a Likert scale that allows the student to sit on the fence and not commit to whether they experienced the particular behaviour or not. While this is a known weakness of Likert scales it is difficult to interpret. In this study, it could however point to illuminating that students are not aware what the standard expectation is in the particular area. To that end the result could be useful in illustrating that there is need to make the expectations in each area of supervision behaviours clearer. Completion of the questionnaire was based on self-report so may be open to over or under estimation. For example, the measure of self-efficacy may be over or under estimated and therefore further research that may determine more empirically the level of self-efficacy may be more accurate. The design of this study was cross sectional which limits the ability to make casual assertions.

Furthermore, the return rate is on the lower end of the acceptable range. Given that there are over 400 students in the faculty under study a higher return rate would have strengthened the results by increasing the representativeness of the information.

6.3. CONCLUSION

Coaching behaviours among the participants of this study were experienced at a low to moderate level. PhD students in the faculty of health sciences experienced a low level of academic support for research skills and process, personal support, supervisor availability and satisfaction with supervision. Autonomy support and self-efficacy had relatively high levels of attainment. Further research is needed to establish if the systematic inclusion of coaching practice in the process of supervising PhD students. Of particular interest, would be research that aims to establish supervisors' acceptance, willingness and readiness to adopt coaching. Furthermore, experiences and factors influencing student self-efficacy, satisfaction, satisfaction with supervisors would be useful. Ultimately, a longitudinal coaching intervention study would provide evidence for the feasibility of including coaching formally into supervision practice.

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APPENDIX A

- **SUPERVISION QUESTIONNAIRE**

SUPERVISION QUESTIONNAIRE

Instruction:
Please provide the following information

SECTION 1
Demographic Information

1. Age : _____
2. Gender : Male ☐ Female ☐
3. Area of study (please tick):
4. Type of study : Qualitative ☐ Quantitative ☐
5. School of registration:

   Clinical medicine ☐ Public health ☐ Anatomy ☐ Physiology ☐
   Dental and oral hygiene Pathology ☐ Therapeutic sciences ☐
6. Type of registration: Part time ☐ Full time ☐
7. Date of registration:
8. Supervisor gender : Male ☐ Female ☐
9. How many supervisors do you have?(please tick)
10. Type of supervision undertaken (please tick individual, group or both
11. Do you attend a PhD support group?
12. Primary supervisors' area of interest: _____

SECTION 2
This section comprises 7 areas where your experience is elicited.
Instruction: Please tick the appropriate answer to each section. Please note the programme will not permit you to proceed unless all sections are completed fully.

Section 2: Supervision Experience (in years)

Academic Support for Research		**Not at All**	**Somewhat Confident**	**Completely Confident**
1	My supervisor provides clear expectations and goals I need to achieve	1	4	7
2	My supervisor helps me plan and manage the different research tasks I have to complete	1	4	7
3	My supervisor helps me to construct timelines and deadlines to ensure I complete tasks on time	1	4	7
4	My supervisor gives me good, practical advice regarding how to plan and conduct my research	1	4	7
5	My supervisor offers suggestions about how to find the resources I need	1	4	7
6	My supervisor gives me guidance to find relevant literature and research materials	1	4	7
7	My supervisor seeks information that will help me with my thesis	1	4	7
8	My supervisor teaches me the technical knowledge and skills that I need to complete my research	1	4	7
9	My supervisor spends time helping me learn the skills I need to complete my research	1	4	7
10	My supervisor provides practical assistance when I need help conducting research tasks	1	4	7
11	My supervisor helps me to develop good writing skills (e.g. expression of ideas, grammar, structure of thesis e.t.c)	1	4	7
Supervisor Availability (my supervisor was accessible)		**Not at All**	**Somewhat Confident**	**Completely Confident**
12	My supervisor sets aside uninterrupted time to meet with me about my research	1	4	7
13	My supervisor is always available to answer any questions I have	1	4	7
14	My supervisor responds to my queries or requests for help within a reasonable time frame	1	4	7
15	My supervisor provides me with prompt feedback whenever I submit written work to him / her	1	4	7
16	My supervisor is available to answer any questions I have	1	4	7
Personal Support		**Not at All**	**Somewhat Confident**	**Completely Confident**
17	My supervisor behaves warmly toward me when discussing my research and / or any problems I am experiencing	1	4	7
18	My supervisor expresses understanding and empathy when I experience difficulties	1	4	7
19	My supervisor listens and responds to any concerns I have	1	4	7
20	My supervisor is friendly, supportive and	1	4	7

	approachable			
21	My supervisor comforts and reassures me when I am feeling down	1	4	7
22	My supervisor compliments me and makes me feel good about myself and my work	1	4	7
23	My supervisor shows me that they respect and value me	1	4	7
24	My supervisor reassures me that I will be able to successfully complete my research/thesis	1	4	7
25	My supervisor makes me feel that I have the ability to do well	1	4	7
Autonomy Support		**Not at All**	**Somewhat Confident**	**Completely Confident**
26	My supervisor encourages me to ask questions	1	4	7
27	My supervisor encourages me to be open about my own ideas and any issues that concern me	1	4	7
28	My supervisor listens to how I would like to do things	1	4	7
29	My supervisor welcomes my input in discussions and treats my ideas with respect	1	4	7
30	My supervisor provides me with choices and options	1	4	7
31	My supervisor encourages me to work independently	1	4	7

Research Self-Efficacy *(Your belief in your own capacity to execute behaviours necessary to produce results)*				
How confident are you to:		**Not at All**	**Somewhat Confident**	**Completely Confident**
32	I am confident with research procedure to collect data	1	4	7
33	I am confident with data analysis (Understanding and interpreting my data)	1	4	7
34	I am confident with my writing (editing, logical flow logical and succinct)	1	4	7
35	I am confident to write a research article	1	4	7
36	I am confident to integrate my research through generating researchable questions, and synthesize results with current literature	1	4	7

Coaching Behavious				
To what extent does/did your supervisor display these behaviours:		**Not at All**	**Somewhat Confident**	**Completely Confident**
37	Non directive guidance allowing growth , control and responsibility on my part	1	4	7
38	Asked questions to lead me to a self-discovered answer and did not always tell me what to do	1	4	7
39	Targetted/targets all efforts at obtaining defined goals	1	4	7

40	In collaboration with myself offer constructive ways to develop and offer solutions when asked	1	4	7
41	Practice listening skills and create opportunities to conduct coaching sessions often	1	4	7
42	Encourages thoughts that enhances performance	1	4	7
43	Facilitates self awareness of underlying barriers to your attainment	1	4	7
44	Create opportunities for perfomance in behaviour and effective thinking	1	4	7
45	All efforts were generally targeted at defined goals	1	4	7
46	Worked with me to find solutions for my developmental needs	1	4	7
47	Listened empathetically and discussed my concerns in depth	1	4	7

Satisfaction with your Supervisor				
Indicate your satisfaction with your supervisors by answering the following questions:		**Strongly Disagree**	**Neither Agree or Disagree**	**Strongly Agree**
48	I feel satisfied with the way I am/was supervised	1	4	7
49	My supervisors is much better than other supervisors	1	4	7
50	My supervisor is close to ideal	1	4	7
51	I have the supervisor I wanted	1	4	7
52	If I did it over I would want a different supervisor	1	4	7
53	There are many aspects of supervision I am unhappy with	1	4	7
54	My supervisor is not very good	1	4	7
55	I wouldn’t do as well if it weren’t for my supervisor	1	4	7
56	I could do just as well without my supervisor	1	4	7
57	I would be better off with a different supervisor	1	4	7
59	I feel lucky I have the supervisor I have	1	4	7

APPENDIX B

- **INFORMATION AND CONSENT LETTER (e-mail)**

LETTER 1: TO STUDENTS

The Graduate School of Business Administration

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PO Box 98, WITS, 2050
Website: www.wbs.ac.za

Research Consent Form
Study: PhD student supervision experiences and the extent of supervisor coaching and academic support in the Faculty of Health Sciences University of the Witwatersrand

INFORMATION SHEET AND CONSENT FORM

Who I am
Hello, I am Hellen Myezwa a first year Masters student. I am conducting research for the purpose of completing my Masters in Management, leadership and coaching at Wits Business School

What I am doing
I am conducting my research study using an online survey on PhD student supervision with the following objectives:

- To establish supervision experience of PhD students in the Faculty of Health Sciences (in terms of academic, personal and autonomy support provided by supervisors) in addition supervisor availability and coaching practices is assessed.
- To establish the student's level of self-efficacy.
- To establish the level of satisfaction with all the different aspects of supervision experience.
- To determine to what extent supervision behaviour including coaching, academic, personal and autonomy support influences student self-efficacy and satisfaction with supervision.

Why am I undertaking this study?

- *Much of the literature points to two major factors that influence student through put. Supervision experience which includes the extent to which a student is coached and given direct academic and personal support. Resultant student self-efficacy is important for success (how well one can exercise control over level of functioning and environmental demands to produce results). It is therefore important that a better*

understanding of the experience of student supervision is explored. A deeper understanding of what support is given will help the faculty to enhance what is done well or train appropriate areas of need.

Your participation
Please complete the questionnaire shared with you via the link to the online tool Red cap

- Please understand that **your participation is voluntary** and you are not being forced to take part in this study. The choice of whether to participate or not, is yours alone. If you choose not to participate, you will not be affected in any way whatsoever. You may stop participating in the research at any time. If you do this there will also be no penalties and you will NOT be prejudiced in ANY way.

- **If you agree to participate in this study, please click the link below and complete the questionnaire which is hosted on Red Cap. Red cap is an online tool that supports online surveys. The survey will take approximately 15 minutes.**

Confidentiality
Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including my academic supervisor/s. (All of these people are required to keep your identity confidential.)

NB: Red cap will automatically code your questionnaire and therefore your identity will remain anonymous. The programme has been set to share your results with you and if you wish to know the results in comparison to others please tick the button that states: " I would like to know my results in comparison to the rest of the cohort"

Risks/discomforts
At the present time, I do not see any risks in your participation. The risks associated with participation in this study are no greater than those encountered in daily life.

Benefits
There are no immediate benefits to you from participating in this study. However, this study will be extremely helpful to us in understanding the extent and type of supervision support.

If you tick the box I would like to receive feedback of my results you will automatically receive feedback once the survey is closed.

Who to contact if you have been harmed or have any concerns
This research has been approved by the Wits Business School. If you have any complaints about ethical aspects of the research or feel that you have been harmed in any

way by participating in this study, please contact the Research Office Manager at the Wits Business School, Mmabatho Leeuw. Mmabatho.leeuw@wits.ac.za

If you have concerns or questions about the research you may call my academic research supervisor XXXX on telephone no :xxxx

CONSENT

I hereby agree to participate in research on to establish the extent and type of supervision and coaching support given to PhD students and the effect of student self-efficacy and satisfaction. I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop participating at any point should I not want to continue and that this decision will not in any way affect me negatively.

I understand that this is a research project whose purpose is not necessarily to benefit me personally in the immediate or short term.

I understand that my participation will remain confidential.

……..

Signature of participant **Date**:……..

APPENDIX C

- **REQUEST FOR PERMISSION**

This letter was sent to the Dean and the Assistant Dean -Research and all Heads of schools.

Dear……..

I am currently registered for a Masters in Management leadership and coaching. Fifty percent of this degree requires that I undertake a research project. I have chosen to conduct a study in the Faculty of Health Sciences in the area of supervision. There is previous work done by Geber et al., (2010-2013) on coaching of students and I would like to explore student supervision experiences and the extent to which coaching is undertaken by supervisors.

My study aims and objectives are:

The aim of my study is to establish the supervision experience of PhD students in the Faculty of Health Sciences (in terms of academic, personal and autonomy support provided by supervisors); in addition supervisor availability and coaching practices will be assessed.

The objectives of the study are to:

1. To determine the extent of academic, personal and autonomy support experienced by students
2. To establish the extent of coaching practices experienced by students
3. To establish the supervisors' availability
4. To establish the student's level of self-efficacy.
5. To establish the level of satisfaction with all the different aspects of supervision experience.
6. To determine to what extent supervision behaviour including coaching, academic, personal and autonomy support influences student self-efficacy and satisfaction with supervision

I request permission to access PhD student records via the university's academic information department in order to invite all registered and recently qualified PhD students to participate in the study. For further details please find attached a copy of my proposal and the research tool which will be loaded onto Red Cap and distributed electronically.

Yours Sincerely

Hellen Myezwa

APPENDIX D

- **ETHICAL APPROVAL**

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Myezwa

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H16/02/28**
PROJECT TITLE	PhD student supervision experiences and the extent of supervisor coaching and academic support in the Faculty of Health Sciences, University of the Witwatersrand
INVESTIGATOR(S)	Professor H Myezwa
SCHOOL/DEPARTMENT	Wits Business School/
DATE CONSIDERED	19 February 2016
DECISION OF THE COMMITTEE	Approved unconditionally
EXPIRY DATE	15 March 2019

DATE 16 March 2016 **CHAIRPERSON** _____
(Professor J Knight)

cc: Supervisor : Dr H Geber

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

_____ _____/_____/_____
Signature Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

APPENDIX E

- **CONSISTENCY MATRIX**

Research problem stated here: The experience of students in the Faculty of Health Sciences and which tasks undertaken by supervisors are closely aligned to coaching practices or goals and to what extent and how well the student has experienced this task is unknown.					
Sub-Problem	**Literature Review**	**Hypotheses or Propositions or Research Questions**	**Source of Data**	**Type of Data**	**Analysis**
The experience of PhD students in terms of autonomy, personal, coaching and academic support is unknown	1.Overall et al. (2011) - Concepts of supervisor support , academic support, personal support, autonomy support, self-efficacy and student satisfaction with supervisor 2.Pearson and Brew (2002) - supervisor support, academic support, personal support, autonomy support (McCallin & Nayar, 2011) - coaching (Boehe, 2014) coaching (Grant et al., 2009) - coaching	What is the supervision experience of PhD students in the Faculty of Health Sciences (in terms of the concepts of academic, personal and autonomy support provided by supervisors) in addition supervisor availability and coaching practices is assessed?	See appendix A – questionnaire Example of an extract of questions: – *Academic support = My supervisor provides clear expectations and goals I need to achieve*	Ordinal data in a 3 point Likert scale	Describe the specific analysis method you will use

Research problem stated here: The experience of students in the Faculty of Health Sciences and which tasks undertaken by supervisors are closely aligned to coaching practices or goals and to what extent and how well the student has experienced this task is unknown.					
Sub-Problem	**Literature Review**	**Hypotheses or Propositions or Research Questions**	**Source of Data**	**Type of Data**	**Analysis**
PhD student's level of self-efficacy is unknown. PhD students level of satisfaction with supervision is unknown	Bong and Skaalvik (2003) Boehe (2014) Lee (2008) McCallin and Nayar (2011)	What is the level of student self-efficacy and satisfaction is unknown	Appendix A Self efficacy – An example Of an extract of the first 3 questions= *I am confident with research procedure to collect data* *I am confident with data analysis (Understanding and interpreting my data)* *I am confident with my writing (editing, logical flow logical and succinct)* Satisfaction: I feel satisfied with the way I am/was supervised My supervisors is much better than other supervisors My supervisor is close to ideal	Ordinal	Frequency and mode Tests internal reliability (Santos, 1999)

Research problem stated here: The experience of students in the Faculty of Health Sciences and which tasks undertaken by supervisors are closely aligned to coaching practices or goals and to what extent and how well the student has experienced this task is unknown.					
Sub-Problem	**Literature Review**	**Hypotheses or Propositions or Research Questions**	**Source of Data**	**Type of Data**	**Analysis**
The relationship between the level of satisfaction and self-efficacy with all the different aspects of supervision experience is unknown.	(Overall et al., 2011) - Concepts of supervisor support , academic support, personal support, autonomy support, self-efficacy and student satisfaction with supervisor 2.(Pearson & Brew, 2002)- supervisor support , academic support, personal support, autonomy support (McCallin & Nayar, 2011)- coaching (Boehe, 2014) coaching (Grant et al., 2009)- coaching	What is the relationship between student satisfaction, their self-efficacy and supervision support and coaching behaviours experienced?	Outcomes of the five parts of data in terms of modes and correlational statistics	Ordinal	Test of association And multiple logistic regression analysis