FACTORS THAT INFLUENCE THE ACADEMIC PERFORMANCE OF MEDICAL STUDENTS WITH PRIOR TERTIARY EDUCATION

by

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MINI-DISSERTATION

submitted in partial fulfilment of the requirements for the degree

**Magister in Health Professions Education
(M.HPE)**

in the

DIVISION OF HEALTH SCIENCES EDUCATION

FACULTY OF HEALTH SCIENCES

UNIVERSITY OF THE FREE STATE

BLOEMFONTEIN

JANUARY 2014

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DECLARATION

I hereby declare that the work submitted here is the result of my own independent investigation. Where help was sought, it was acknowledged. I further declare that this work is submitted for the first time at this university/faculty towards a Magister degree in Health Professions Education and that it has never been submitted to any other university/faculty for the purpose of obtaining a degree.

_____   January 2014

Esther Berghout   **Date**

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DEDICATION

I dedicate this mini-dissertation to my dear Opa Jan (my grandfather), who planted curiosity and a passion for research in me. He is a great example to me because he is still studying at the age of 75+.

ACKNOWLEDGEMENTS

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LIST OF ACRONYMS

AH5	High Grade Intelligence test
BA	Bachelor of Arts
BMBS	Bachelor of Medicine, Bachelor of Surgery
B.Med.Sci.	Bachelor of Medical Science
B.Sc.	Bachelor of Science
cf	Confer (=*"compare"*)
GPA	Grade Point Average
GPAs	Grade Point Averages
M.B.,Ch.B.	Bachelor of Medicine and Bachelor of Surgery
MCAT	Medical College Admission Test
s.a.	*Sine anno* (="without date")
UFS	University of the Free State
UK	United Kingdom
USA	United States of America

SUMMARY

Key terms: Adult education; senior students; prior/previous tertiary education; influencing factors; academic performance; student selection; Mixed-methods design; semi-structured interview.

An in-depth study was carried out with a view to provide the School of Medicine, University of the Free State, with more insight into the academic performance of senior students (i.e. students with prior tertiary education) and factors influencing the performance in their medical studies. Many studies have been done to investigate the influence of factors on academic performance with a view to enhance understanding of academic performance, to predict academic performance and to select the students who are best equipped to study medicine. Many factors have been identified and measured in the past years, but no study has focussed on the factors that influence the academic performance of senior students specifically.

In this study, the specific characteristics of senior students were identified and analysed for having influence on academic performance. The research methods comprised a literature review, a retrospective-cohort study (quantitative data) and semi-structured interviews (qualitative data).

The literature review provided the study with a theoretical framework. Recent and relevant studies were used to gather information about characteristics of senior students, factors that have an influence on academic performance and student selection. Quantitative data were gathered from the database of the University of the Free State to measure and compare the academic performance of senior students with the rest of the class. The quantitative data underwent statistical analyses to identify factors that influence the academic performance of senior students. Semi-structured interviews were conducted with the intent to include personal experiences, opinions and ideas of the senior students on their academic performance and the influence of their previous studies and other factors.

The quantitative and qualitative results were combined when the results were interpreted and discussed. Different factors that were found to have an influence in

previous studies were confirmed, new factors were found and a few results differed from what was found in the literature.

Different characteristics of senior students were identified in the semi-structured interviews; factors such as intrinsic motivation, maturity and more awareness of learning style have a positive influence on academic performance. Social division from the rest of the class, financial strain and family commitments, however, have a negative influence on academic performance. The type of previous tertiary education had a limited influence on academic performance. The number of previous courses and the number of years studied were found to have an influence (two or more courses and more than five years have positive influence). Many students were of the opinion that their previous tertiary education helped them in the transition to medical school. The quantitative data analysis concluded that students with a Health Profession background perform significantly better than the other senior students in first and second year. Non-Science students start their medical studies significantly better than biomedical science students in the first year, but their performance drops far below the class average over time. A Biomedical Science background has a lower pass rate in the first year compared to students who study Biomedical science for only one year. Demographic factors that were found to have a positive influence in every year were female gender and studying in the mother language. Older age showed to have a negative influence on academic performance in fourth and fifth year.

The findings of this study made a valuable contribution to the knowledge base of health professions education. The study ends with a list of recommendations with regard to student selection and student support and development as well as further research. The sound research approach and methodology ensured quality, reliability and validity.

OPSOMMING

Belangrike terme: Volwasse onderwys; senior studente; vorige tersiêre onderwys; invloedryke faktore; akademiese prestasie; studentekeuring; Mixed-methods design; semi-gestruktureerde onderhoud.

'n Grondige studie is uitgevoer om die Skool vir Geneeskunde, Universiteit van die Vrystaat, meer insig te gee in die akademiese vooruitgang asook die faktore wat die prestasies van senior studente (studente met vorige tersiêre onderwys) in hul mediese studies beïnvloed. Baie navorsing is gedoen om die faktore wat 'n invloed op akademiese prestasies uitoefen te bepaal en sodoende beter te verstaan. Die doel tydens hierdie studie is om akademiese prestasies te voorspel, en om die keuringsproses vir die mees toepaslike studente vir medies te verbeter. Baie faktore is geïdentifiseer oor die afgelope paar jare, maar nog geen studie was spesifiek gefokus op die faktore wat die akademiese prestasies van senior studente beïnvloed nie.

Tydens hierdie studie is die spesifieke kenmerke van senior studente wat 'n invloed op hul akademiese prestasies het, geïdentifiseer en geanaliseer. Die navorsingsmetodes het bestaan uit 'n literatuuroorsig, retrospektiewe kohort-studie (kwantitatiewe data) en semi-gestruktureerde onderhoude (kwalitatiewe data).

Die literatuuroorsig het 'n teoretiese raamwerk verskaf. Onlangse en relevante navorsing is gebruik om inligting te verskaf oor die eienskappe van senior studente, faktore wat 'n invloed het op hul akademiese prestasie en die keuringsproses van studente. Kwantitatiewe data is verkry vanaf die databasis van die Universiteit van die Vrystaat om die akademiese prestasies van senior studente te bepaal en met die res van die klas te vergelyk. Die kwantitatiewe data is volgens statistieke geanaliseer om faktore te identifiseer wat 'n invloed het op die akademiese prestasies van senior studente. 'n Semi-gestruktureerde onderhoud is met die senior studente gevoer om hul persoonlike ervarings, menings en idees te verkry oor die invloed wat sowel hul vorige studies as ander eksterne faktore op hul akademiese prestasies het.

Na afloop van interpretasie en bespreking van die resultate is die kwantitatiewe en kwalitatiewe resultate saamgevoeg. Verskillende faktore wat in voorgaande studies gevind is, is bevestig, nuwe faktore is verkry en 'n paar resultate het verskil van die literatuur.

Verskillende eienskappe is tydens hierdie ondersoek geïdentifiseer. Faktore soos intrinsieke motivering, volwassenheid en meer bewusheid van die leerstyl het 'n positiewe invloed op die akademiese prestasies getoon. Sosiale afsondering van die res van die klas, finansiële probleme en familieverpligtinge, het weer 'n negatiewe invloed op die akademiese prestasie getoon. Die tipe van vorige tersiêre onderwys het 'n beperkte invloed op akademiese prestasie gehad. Daar is bewys gevind dat die hoeveelheid studies en die tyd wat daaraan bestee is, wel ook 'n invloed het (twee of meer studies en meer as vyf jare het 'n positiewe invloed). Baie studente het gevoel dat hul vorige tersiêre studies hulle gehelp het met die oorskakeling na die mediese rigting. Tydens die analisering van die kwantitatiewe data is tot die gevolgtrekking gekom dat studente met 'n Gesondheidswetenskaplike agtergrond egter beter vaar in hul eerste en tweede jaar. Studente met 'n nie-wetenskaplike agtergrond begin hul mediese studies beduidend beter as die studente wat Biomediese wetenskappe gestudeer het in hul eerste jaar, maar, met tyd neem hul prestasies af tot ver onder die klasgemiddelde. Studente met 'n Biomediese agtergrond toon 'n baie laer slaagsyfer in hul eerste jaar in vergelyking met die studente wat slegs Biomediese wetenskappe vir een jaar gedoen het. Demografiese faktore wat jaarliks 'n positiewe invloed getoon het was vroulike geslag, asook die voordeel om in jou moedertaal te studeer. Daar is ook bewys dat ouer studente swakker vaar in hul 4de en 5de jaar.

Die bevindinge tydens hierdie studie het 'n waardevolle bydrae gelewer tot die kennis in gesondheidswetenskappe-onderwys. 'n Lys van aanbevelings met betrekking tot die keuring, ondersteuning en ontwikkeling van studente asook verdere navorsing word aan die einde van die studie voorgestel. 'n Deeglike en 'n in-diepte benadering van navorsingsmetodes het dus goeie kwaliteit, betroubaarheid en geldigheid verseker.

FACTORS THAT INFLUENCE THE ACADEMIC PERFORMANCE OF MEDICAL STUDENTS WITH PRIOR TERTIARY EDUCATION

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

This research study was undertaken in order to provide the School of Medicine, Faculty of Health Sciences at the University of the Free State with an in-depth investigation into the academic performance of medical students who have had prior tertiary education. The School of Medicine is in need of information regarding these students to determine if they are equipped to study medicine before they enter medical school. This study can serve as a directive for future policy making and decision making regarding these students and the selection of these students for the undergraduate M.B.,Ch.B. programme.

The aim of this first chapter is to orientate the reader to the study. The chapter starts with a description of the background to the research problem. This is followed by an exposition of the problem statement, research questions, goal, aim and objectives of the study. These, in turn, are followed by the design of the study, methods of investigation, data analysis and a description of the value of the study. The chapter concludes with a layout of the report and a summary of the chapter.

1.2 BACKGROUND TO THE RESEARCH PROBLEM

1.2.1 Academic performance in Medical Education

According to Giannakopoulos and Buckley (s.a.:Online), the attrition rate in higher education is high all over the world (about 70%), but in medical education the attrition rate is lower, because it is subjected to a selection procedure. In South Africa, however, the attrition rate in medical education is high compared to other countries (±13% compared to 1.4%, 6% and 8% in North America, Britain and New Zealand respectively) (McGaghie 2002:304).

1.2.2   Predicting academic performance in Medical Education

Over the years, universities have tried to predict the academic performance of medical students for different reasons. More insight is required for better student support but is also important for making evidence-based decisions with regard to the selection of medical students. Selection for medical education has been scrutinised over the years with the goal of finding selection criteria to select only the very best. Previously, medical schools selected students based on examination marks from secondary school only. The subjects during secondary school were also part of the selection criteria. Some international medical schools even select students by using a lottery system, that is, a random selection of qualifying students. However, as research evidence is building up, more and more universities start looking at other selection criteria such as personality, learning styles and other non-cognitive abilities.

1.2.3   Senior students

Within the School of Medicine, University of the Free State the students who have had prior tertiary education are referred to as *"senior students"*. In this study, the same terminology was used. Only students who could show any formal results from their previous tertiary education were regarded as *"senior students"*. The word "course" is used in this study to describe any programme for a tertiary qualification. This includes students who completed or did not complete a degree, certificate or diploma.

1.2.4   Academic performance of *"senior students"* in Medical Education

People have different assumptions when predicting the academic performance of *"senior students"*. Firstly, the fact that they are older and more mature makes one think that they are more serious about their studies. This might also be strengthened by the fact that this is their second experience in tertiary education, so the students are assumed to be more certain about their choice of study, and have a deeper motivation for success. What needs to be kept in mind is that these students also have other responsibilities than students who enter medical school directly from high school. They might have heavier financial responsibilities; need to work while studying; or have a family to take care of. These factors are assumed to have an influence on the academic performance of *"senior students"*.

There seems to be a wide array of factors that might have an influence on the academic performance of *"senior students"*. Different studies have been conducted in this field of study, but with the focus on different aspects. According to Richardson (1995:15) *"senior students"* (in Richardson's study: honours students aged 23 and older) perform better because they are more likely than younger students to adopt a deep approach or a meaningful orientation towards their academic work and are less likely to adopt a surface approach or a reproducing orientation. Ferguson, James and Madeley (2002:954) show in their literature review that previous academic performance would be classified as a factor with a small effect on success in medical school. Another study concludes that mature-age entrants experienced greater stress throughout the medical programme, especially with regard to financial difficulties, loneliness or isolation from the other students, and family problems (Harth, Biggs & Thong 1990:Online).

1.2.5 Measuring academic performance

Performance in medical education can be measured by looking at the attrition rate (Dyhrberg O'Neill, Wallstedt, Eika & Hartvigsen 2011:440). In order to determine the factors that influence the performance of students, it has to be measured in more detail. Performance can be measured by analysing the results of existing assessments that are done in the medical programme, or just the final mark for each year (Ferguson, James, O'Heir & Sanders 2003:430; Lievens, Coetsier, De Fruyt & De Maeseneer 2002:1050). Average marks were calculated for all the modules, and the pass-rates were taken into consideration when the academic performance of the students was measured in this study.

1.3 PROBLEM STATEMENT AND RESEARCH QUESTIONS

Not many research studies have been done to get more insight into the academic performance of *"senior students"*. The School of Medicine, University of the Free State wanted to know if *"senior students"* were having specific challenges with medical education. This was investigated by measuring which factors influence their academic performance.

Different researchers have studied factors that influence the academic performance of students. Other studies identified differences between the performance of *"senior*

students" and students with no previous tertiary education and touched on a few factors that cause these differences. A few of these studies are mentioned in Chapter 2. Because these studies measured the influence of only a few variables at a time, it raises the question as to whether the results of the studies are relevant in the context of this current study. In conclusion, no recent research could be found that focussed on the factors that influence the academic performance of the group of *"senior students"* specifically.

With a view to filling this gap in knowledge, this study was conducted. The study focussed on the readiness of *"senior students"* to study medicine and the factors influencing the academic performance of this particular group of students.

In order to address the problem, the following research questions were raised:

1. *How can student learning and student selection be conceptualised and contextualised to form a theoretical base to understand the academic performance of students with prior tertiary education?*
2. *How did students with prior tertiary education perform in their undergraduate medical studies over the past 12 years?*
3. *Which other factors influence student learning, and what is the importance of each factor?*
4. *What is the influence of previous tertiary studies on the academic empowerment of students and their academic performance during medical studies?*

1.4 OVERALL GOAL, AIM AND OBJECTIVES OF THE STUDY

1.4.1 Overall goal of the study

The overall goal of the study was to evaluate if students with a prior tertiary education background are equipped to study medicine. The study was done to provide the School of Medicine with a scientific study into the academic performance of *"senior students"* during the past 12 years, including data on the factors that influence the academic performance of students who have had prior tertiary education.

1.4.2   Aim of the study

The aim of the study was to investigate factors that influence the academic performance of medical students with prior tertiary education to determine the readiness of these students for medical studies.

1.4.3   Objectives of the study

To achieve the aim, the following objectives of the study were pursued:

- To conceptualise and contextualise student learning and student selection with the focus on students with prior tertiary education by conducting a literature review.
  This objective addresses research question 1.
- To analyse the available data about academic performance of *"senior students"* in their undergraduate medical studies over the past 12 years, by means of a quantitative (retrospective cohort) study.
  This objective addresses research question 2.
- To list the factors that influence student learning and indicate the importance of every factor by using a literature review and a qualitative (semi-structured interview) study.
  This objective addresses research question 3.
- To evaluate the influence of previous tertiary studies on the academic empowerment of the students and their academic performance during medical studies, based on the literature review, and quantitative and qualitative studies.
  This objective addresses research question 4.

1.5   DEMARCATION OF THE FIELD AND SCOPE OF THE STUDY

The study is in the field of Health Professions Education and lies in the domain of student learning and performance with a view to student selection.

The participants in the study were limited to senior students who were enrolled between January 2000 and June 2012. Semi-structured interviews were conducted with a sample of the group of students who were enrolled at the time of the interviews in February and March 2013.

In a personal context, the researcher in this study has a bachelors' degree in radiography for which she qualified in the Netherlands. During her studies in the Netherlands, she took the opportunities to study and develop practical skills in South Africa as well as in Norway. After working in the Netherlands for one and a half years, she moved to South Africa and decided to do her Master's degree in Health Professions Education. For her research project she decided to approach the School of Medicine, Faculty of Health Sciences at the University of the Free State to identify a current problem which would be suitable as a research study for a mini-dissertation, because she wanted to do a study that was meaningful and needed in the faculty. The topic of the research appealed to the researcher's interests, because it deals with the individual differences between students and the influence that this has on the academic performance of the student.

As far as the timeframe is concerned, the study was conducted between March 2012 and December 2013, with the empirical research phase from October 2012 until April 2013.

1.6   SIGNIFICANCE AND VALUE OF THE STUDY

The study will be valuable to the University of the Free State and the students. Because it provides the School of Medicine with insight into the academic performance of their students who have had prior tertiary education and will explain the reasons for their performance. This will give the School of Medicine a scientific base for their decision making regarding student selection as far as "*senior students*" are concerned. The information will help with the identification of students who are likely to be successful in their studies, which is crucial for the selection of students.

1.7   RESEARCH DESIGN OF THE STUDY AND METHODS OF INVESTIGATION

1.7.1   Design of the study

The study was a descriptive study with analytical aspects. It made use of quantitative as well as qualitative research methods; therefore, the mixed-methods approach was used. The design of the study will be discussed in more detail in Chapter 3.

1.7.2 Methods of investigation

The methods that were used and formed the basis of the study comprised a literature review, a quantitative as well as a qualitative study.

Different perspectives from the literature were studied to provide the study with a good theoretical base and to conceptualise and contextualise student learning and student selection.

The quantitative phase of the study was defined as a retrospective cohort study. The quantitative data were collected from the database of the University of the Free State to determine how the *"senior students"* perform and secondly to identify factors that influence the academic performance of these students.

The qualitative data were collected with semi-structured interviews amongst the *"senior students"*. These data were used to confirm or disprove the influence of the factors that were found in the case-control study on student performance, and enhance the completeness and accuracy of the study.

The detailed description of the population, sampling methods, data collection and techniques, data analysis and reporting, and ethical considerations are given in Chapter 3. To illustrate the different phases of the study, a schematic overview is given in Figure 1.1.
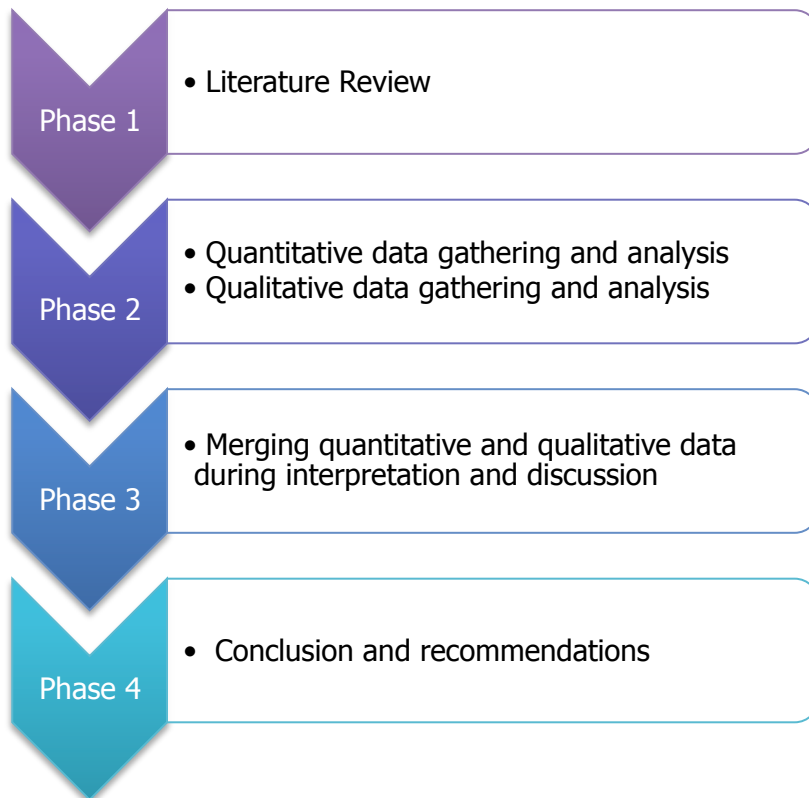
FIGURE 1.1: A SCHEMATIC OVERVIEW OF THE STUDY
(Compiled by the researcher, Berghout 2013)

1.8   IMPLEMENTATION OF THE FINDINGS

The findings of this study will be presented to the Selection Committee of the School of Medicine at the University of the Free State together with recommendations for the implementation of the findings of the study.

To make a contribution to the field of study, the researcher will submit the research findings for publication in academic journals, and present the research project at conferences.

1.9   ARRANGEMENT OF THE MINI-DISSERTATION

The arrangement of the content of the mini-dissertation is as follows:

Chapter 1:   Orientation to the study
This chapter provides an introduction to the study. The background of the research problem and the value of the study are presented. It introduces the research design and methods and emphasises the value of the study.

Chapter 2:   Conceptualisation and contextualisation of student learning and student selection with the focus on senior students

The second chapter describes and discusses different perspectives from the literature on student learning.   Characteristics of "*senior students*" are presented and the literature about the factors that have an influence on the academic performance of medical students is reviewed with the focus on "*senior students*" and student selection.

Chapter 3:   Research methodology

This chapter describes and explains the research design and the methods that were used in the study.   The reliability and validity as well as ethical considerations are also discussed.

Chapter 4:   Quantitative phase: Presentation and analysis of the results of the retrospective cohort study

In Chapter 4, the results of the quantitative phase of the study are presented and analysed.

Chapter 5:   Qualitative phase: Presentation and analysis of the findings of the semi-structured interviews

The qualitative results of the study and the analysis thereof are described in Chapter 5.

Chapter 6:   Interpretation and discussion of the results and findings

In this chapter, the results and findings of the quantitative and qualitative data gathering and analysis are merged, interpreted and discussed.   The strengths and limitations of the study are also discussed in this chapter.

Chapter 7:   Conclusion and recommendations

The final chapter presents the conclusions and recommendations of the study.

1.10   CONCLUSION

Chapter 1 was an introduction to the research study that was done to identify factors that influence the academic performance of students with prior tertiary education. The background to the study was described and the design and methods of the study were explained briefly.   The scope and value of the study were discussed, and the arrangement of the report was set out and explained.

The next chapter, Chapter 2, **Conceptualisation and contextualisation of student learning and student selection with the focus on senior students,** describes and discusses different perspectives from the literature on student learning and student selection, with the focus on "*senior students*".

CHAPTER 2

CONCEPTUALISATION AND CONTEXTUALISATION OF STUDENT LEARNING AND STUDENT SELECTION WITH THE FOCUS ON SENIOR STUDENTS

2.1 INTRODUCTION

De Clercq, Pearson and Rolfe (2001:418) describe two opposite assumptions about the performance of *"senior students"*. Firstly, they quote Geffen (1991 <u>in</u> De Clercq *et al.* 2001:418): *"It is widely assumed that students with previous tertiary education have a rich array of life experiences, are more motivated and as such are better equipped to deal with the transitional stresses of university life"*. Secondly, they found that other research, for example by Harth *et al.* (1990:Online), conclude that mature-age entrants experience greater stress with regard to financial difficulties, loneliness or isolation from fellow students as well as family responsibilities. These assumptions are based on different factors that have an influence on the performance of *"senior students"*. Various studies have been conducted on the factors that influence or predict the performance of medical students. These studies focus on a few factors at a time, which raises the question, which factors are most important, and which ones apply to *"senior students"*?

This chapter provides the study with a theoretical framework to support the empirical part of this study. The literature was consulted and relevant, recent studies were identified. Different aspects that play a part in this research study will be explained and discussed. A schematic framework for the literature review was designed and is shown in Figure 2.1. Three main aspects will be described, namely, *"senior students"*, factors influencing academic performance and student selection. The figure shows that these three aspects are related or influence one another. The chapter will begin with a description of the characteristics of *"senior students"* and some specific learning needs and challenges of these students. Thereafter, the factors that the literature describes as having a significant influence on the academic performance of students will be presented and discussed with the focus on *"senior students"*. The selection of medical students and *"senior students"* specifically will be discussed briefly.
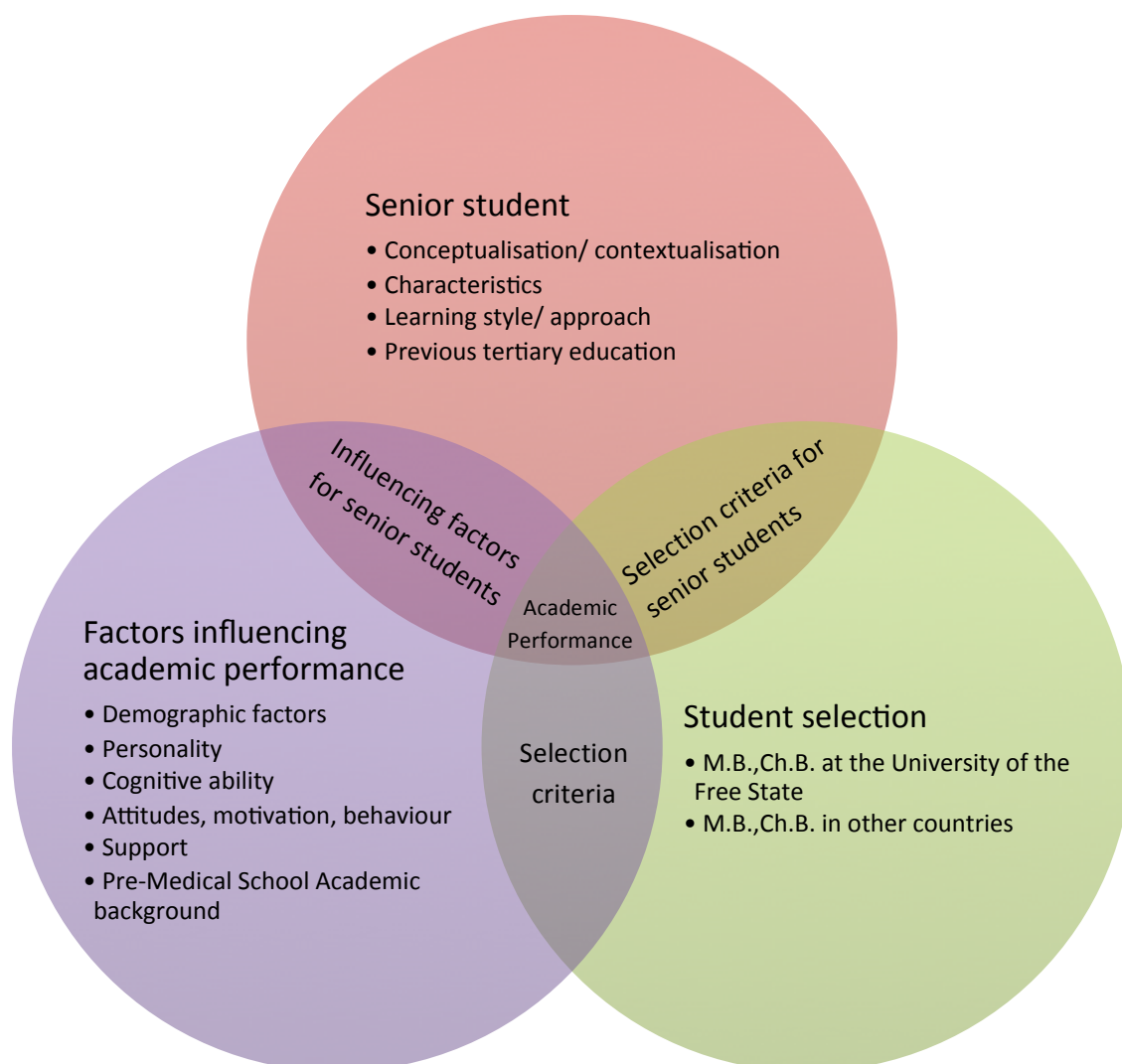
**FIGURE 2.1: SCHEMATIC FRAMEWORK OF THE LITERATURE REVIEW
(Compiled by the researcher, Berghout 2013)**

2.2   SENIOR STUDENTS

"Senior students" have specific characteristics that must be considered when looking at the factors that influence the academic performance of these students. The researcher first describes the process of finding a definition and characteristics of the *"senior student"*. Thereafter, the specific learning needs of these students are described followed by a literature review of the influencing factors of prior tertiary education on academic performance.

2.2.1   Who is a senior student?

In this study the word *"senior students"* is used for students with a previous tertiary education background. This includes all the students of whom any formal results are

recorded on the database of the University of the Free State. Students who only studied for one year before entering medical school are included, as well as students who have had prior tertiary education for eight years.

In the literature, terminology such as mature student, adult learner and senior student are used in different ways (cf. following text). Unfortunately, the authors of articles do not always give a definition of the term that they use, which makes it very difficult to decide if the article is applicable to research about students with tertiary education backgrounds. It is found that the terminology is specific for different countries, but universities also use different definitions. For example, in the United Kingdom (UK), the term "mature learner" is used, whereas in North America the term "adult learner" is used (cf. following text).

In North America, adult learners fall in the category of non-traditional students. The National Center for Education Statistics defines non-traditional students as meeting at least one of the following seven criteria:

- *"Delayed enrolment (does not enter postsecondary education in the same calendar year that he or she completed high school);*
- *Attends part time for at least part of the academic year;*
- *Works full time (35 hours or more per week) while enrolled;*
- *Is considered financially independent for purposes of determining eligibility for financial aid;*
- *The student has dependants other than a spouse;*
- *Is a single parent (either not married or married but separated and has dependants);*
- *Does not have a high school diploma (completed high school with a General Education Diploma or other high school completion certificate or did not complete high school)"* (Horn & Carroll 1996:Online).

Admission information from the Cambridge University in the UK defines a "mature student" as aged 21 or over with no completed higher education courses. Students with a prior degree are regarded as affiliated students. These students can complete a degree in a year less than usual (Cambridge Admissions Office 2012:Online).

At the Trinity College in Dublin, students who are older than 23 years before the beginning of the academic year are called mature students.   There are different admission criteria for these students (Trinity College 2013:Online).

In South Africa, adult learners can be classified from a legal perspective based on their chronological age, which is 18 years in South Africa, but in terms of legislative procedures a mature-age learner is 23 years or older (Buchler, Castle, Osman & Walters 2007:128; Gravett 2005:7; Merriam & Brockett 2007:5).

2.2.2   What are the characteristics of senior students?

Because there is no globally recognised definition for adult learners, mature students or senior students, Corder (2008:5) suggests a description of the characteristics of adult learners instead.

According to Corder (2008:5) adult learners often have most of the following characteristics:

- *"They are above the age of compulsory education;*
- *They have some experience of the world of work;*
- *They have family responsibilities;*
- *They have financial responsibilities;*
- *They have domestic responsibilities;*
- *They are reasonably independent;*
- *They are able to make their own judgements about the world around them;*
- *They have some experience of life;*
- *Their tastes are more sophisticated than they were when they were younger;*
- *This is not their first learning experience".*

Gravett (2005:7) describes adults by looking at the definition of an adult, the life experience of adults and their readiness to learn; and also touches on the teaching of these students.

2.2.2.1 *Adult by definition*

The concept "adult" focuses mainly on the adult's life situation, according to Gravett (2005:7). Adulthood includes a collection of norms and values. Autonomy, responsibility and self-determination are generally perceived as significant attributes of adulthood. Teaching must accommodate the learners' adult attributes, preferences and psychological needs, as well as the adult educator's expertise and guidance (Gravett 2005:7).

2.2.2.2 *Life experience*

To adults, their experience is who they are. If adults' experience is devalued or ignored, they may feel that they are being rejected as persons. Adults' experience can serve as a rich resource for learning (for the adult learners themselves and for fellow learners). Experience can sometimes be an obstacle to learning; for instance, prior educational experience can cause a pre-set idea of what it means to be a learner. Adults often have well-established attitudes, convictions and thinking patterns and may find it difficult to learn new ways of thinking and doing if these contradict their beliefs and experience (Gravett 2005:8-9).

Adult learners can be activity-orientated. They pursue learning activities out of social or personal growth needs. Goal-orientated learners wish to use education to achieve some definite external objective, such as a certificate or promotion or to solve an immediate problem facing them. Learning-orientated learners seek knowledge or skills for its own sake, because it interests them (Houle <u>in</u> Gravett 2005:10).

2.3 ADULT LEARNING

Because of the characteristics of "*senior students*", they present with specific learning approaches and needs. Adult learning has no set definition, model or theory that explains how adults learn, why they learn and how this process can be best facilitated. Instead of a single definition, we have a colourful mosaic of theories, models, sets of principles and explanations that form the knowledge base of adult learning (Merriam 2010:1). In the mid-twentieth century, adult education was a recognised field of practice. Adult educators realised that adults need another approach to education than children. Humanistic psychology provided the philosophical base for three

theories of adult learning: andragogy, self-directed learning and transformational learning (Merriam 2010:1).

2.3.1 Andragogy

Knowles introduced the concept of andragogy in 1970 in his book called *"The modern practice of Adult Learning: Andragogy versus Pedagogy"*. He developed the theory that adult learning should be distinguished from pedagogy (Knowles 1984:6). Pedagogy is defined as the study of the methods and activities of teaching (Cambridge 2010:1047). The word means 'child-leading' in Greek. The term andragogy means 'man-leading' in Greek. Knowles presented characteristics of adult learners as compared to children (Table 2.1). This formed a base for a programme-planning model for designing, implementing and evaluating educational activities for adults.

TABLE 2.1: CHARACTERISTICS OF CHILDREN AND ADULT LEARNERS
(Compiled from Knowles 1984:8-12)

	Pedagogy	Andragogy
The learner	Dependent	Self-directing, responsible
The learners' experience	Little experience that is of value. Teacher and books are resources	Life experience and experience from performing different roles. Learner is resource. Identity of the learner lies in his/her experience. Need individual approach.
Readiness to learn	Students are told what to learn	Experience a need to know
Orientation to learning	Subject-centred orientation	Life-centred, task-centred or problem-centred orientation.
Motivation to learn	External motivations	Internal motivations

The programme planning model that Knowles developed would, for example, suggest that adults can participate in their own learning by assisting in diagnosing their learning needs, planning and implementing learning activities and evaluating those experiences (Merriam 2010:2).

Initially, Knowles saw the two models (pedagogy and andragogy), as two separate processes- one for children, the other for adults. But when experimenting with the andragogical model, teachers found that young people learned better, too, when the andragogical model was applied. Other educators experienced a need for a pedagogical model in basic skills training for adults (Knowles 1984:6). Knowles subsequently revised his theory in such a way that the pedagogical and andragogical

models are seen as parallel. He sees both approaches as appropriate for children and adults, depending on the situation (Knowles 1984:12-13).

2.3.2 Self-Directed Learning

At the same time that Knowles introduced andragogy, the concept of self-directed learning was introduced. Merriam (2010:2) describes how the researcher Tough conducted one of the studies that formed the basis of this concept in 1971. He researched Canadian adult learners, and found that in one year, 90% of the participants had engaged an average of 100 hours of self-planned learning projects, which were deeply embedded in their everyday lives. More than 35 years of research in North America and Europe has verified widespread presence of self-directed learning among adults. According to Merriam (2010:2-5) different Models of Self-Directed Learning have been proposed, firstly by Tough in 1971 and Knowles in 1975, who developed different models. Both models started by diagnosing needs to identify resources and instructional formats ending with evaluating outcomes. Later models also considered the context of the learning and the nature of the learning (for example, opportunities for learning that are found in one's environment). Merriam (2010:4) states that the Grow 1991 model is the most popular model. The stages of Grow's model of self-direction are shown in Table 2.2. This model has as aim to teach learners to be self-directed. It speaks of learners in four different stages, and stresses the idea that teachers should try to match the learners' stage of self-direction and prepare the learner to advance to higher stages (Grow 1991:129; Merriam 2010:4).

TABLE 2.2: STAGES OF SELF-DIRECTION (GROW 1991:129)

	Student	Teacher	Instructional method
Stage 1	Dependent	Authority Coach	Coaching with immediate feedback. Drill. Informational lecture. Overcoming deficiencies and resistance.
Stage 2	Interested	Motivator Guide	Inspiring lecture plus guided discussion. Goal-setting and learning strategies.
Stage 3	Involved	Facilitator	Discussion facilitated by teacher who participates as equal. Seminar. Group projects.
Stage 4	Self-directed	Consultant Delegator	Internship, dissertation, individual work or self-directed study-group.

2.3.3 Transformative Learning

An act of learning can be called transformative only if it involves a fundamental questioning and reordering of how one thinks or acts. If something is transformed, it

is different from what it was before at a very basic level (Brookfield 1995 <u>in</u> Cranton 2010:2).

Transformative learning is about the cognitive process of meaning-making. It is in particular an adult learning theory because it is dependent on adult life experiences and a more mature level of cognitive functioning than found in childhood. According to Merriam (2010:3) Mezirow developed the transformative learning theory in 2000. It is based on the idea that learning is making sense of our experiences. Learning can result in a change in one of our beliefs or attitudes, or it can be a change in our entire perspective (Merriam 2010:3). Mezirow (1995 <u>in</u> Cranton 2010:2) describes the process of personal-perspective transformation in ten different phases:

1. *"Experiencing a disorienting dilemma;*
2. *Undergoing self-examination;*
3. *Conducting a critical assessment of internalised assumptions and feeling a sense of alienation from traditional social expectations;*
4. *Relating discontent to the similar experiences of others;*
5. *Exploring options for new ways of acting;*
6. *Building competence and confidence in new roles;*
7. *Planning a course of action;*
8. *Acquiring the knowledge and skills for implementing a new course of action;*
9. *Trying out new roles and assessing them; and*
10. *Reintegrating into society with the new perspective".*

There are three fundamental aspects to teaching for transformation: empowering learners, fostering critical reflection and self-knowledge, and supporting learners (Cranton 2010:4). Teachers have the power to create learner-empowerment by giving equal access to resources, by including self-evaluation and involving students in managing the learning environment, for example. Educators also need to encourage learners to discuss different perspectives and to take different roles in the dialogue. Involving learners in decision making also enhances feelings of empowerment (Cranton 2010:5). Educators must create an environment in which students can engage in critical self-reflection. This can be reached by opening up new perspectives, challenging existing assumptions and presenting information from a different point of view (Cranton 2010:5). In transformative learning experiences, learners might have to let go of assumptions, beliefs and perspectives that they may have held for a

lifetime. The educator needs to support the students in this process (Cranton 2010:5-6).

2.3.4 Deep versus surface-orientated learning

Fogarty and Taylor (1997:6-9) analysed 503 mature maths students and concluded that the deep orientation was unrelated to academic progression in mathematics, but that high scores in the surface orientation are associated with poor academic performance. Richardson (1995:9-13), in turn, concluded that mature students obtain significantly higher scores in meaning orientation, and that they tend to produce lower scores in reproducing orientation compared to non-mature students who took the same course. In terms of both their persistence and their attainment, the subsequent academic performance of the mature students on their degree courses is at least as good as that of the non-mature students. The effect of age is highly significant in the case of meaning orientation, but not in the case of reproducing orientation.

Richardson (1995:13) concludes his study with three possible explanations for the development of learning characteristics in students:

- Mature students are motivated more by intrinsic goals than by vocational ones.
- Younger students acquire a surface approach to learning in the final years of secondary education.
- Prior life-experience of mature students promotes a deep approach towards studying in higher education.

Older students are somewhat more likely to complete their programme of study (only significant in the case of distance learning). This is probably because they have more to lose from academic failure. Mature students tend to be more conscientious in their studying, much more demanding and more insistent on quality in their teaching (Richardson 1995:13).

2.4 FACTORS INFLUENCING ACADEMIC PERFORMANCE

The literature was reviewed for factors that have a significant influence on the academic achievement of medical students, for example, factors that have predictive value for success or failure in medical education. Different studies have been done in

this field of study. To get an impression of the perspectives that the literature presents about this subject, a number of articles were selected and discussed. Most of the articles described a cohort study, but two literature reviews, a qualitative study as well as an experimental study were found to be useful. A systematic review and partial meta-analysis reported that previous academic performance accounts for 23% of the variance in undergraduate performance (Ferguson *et al.* 2002:953-956). But other non-academic criteria such as gender, ethnicity and elements of personality also have an influence on academic performance in medical school.

Point 2.4.1 will present the findings of research regarding the influence of previous tertiary education on academic performance of medical students. The following sections (Points 2.4.2 to 2.4.5) will give a summary of the results of recent and relevant research about other influencing factors.

2.4.1   Previous tertiary education

The *"senior students"* in this research study all have a prior tertiary education background, which may have an influence on their performance. There are different reasons for the academic background of *"senior students"*, for instance:

1. The student was not selected to study medicine, and decided to study something else to increase his/her chances to get selected the next time.
2. The student did not get the opportunity to study medicine after high school, because of financial, personal or other reasons.
3. The student was not happy with his/her first choice of study, and decided to change studies and apply for medicine.
4. The student has wide interests and decided to study something else (music for example) before commencing to study medicine.

The reason for the academic background of *"senior students"* might have an influence on the academic performance in medical studies. No research studies could be found which investigated this. The influence of the type of degree on the academic performance, however, has been researched in different studies. De Clercq *et al.* (2001:421-422) conducted a research study at Newcastle University, Australia. They found that students with a nursing or arts background are most likely to have non-satisfactory results during the first-year assessments. The level of academic

achievement in the previous studies also proves to have an influence on the academic performance in medicine. Students with less than a distinction average on their previous studies are more likely to get unsatisfactory results in the first year assessments (De Clercq *et al.* 2001:421-422).

Another study that was also conducted at Newcastle University, Australia by Grey, Pearson, Rolfe, Kay and Powis (2001:92) looked at the relationship between the academic performance of medical students and the subjects they studied at secondary school, as well as the type of degree undertaken before medical school. They conclude that there is no significant difference in academic performance caused by the previous study subjects and courses.

By distributing questionnaires under graduated medical students from the University of Newcastle in Australia, Rolfe, Ringland and Pearson (2004:782) wanted to identify differences between students who entered the medical school after secondary school, and students who entered with tertiary level education. They found no differences in academic performance between both groups (Rolfe *et al.* 2004:782).

Craig, Gordon, Clark and Langendyk (2004:1166-1167) did a retrospective cohort study of 317 students at the University of Sydney, Australia. They looked at the prior academic background and the academic performance in medical studies. The prior degrees were put into categories: Health Professions, Biomedical Science, Other Biology, Physical Sciences and Non-Science. Significant differences were found between types of prior degrees with regard to the performance in most of the assessments that were measured. Health Profession students perform significantly better in the assessments than those with Biology or Biomedical science backgrounds; this advantage of the Health profession students lessens over time. Students from a Physics background perform at or above average in the assessments, while Non-Science background students perform below average early in the programme. The performance of Non-Science students improves with time (Craig *et al.* 2004:1166). Craig *et al.* (2004) conclude their study with a discussion of the findings. They state that their findings are consistent with the majority of studies, which find little or no difference in performance by medical students from various academic backgrounds. But where differences occur, a temporary advantage for those with science backgrounds is seen (Craig *et al.* 2004:1167).

The assumption that students with a scientific background will be better prepared for their medical studies, might not be so widely held as was assumed. When looking at the literature, the admission requirements and predictors for success in medical school have been a theme, which has been discussed from even before 1980. Zeleznik, Hojat and Veloski (1983:26-33), for example, did a study at the Thomas Jefferson University in Philadelphia, Pennsylvania, USA, where they compared the academic performance among students of four groups: with B.A. degrees in the social sciences, B.A. degrees in humanities, B.A. degrees in science and B.S. degrees in science. Initially, the students with a humanities background got lower scores, but later in the programme no difference could be measured. Interestingly, the only difference that could be identified was the choice of specialisation, with science students choosing internal medicine, and students with a humanities or social science background choosing psychiatry more often.

In a recent study that focussed on the influence of humanities (which fell into the Non-Science category in this study) on academic performance in medical students, the researchers provided a summary of the literature between 1980 and 2009 on this subject (Figure 2.2) (Schwartz, Abramson, Wojnowich, Accordino, Ronan, Rifkin 2009:372-380). The summary shows that most studies did not find any difference between the students from different academic backgrounds, but could identify a difference in career or academic achievements (earned Medical Honor Society membership, earned more graduation awards and honours). Most of these reports provide arguments for the discussion for a smaller focus on scientific achievements of students in the admission process for medical school.

Study Group	Finding	Reference
190 medical students	Despite lower uGPAs, humanities majors more likely to earn AOA membership and formal commendations.	Stratton et al.[81] (2003)
808 medical students	Previous academic performance is the best predictor of medical school performance.	Bastias et al.[25] (2000)
255 medical students	Compared to matched traditional premed humanities and science majors, humanities and medicine students had more NBME Step 1 failures but earned more graduation awards and honors and were more likely to earn AOA membership.	Rifkin et al.[16] (2000)
406 medical students	No difference in medical school performance between humanities/social science majors and science/math majors.	Smith[22] (1998)
200 medical students	No correlation between the quantity of undergraduate science and average preclinical performance. uGPA and MCAT scores predict NBME performance.	Hall and Stocks[21] (1995)
782 medical students	No difference in medical school performance based on the quantity of previous science study.	Neame et al.[24] (1992)
812 medical students	Undergraduate science majors had higher MCAT scores than humanities majors, but no statistically significant difference in performance in the first 2 years of medical school.	Ashikawa et al.[20] (1991)
200 medical students	No difference in uGPAs or NBME performance between degree types; humanities majors consider leaving medical school more frequently, and humanities/social science majors are more likely to choose psychiatry.	Zeleznik et al.[17] (1983)
735 medical students	Nonscience majors do just as well or better than science majors.	Yens and Stimmel[19] (1982)
1077 medical students	No relationship between premedical training and clinical competence.	Herman and Veloski[18] (1981)

NOTE: The studies are presented in reverse chronological order.
Abbreviations: AOA, Alpha Omega Alpha Medical Honor Society; MCAT, Medical College Admission Test; NBME, National Board of Medical Examiners; uGPA, undergraduate grade point average.

FIGURE 2.2: PREDICTORS OF SUCCESS IN MEDICAL SCHOOL (In: Schwartz et al. 2009:375)

2.4.2   Demographic factors

2.4.2.1   *Gender*

Yates and James (2006:1011) did a study to predict strugglers at Nottingham University in the UK. They prove that male medical students tend to struggle more than female students. Another study that was done in Austria, at the Vienna Medical School, however, found that male gender is one of the three factors which are relevant in predicting academic success (Frischenschlager, Haidinger & Mitterauer 2005:60). Craig *et al.* (2004:1166) ascertained no significant differences based on gender for single best answer assessments, but female students perform better in the modified essay question assessments. James and Chilvers (2001:1059) also came to the conclusion that female gender is a highly significant predictor of success in obtaining honours at Bachelor of Medicine, Bachelor of Surgery (BMBS) in the cohorts between 1986 and 1990, but also that gender is no predictor for success in examinations in the earlier years of the medical programme at Nottingham Medical School (James & Chilvers 2001:1059).

2.4.2.2 *Ethnicity*

A non-white ethnicity is found to be a predictor of struggling in medical school in a study at Nottingham Medicine School in the UK by Yates and James (2006:1011) with a ratio of 2.77 (1.52 to 5.05). The performance of international students is slightly lower than that of the local students in the assessments, but this difference only reaches significance in the first assessment in year 1 (Craig *et al.* 2004:1166). Being able to do the medical programme in your mother language is also a relevant predicting factor for academic success in a study that was conducted at the Medical University of Vienna, Austria (Frischenschlager *et al.* 2005:60).

White, Dey and Fantone (2009:445-464) made a distinction between majority (Whites, Asians) and minority (African-Americans, Hispanic, Filipinos, Native Americans and Pacific Islanders) students and the predictive value of admission tests for the clinical performance at the University of Michigan Medical School, United States of America (USA). This study shows that the Medical College Admission Test examination does not predict performance in the first year for minority students, though it is able to predict Medical examination (that is done after the second year) scores for both minority and majority students. The Grade Point Average (GPA) is also a strong and significant predictor of performance in the first year for minority students only (White *et al.* 2009:459). James and Chilvers (2001:1059) found that white ethnicity predicts success in obtaining honours at BMBS in the cohorts between 1986 and 1990, but also that ethnicity is no predictor for success in examinations in the earlier years of the medical studies at Nottingham University, UK.

2.4.2.3 *Age or maturity*

Most studies talk about maturity without providing the reader with a definition. These articles have been used in this study as maturity not necessarily representing age. The study of James and Chilvers (2001:1058), which was done to find academic and non-academic predictors of success, discovered that older, mature or graduate entrants are more successful at obtaining a first-class degree at B.Med.Sci (Bachelor of Medical Science) for the whole cohort; however, they are less likely to be successful at passing the BMBS. Frischenschlager *et al.* (2005:63) as well as Richardson (1995:13) found evidence that maturity and intrinsic motivational structure are linked to superior academic performance.   Later research that was conducted by Yates and James

(2006:1011) used a different approach, and looked at the prediction of strugglers. They concluded that mature age (>21 years) and the possession of a previous degree are not predictive factors for strugglers.

2.4.3   Personal factors

2.4.3.1   *Personality*

Lievens *et al.* (2002:1053) investigated two sets of traits: firstly, the typical personality traits of medical students as compared to students from other academic majors, and secondly the personality traits that predict academic performance of students in pre-clinical years.   They conducted a cross-sectional inventory and a prospective longitudinal study of one cohort of medical students from five Flemish Medical Universities. A total of 631 medical students as well as 914 first-year students of seven other academic majors completed the Five-Factor Model of Personality test.   They demonstrated that medical students score highest on extraversion and agreeableness. Conscientiousness (self-achievement and self-discipline) significantly predicts final scores in each pre-clinical year.   Furthermore, medical students who score low on conscientiousness and high on gregariousness and are excitement-seeking are significantly less likely to sit examinations successfully (Lievens *et al.* 2002:1053).

Ferguson *et al.* (2003:430-431) studied different personality domains and verified the finding of Lievens *et al.* (2002:1053) when they showed that conscientiousness is a very strong predictor of success in preclinical performance.   They found that higher scores on conscientiousness are significantly related to better performance across most (78%) of the assessments.   Students scoring higher on agreeableness performed better on 33% of the assessments.   A literature review also reveals that sufficient preliminary data indicate an impact of personality on medical school progression (Ferguson *et al.* 2002:956).

2.4.3.2   *Learning capacity and learning styles*

Frischenschlager *et al.* (2005:62) distributed a questionnaire amongst medical students at the University of Vienna, Austria, and obtained a response rate of 50%. They found that successful students more often report that they learn easily, prefer autonomy over guidance and are less impaired by nervousness at the examinations.

McManus, Richards, Winder and Sproston (1998:345-350) studied the relationship between the learning style (surface, deep or strategic) and the performance in the clinical years and final examination. Two cohorts of medical students from St Mary's Hospital Medical School, London, UK, were followed up to their final year. They were sent questionnaires before they started their studies as well as after completing. Only 51% of the first cohort and 65% of the second cohort replied to the second questionnaire. An important finding is that knowledge that is acquired by a clinical student can be predicted from the learning style measured at the time of application to medical school. A correlation is seen between clinical experience and study habits; students with a deep and strategic learning approach show higher levels of overall experience. A-level grades show a significant correlation with performance in final examinations, but there is almost no association between A-levels and learning style (McManus *et al.* 1998:347).

Todres, Tsimtsiou, Sidhu, Stephenson and Jones (2012:325-331) conducted semi-structured interviews with medical students of a London Medical School, to explore the students' attitudes and approaches to learning, social relationships and conceptualisations of professional life beyond graduation. The topics covered included the reasons that brought them to study medicine, their current motivation to become doctors, things that had gone well and less well during their medical studies, learning habits, social situation and pastoral issues. A number of 18 students participated. High-achieving students seem more able to reflect on their approaches to learning and learning experiences, and they show a greater awareness of their learning methods than re-sitting students who could articulate what needs to be learned rather than how they would go about learning it. They often only start to think about their learning style after they have failed. High achievers appear to be more learning-goal orientated than re-sitting students who are more performance-goal orientated (Todres *et al.* 2012:328).

As described in 2.3.4, Richardson (1995:13) found a relationship between deep (or meaning) orientated learning and maturity of the students. He concludes that the mature students are motivated by intrinsic goals and that life experiences promote the deep learning orientation (Richardson 1995:13).

2.4.3.3 *Study motivation*

Motivation can be through either an internal need to achieve and expand knowledge and experience (intrinsic motivation) or as a product of demands of external situations and sources (extrinsic motivation) (Murphy & Roopchand 2003:244).

Murphy and Roopchand (2003:254-255) explored the relationship between motivation and self-esteem for traditional (age between 18-21) and mature students (age between 22 and 48) at Universities in the North-East of England. One hundred and sixty students were asked to fill out an Intrinsic Motivation towards Learning Questionnaire and the Rosenberg Global Self-Esteem Questionnaire. The results revealed that intrinsic motivation towards learning and self-esteem are related. Mature female students have the highest intrinsic motivation scores as well as the highest self-esteem scores in the sample (Murphy & Roopchand 2003:254-255). The results show mature student participants to have significantly higher levels of self-esteem and intrinsic motivation towards learning. There may be several explanations for this. Firstly, in terms of self-esteem, this tends to increase as we become older. Secondly, in terms of intrinsic motivation, mature students may have developed a clearer perspective on the purpose of their education simply through accumulation of life experience. The researchers (Murphy & Roopchand 2003:250) proposed possible reasons for another finding, which states that women have higher intrinsic motivation and self-esteem. They quote Stables and Stables (1995), who reported that young women (rather than men) are more likely to study subjects that are of interest to them and which they enjoy, which reflects the role of autonomy in their subject and career choices. This could explain the higher levels of intrinsic motivation.

In a study, conducted by Rolfe *et al.* (2004:781-782), at the University of Newcastle, Australia, the findings were similar. They concluded that, compared to secondary entrants, tertiary entrants are more likely to be motivated to study medicine intrinsically or because of a desire to be independent or prevent disease, whereas secondary students are more often motivated by parental expectation (external motivation).

In a prospective cohort study amongst successful students and unsuccessful students, Frischenschlager *et al.* (2005:62) found that in the group of very successful students, the wish to study medicine is of distinctly shorter duration in comparison with

unsuccessful students. These students are also less frequently advised to study medicine. The successful students state more often that they enjoy acquiring knowledge, tend to study other subjects, and consider study success as important. Successful students are also more confident that they would be able to complete their studies, than unsuccessful students. Successful students have fewer ideas about their future specialisation.

2.4.3.4 *Finances*

Very successful students see their financial status more optimistically and are more confident with regard to their financial situation (Frischenschlager *et al.* 2005:61). Rolfe *et al.* (2004:782) found that most of the medical students experience stress, but they found a difference in stressors between students who entered medical school after secondary school versus students who enter with a tertiary education background. The last group experience concerns about balancing their commitments, financial stress and lack of leisure time. The secondary graduates experience stress because of doubts about being a doctor (Rolfe *et al.* 2004:782).

2.4.4 Previous academic performance

Previous performance can be measured in many different ways, depending on the available measures in different countries. Many studies refer to the undergraduate GPA, or A-Levels (British school exam taken at the end of secondary school (Cambridge 2010:34)) for academic performance in high school. Most universities use some extra examination tools to determine the cognitive ability of the prospective students. Overall, a higher GPA or A-Level has a positive influence on the academic performance of students. Frischenschlager *et al.* (2005:60) demonstrate in their research that the students' performance in high school has a significant influence on success in the first year of their medical studies.

2.4.4.1 *Grade Point Average*

Yates and James (2006:1011) confirmed the undergraduate GPA to be a significant predictor of performance. White *et al.* (2009:459) found that the GPA is a strong and significant predictor of performance in the first year, but only for minority students (African-Americans, Hispanic, Filipinos, Native Americans and Pacific Islanders).

Cohen-Schotanus, Muijtjens, Reinders, Agsteribbe, Van Rossum and Van Der Vleuten (2006:1017) show in their study that the Grade Point Average score has no effect on dropout rate, but that GPA can predict success in study and career. High GPA scores are associated with significantly less time taken to graduate. More graduates with higher Grade Point Averages (GPAs) qualify in their preferred speciality. Higher GPA groups show more dissertations and first and second authorships of papers, but fewer women write dissertations and authored papers. This study was conducted in the Faculty of Medicine, University of Groningen in the Netherlands, where students are selected by means of a partial lottery medical school admission system (Cohen-Schotanus *et al.* 2006:1017).

2.4.4.2 *A-Level grade*

Better A-level grades significantly predict better performance in six of the 18 assessments in the study of Ferguson *et al.* (2003:430). McManus *et al.* (1998:348) also found a significant correlation between A-levels and performance, but only in the final examinations. In the study of James and Chilvers (2001:1059) a distinction is made between the subjects for which A-levels were achieved, and their predictive value for success in medical school. They found that A-level grades for Chemistry and Biology are strong predictors of success at B.Med.Sci and BMBS in a cohort that was followed between 1986-1990, but this predictor is not found in the cohort of 1970-85. A-levels that are achieved for general studies are found to be poor predictors of achievement (James & Chilvers 2001:1059).

Ferguson *et al.* (2002:954) concluded that prior academic achievement does predict academic achievement at medical school, but it only accounts for <23% of the variance. However, McManus, Dewberry, Nicholson, Dowell, Woolf and Potts (2013:18-19) describe in their study that academic achievement at secondary school strongly predicts undergraduate and postgraduate performance of medical students. They found that A-level grades account for 65% of the variance in first year performance.

In the UK, the AH5 (high grade intelligence test) was administered to students entering the Westminster Medical School between 1975 and 1982. This test measures verbal and reasoning ability, as well as spatial ability. McManus, Smithers, Partridge, Keeling

and Fleming (2003:139-142) used this test to measure the predictive ability of intelligence and achievement (A-Levels) of medical careers. In 2002, they sent out questionnaires to 464 of the 511 doctors that could be traced back, of which 349 responded. They show that A-level results can predict time taken to gain membership qualifications, choosing to become a general practitioner, and leaving the register. In contrast, the AH5, which measures ability, cannot independently predict membership qualifications or dropout, but it is not yet clear whether the predictive value of A-levels results from assessing knowledge, motivation or study habits.

2.4.5   Selection criteria

2.4.5.1   *Personal statements and references*

One study discussed the predictive value of personal statements, which is found to relate to clinical performance (Ferguson *et al.* 2003:431). Two studies looked at the teachers' reference. One study only looked at the quantity of information that was provided and concluded that it does not have any predictive value (Ferguson *et al.* 2003:431). The other study highlighted negative comments and found it to be a good predictor of poor performance in the medical programme (Yates & James 2006:1011).

The Medical College Admissions Test (MCAT), which is used in the USA as a selection method, fails to predict performance in the first year of minority students, while being able to predict the other students' first-year results. In previous studies, the predictive value of the MCAT examination has always been a strong predictor of performance, but in this study it only proves able to predict the performance of all the students in later examinations (White *et al.* 2009:459).

2.4.5.2   *Non-cognitive selection criteria*

Urlings-Strop, Stijnen, Themmen and Splinter (2009:176-182) did a study in the medical schools in the Netherlands on the selection of medical students. In the Netherlands, central selection takes place on the basis of a lottery that is weighted for academic attainment. The GPA has high predictive value for student achievement, but individual characteristics also play some part in study success. The medical schools are, therefore, allowed to select a maximum of 50% of their students on the basis of

characteristics other than GPA (Urlings-Strop *et al.* 2009:176). This created the opportunity to perform an experiment, in which a selection procedure could be designed, implemented and compared with the weighted lottery procedure. The selection procedure consisted of two steps based on non-cognitive and cognitive abilities. The first step was an assessment of the applicants to the quality and extent of their extracurricular activities before application (for instance, activities in health care, management and organisation, talent like music, sport or science, and additional pre-university education). The second step consisted of five cognitive tests on a medical subject (Urlings-Strop *et al.* 2009:176-182).

The criteria for student achievement were specified by the study rate (measured as number of credits per year, using the European Credit Transfer System: one credit = 28 hours, 1 year = 60 credits) and GPA at the first examination attempt per year. The students were divided into three categories: dropouts with < 60 credits after two years; optimal performers with the maximum study rate of 60 credits after each year; and average performers with a study rate of < 60 credits per year. The selected group had a relative risk for dropout that was 2,58 times lower than that of the control group (the lottery students). The percentages of optimally performing students were almost identical and there was no significant difference in terms of GPAs achieved at first examination attempts (Urlings-Strop *et al.* 2009:176-182).

2.4.5.3 *Time to admission*

Delayed or late admission was found to predict more struggling during an academic programme (Yates & James 2006:1011). Frischenschlager *et al.* (2005:65) state that late admission has significant influence on study success, because they discovered that students who enrolled earlier are more successful in their studies. They also state that a late admission can be associated with bad personal organisation and motivation of the student.

2.5 STUDENT SELECTION

The criteria that can be used for student selection range from prior academic performance to personal statements from previous teachers. A study that was conducted in the USA investigated current medical school admission processes, and how they have changed since 1986 (Monroe, Quinn, Samuelson, Dunleavy & Dowd

2013:672). They found that medical schools previously used Grade Point Averages as the most important data in decision making in all stages of the selection procedure. Currently (2008) the GPA and MCAT scores are used to decide whom to invite for interviews, but the letters of recommendation and the interview are seen as the most important data in deciding whom to accept into medical school (Monroe *et al.* 2013:672).

Selection of medical students has been an on-going discussion in the past years. Kanter, editor of the Academic Medicine journal, wrote an essay and states that premedical education should prepare the student to be a better doctor and should not only maximise a student's change of acceptance to medical school (Kanter 2008:423). Powis, Hamilton and McManus (2007:1239) argue the fact that academic achievement is weighted higher than personal attributes or other skills in student selection procedures. And if they are considered, it only happens after the academic threshold has been met.

Powis *et al.* (2007:1239) looked at two issues in the context of medical school admission, firstly the high academic standards that are used as admission criteria and secondly, if other qualities should be sought in applicants. The reason for the high academic threshold was analysed and a relationship between an increase in demand for places and escalation in required A-level grades was found. The phenomenon of 'grade inflation' is also a reason for high academic threshold (McManus 1982 <u>in</u> Powis *et al.* 2007:1240). Another reason is that medical schools are influenced by the fact that the media and applicants judge their relative excellence and standing on the academic level of their student intake (McManus 1982 <u>in</u> Powis *et al.* 2007:1240). Because the standard of higher education in South Africa has dropped, A-level grades are not found to be representative for academic achievement anymore. The School of Medicine at the University of the Free State has therefore decided to use the National Benchmark Test, as an edition to the other selection requirements, to ensure selection of top students (De Klerk 2011:144). The current study was undertaken from the same point of view.

In the context of 'widening access' policies, A-levels as selection criterion could be the reason for fewer applications from specific groups (for example: students from lower socio-economic groups) (Powis *et al.* 2007:1237-1238). In the South African context,

widening access is an important goal, which influences the selection procedures of many universities.

Another point of discussion is the subject prerequisites. Some studies found that students with a science background have a better chance of success in medical school (for example: Craig *et al.* 2004:1166-1167; De Clercq *et al.* 2001:421-422), while others do not support this conclusion (for example: Grey *et al.* 2001:92; Schwartz *et al.* 2009:372-380). Kanter (2008:423) also discusses this point in his essay. He argues that medical students should have a broad based education. But students tend to focus on the selection criteria and choose subjects that will enhance their chance of getting selected, rather than choosing subjects of interest (Kanter 2008:432). These discussions point out the importance of understanding how students perform academically, which factors influence this and how this should be used in policy making with regard to student selection.

At the University of the Free State, Faculty of Health Sciences, School of Medicine, the criteria for selection for the M.B.,Ch.B programme are as follows:
- National Benchmark Test (score 36 points)
- Language of instruction = Achievement level 5 (60%)
- Mathematics = Achievement level 5 (60%)
- Physical Sciences = Achievement level 5 (60%)
- Life Sciences = Achievement level 5 (60%) (UFS 2013a:22).

For "*senior students*", different admission criteria are used. Students who have completed two or more years of a programme that does not fall within the Health Sciences will qualify for selection if he/she obtains a minimum average of 75% for the completed years and has the minimum credits required to pass a year of any degree. Students who have only completed one year of tertiary education, a minimum average of 80% is used as admission criteria. Preference will be given to students with applicable modules. If a student has already obtained a degree, also a minimum average of 75% gets preference, and the programme must have been completed in no longer than the allowed minimum period plus one year. Students who come from technological universities and other institutions need a minimum average of 80%, and students with applicable modules will be given preference (UFS 2011:10).

2.6   CONCLUSION

The literature review was described in this chapter. Concepts of student learning with the focus on *"senior students"* were introduced. Characteristics and specific learning needs of *"senior students"* were described in Point 2.2 and 2.3. The context of this study was described in Point 2.4 where an overview was given of what the literature states with regard to factors that have an influence on the academic performance of medical students. Point 2.5 brought in a link with student selection. In the next chapter, Chapter 3, **Research methodology**, the methods that were used to conduct this study will be described.

CHAPTER 3

RESEARCH METHODOLOGY

3.1   INTRODUCTION

In Chapter 2, different perspectives on student learning and student selection with the focus on *"senior students"* were presented and discussed. After this theoretical base was established, the research design and methodology will now be extrapolated in this chapter. Firstly, the theoretical background to the research design will be set out. Thereafter, a theoretical overview of the methods and a description of the application of the methods will follow. The sampling, data gathering and analysis will also be explained in this chapter.

3.2   THEORETICAL PERSPECTIVES ON THE RESEARCH DESIGN

The research design of the study is descriptive with analytical aspects. Quantitative as well as qualitative research methods were used. Because the quantitative and the qualitative research designs were combined, the researcher decided to use the mixed-methods approach for this study. Point 3.2.1 gives more background information on mixed-methods, and describes why and how this design was used in this study.

3.2.1   Description of mixed-methods design

In a mixed-methods design, the quantitative and qualitative methods are integrated in a way that each method plays an essential role in the study. Quantitative and qualitative designs are based on different methods and approaches to analyse and interpret. They have their own strengths and limitations, but in practice the methods are not exclusive. Many quantitative research reports include qualitative observations, and qualitative studies report on some numerical data, which enhances completeness and accuracy. In a mixed-methods design, both methods are used and are essential to the study (Springer 2010:436-437).

Creswell and Plano Clark (2011:4) compare definitions for mixed-methods and conclude that there are many different viewpoints for defining mixed-methods.

In mixed-methods, the researcher:

- *"Collects and analyses both qualitative and quantitative data persuasively and rigorously;*
- *Mixes (integrates or links) the two forms of data concurrently by combining them (or merging them) sequentially by having one build on the other, or embedding one within the other;*
- *Gives priority to one or to both forms of data;*
- *Uses these procedures in a single study or in multiple phases of a programme of study;*
- *Frames these procedures within philosophical worldviews and through theoretical lenses;*
- *Combines the procedures into specific research designs that direct the plan for conducting the study"* (Creswell & Plano Clark 2011:5).

A variety of research problems are suited for mixed-methods. Creswell and Plano Clark (2011:9) argue that a need to explain the initial results of a quantitative study is a good indication for choosing a mixed-method approach. When the results of one study method provide an incomplete understanding of the research problem, a second method can give a more detailed understanding of what the first method was lacking. A qualitative method can, for instance, provide the study with better insight into the results of a quantitative method.

3.2.2 Types of mixed-methods

The types of mixed-method designs are based on the decisions that have been made regarding timing, weighting and mixing:

- *"The order in which the qualitative and quantitative data are collected. This can be simultaneous (concurrently) or sequential.*
- *The importance or priority of the quantitative and qualitative methods.*
- *The type of mixing that will be used. Mixing can be done as merging, embedding or connecting the data in certain phases of the study"* (Collender 2011:103).

The following table shows the major design types and the ways that they are different in terms of timing, weighting and mixing (Table 3.1).

In a **triangulation design,** quantitative and qualitative data are collected and analysed at the same time and the results are compared and integrated (Ivankova, Creswell & Plano Clark 2009:266). In an **embedded design,** the research study requires two different types of data (quantitative and qualitative) to answer the research questions. The data are collected sequentially or concurrently and analysed separately. One set of data provides a supportive, secondary role and is used before, during or after the major data collection procedure (Creswell & Plano Clark 2011:73-76). In an **explanatory design**, the role of the qualitative information is to explain the trends and relationships of the quantitative data collection. In an **exploratory design**, qualitative data collection is done to offer preliminary guidance for quantitative data collection (Springer 2010:437-440).

TABLE 3.1: MAJOR TYPES OF MIXED-METHODS DESIGNS (In: Collender 2011:105-106 (compiled from Creswell & Plano Clark 2007:85))

TYPE OF DESIGN	TIMING	WEIGHTING	MIXING
Triangulation	Concurrent	Usually equal	Merge data during interpretation or analysis
Embedded	Concurrent or sequential (one-or-two phase approach)	Unequal	Embed one type of data within a larger design using the other type of data
Explanatory	Sequential: Quantitative first, followed by qualitative	Quantitative	Connect data between the two phases
Exploratory	Sequential: Qualitative first, followed by quantitative	Qualitative	Connect the data between the two phases

3.2.3   Application of mixed-methods in this study

The decisions that were made regarding time, weighing and mixing for this study are made visual in Figure 3.1 and highlighted by a black frame. The triangulation design type was used in this study.   Quantitative and qualitative data were collected concurrently with emphasis on the quantitative data. The findings were compared and integrated during the interpretation of the study (Chapter 6). The exploratory design would have been a good design for this study, but due to time constraints a sequential data collection was not possible. In 2011, Creswell and Plano Clark updated their mixed-methods designs, added new designs to the existing ones and renamed the triangulation design to "convergent parallel design" (Creswell & Plano Clark 2011:69-70).
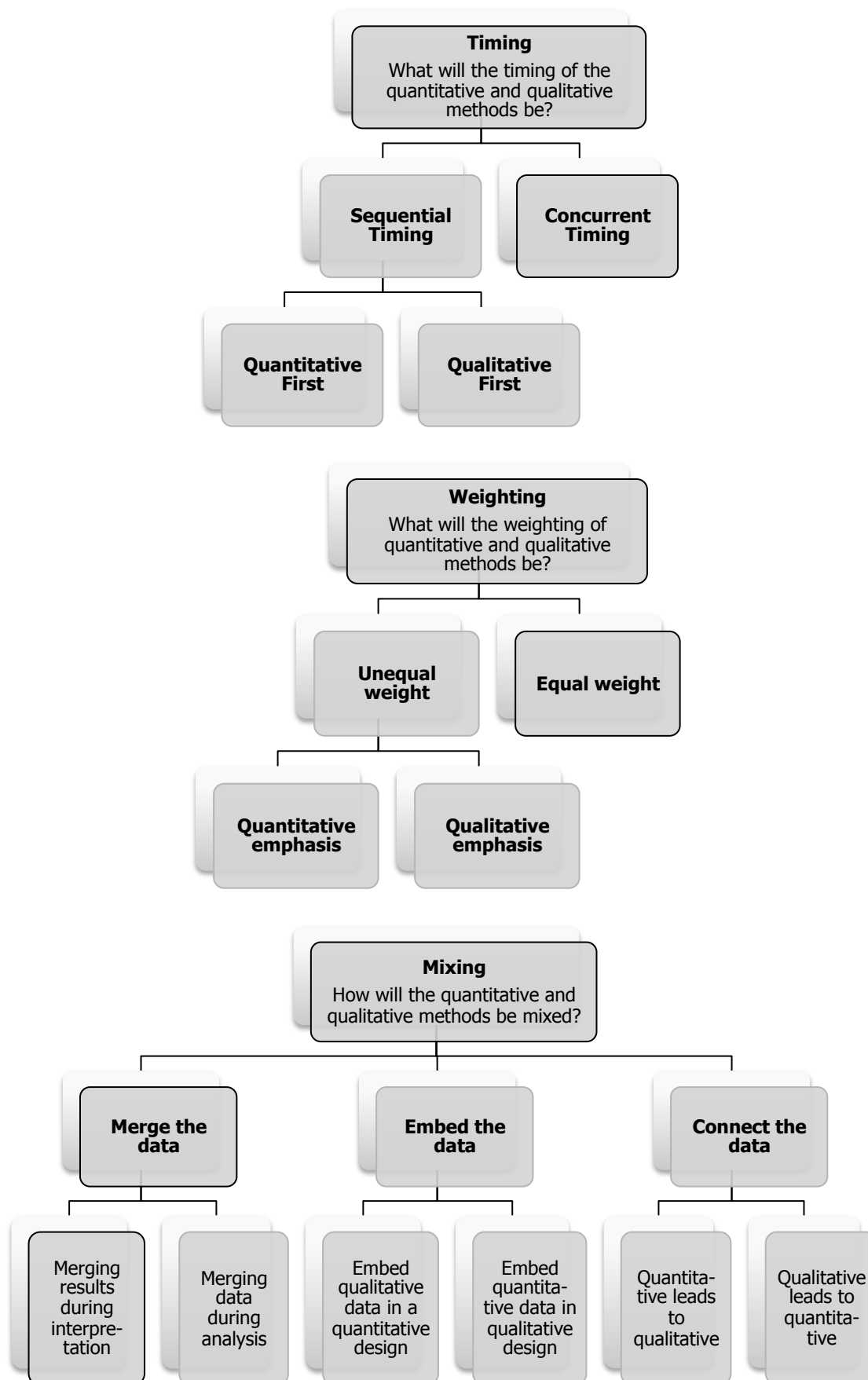
FIGURE 3.1: OVERVIEW OF DECISIONS IN MIXED-METHODS DESIGN (adapted from Collender 2011:104)

3.3 RESEARCH METHODS

The study started with a literature review. The rest of the study consisted of two sequential data collections where two different methods were used. Firstly, a quantitative, retrospective cohort study was conducted to measure the academic performance of *"senior students"* and to identify and measure factors influencing this. Semi-structured interviews were done to include influencing factors that were not measurable in the quantitative data gathering, and also to analyse the findings of the quantitative data gathering and qualitative data gathering for correlating factors. The three methods are described in the rest of this section.

3.3.1 Literature review

A literature review was done as orientation to the subject and to identify articles that were relevant to this study (Springer 2010:42-43,56). Within this study, the literature review was used to conceptualise and contextualise student learning and student selection to provide the study with a good theoretical base.

3.3.2 Quantitative, retrospective cohort study

The quantitative phase of the study was defined as a retrospective cohort study. A cohort study is a study in which a specific sub-population, the cohort, is studied over time. The cohort can have different members in each set of observations (Babbie 2010:108). A cohort study falls in the group of longitudinal studies, because the cohort is studied over time (Springer 2010:255-256). This type of study can be prospective or retrospective. In a retrospective cohort study, existing data are used. The period that is studied can be many years, but the study itself is done in one moment in time (Mann 2003:54).

3.3.2.1 *Application of the quantitative method in this study*

The goal of the quantitative phase in this study was to:

- Analyse the available data about academic performance of *"senior students"* in their undergraduate medical studies between 2000 and 2012;

- List the factors that influence student learning and indicate the importance of every factor;

- Evaluate the influence of previous tertiary studies on the academic empowerment of the *"senior students"* and their performance during medical studies.

The cohort in this study consisted of the *"senior medical students"*. The data were gathered from the database of the University of the Free State. Quantitative data were collected about three aspects, namely, student demographic information, academic achievement in prior tertiary studies and academic performance in undergraduate medical education. The gathered information was analysed for trends and relationships with help from a biostatistician from the Department of Biostatistics at the Faculty of Health Sciences, University of the Free State.

3.3.3 Semi-structured interviews

An interview is a data collection tool in which an interviewer asks questions or discusses a set of topics with a participant (Babbie 2010:318). The aim of the interviewer is to collect data and learn about the ideas and opinions of the participant. An open-ended interview is a two-way conversation around topics, whereas a structured interview uses a list of questions, which must be exactly the same for every participant. A semi-structured interview is the median of the two types. The interviewer is prepared with a list of questions, but can also ask additional questions to clarify the answers.

3.3.3.1 *Application of semi-structured interviews in this study*

A semi-structured interview is generally used in research projects to corroborate data that have been gathered from other data sources (Nieuwenhuis 2009:87). Semi-structured interviews were conducted to give the researcher the opportunity to gather the information by posing questions to the students and also give them the opportunity to explain and add factors that were influencing their learning. This method was done to confirm or disprove the influence of the factors that were found in the case-control study on student performance, and enhance the completeness and accuracy of the study.

To obtain the maximum amount of data the interviewer can use probes. Probes are used to ensure that the 'where' and 'what' of an answer are clear, to ask for more detail in an answer or to check if the answers are understood correctly (Nieuwenhuis 2009:87).

3.4 SAMPLE SELECTION

The goal of sampling is to learn something about the population of which the samples are drawn (Springer 2010:100). The target population is a group of individuals of interest (Springer 2010:100). Aldous, Rheerder and Esterhuizen (2011:34) refer to a population as the people to whom you would like the results of the study to be generalisable. In this study, the target population consisted of students who had received prior tertiary education before studying medicine (at the University of the Free State).

A survey population must be defined in terms of person, place and time (Aldous *et al.* 2011:34). The quantitative phase of the study focused on the abovementioned students who are or have been enrolled in the undergraduate medical programme at the University of the Free State for the period January 2000 - June 2012. Students were only included in the research if there were data available regarding their previous tertiary studies and their academic performance in the undergraduate medical programme.

3.4.1 Sample selection for quantitative data gathering

For the quantitative data gathering, no sampling was used because of the limited number of *"senior students"* who could be included in the study. The sample consisted of students of whom there was proof of prior tertiary education in the database of the University of the Free State, and who were enrolled for the undergraduate medical programme at the University of the Free State for the period 2000-2012. Students were only included if the data were available and complete. Following these criteria, 200 *"senior students"* could be included in this sample.

3.4.2 Sample selection for qualitative data gathering

For the qualitative data gathering, the study population consisted of *"senior students"* who were included in the quantitative phase of the study and who were enrolled at the time of the interviews. Only students who gave consent to participate in the study were included. The survey population for the qualitative data gathering could consist of a maximum of 30 students because of time constraints. There were 79 *"senior students"* enrolled at the time of the interviews, so the researcher decided to use sampling.

There are two main sampling methods, namely random (probability) sampling and purposive sampling. In probability sampling, inclusion or exclusion from the sample is a matter of chance, whereas in purposive sampling the researcher selects a particular section of the population to include or exclude from the sample (Cohen, Manion & Morrison 2010:110). In qualitative research, the emphasis is placed more on describing particular individuals and groups than on generalising broader populations. Therefore, qualitative research is often described as purposeful. Sampling methods for qualitative research are shown in Table 3.2 (Springer 2010:109-112).

TABLE 3.2: SAMPLING METHODS COMMONLY USED IN QUALITATIVE RESEARCH DESIGNS (compiled from Springer 2010:109-112)

SAMPLING METHOD	SIMPLE DEFINITION
Typical case sampling	Cases that are typical are selected
Extreme case sampling	Unusual cases are selected
Intensity sampling	Cases that represent different perspectives are selected
Maximum variation sampling	Participants who reflect the entire range of variation are selected
Critical case sampling	Especially informative cases about the phenomenon or perspective under study are selected
Homogeneous sampling	Cases who are highly similar in background, experience and/or other characteristics are selected.
Snowball sampling	Participants help to identify additional participants.

The focus of the qualitative part of the study was to explain and gain a more in-depth insight into the results of the quantitative data analysis. The researcher selected a sample from the 79 students who were enrolled at the time of the semi-structured interviews. The sample was selected based on different criteria. Firstly, students with an unusual educational background like music or accounting were selected. Secondly, students who were married or older than the average age were of special interest to the researcher. Thirdly, the researcher looked at the academic performance of the

students and selected students who were either performing poorly or were very bright students. The researcher also aimed to conduct interviews with an equal number of participants from each academic year. This sampling method is called intensity sampling and has the strength of ensuring the gathering of a range of different perspectives and cases. This method was chosen to enhance the completeness of the explanations and conclusions that the qualitative phase of the study aimed to provide. The sample consisted of 36 students.

The students were invited to a meeting where the researcher explained the aim of the study and asked the students to participate. A total of 19 students attended the meeting, and 18 of them agreed to participate in the study. A group of four students came to see the study leader at a later stage, because they were not able to attend the meeting. They also agreed to participate. Another four students agreed to participate after they were contacted by phone. To get enough participants, the researcher added 17 students to the sample, of which the first six students agreed to participate after being contacted by phone. The total number of participants was 32.

3.5   DATA GATHERING

3.5.1   Quantitative data gathering

The quantitative data were collected from the database of the University of the Free State with help of the administrative staff. All the available data on student demographic information, academic achievement in prior tertiary studies and academic performance in undergraduate medical education were gathered for analysis. Using Excel^{TM}, the researcher adapted the data to a usable format. To be able to compare the students' performance, the class average was collected per module per year. The students' module marks were compared with the class module averages for the year in which the student obtained the mark. The year averages were calculated to get an overview of the student's performance. Because of many incomplete data, the researcher used the database of the Faculty of Health to localise and include the missing data into the study with the help of an authorised person.

3.5.2 Qualitative data gathering

A total of 32 students agreed to participate in the study. The students could make an appointment on one of five days. They were handed out the information about the interviews, the consent form and the interview guide (cf. Appendix A1-3) so that they could prepare themselves for the interview if they wanted to. On the day of the interview, each student would receive a message (SMS) with a reminder of the time and place of the interview. Only one student could not come to the interview, which made the total number of interviews 31.

The researcher conducted the interviews personally. Altogether 19 interviews were done in Afrikaans and 12 in English, as per language preference of the participant. The researcher made use of a checklist to ensure that each participant had received the same information and signed the informed consent form (cf. Appendix A2) before starting the interview.

An interview guide was used (cf. Appendix A3), which was compiled based on the questions that arose during the literature review and the gathering of the quantitative data. During the interviews, an independent staff member of the School of Medicine, Programme Management, assisted the researcher by taking notes, operating the recording instrument and with transcribing the interviews.

3.5.2.1 *Pilot study*

The researcher practiced conducting the interviews two times before commencing to interview the participants. The researcher conducted a pilot study with three students who were part of the survey population. The pilot study was done to evaluate, finalise and streamline the questions, and to determine the length of the interview. The students were asked if the questions were clear and relevant. Their feedback was positive. They enjoyed sharing their story, and were very positive about the way the researcher conducted the interviews. They felt safe to answer the questions and found the questions relevant. The students were very enthusiastic about participating in the research project. The pilot-students did not give any negative feedback, and the researcher also found that the interview guide was useful and effective. No changes were made to the interview guide. As decided beforehand, if no changes were to be made after the pilot study, these interviews would be included in the study.

3.6   DATA ANALYSIS

The analysis of data in mixed-methods research can be done in different ways. Creswell and Plano Clark (2011:215-216) describe the steps that should be taken in the analysis of data in a convergent design (previously called triangulation design).

1. *"Collect the quantitative and qualitative data concurrently.*
2. *Independently analyse the quantitative data quantitatively and the qualitative data qualitatively using analytic approaches best suited to the quantitative and qualitative research questions.*
3. *Specify the dimensions by which to compare the results from the two databases.*
4. *Specify what information will be compared across the dimensions.*
5. *Complete refined quantitative and/or qualitative analyses to produce the needed comparison information.*
6. *Represent the comparisons.*
7. *Interpret how the combined results answer the quantitative, qualitative and mixed-methods questions"* (Creswell & Plano Clark 2011:215-216)*.*

In the next two Points (3.6.1 and 3.6.2), the analysis of the two data types is described.

3.6.1   Quantitative study

The collected data were entered into an Excel™ sheet by the researcher.   A biostatistician of the Department of Biostatistics at the Faculty of Health Sciences, University of the Free State did the statistical analysis. The main aim of the statistical analysis was to determine the effect of prior tertiary education on the academic performance in the undergraduate medical programme and to identify other factors that influence the marks of these students.

3.6.2   Semi-structured interviews

The researcher and an independent colleague controlled the transcriptions of the semi-structured interviews. Each student was given a letter according to the year of the medical programme that he/she was enrolled in at the time of the interview:

A = second year

B = third year

C = fourth year

D = fifth year

After this, the students were numbered randomly. This was done to ensure the anonymity of the students, but also to be able to interpret the remarks of the student with reference to the phase of the programme the student was enrolled in at the time of the interview.

To be able to analyse and summarise the findings, the researcher read through each interview and ordered the different answers on each question into categories. The categories were divided into different themes, which were defined by the researcher. A schematic overview of the process of the interview analysis is shown in Figure 3.2.
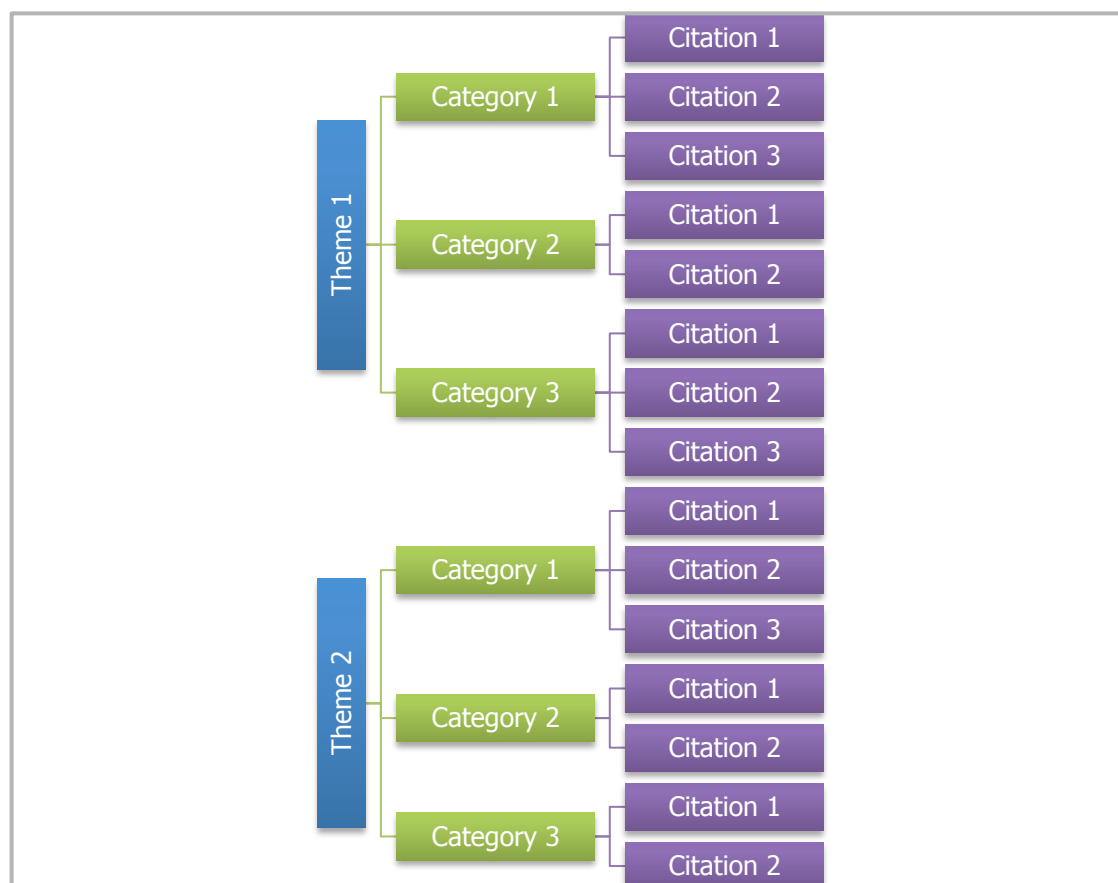
FIGURE 3.2: PROCESS OF ANALYSIS OF QUALITATIVE DATA
(Compiled by the researcher, Berghout 2012)

In this way, the researcher was able to summarise the findings and to describe important issues that arose. The citations from the interviews that were conducted in Afrikaans were translated by a language practitioner after the findings were summarised. In Chapter 5, the findings are presented and discussed. An independent researcher controlled the data analysis. The researcher was cautious to avoid changing the meaning of the responses while grouping and summarising the answers.

3.7   RELIABILITY AND VALIDITY

The terminology that is used to describe the quality of research is specific to the research design, which can be quantitative or qualitative. There are different views on the description of the quality of data and results in a mixed-methods approach.

3.7.1   Reliability

The reliability of a measurement procedure is the stability or consistency of the measurements. This means that if the same variable is measured under the same conditions, a reliable measurement procedure will produce identical (or nearly identical) measurements (De Vos, Strydom, Fouché & Delport 2005:162).

A detailed description of the data gathering, preparation, analysis and interpretation of the quantitative and qualitative data in the final research report ensured the reliability of this research project. The biostatistician controlled the preparation of the quantitative data before she analysed the data. Experienced researchers controlled every step of the qualitative data gathering, summarising and analysis.

With the gathering of qualitative data, reliability is a concern every time a single observer is the source of data, because there is no certain guard against the impact of that observer's subjectivity. When different interviewers are used, though, they might get different answers from respondents, because of their own attitudes and demeanours, which also influence subjectivity. In this study, the researcher conducted all the interviews. This seems most suitable, because the researcher is then able to analyse and interpret the verbal as well as the non-verbal reactions of the participants. It furthermore ensures uniform data collection in this phase.

3.7.2 Validity

Validity is defined as the extent to which an empirical measure accurately reflects the concept it is intended to measure (Babbie 2010:153).

The mixed-methods design enhances the accuracy and credibility of the results of the study by merging qualitative data with quantitative data during the interpretation of the findings. The semi-structured interviews had been piloted to make sure that the questions were relevant and formulated correctly and understandably. The semi-structured interviews were conducted according to the interview guide (cf. Appendix A3), but the researcher guarded the process and the credibility of the data by making sure that the participants understood the questions and that the answers of the participants were complete and also understood correctly.

The validity of the quantitative research was ensured by logical and truthful data preparation for analysis. Every step of the preparation of data was discussed with the biostatistician to ensure that the correct data were provided for analysis, and that good comparisons could be made.

3.7.3 Transferability and generalisability

Transferability speaks about the extent to which the results can be generalised. This research used only the data and responses of *"senior students"* who study at the School of Medicine in the Faculty of Health Sciences at the University of the Free State. This might give the study results that are typical for this university, but the results of the study will be interesting, useful and transferable to other universities as well.

3.8 ETHICAL CONSIDERATIONS

3.8.1 Approval

Approval to execute the research and gather information from the students was obtained from the Dean of the Faculty of Health Sciences, the Vice-Rector Academic Matters of the University of the Free State as well as the Head of the School of Medicine. Approval was also obtained from the Ethics Committee of the Faculty of Health Sciences ECUFS NO 143/2012.

3.8.2 Informed consent

Informed consent was obtained from different people. For the quantitative data gathering, consent was obtained from the Dean of the Faculty of Health Sciences to enable the researcher to have access to the relevant data of the students. For the qualitative data gathering, informed consent was obtained from the students who participated in the semi-structured interviews (cf. Appendix A2). The Vice-Rector of the University of the Free State was also asked for permission to perform a study where university students were involved.

3.8.3 Right to privacy

The students were given a code during the data gathering, analysis and interpretation. Only the researcher has the list with the student names and allocated codes. Confidentiality was maintained at all times.

3.9 CONCLUSION

Chapter 3 provided a theoretical background to the research design and methodology, and described the application of those. It also included the considerations that were taken with regards to quality and ethics.

The next chapter, Chapter 4, **Quantitative phase: Presentation and analysis of the results of the retrospective cohort study**, the results of the quantitative data gathering and analysis will be presented and analysed.

CHAPTER 4

QUANTITATIVE PHASE: PRESENTATION AND ANALYSIS OF THE RESULTS OF THE RETROSPECTIVE COHORT STUDY

4.1 INTRODUCTION

The purpose of this chapter is to present the data that were gathered from the database of the University of the Free State. Data were gathered regarding the demographic information, the previous academic background and the academic performance of the medical students with prior tertiary education. These data were used to analyse the performance of "*senior students*" in their undergraduate medical programme between 2000 and 2012, to list factors that have an influence on the academic performance of these students and to evaluate the influence of previous tertiary studies on the academic empowerment of the *"senior students"*. The gathered information was analysed with help from a biostatistician from the Department of Biostatistics at the Faculty of Health Sciences, University of the Free State.

This chapter will begin with a description of the cohort, and the selection of data. Thereafter the process of data preparation for analysis is explained and described in detail. The demographic description of the cohort will follow in Point 4.2.3. and the previous tertiary education types and numbers are presented in Point 4.2.4. In Point 4.3 the academic performance of the "*senior students*" is described. The Points in 4.4 will describe the analysis of the factors that have an influence on the academic performance.

The results will be interpreted and discussed together with the findings of the qualitative phase of the study in Chapter 6.

4.2 QUANTITATIVE DATA GATHERING AND PREPARATION FOR ANALYSIS

Before the findings will be presented, the data gathering and preparation for analysis is described in the next few sections.

4.2.1   Data gathering and description of the cohort

Medical students were selected as *"senior students"* only if there was proof of prior tertiary education available in the database of the University of the Free State, and if the student was enrolled between 2000 and 2012. Initially 211 *"senior students"* could be identified.   Due to many incorrect and incomplete academic records in the University's database, the academic record of a number of students was drawn from the database of the Faculty of Health Sciences with help from an authorised person. The academic record of 11 students remained incomplete or different from the norm. Several of these only enrolled for the fifth year of the medical programme, for example. These students were excluded from the cohort, which brought the cohort to a total of 200 *"senior students"*. No sampling was done because of the limited number of "*senior students*" who could be included into the study.

4.2.2   Data preparation for analysis

The data preparation for analysis was a long process. It is important to understand the history of the curriculum and rules with regard to the modules and examinations.

4.2.2.1   *Background of the M.B.,Ch.B curriculum*

The Bachelor of Medicine and Bachelor of Surgery (M.B.,Ch.B.) programme at the University of the Free State runs over a period of five years.   The curriculum was changed in 2007 from code 8370 to 8371. All the module codes were changed in the new curriculum as well as the division of the semesters in the phases. Previously, the first two semesters were Phase I of the programme (UFS 2009:12).   In the new curriculum this Phase only filled the first semester. And Phase II currently runs from semester two to five.   These phases are arranged in thematic or system-based modules. The clinical part of the programme runs in semester six to 10, which is called Phase III   (UFS 2013b:15).   Diagrammatical representation of the programme structures of 8370 and 8371 are added in Appendices B1 and B2.

In the cohort that was analysed in this study, 58 students were enrolled for code 8370, 130 students were enrolled for code 8371 and 12 students were enrolled for both study codes. This means that 70 students started their medical programme in or before 2006.

4.2.2.2 *Measuring academic performance*

The academic record of each student was drawn from the university database. The academic performance of each student was measured in two different ways. The first way looked at the pass rates of the students, the second compared the *"senior students"* marks with the class averages.

Academic performance by measuring first pass rates

Academic performance can be measured by looking at the number of students who pass a year in one attempt. In this study, this measurement of academic performance is called first-pass rate. The first-pass rate was analysed to measure the influence of different factors on the academic performance of "*senior students".*

Academic performance by measuring average differences between students and the class

If the academic performance is measured by looking at marks, average marks need to be used. Some students do not complete all their modules for a year if they find out that they've failed. Others, who have failed and repeat, only complete those failed modules in a year. On top of these exceptions, specific modules are presented more than once per year. This resulted in a rather complex averaging process - the researcher could not simply apply a student's year average to a class's year average.

Each module's average was therefore worked out and weighted according to the number of students. An accurate year average for each module could then be obtained, and compared to the student's result for that module for that year.

> **Example.** In year X, module A was presented twice. The first time there were five students; the second time the module was presented to 20 students.
> Module A(1)'s average was 70%. Module A(2)'s average was 80%.
> Without weighting, the year average would have equated to 75%. This would have been inaccurate because a minority's marks would have equally informed the average for that year.
> Therefore, because A(2)'s class had more students, the class average for the year would have been more informed by their average, which in this example would equate to 78%.

Once the class averages for each module for each year had been accurately calculated, the researcher worked out the difference between each *"senior students'"* average and the class average. The student's differences for each module for each year were averaged, which was used as year-average from then on.

4.2.2.3 *Statistical analysis*

A biostatistician from the Department of Biostatistics at the Faculty of Health Sciences, University of the Free State did the statistical analysis. Two different analyses were performed to determine the influence of different factors on the academic performance. Firstly, the probability of passing on the first attempt was analysed in different phases of the medical programme. The Chi-square and Fisher's exact test were used to analyse the influence of factors on the first-pass performance. A chi-square test is used for testing independence. This test measures the dependence of two variables, to see if one variable helps to estimate the other. The Fisher's exact test is only used when the sample size was small or when the data were unequally distributed.

Secondly, the *"senior students"* average academic performance difference was measured against the class average. The t-test was used to measure the influence of different factors on the academic performance. A t-test is used to determine if there is a significant difference between the average scores of two groups. An example of two groups would be male and female. When measuring more groups, for example, four types of previous programmes, the ANOVA (analysis of variance) is done. In each of the tests that were used, a probability value of less than $p = 0,05$ shows significance.

When statistical significance was found between more than two variables, multiple comparisons were done to measure which factor was responsible for the variance. The p-value for a multiple comparison of four groups should be 0,008. Because of the small number of students representing each group, statistical significance would never be reached in multiple comparisons in this study. Therefore the researcher and biostatistician decided to use a p-value of 0,05 for multiple analyses in this analysis.

4.2.3 Demographic presentation of the cohort

The cohort consisted of 200 *"senior students"*. The cohort is introduced in this section with regard to demographic information.

4.2.3.1 *Age*

The age-distribution of the *"senior students"* in the cohort is presented in Table 4.1. The ages were grouped into three groups for the analysis of the data. These groups and the distribution of "*senior students"* into the groups are presented in Figure 4.1.

TABLE 4.1: AGE DISTRIBUTION

AGE GROUP	NR OF STUDENTS	%
19	19	9,5%
20	75	37,5%
21	36	18%
22	13	6,5%
23	16	8%
24	9	4,5%
25	6	3%
26	5	2,5%
27	3	1,5%
28	3	1,5%
29	1	0,5%
30	2	1%
31	1	0,5%
33	3	1,5%
34	3	1,5%
36	1	0,5%
38	1	0,5%
42	1	0,5%
44	1	0,5%
46	1	0,5%

Percentage of students in age-groups

65% 26% 9%

■ 19-21 ■ 22-27 ■ 28+
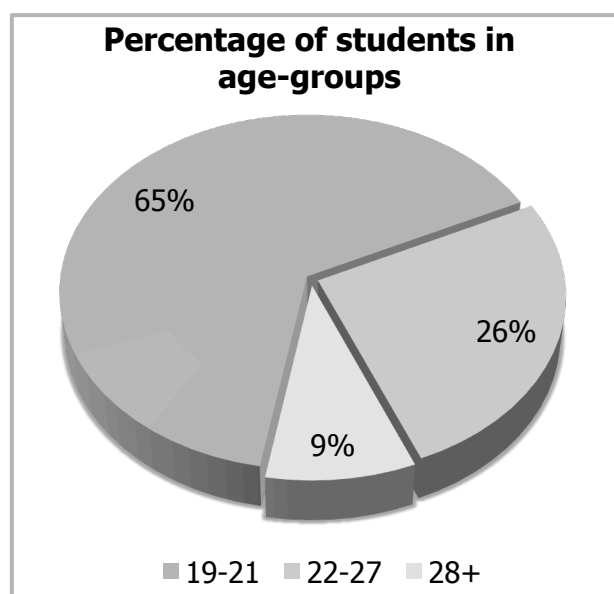
FIGURE 4.1: AGE DISTRIBUTION INTO GROUPS

A total of 65% of the *"senior students"* were between 19 and 21 year old when they started their medical studies. 19% of the students fall into the 22-24 age group and a total of 14 students, or 7% account for the 25-27 age group. From there on the numbers get very slim, the last 7% is divided over 20 years, from 28 to 48. The median age is 21 years.

4.2.3.2 *Gender*

With the cohort of a round number of 200 students, the male-female ratio was 1:1.

4.2.3.3 *Language*

With 11 official languages, South Africa has some specific challenges. The language distribution of the cohort of "*senior students*" is presented in Table 4.2.

TABLE 4.2: HOME LANGUAGE

HOME LANGUAGE	NUMBER OF STUDENTS	PERCENTAGE
English	45	22.5%
Afrikaans	91	45,5%
Sotho	26	13%
Xhosa	15	7,5%
Setswana	1	0,5%
Zulu	4	2%
Venda	1	0,5%
Tswana	11	5,5%
Swati	1	0,5%
Tsonga	1	0,5%
Ndebele	0	0
Other	4	2%

The influence of the home language, language of instruction and a difference between those two on the academic performance of "*senior students*" is measured in this study. At the University of the Free State the students have the choice between Afrikaans and English as the language of instruction. Figure 4.2 shows the instructional language of the "*senior students*". And the percentage of students that study in their home language or a language that is different from their home language.
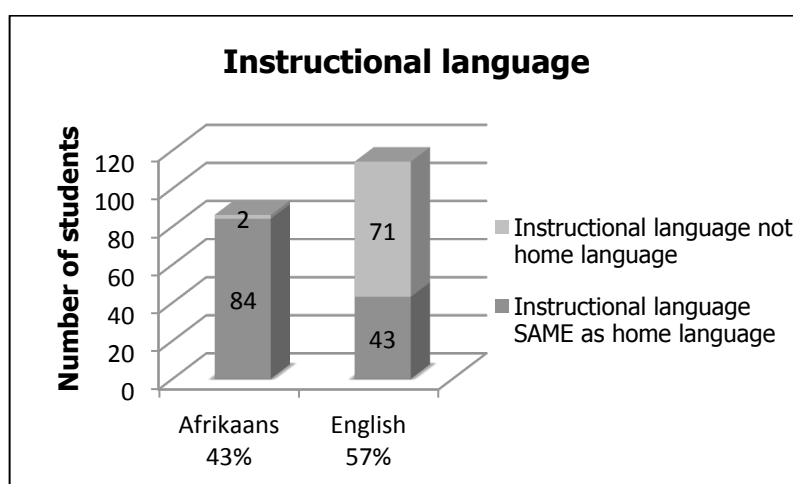
FIGURE 4.2: INSTRUCTIONAL LANGUAGE

Of the total number of students, 57% is studying in English, while the remaining 43% have classes in Afrikaans. Only two of the 86 students in the Afrikaans classes are not

from an Afrikaans speaking background, while a rather larger 62,3% of the English class does not speak the language at home.

4.2.3.4   *Marital status*

The available data on marital status of the students was found incorrect when the researcher conducted the semi-structured interviews with the students, because the marital status was only recorded at time of registration for the programme.   The database shows seven married students and one divorced student between 2000 and 2012.   When conducting the interviews with a sample of currently enrolled "*senior students*", the researcher found that of the 31 interviewees four were married, but none of these marriages were recorded on the university's database.   Therefore, the marital status was not taken into account in the quantitative data analysis.

4.2.4   Previous tertiary education

In this section, the previous tertiary education background of the students in the cohort is presented in different tables.   Firstly a description of the grouping into categories is given, then a presentation of the divisions within the cohort.

4.2.4.1   *Type of previous study*

To present the academic background of the students, the previous tertiary education studies were grouped into categories.   A study conducted by Craig *et al.* (2004:1165-1166) in 2004 was used as an example for the categorisation of previous degrees.   Table 4.3 displays which prior degrees are presented in each category.

TABLE 4.3: PRIOR TERTIARY DEGREE CATEGORIES

CATEGORY	PRIOR DEGREES INCLUDED IN CATEGORY
Health Professions	Nursing, Occupational Therapy, Optometry, Dietetics, Physiotherapy, Human Movement Science, Social Work
Biomedical Science	Human Biology, Medical Physics, Radiation Science, Medicine and Surgery, Biochemistry, Genetics, Microbiology, Behaviour Genetics, Human Biology, Human Molecular Biology, Medical Microbiology, Microbial Biotechnology, Entomology
Other Biology	Animal Science, Agriculture: Animal Science/Grassland Science, Botany, Chemistry and Management, Chemistry/Physics and Biology, Plant Molecular Biology, Natural and Agricultural Sciences, Zoology
Physical Sciences	Architect, Actuarial Science, Physics, Chemistry, Astrophysics, Physics, Higher Education Diploma (Science), Natural Sciences, Quantity Surveying
Non Science	Drama and Theatre Arts, Language Studies, Baccalaureus Commercii, General Management, Human Resource Management, Education, Accounting, Music, Business Administration Health Care Management, Economic and Management Sciences, Humanities

The distribution of different types of previous studies is listed in Table 4.4.

TABLE 4.4: DISTRIBUTION OF TYPE OF PREVIOUS STUDY

TYPE OF PREVIOUS STUDY	NUMBER OF STUDENTS	PERCENTAGE
Health Professions	26	13%
Biomedical Science (Only first year B.Sc.)	142 (99)	71% (49,5%)
Other Biology	7	3,5%
Physical Sciences	5	2,5%
Non-Science	12	6%
Science not specified	8	4%

A total of 68% of the students had done Biomedical science, with a majority of students who had only done the first year. The University mostly advises the students who do not get selected the first time, or who do not have the required high school grades, to study something that will be their second career. Many students decide to do one year Bachelors of Science (B.Sc.) and apply (again) for medicine. Half of the students within this cohort did one B.Sc. year. And the other 50% followed a different route. A total of 26 students (13%) came from a Health Profession. Six percent of the students did either Biology or Physical Science before coming to medicine. There were 12 students (6%) who did a wide range of Non-Science related studies like music, drama, language, accounting and humanities. There were students who did two different types of studies which represented 3% of the cohort, and 4% of the students did a scientific study but it was not specified in the database which type of study it was.

4.2.4.2 *Number of years studied before medicine*

The number of years that the students studied before starting their medical studies is presented in Table 4.5.

TABLE 4.5: NUMBER OF YEARS STUDIED BEFORE MEDICINE

NUMBER OF YEARS STUDIED BEFORE M.B.,Ch.B.	NUMBER OF STUDENTS	PERCENTAGE
1	132	66%
2	23	11,5%
3	16	8%
4	17	8,5%
5	7	3,5%
6	1	0,5%
8	3	1,5%
10	1	0,5%

Two thirds of the students only studied for one year. The students who studied two to four years represented 28% of the group, and a total of 12 students (6%) studied for more than 5 years.

4.2.4.3 *Degrees obtained*

A bachelor's degree takes approximately three to four years, and a honours degree one or two years longer. When looking at the number of years that the students studied prior to their medical studies, 29 students studied four years or longer and 41 students studied three years or longer. A total of 25 students obtained a bachelor's or even an honours degree as shown in Table 4.6.

TABLE 4.6: DEGREES OBTAINED

HIGHEST QUALIFICATION BEFORE MEDICINE	NUMBER OF YEARS STUDIED BEFORE MEDICINE	NUMBER OF STUDENTS	PERCENTAGE
Bachelor's degree	3	6 (of 16)	
	4	7 (of 17)	
	5	5 (of 7)	
	6	1 (of 1)	
	Total Bachelor's degree	19	9,5%
Honours degree	2	1 (of 23)	
	4	4 (of 17)	
	5	1 (of 7)	
	Total Honours degree	6	3%

Note that the students who studied eight years and the one student, who studied 10 years, did not obtain any degrees. It is unfortunately not possible to validate these data. During the interviews with 31 students, it became clear to the researcher that some of those students did not present the University with all the details of their academic background. This might explain why there is one student who, according to the available data, studied for two years and obtained a honours degree. Because of this incomplete data, the researcher decided not to use this in the analysis.

4.3 ACADEMIC PERFORMANCE OF SENIOR STUDENTS

The academic performance of the students is presented in this section. The number of *"senior students"* enrolling into the medical programme each year, the current status of their studies as well as their pass rate and academic performance compared to the class performance, fail rate and discontinuation rate are presented in this section.

4.3.1   Number of students enrolled each year

Between the year 2000 and 2003, only a small number of *"senior students"* (2-5) enrolled into the medical programme. After 2004 the numbers increased to an average of 21 *"senior students"* per year. These numbers are presented in Figure 4.3.
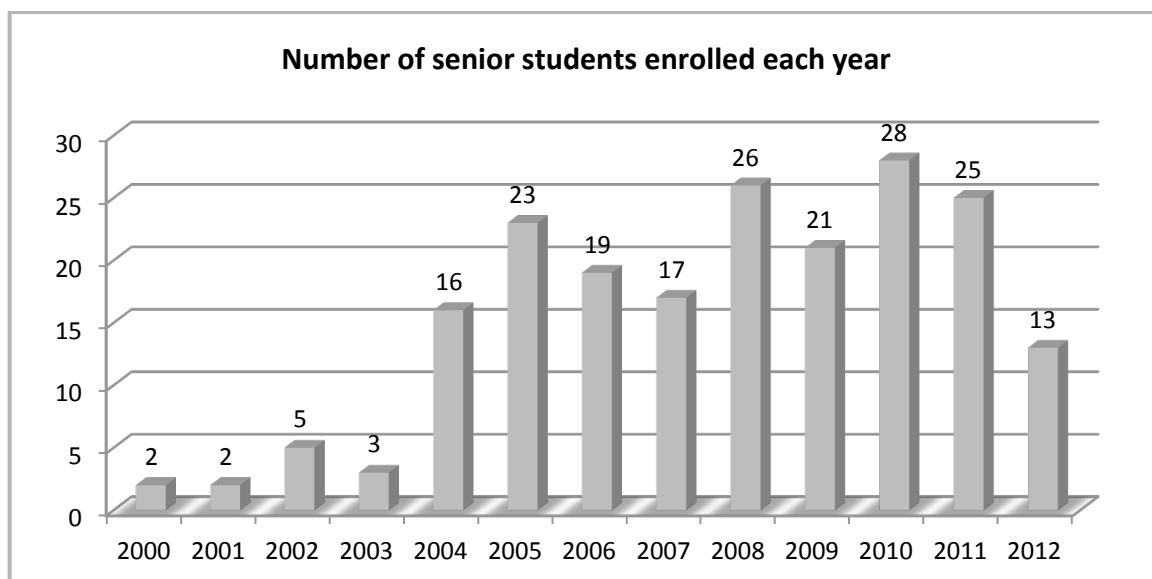
FIGURE 4.3: NUMBER OF SENIOR STUDENTS ENROLLED EACH YEAR

In the year 2011, a total of 25 *"senior students"* enrolled for the first time and three students repeated the year, which brings the total number of students to 28 for that year. Only the students who enrolled in the first year of the medical programme for the first time are presented in Figure 4.3.

4.3.2   Current status of medical studies

Of the cohort of 200 students, 87 students have graduated, 29 students have discontinued their studies and 84 students were still enrolled at the time of this study (the end of 2012). The breakdown of the years in which the students were enrolled at the time of this study, is presented in Figure 4.4. In the following points, namely 4.3.3 to 4.3.5, each group of students will be described and analysed.
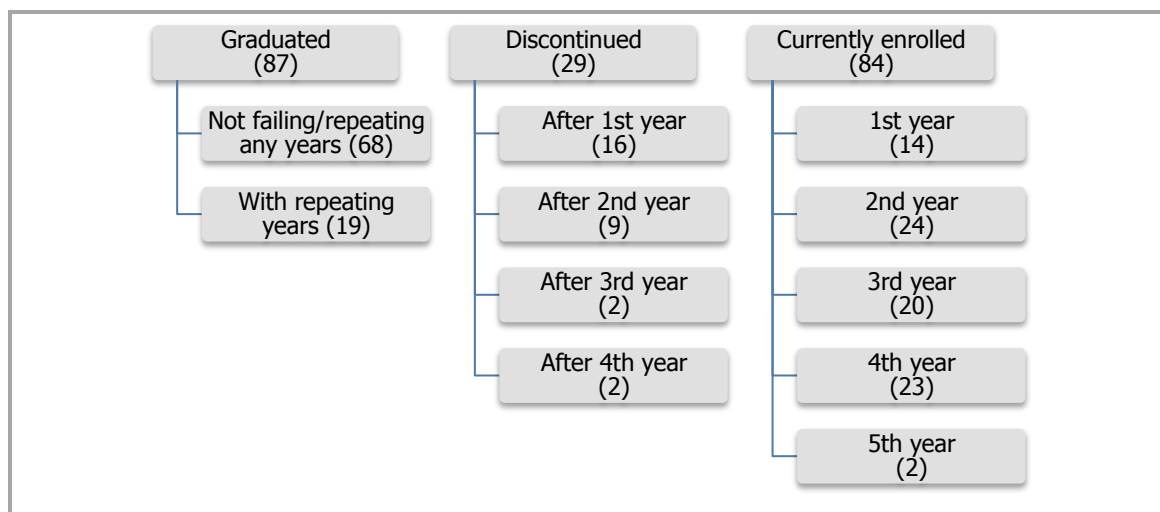
FIGURE 4.4: CURRENT STATUS OF MEDICAL STUDIES

4.3.3 Academic performance of senior students compared to class average

Because the difference in academic performance of *"senior students"* is measured against the academic performance of the class in this analysis, this firstly needs to be put into perspective. As explained earlier (cf. Point 4.2.2.2), year averages are difficult to use in the measurement, because of inconsistencies in the available data. To give an idea of the marks, the marks of the students on the modules that were used in the analysis were averaged and presented in Figure 4.5.a-e. The graphs of marks per academic year are accompanied by a graph that presents the academic performance of "senior students" measured by means of performing above, or below the class average is presented in percentages in Figure 4.5.a-e.

Figure 4.5.a shows the academic performance of *"senior students"* compared to the class average in the first year, as explained above.
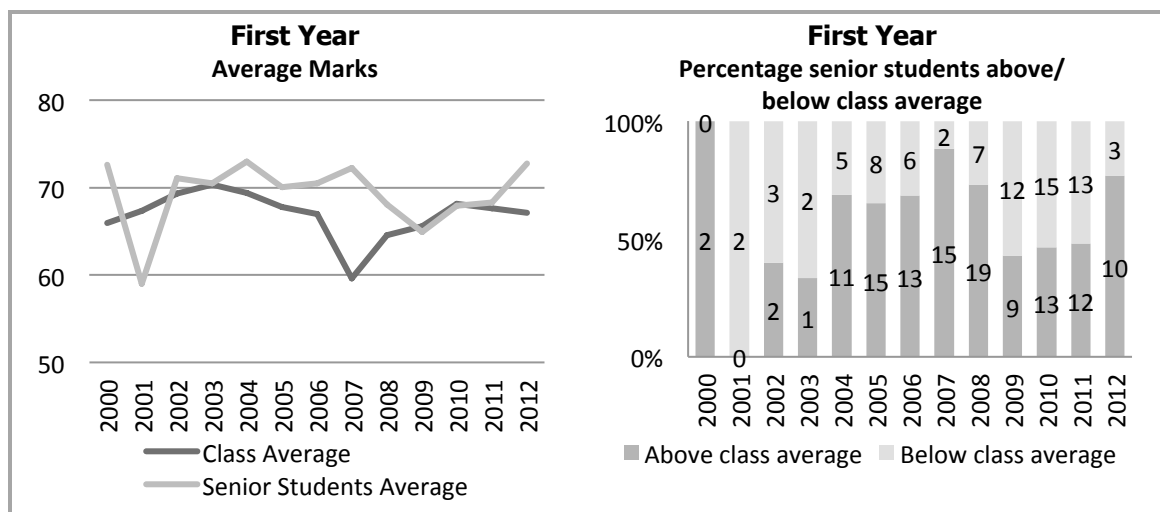
FIGURE 4.5.a: SENIOR STUDENTS' ACADEMIC PERFORMANCE VERSUS AVERAGE CLASS PERFORMANCE IN THE FIRST YEAR

The first year is the only year in which the "*senior students*" have shown a better performance than the rest of the class between 2004 and 2008. The above and below class average scores were close to 50% in recent years but have been higher between 2004 and 2008.

Figure 4.5.b shows the academic performance of "*senior students*" compared to the class average in the second year.
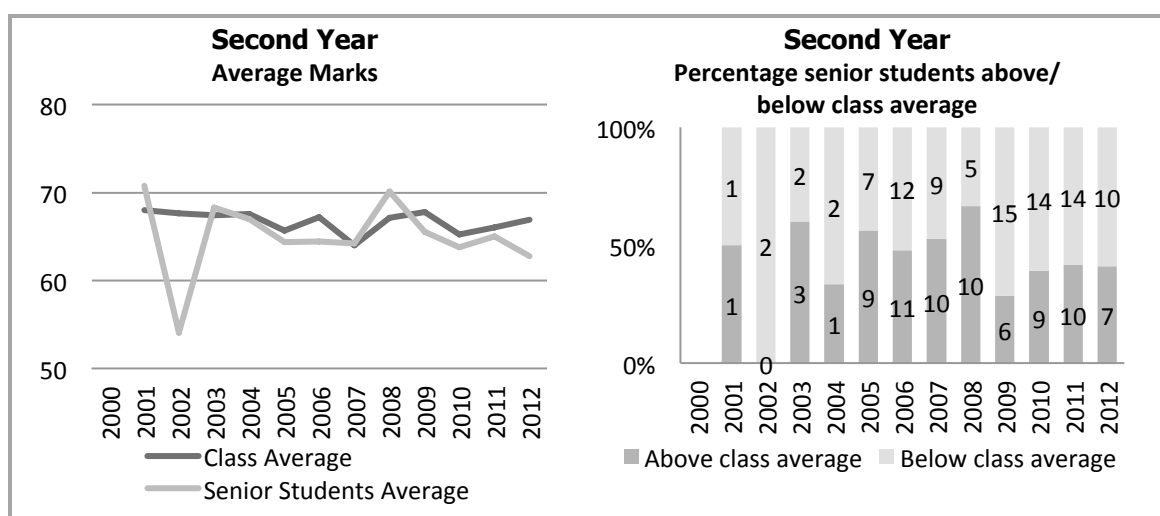
FIGURE 4.5.b: SENIOR STUDENTS' ACADEMIC PERFORMANCE VERSUS AVERAGE CLASS PERFORMANCE IN THE SECOND YEAR

In the second year, the "*senior students*" perform very close to the class average, but the number of students that performs below class average has been increasing.

Figure 4.5.c shows the academic performance of "*senior students*" compared to the class average in the third year.
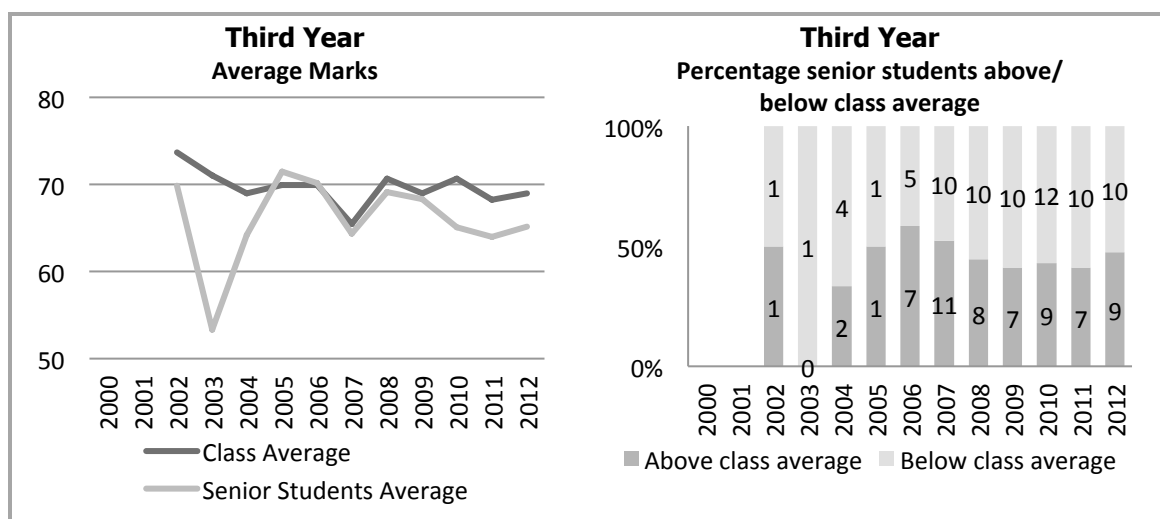
FIGURE 4.5.c: SENIOR STUDENTS' ACADEMIC PERFORMANCE VERSUS AVERAGE CLASS PERFORMANCE IN THE THIRD YEAR

In the third year, besides one low value in the past years, a very average performance is seen. In the most recent years (2008-2012) a lower performance is visible amongst the "*senior students*", the percentage of students performing under the class average is more than 50% in these years.

Figure 4.5.d shows the academic performance of "*senior students*" compared to the class average in the fourth year.
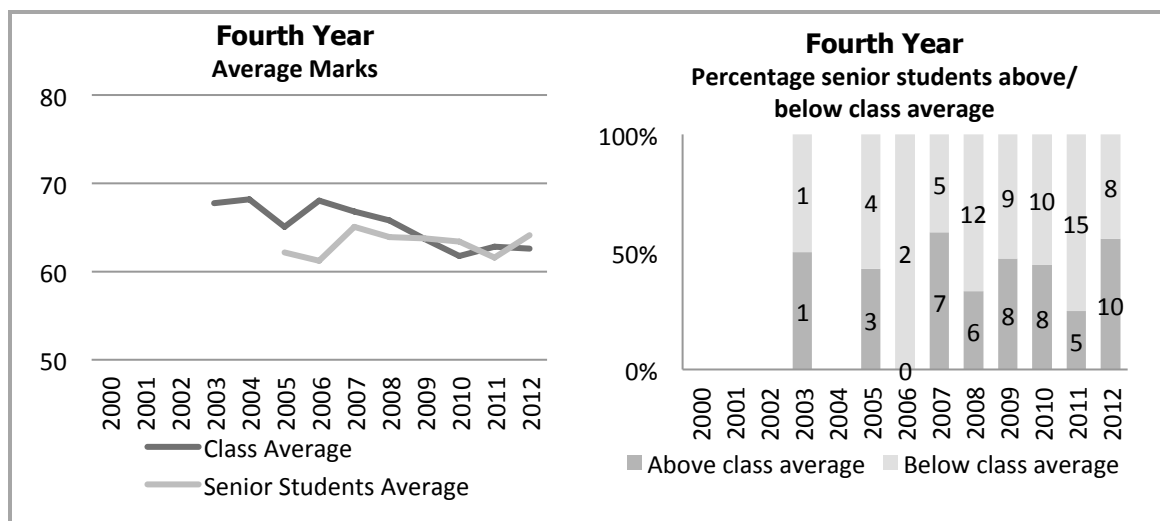
FIGURE 4.5.d: SENIOR STUDENTS' ACADEMIC PERFORMANCE VERSUS AVERAGE CLASS PERFORMANCE IN THE FOURTH YEAR

The fourth year seems to have been a difficult year for the *"senior students"* in the first years that were measured, but in the more recent years the class average has dropped, which means that the *"senior students"* are preforming the same as the class now.

Figure 4.5.e shows the academic performance of "*senior students*" compared to the class average in the fifth year.
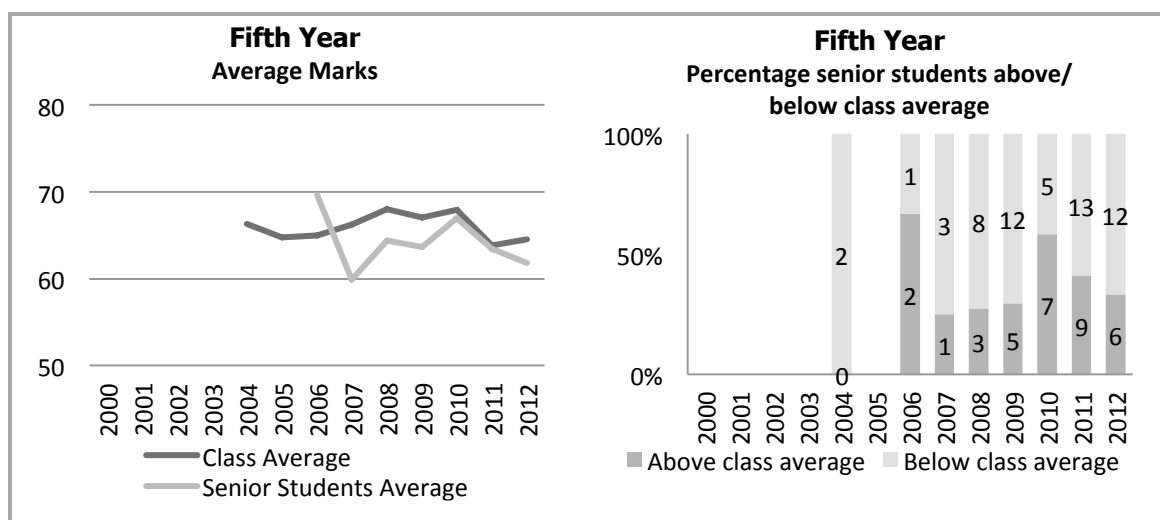
FIGURE 4.5.e: SENIOR STUDENTS' ACADEMIC PERFORMANCE VERSUS AVERAGE CLASS PERFORMANCE IN THE FIFTH YEAR

In the fifth year, the overall class performance is lower and the *"senior students"*, again, stay very close to the average. The percentage of students performing above the class average has been low over the years, and is decreasing again.

The graphs show a slight decrease in average class performance over the years. The students also perform better in the first few years, and get lower scores in the last years of their studies. In the early years, a low academic performance is visible under *"senior students"*. Later the academic performance of *"senior students"* has stabilised and stays much closer to the class average, although they perform a few points under the class average in most of the academic years in recent years.

The average difference between "*senior students"* and the class of all the measured years (2000-2012) together gives us the graph in Figure 4.6. The average academic performance of the class is the zero-line in the graph, and the standard deviation of average academic performance of the "*senior students"* is displayed around that line in grey. For example, in the first year the average difference in academic performance is +2,6 for "*senior students"*. This means that the "*senior students"* perform 2,6 points above the class average in that year. In fifth year the academic performance of "*senior students*" is -1,7, which shows an academic performance of "*senior students*" which is 1,7 points below the class average.

Average academic performance of senior students versus academic performance of the class

	first year	second year	third year	fourth year	fifth year
Mean	2,5784111	0,3865759	-0,9664925	-1,892229	-1,6672627
Standard Deviation	8,1779118	9,3472068	7,6047342	7,2582115	5,9338602
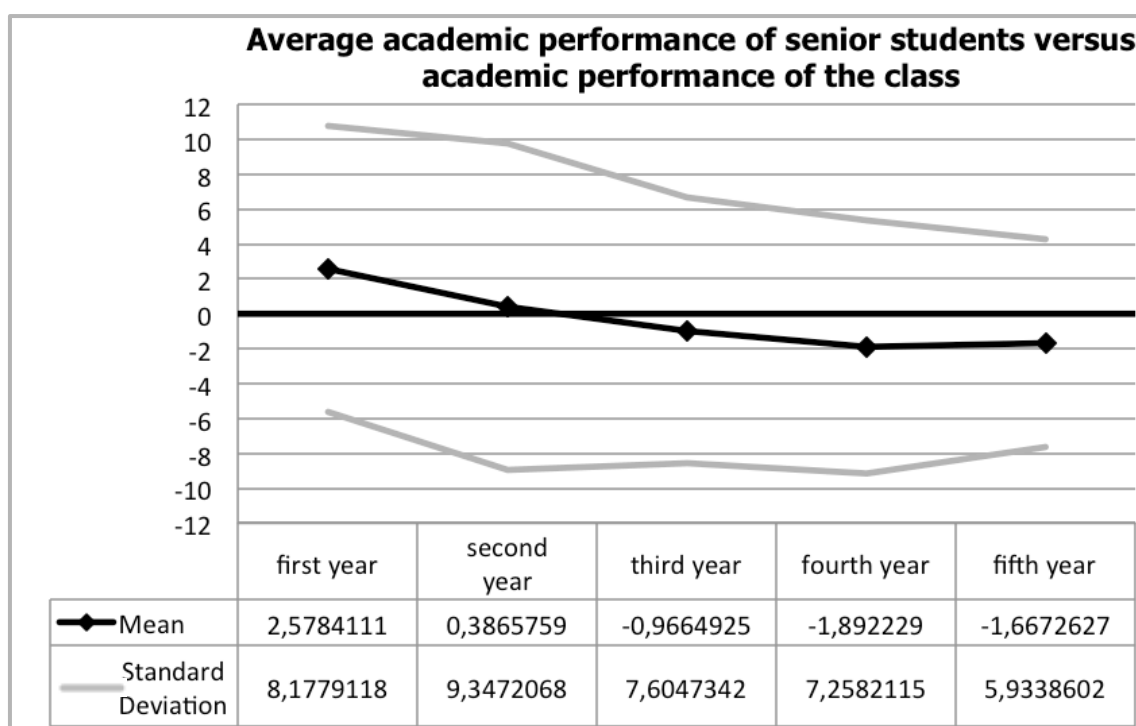
FIGURE 4.6: AVERAGE ACADEMIC PERFORMANCE OF SENIOR STUDENTS VERSUS CLASS PERFORMANCE

Over the twelve years, the *"senior students"* have performed an average of 2,6 points above class average in the first year. But further in the programme, the *"senior students"* perform below the class average. The standard deviation is also visible in the graph, which shows a very wide variety in the results of the *"senior students"*.

4.3.4 Success rate of senior students

The success rate of each cohort was measured in different ways. Firstly the number of years that it takes the students to complete their studies was measured. It takes the students an average of 5,4 years to complete their medical studies. The majority (57,5%) graduates within five years. The percentages of students completing their studies are presented in Table 4.7. Only the students who (could) have completed their studies are used in the measurement. In other words, it only includes students who enrolled before 2009.

TABLE 4.7: NUMBER OF YEARS TO COMPLETE STUDIES

NUMBER OF YEARS TAKEN TO COMPLETE STUDIES (students enrolled before 2009 N=113)		
YEARS	NUMBER OF STUDENTS	PERCENTAGE COMPLETED
5	65	57,5%
6	12	10,6%
7	7	6,2%
8	2	1,8%
9	1	0,9%
Discontinued	15	13,3%
Still enrolled	11	9,7%

Secondly, the pass rate of the *"senior students"* was measured. Unfortunately, the pass rate could not be calculated from the marks for these were not complete in the database and the rules for passing are very complex. Therefore, the researcher decided to look at the calendar years in which the student was enrolled. If a student had to repeat a year, or did not come back for any reason, it was measured as a non-pass. This was measured per cohort, meaning the group of students that started the medical programme in the same year. The pass rate of the first attempt for each year is presented in Figure 4.7 and Table 4.8.
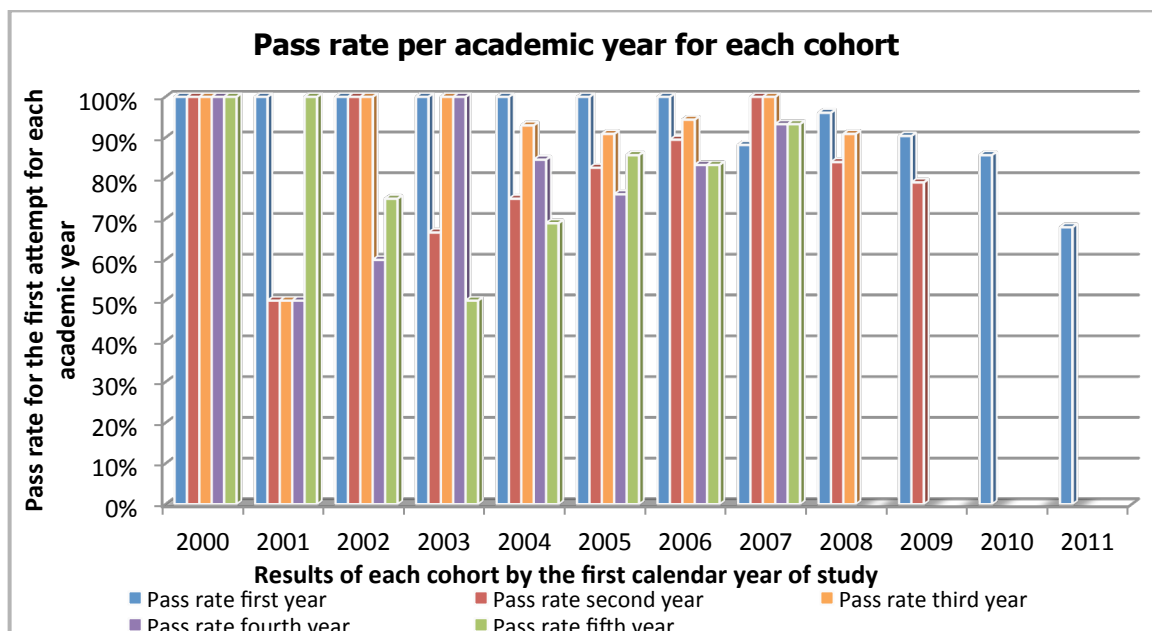
FIGURE 4.7: PASS RATE PER ACADEMIC YEAR FOR EACH COHORT

TABLE 4.8: PASS RATE PER ACADEMIC YEAR FOR EACH COHORT

Cohort	Pass 1st year	%	Pass 2nd year	%	Pass 3rd year	%	Pass 4th year	%	Pass 5th year	%
2000	2/2	100%	2/2	100%	2/2	100%	2/2	100%	2/2	100%
2001	2/2	100%	1/2	50%	1/2	50%	1/2	50%	1/1	100%
2002	5/5	100%	5/5	100%	5/5	100%	3/5	60%	3/4	75%
2003	3/3	100%	2/3	67%	2/2	100%	2/2	100%	1/2	50%
2004	16/16	100%	12/16	75%	13/14	93%	11/13	85%	9/13	69%
2005	23/23	100%	19/23	83%	20/22	91%	16/21	76%	18/21	86%
2006	19/19	100%	17/19	90%	17/18	94%	15/18	83%	15/18	83%
2007	15/17	88%	15/15	100%	15/15	100%	14/15	93%	14/15	93%
2008	25/26	96%	21/25	84%	20/22	91%	13/22			
2009	19/21	90%	15/19	79%	14/18					
2010	24/28	86%	18/25							
2011	17/25	68%								

A few trends are visualised in the figure. The overall pass rate per cohort shows to have increased before the 2007 cohort, which had the highest overall pass rate. After the 2007 cohort, the pass rate is varying. Interestingly enough, the first-year pass rate, which has been 100% before the 2007 cohort, has decreased to a low 70% in the 2011 cohort. This might be explained by the fact that in 2007 the new curriculum (8371) was introduced, with the biggest adjustment in the first year, which changed to a 6-month semester. The second-year pass rate rose steadily until the 2008 cohort, when the second-year pass rate started decreasing again. The third-year pass rate has always been around 90% and is continuing to do so. No trends can be seen for the fourth- and fifth-year pass rate; because the current students have not completed these years, limited data were available for these years.

The pass rates of the *"senior students"* could unfortunately not be compared with the pass rate of the whole class, because these data were not readily available at the University of the Free State.

The throughput rate of the initial cohorts was measured and presented in Figure 4.8. The number of students who started their medical studies in each year is shown between brackets in the titles on the x-axis in the figure, for example: (16), this number represents the 100% on the graph. The percentages of students who discontinued or delayed in the different years are presented as different colours and are described in the legend. The percentage of students, who got to the fifth year (or last measured year) without delays, is presented as blue in the graph. In the first four years (2000-2003) the number of *"senior students"* who enrolled into the medical programme was very small, between two and five students. This must be kept in mind when analysing these data. It is also important to notice that the students who started from 2009 had not reached the fifth year in 2012 as yet.
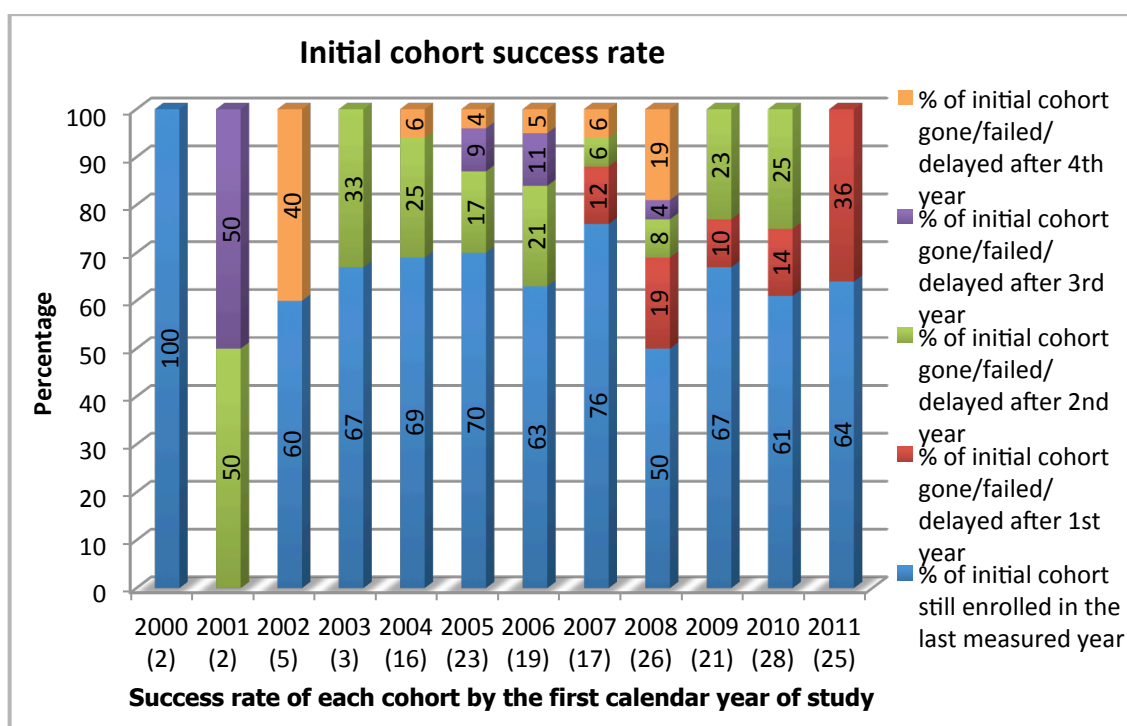
FIGURE 4.8: INITIAL COHORT SUCCESS RATE

Figure 4.8 shows that the percentage of students getting to the fifth year without any delays range between 100 and 0%, but in the years in which more than 16 students were enrolled (from 2004) and the years before 2009, the initial cohort success rate

ranged between 50% and 76%. From 2007, the students started dropping out, or delaying, in the first year, which is visible in the red colour in the figure.

4.3.5 Discontinuation and repeating of years

A total of 29 students of the 200 *"senior students"* discontinued their studies between 2000 and 2011. An organogram of the discontinuation is shown in Figure 4.9.
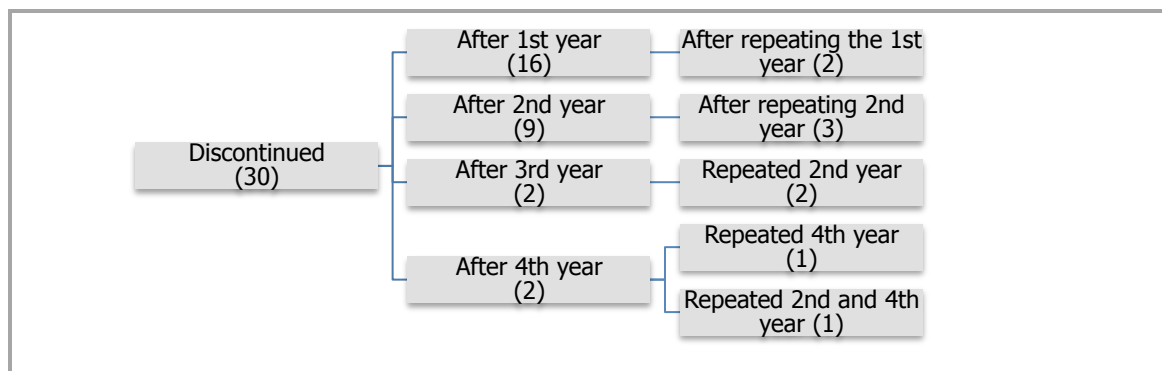
FIGURE 4.9: DISCONTINUATION ORGANOGRAM

The majority of *"senior students"* (16) decided to, or had to quit their studies in the first year. Nine students discontinued after or in their second year, of which three students decided or had to quit after repeating their second year. Only four students discontinued after the third or fourth year. All of these students had repeated one or more years.

The number of students that discontinued of each cohort is presented in Table 4.9.

TABLE 4.9: DISCONTINUATION NUMBERS PER COHORT PER YEAR

Cohort	Total 1st year	1st year	2nd time 1st	2nd year	2nd time 2nd	3rd year	2nd time 4th
2000	2						
2001	2						1
2002	5						1
2003	3				1		
2004	16				2	1	
2005	23			1		1	
2006	19			1			
2007	17	2					
2008	26	1		3			
2009	21	2					
2010	28	1	2	1			
2011	25	8					

Two students who started in 2001 and 2002 discontinued their studies in their fourth year, just before completing their studies. When looking at more recent years, it is

obvious that students decide to, or have to leave the programme in earlier stages of their studies. There were no students who left in the fifth year. The data on the discontinuation rate amongst *"senior students"* could also not be compared with the rest of the class, because these data were not available from the database.

In Table 4.10 the percentage of students who repeated different years is given. Only the results of the students who (could) have completed their studies were taken into account to present a fair division, because the students who are still enrolled can still fail or repeat years.

TABLE 4.10: REPEATING YEARS

REPEATING YEARS (students enrolled before 2009 = 113)		
Year	Number of students	Percentage
1st year	0	0%
2nd year	11	9,7%
3rd year	6	5,3%
4th year	20	17,7%
5th year	12	10,6%

Of the 113 "*senior students"* who enrolled into the medical programme before 2009, zero students had to repeat their first year, 11 students repeated second year and six students repeated third year. The highest number of students repeated fourth year, which, with 20 students, accounted for 17,7% of the *"senior students"*. And slightly more than 10% of the students had to repeat their fifth year.

The available data could give information about the number of *"senior students"* who had to repeat years, but the data does not give insight in the failure rate of *"senior students"*. From the number of *"senior students"* that was enrolled in each academic year, the number of students repeating that year is displayed. These numbers are presented in Table 4.11.

TABLE 4.11: NUMBER OF STUDENTS REPEATING EACH YEAR PER COHORT

	Total 1st Year	Repeat 1st Year	Total 2nd Year	Repeat 2nd Year	Total 3rd Year	Repeat 3rd Year	Total 4rd Year	Repeat 4rd Year	Total 5th Year	Repeat 5th Year
2000	2		2		2		2		2	
2001	2		2	1	2	1	2	2	1	1
2002	5		5		5		5	2	4	1
2003	3		3	1	2		2		2	1
2004	16		16	4	14		13	2	13	4
2005	23		23	3	22	2	21	5	21	3
2006	19		19	1	18	1	18	3	18	1
2007	17		15		15		15	1	15	1
2008	26		25	1	22	2	22	5	13	
2009	21		19	5	17	1	14			
2010	28	3	25	6	17					
2011	25		16							
2012	13									

Of the 2010 cohort, three students repeated the first year. This is the only year in which *"senior students"* repeated the first year, according to the available data. Because of the small number of students in the 2000 and 2001 cohort, these numbers are not included into the figure.

The number of *"senior students"* who have to repeat years seems to be fairly small. These data could not be compared to the class performance, because these data were not readily available at the University of the Free State.

4.4 INFLUENCE OF PREVIOUS TERTIARY EDUCATION ON ACADEMIC PERFORMANCE

In this section the results of the analysis of factors related to the previous tertiary education and the influence on academic performance of "*senior students"*. The statistical analysis that was done was described in Point 4.2.2.2.

4.4.1 Influence of the type of previous studies on academic performance

As described in Point 4.2.4.1, the previous degrees were grouped into categories. Of these categories, four were used for the analysis, based on the number of students represented in these categories. The influence of these categories of previous studies on the academic performance was measured. There were 136 students with a Biomedical science (B.Sc.) background, but 99 of these students had only done the first year. To measure any differences between the B.Sc. students with only one-year experience and the other B.Sc. students, they were analysed as different groups. A

significant number of students came with a Health Profession background. The influence of Non-Science backgrounds was also measured.

- Health Professions (n=26)
- Biomedical Science (B.Sc.) (n=37)
- One year B.Sc. (n=99)
- Non-Science (n=12)

Figure 4.10 presents the results of the analysis of the average academic performance compared to the academic performance of the class. The class average is used as the baseline, which is the black zero line in the graph. The average difference in the academic performance of the "*senior students*" versus the class is displayed as the average amount of points the "*senior students*" performed above or below the class average. If the "*senior students*" had an average performance of 8 points below the class average, this appears as minus in the graph. The graphs that follow in this chapter will all use the same principle. Table 4.12 provides the data on which the graph is based and includes the Standard Deviation, the number of students and statistical analysis of these data, as well as the first pass percentages and the statistical analysis thereof, as described in Point 4.2.2.2 and 4.2.2.3. The numbers that reflect significance ($p = 0,05$) are displayed in **bold** in the tables.

Influence of the type of previous studies on the academic performance in the medical programme

	First Year	Second Year	Third Year	Fourth Year	Fifth Year
Health Professions	7,5	4,5	2,8	0,8	-0,8
Biomedical Science	0,6	-1	-1,7	-1,1	-1,5
One year BSc	2	-1,5	1,4	-3	-2,1
Non-Science	8,5	3,1	-0,6	-2	-5,7
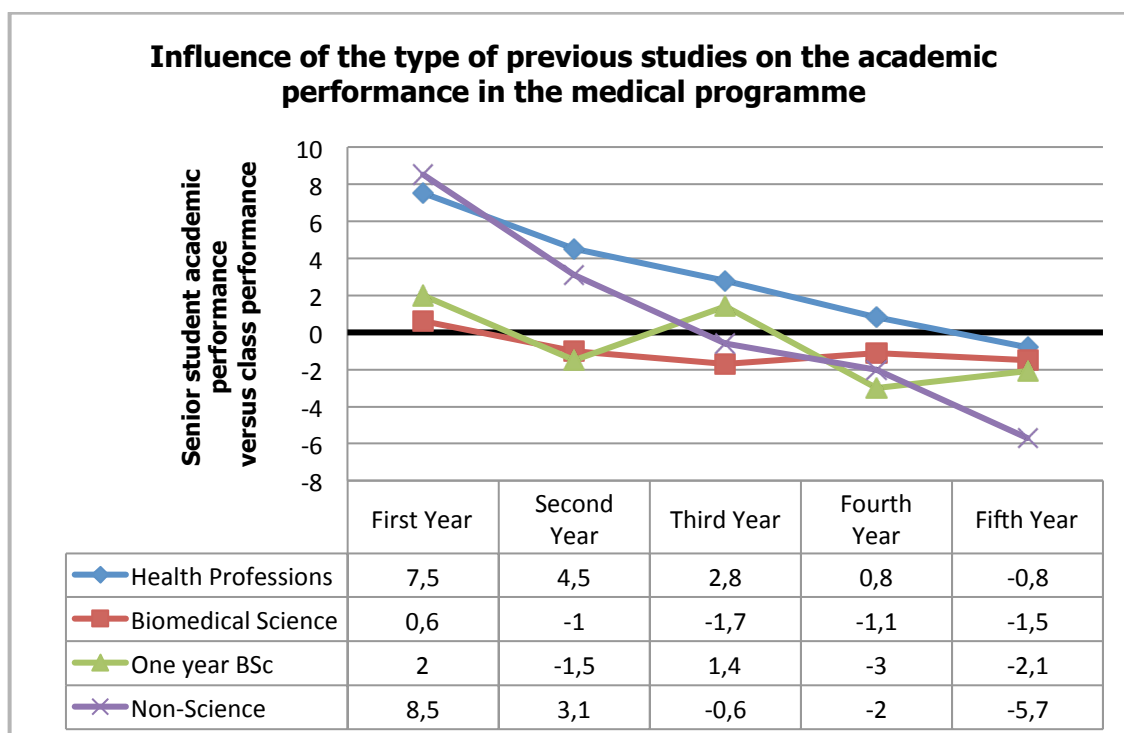
FIGURE 4.10: INFLUENCE OF TYPE OF PREVIOUS STUDIES ON ACADEMIC PERFORMANCE

TABLE 4.12: INFLUENCE OF TYPE OF PREVIOUS STUDIES ON ACADEMIC PERFORMANCE

		1st Year	2nd Year	3rd Year	4th Year	5th Year
Health Professions	**N**	26	24	22	18	14
	Mean Avg	7,5	4,5	2,8	0,8	-0,8
	SD	6,6	9,9	7,9	7,2	6,4
	Pass %	100	87,5	95,5	77,8	78,6
Biomedical Science	**N**	43	34	26	24	21
	Mean Avrg	0,6	-1	-1,7	-1,1	-1,5
	SD	10,1	10,4	8,6	7,3	5,6
	Pass %	78,4	75,9	87	86,4	85
One year B.Sc.	**N**	99	86	66	55	41
	Mean Avrg	2	-1,5	1,4	-3	-2,1
	SD	7,2	8,3	6,6	7,3	5,7
	Pass %	95	82,6	97	83,6	85,4
Non-Science	**N**	12	10	8	5	3
	Mean Avrg	8,5	3,1	-0,6	-2	-5,7
	SD	5,9	8	6,7	6,2	5,1
	Pass %	91,7	100	100	80	100
Average	**ANOVA**	**0,0002**	**0,024**	0,123	0,2562	0,5898
First pass %	**Fisher's exact test**	**0,0069**	0,2731	**0,0483**	0,7656	0,899

The performance of students with a Non-Science and Health Profession background decreases over the years. The Non-Science students perform 8,5% above the class average in the first year and 5,7% below class average in fifth year. The group of Non-Science students was very limited, only 12 students in the first year and three students in the fifth year. Therefore the results of these students can only be seen as an approach of the academic performance of students with a Non-Science background. The performance curve for students with a Biomedical background stays closer to the class average, but shows a slight decrease as well.

In the first year, the *"senior students"* with a Non-Science and a Health Profession background perform significantly better ($p = 0,0002$) than the students with a Biomedical background when looking at the average difference between the "*senior students"* and the class. In the multiple comparisons a difference was found between Health Profession backgrounds and Biomedical science backgrounds ($p = 0,0021$ more than one year B.Sc. and $p = 0,0006$ one year B.Sc.), as well as between Non-Science and Biomedical science backgrounds ($p = 0,0100$ more than one year B.Sc. and $p = 0,0032$ one year B.Sc.). The first-pass performance analysis showed a significant difference between Health Profession backgrounds and more than one-year Biomedical science background ($p = 0,0112$); a significant difference was also found between one year B.Sc. and more than one year B.Sc. ($p = 0,01808$) in the first year.

In the second year, significant differences were found between the average performances of the students (p = 0,0240), the multiple comparisons determined that the difference in performance happened between the students from a Health Profession background and the students who did Biomedical sciences (p = 0,0502 and p = 0,0036 for one year B.Sc.).

A significant difference was also found in the multiple comparison of third year between the first-pass performance of B.Sc. students who studied one year and the student who studied longer than one year (p = 0,0179).

4.4.2 Influence of the number of previous courses on academic performance

The *"senior students"* who applied for the medical programme came with different backgrounds. The influence of the number of tertiary courses on the academic performance in the medical programme was analysed. As explained in Point 1.2.2, in this study, the word "course" means: the programme for any tertiary qualification. This includes students who completed and did not complete a degree, certificate or diploma. The results of the analysis are presented in Figure 4.11 and Table 4.13.

	First Year	Second Year	Third Year	Fourth Year	Fifth Year
1	2,3	-0,8	-1,4	-2,6	-2,1
2+	3,6	1,5	0,2	0,1	-0,5
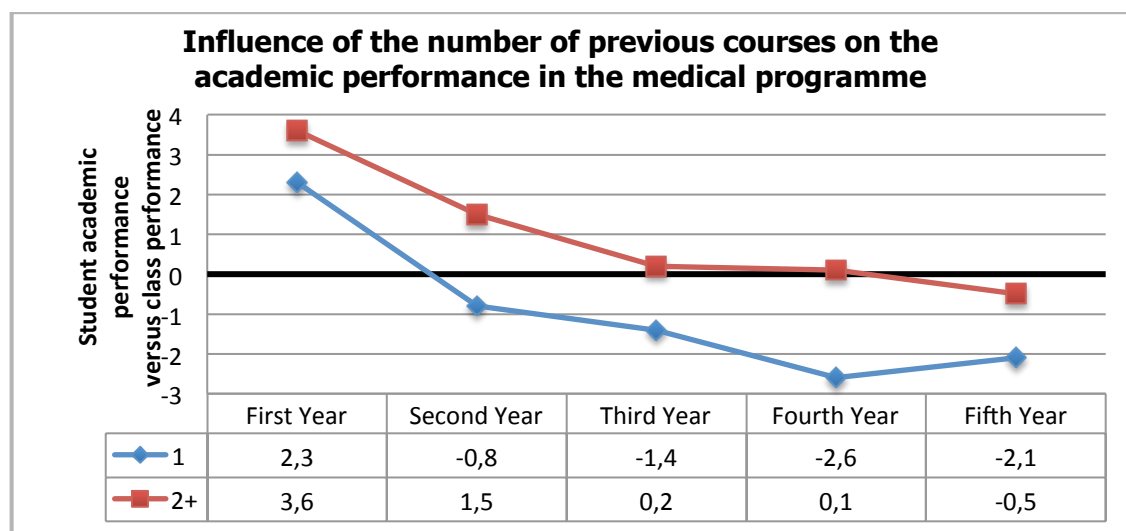
FIGURE 4.11: INFLUENCE OF THE NUMBER OF PREVIOUS COURSES ON ACADEMIC PERFORMANCE

TABLE 4.13: INFLUENCE OF THE NUMBER OF PREVIOUS COURSES ON ACADEMIC PERFORMANCE

		1st Year	2nd Year	3rd Year	4th Year	5th Year
1 previous tertiary course	**N**	153	128	100	82	63
	Mean Avrg	2,3	-0,8	-1,4	-2,6	-2,1
	SD	8	9	7	6,9	5,7
	Pass %	90,9	82,8	96	80,5	85,7
2 or more previous tertiary courses	**N**	47	42	36	32	26
	Mean Avrg	3,6	1,5	0,2	0,1	-0,5
	SD	8,8	9,8	9	7,8	6,5
	Pass %	91,5	83,3	86,1	87,5	80,8
Averages	**T-test**	0,3451	0,1519	0,2812	0,0768	0,2436
First pass %	**Chi Square**				0,3764	
	Fisher's exact test	1	1	0,0549		0,5399

The figure shows that students with a background of two or more different previous courses perform better in every phase of their medical studies, but this is not statistically significant. The performance decreases over the years in both groups, which follows the trend of the average academic performance of the total group of *"senior students"*. The first-pass performance in the third year almost reached significance. The students with two or more previous courses were found to have a lesser chance of passing the third year. Compared to the average performance, this result was not expected.

4.4.3 Influence of the number of years studied before medicine on academic performance

The time that the student studied in a tertiary institution before beginning with the medical programme was found to have an impact on the academic performance of the *"senior students"*. Figure 4.12 and Table 4.14 show the results of the analysis.
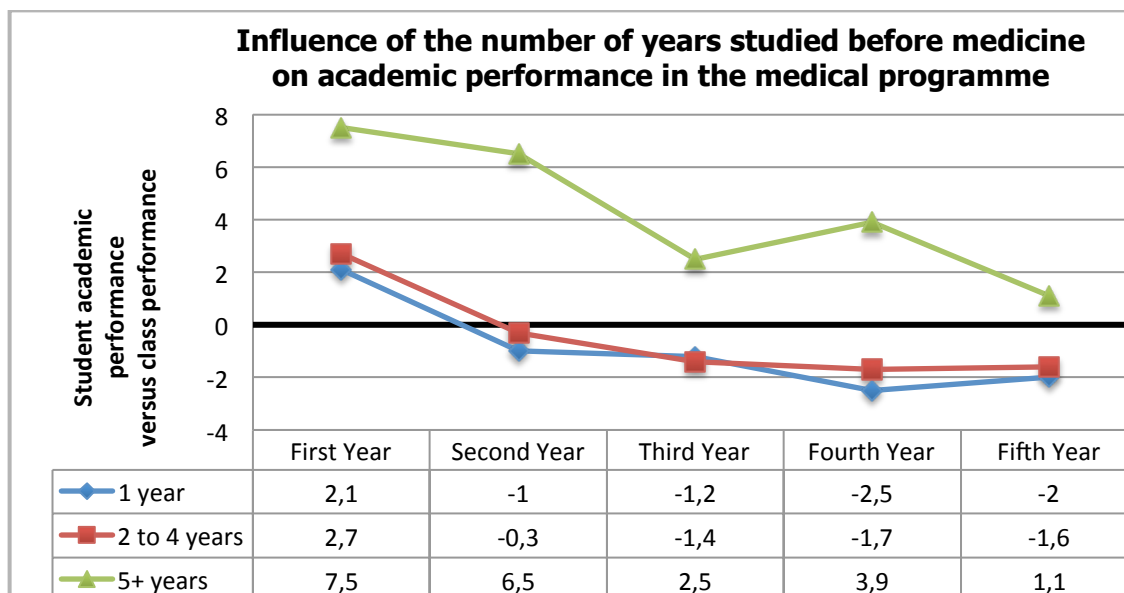
FIGURE 4.12: INFLUENCE OF THE NUMBER OF YEARS STUDIED BEFORE MEDICINE ON ACADEMIC PERFORMANCE

TABLE 4.14: INFLUENCE OF THE NUMBER OF YEARS STUDIED BEFORE MEDICINE ON ACADEMIC PERFORMANCE (Table continues on next page)

		1st Year	2nd Year	3rd Year	4th Year	5th Year
1 year	N	132	108	82	67	51
	Mean Avrg	2,1	-1	-1,2	-2,5	-2
	SD	7,7	8,5	6,3	7,2	5,6
	Pass %	89,4	83,3	97,6	83,6	86,3
2-4 years	N	56	50	43	39	32
	Mean Avrg	2,7	-0,3	-1,4	-1,7	-1,6
	SD	9,1	10,6	9,2	7,5	6,7
	Pass %	92,9	80	88,4	76,9	78,1
5+ years	N	12	12	11	8	6
	Mean Avrg	7,5	6,5	2,5	3,9	1,1
	SD	8	8,1	9,8	4	4,7
	Pass %	100	91,7	81,8	100	100
Averages	T-test	0,0879	**0,0298**	0,2889	0,0608	0,4645
First pass %	Chi Square	0,3988	0,6178		0,2744	0,3352
	Fisher's exact test			**0,0172**		

Figure 4.12 shows that the *"senior students"* with more than five years previous tertiary education perform much better than the students with fewer years of previous tertiary education. These findings were significant for the second year ($p = 0,0298$), and are almost significant for the fourth year of the medical programme ($p = 0,0608$) as shown in Table 4.14. The pass-rate was measured, but in the third year, a significant difference ($p = 0,0468$) in pass-rate was found with the multiple comparisons between the students with one year and students with two to four years of previous tertiary study backgrounds. This result is very different when looking at the average of those two groups which is exactly the same in the third year.

4.4.4   Influence of the number of applications on academic performance

In studies that were performed by Yates and James (2006:1011) and Frischenschlager *et al.* (2005:65), a late admission was found to have an influence on the academic performance in the medical studies. In this study, the time of admission could not be used, therefore the number of applications was investigated and analysed, since these data would say something about the number of rejections and perseverance of the students. The results are presented in Figure 4.13 Table 4.15.
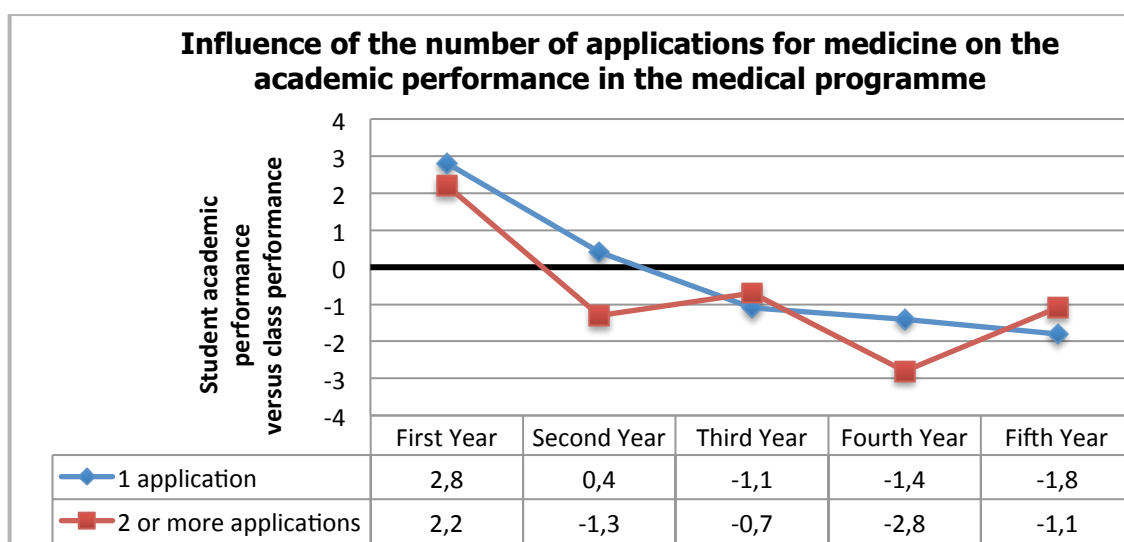
FIGURE 4.13: INFLUENCE OF THE NUMBER OF APPLICATIONS FOR MEDICINE ON THE ACADEMIC PERFORMANCE

TABLE 4.15: INFLUENCE OF THE NUMBER OF APPLICATIONS FOR MEDICINE ON THE ACADEMIC PERFORMANCE

		1st Year	2nd Year	3rd Year	4th Year	5th Year
1 application	**N**	124	107	95	82	69
	Mean Avrg	2,8	0,4	-1,1	-1,4	-1,8
	SD	8,2	9,9	8,1	7,3	5,9
	Pass %	89,5	85	91,6	80,5	82,6
2 or more applications	**N**	76	63	41	32	20
	Mean Avrg	2,2	-1,3	-0,7	-2,8	-1,1
	SD	8,2	8,2	6,5	7,3	6,3
	Pass %	93,4	79,4	97,6	87,5	90
Averages	**T-test**	0,6164	0,2669	0,7947	0,3581	0,6015
First pass %	**Chi Square**	0,3489	0,3415		0,3764	
	Fisher's exact test			0,2772		0,7276

The difference between two groups of students was measured; the first group consisted of students who only applied for the medical programme once, and were accepted. The second group included the students who had to apply more than once

before being selected for the medical programme. In Table 4.15 it is shown that there are no significant differences between the two groups.

4.4.5 Influence of the curriculum code on academic performance

Because of the recent changes in the curriculum of the medical programme, the influence of this change was measured. The curriculum code changed from 8370 to 8371. And changes were made to the curriculum as described in Point 4.2.2.1. A total of 12 *"senior students"* have been enrolled in both curricula. This might be due to an interruption of studies or a delay because of repeating years. Table 4.16 and Figure 4.14 make the difference visible between the students who were only enrolled in one of the curricula, and the students who were enrolled in the two different curricula.

Influence of the curriculum on academic performance in the medical programme

	First Year	Second Year	Third Year	Fourth Year	Fifth Year
8370	2,9	0,7	-0,4	0	-1,9
8370+8371	1	-6,4	-6,5	-9,4	-5,7
8371	2,6	0	-0,4	-1,8	0,4
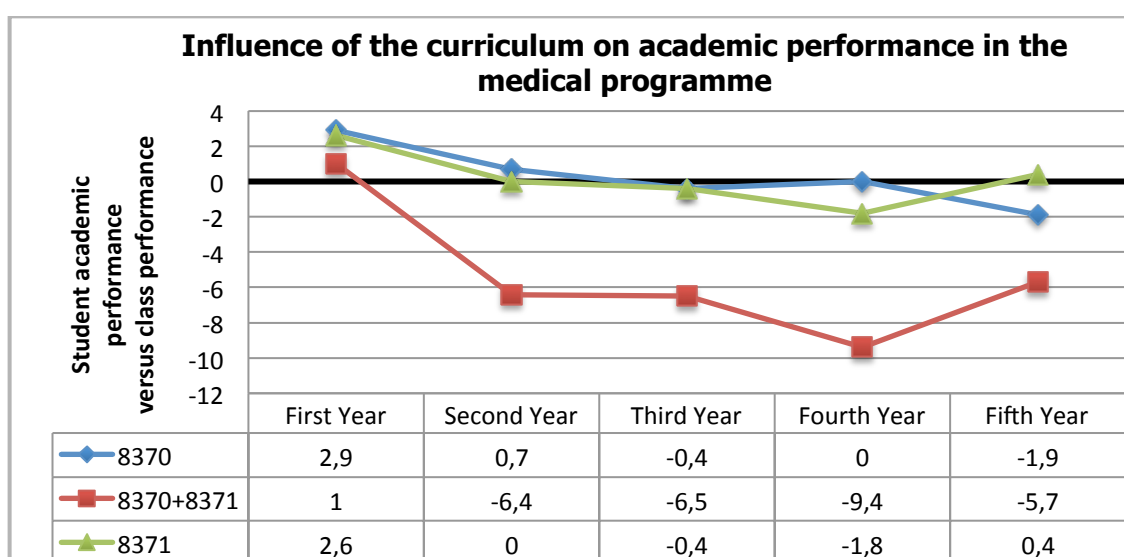
FIGURE 4.14: INFLUENCE OF THE CURRICULUM ON THE ACADEMIC PERFORMANCE

TABLE 4.16: INFLUENCE OF THE CURRICULUM ON THE ACADEMIC PERFORMANCE

		1st Year	2nd Year	3rd Year	4th Year	5th Year
8370	**N**	58	58	53	51	49
	Mean Avrg	2,9	0,7	-0,4	0	-1,9
	SD	6,4	10,2	8	6,9	5,9
	Pass %	100	86,2	94,3	90,2	81,6
8370+8371	**N**	12	12	12	12	12
	Mean Avrg	1	-6,4	-6,5	-9,4	-5,7
	SD	7,9	9,6	6,6	6,6	4,6
	Pass %	100	66,7	75	25	66,7
8371	**N**	130	100	71	51	28
	Mean Avrg	2,6	0	-0,4	-1,8	0,4
	SD	8,9	8,5	7,1	7	5,6
	Pass %	86,2	83	95,8	88,2	96,4
Averages	**ANOVA**	0,7508	**0,0503**	**0,0279**	**0,0002**	**0,0089**
First pass %	**Chi Square**	**0,0049**	0,2614		**0,0001**	
	Fisher's exact test			0,0513		**0,0278**

It is very clear that the students who were enrolled for both curricula perform far below the class average than the other *"senior students"*. Table 4.16 presents significant differences for each year, when looking at either student-versus-class averages (year 2, 3, 4, and 5) or first-pass rate (year 1, 3, 4, 5). In the multiple comparisons the students who were enrolled for the two different curricula performed significantly different from 8370 and 8371 curricula. But in the first year, the first-pass performance in 8371 was significantly lower than the other two groups ($p = 0,0029$).

4.5 INFLUENCE OF DEMOGRAPHIC FACTORS ON ACADEMIC PERFORMANCE

The demographic factors have been analysed and are presented in the next sections. General demographic factors were measured amongst the *"senior students"* such as age, gender and language. These factors are assumed to not be different from the total class, but this could not be verified because these data were not readily available at the University.

4.5.1 Influence of gender on academic performance

Many studies have shown that female medical students perform better (Craig *et al.* 2004:1166; James & Chilvers 2001:1059; Yates & James 2006:1011), with a few exceptions. These same results were found in this study. Figure 4.15 and Table 4.17 show a significant difference between the academic performance of male and female *"senior students"* in third, fourth and fifth year.

Influence of gender on academic performance in the medical programme

Student academic performance versus class performance

	First Year	Second Year	Third Year	Fourth Year	Fifth Year
Male	1,5	-1,4	-2,8	-3,5	-3,4
Female	3,6	1	1,3	0,3	0,2
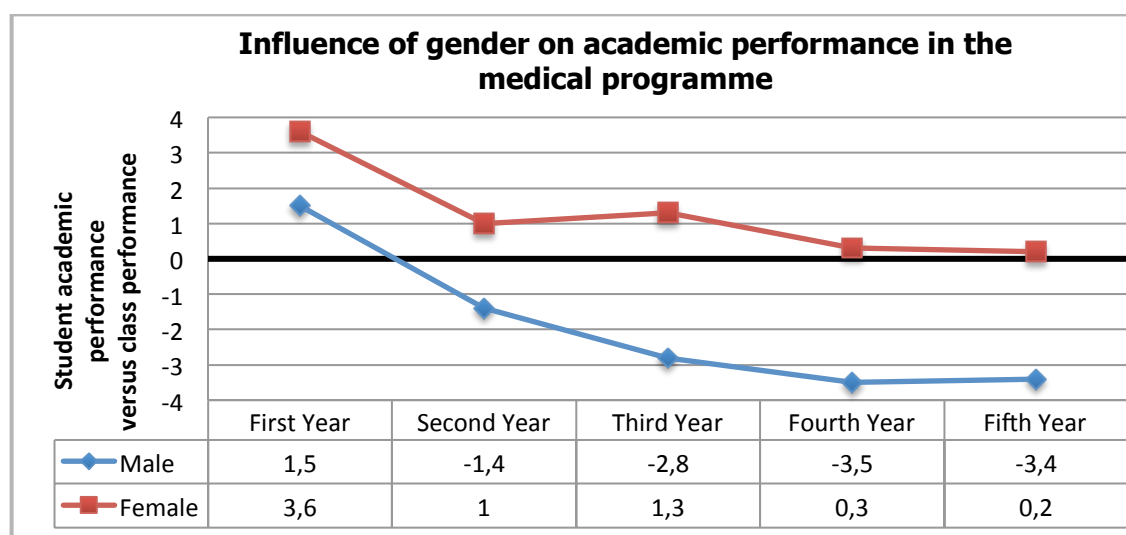
FIGURE 4.15: INFLUENCE OF GENDER ON THE ACADEMIC PERFORMANCE

TABLE 4.17: INFLUENCE OF GENDER ON THE ACADEMIC PERFORMANCE

		1st Year	2nd Year	3rd Year	4th Year	5th Year
Male	N	100	89	74	62	46
	Mean Avrg	1,5	-1,4	-2,8	-3,5	-3,4
	SD	8,2	9	7,2	7	5,3
	Pass %	92	79,8	91,9	79	80,4
Female	N	100	81	62	52	43
	Mean Avrg	3,6	1	1,3	0,3	0,2
	SD	8,1	9,6	7,5	7,2	6
	Pass %	90	86,4	95,2	86,5	88,4
Averages	T-test	0,0662	0,0921	**0,0016**	**0,0047**	**0,0028**
First pass %	Chi Square	0,6212	0,25		0,2939	0,3041
	Fisher's exact test			0,5091		

Both groups show a downward curve in academic performance over the years. The female *"senior students"* stay above the class average in all the years, whereas the male students only perform above the class average in the first years of the medical programme. This factor, however, only has a significant influence on the marks and not on the first-pass rate.

4.5.2 Influence of age on academic performance

The influence of age on academic performance is one of the first factors a researcher thinks of when researching the factors that influence *"senior students"* in their academic performance. The *"senior students"* were separated into three age groups: 19-21, 22-27 and 28+ in first year. The results of the analysis are shown in Figure 4.16 and Table 4.18.

Influence of age on academic performance in the medical programme

	First Year	Second Year	Third Year	Fourth Year	Fifth Year
19-21	2,3	-0,6	-0,3	-1,3	-0,7
22-27	3,3	1,4	-1	-1,9	-1,8
28+	2,2	-2,3	-4,2	-4,9	-5,8
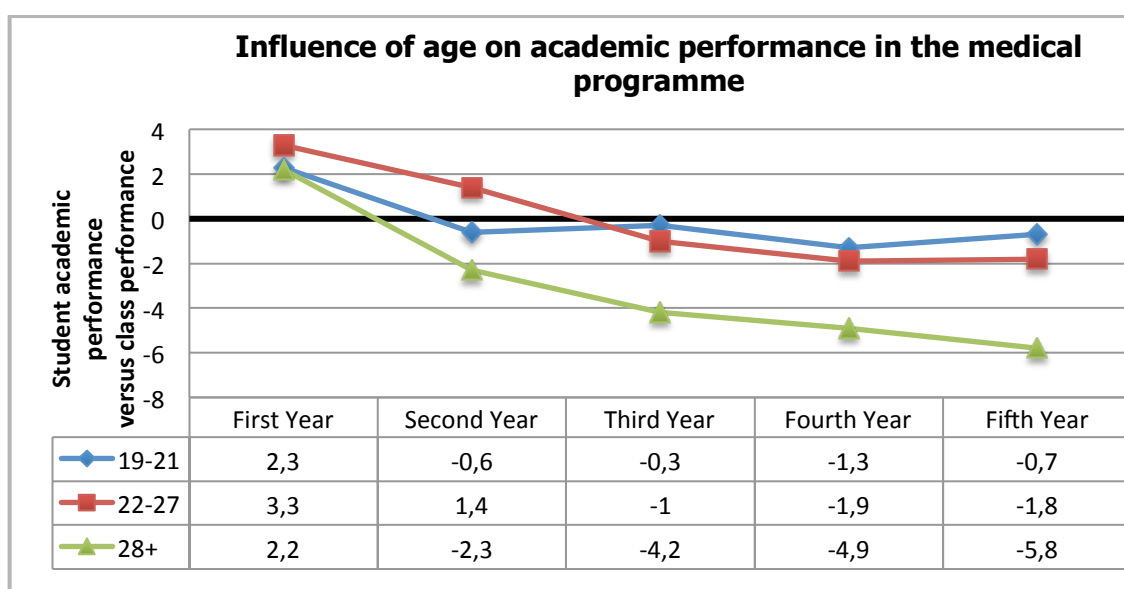
FIGURE 4.16: INFLUENCE OF AGE ON THE ACADEMIC PERFORMANCE

TABLE 4.18: INFLUENCE OF AGE ON THE ACADEMIC PERFORMANCE

		1st Year	2nd Year	3rd Year	4th Year	5th Year
19-21	N	130	107	83	70	53
	Mean Avrg	2,3	-0,6	-0,3	-1,3	-0,7
	SD	7,8	9	7,2	7,5	5,7
	Pass %	89,2	83,2	96,4	84,3	92,5
22-27	N	52	45	38	33	25
	Mean Avrg	3,3	1,4	-1	-1,9	-1,8
	SD	9,5	9,9	7,9	5,6	5,8
	Pass %	92,3	84,4	89,5	87,9	76
28+	N	18	18	15	11	11
	Mean Avrg	2,2	-2,3	-4,2	-4,9	-5,8
	SD	7,1	9	8,2	9,5	6,3
	Pass %	100	77,8	86,7	54,6	63,6
Averages	ANOVA	0,7265	0,3023	0,173	0,299	**0,0344**
First pass %	Chi Square		0,8125		**0,0341**	
	Fisher's exact test	0,4313		0,1634		**0,0182**

Students with an age between 19 and 21 years perform very close to the class average. The 22-27 group shows a slightly better performance compared to the class average in the first two years, and a descending curve in the last years, but all still very close to the class average. The 28+ group is found to perform weakly in each year, starting above class average in the first year, but falling to a -5,8% compared to the class average in the fifth year. This last number is also a significant difference (p = 0,0344) in the total group of "*senior students*" for that year. The group of students older than 28 years was between 11 and 18 students, which means that one student can have a big influence on these average scores. In the chi-square test and the fisher's exact test, the probability for passing each year was measured for the different age groups. In the first three years there was no significant difference between the groups. But in the fourth year a p-value of 0,0341 was found for passing the year, and a p-value of 0,0182 in the fifth year. These results show that the probability of passing fourth year for students older than 28 years is significantly lower (multiple comparisons Fischer's exact test p = 0,0359 19-21 vs 28+, p = 0,0305 22-27 vs 28+) than the other age groups. The first pass performance in the fifth year was also significantly different between the age group of 28+ and 19-21 (p = 0,0244).

4.5.3   Influence of language on academic performance

The influence of language on the academic performance can be measured in different ways. Firstly the home language versus the instructional language plays a major role.

Figure 4.17 and Table 4.19 presents the influence of language, if the student receives education in the home language or in a second language.

Influence of instructional language being the same as home language or differing from home language on academic performance in the medical programme

	First Year	Second Year	Third Year	Fourth Year	Fifth Year
Instructional language NOT home language	-1,7	-5,3	-6,8	-7,2	-5,7
Instructional language SAME as home language	5	2,5	2	0,9	0,1
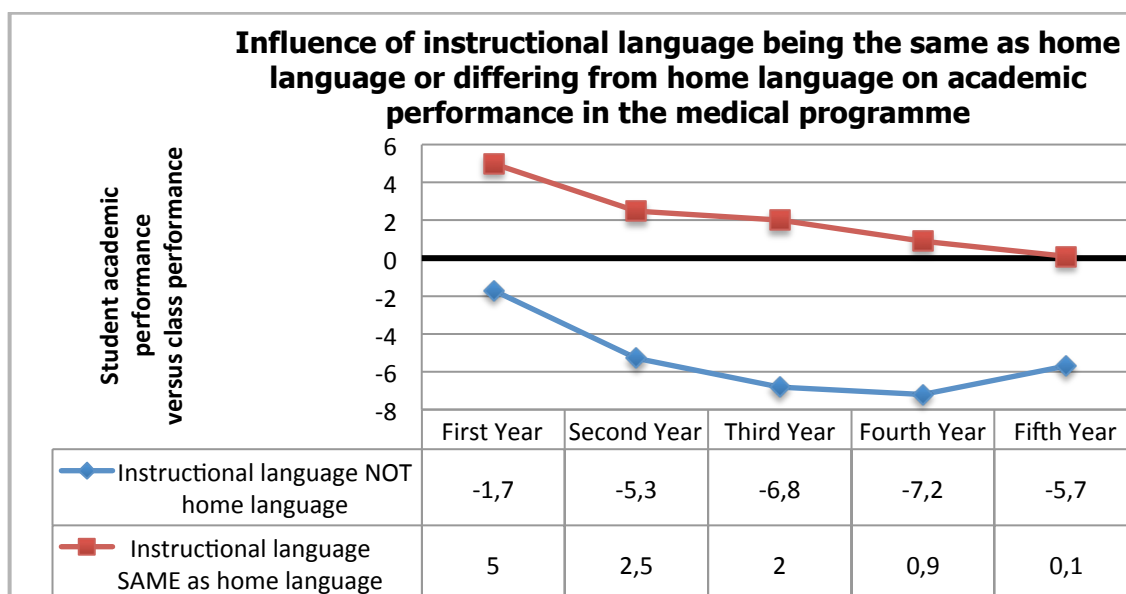
FIGURE 4.17: INFLUENCE OF INSTRUCTIONAL LANGUAGE BEING THE SAME OR DIFFERENT AS HOME LANGUAGE ON THE ACADEMIC PERFORMANCE

TABLE 4.19: INFLUENCE OF INSTRUCTIONAL LANGUAGE BEING THE SAME OR DIFFERENT AS HOME LANGUAGE ON THE ACADEMIC PERFORMANCE

		1st Year	2nd Year	3rd Year	4th Year	5th Year
Instructional language not home language	N	73	60	46	38	27
	Mean Avrg	-1,7	-5,3	-6,8	-7,2	-5,7
	SD	7,3	7,8	6,2	6,2	4,8
	Pass %	84,9	70	82,6	63,2	77,8
Instructional language same as home language	N	127	110	90	76	62
	Mean Avrg	5	2,5	2	0,9	0,1
	SD	7,7	8,9	6,5	6,2	5,6
	Pass %	94,5	90	98,9	92,1	87,1
Averages	T-test	<.0001	<.0001	<.0001	<.0001	<.0001
First pass %	Chi Square	0,023	0,0009		0,0001	
	Fisher's exact test			0,0007		0,3434

The difference in academic performance is significant in every year. It goes without saying that students who study in their home language perform significantly better, as visible in Table 4.19.

The students who study in their home language were compared to see if the instructional language makes any difference in the academic performance. The students who do not study in their home language were excluded because the majority of these students study in English, which makes the comparison between instructional

languages impossible because of the influence of studying in a different language to the home language. In Figure 4.18 the results are presented.
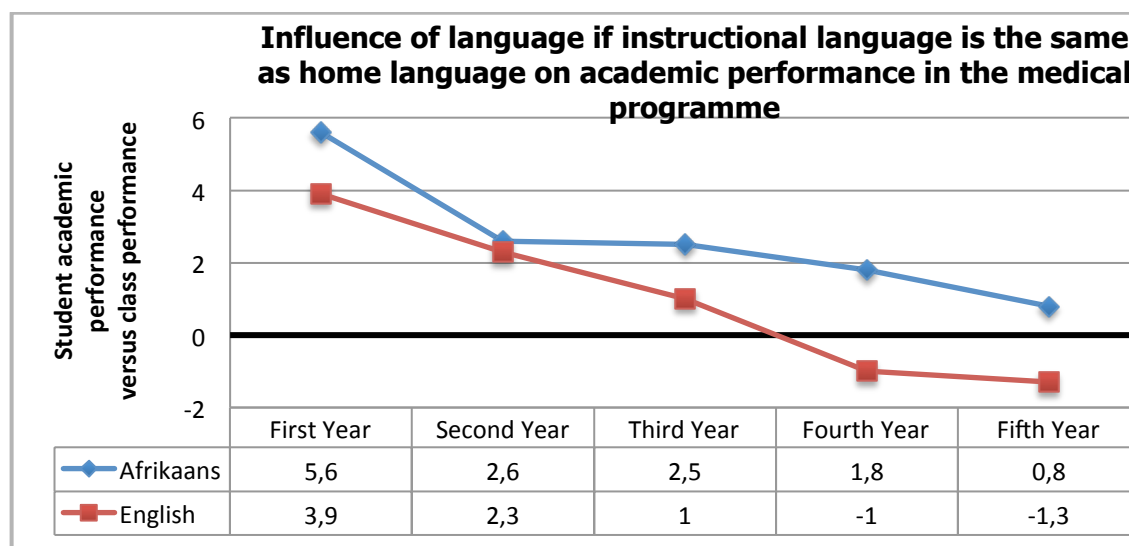
FIGURE 4.18: INFLUENCE OF INSTRUCTIONAL LANGUAGE ON THE ACADEMIC PERFORMANCE

TABLE 4.20: INFLUENCE OF INSTRUCTIONAL LANGUAGE ON THE ACADEMIC PERFORMANCE

		1st Year	2nd Year	3rd Year	4th Year	5th Year
Afrikaans	**N**	84	73	60	51	41
	Mean Avrg	5,6	2,6	2,5	1,8	0,8
	SD	7,5	8,5	6,2	5,5	5,1
	Pass %	95,2	91,8	98,3	96,1	90,2
English	**N**	43	37	30	25	21
	Mean Avrg	3,9	2,3	1	-1	-1,3
	SD	7,9	9,7	7,1	7,1	6,3
	Pass %	93	86,5	100	84	81
Averages	**T-test**	0,2554	0,8742	0,3311	0,0654	0,1609
First pass %	**Fisher's exact test**	0,688	0,5026	1	0,087	0,4259

No significant difference was found between the instructional languages. The Afrikaans group does perform better than the English group, and also stays above the class average in every year. The biggest difference between both languages was seen in the fourth year, but no significance was found (Table 4.20).

4.6 CORRELATIONS AND RELATIONSHIPS

A few factors have been found to have an influence on the academic performance. A summary of the significance of each factor that was analysed in this study is given in Table 4.21. The significant results are displayed as bold in this table.

TABLE 4.21: SUMMARY OF SIGNIFICANCE OF FACTORS INFLUENCING ACADEMIC PERFORMANCE OF SENIOR MEDICAL STUDENTS

		Type of previous studies	Number of previous courses	Number years studied before medicine	Number of applications for medicine	Curriculum	Gender	Age	Instructional language being the same or different as home language	Instructional language
1st Year	T-test/ANOVA	**0,0002**	0,3451	0,0879	0,6164	0,7508	0,0662	0,7265	**<.0001**	0,2554
	Chi-Square			0,3988	0,3489	**0,0049**	0,6212		**0,023**	
	Fisher's Exact	**0,0069**	1					0,4313		0,688
2nd Year	T-test/ANOVA	**0,024**	0,1519	**0,0298**	0,3415	**0,0503**	0,0921	0,3023	**<.0001**	0,8742
	Chi-Square			0,6178	0,3415	0,2614	0,25	0,8125	**0,0009**	
	Fisher's Exact	0,2731	1							0,5026
3rd Year	T-test/ANOVA	0,123	0,2812	0,2889	0,7947	**0,0279**	**0,0016**	0,173	**<.0001**	0,3311
	Chi-Square									
	Fisher's Exact	**0,0483**	0,0549	**0,0172**	0,2772	0,0513	0,5091	0,1634	**0,0007**	1
4th Year	T-test/ANOVA	0,2562	0,0768	0,0608	0,3581	**0,0002**	**0,0047**	0,299	**<.0001**	0,0654
	Chi-Square		0,3764	0,2744	0,3764	**0,0001**	0,2939	**0,0341**	**0,0001**	
	Fisher's Exact	0,7656								0,087
5th Year	T-test/ANOVA	0,5898	0,2436	0,4645	0,6015	**0,0089**	**0,0028**	**0,0344**	**<.0001**	0,1609
	Chi-Square			0,3352			0,3041			
	Fisher's Exact	0,899	0,5399		0,7276	**0,0278**		**0,0182**	0,3434	0,4259

To see if the influence of some of these factors were linked, the distribution of students influenced by two significant factors has been measured against each other. The distribution of students in each variable at time of admission is presented in Appendix C.

Firstly, the male students are a bit older than the female students; this is mostly visible in the 22-27 age group. The female students performed significantly better than the male students in the last three years of the medical programme, the students who were 28+ performed significantly worse compared to the rest of the *"senior students"* in the last two years. The group of 28+ age consisted of 39% female and 61% male students. Age or gender might have a slight influence on the results of either factor.

The age group of 22-27 accounts for the highest number of students that studied two to four years as well as 5+ years before they started with the medical programme. The students that study 5+ years, perform significantly better in the second and third year. No correlation could be identified between the duration of previous studies, and the 22-27 age group.

When looking at the gender distribution in the different types of previous studies, the male-female ratio is the same in Health Professions and One year B.Sc. More than half (55%) of the Biomedical Science group is female and almost two thirds (63%) of the Non-Science group is male. When comparing the academic performance of male students with the Non-Science group, there might be a correlation between both, which might explain the weak performance of Non-Science students in the last years of their medical studies. But the low number of students in the Non-Science group affects the reliability of these results.

The number of female students with a background of more than one previous course was greater than the male students. There might be a connection between the non-significant superior academic performance of female students and students with more than one previous course.

In every previous study type, more than half of the students studied two years or longer before entering medical school. More than three quarters (77%) of the students with a Biomedical Science background studied two years or more before they started their medical studies. A low pass-rate was found for the students with two to four years of previous education. A low pass-rate was also found for students who studied for a B.Sc. for more than one year. There might be a correlation here. But because of low numbers of students who could be included in this study, no correlation could be measured.

The majority of the students who studied for a Health Profession or Biomedical Science were of the age group of 22-27 at the time that they enrolled into the medical programme. The students with a Non-Science background were from all age groups, 47% 19-21, 26% 22-27, 26% 28+. The percentage of older students in the Non-Science group is relatively high (26%), and of all the students that represent the 28+ age group, one third is from a Non-Science background. The 28+ age group was found to have a significant negative influence on the academic performance of "*senior students*" in the fourth and fifth year. The high percentage of Non-Science students representing this group might be a reason for the low performance of this group in the last years of their studies.

A few interesting tendencies were found. The age for the students who did a B.Sc. for one year is expected to be young, but 15 students were above the age of 22 of which five were even above 28 years old. This is interesting because only one of the 99

students with one year B.Sc. did more than one previous course. So this might be a sign of inaccurate data, or a high percentage (15%) of students who start studying at an older age.

Of the students from most of the types of previous studies, the majority did only one previous course, but the Biomedical Science students did more than one previous course, which was found to have a positive influence on the academic performance. But these findings were not significant.

4.6.1   Regression models

The biostatistician applied multiple regression as well as logistic regression models to calculate which factors play the major part in the academic performance of *"senior students"*. Language has a significant influence on average marks through the full medical programme if students study in a language that is not their home language. The type of previous study was the second strongest variable factor on the average mark performance in the first year. In the third, fourth and fifth year, gender was the second variable that has most influence on academic marks. The results of the multiple regression model are presented in Table 4.22. The small sample, however, caused errors for the logistic regression model for first-pass performance. Language that was different from the home language was the only significant variable for the first-pass performance in the fourth year of the medical programme ($p = 0,0012$).

TABLE 4.22: MULTIPLE REGRESSION MODEL

Multiple regression – Average performance versus class average	
1st year	Previous type of study ($p = 0,0028$)
	Instructional language not home ($p < 0,0001$)
2nd year	Instructional language not home ($p < 0,0001$)
3rd year	Gender ($p = 0,0405$)
	Instructional language not home ($p < 0,0001$)
4th year	Gender ($p = 0,0328$)
	Instructional language not home ($p < 0,001$)
5th year	Gender ($p = 0,0361$)
	Instructional language not home ($p < 0,0003$)

4.7   CONCLUSION

In this chapter the findings of the retrospective cohort study were presented. Also, the data gathering process and data preparation for analysis were described. In the next

chapter, Chapter 5, **Qualitative phase: Presentation and analysis of the findings of the semi-structured interviews,** the findings of the qualitative data gathering will be presented and analysed. The quantitative and qualitative data will be mixed in Chapter 6, where the results and findings will be merged, interpreted and discussed.

CHAPTER 5

QUALITATIVE PHASE: PRESENTATION AND ANALYSIS OF THE FINDINGS OF THE SEMI-STRUCTURED INTERVIEWS

5.1 INTRODUCTION

The purpose of this chapter is to present the analysis and findings of the semi-structured interviews. Thirty-one semi-structured interviews were conducted with *"senior students"* who were enrolled in the undergraduate medical programme at the Faculty of Health Sciences, University of the Free State. The aim of the interviews was to get more insight into the influence of previous studies as well as social aspects on the academic performance in the undergraduate medical programme. The interview guide (cf. Appendix A3) was composed based on the findings of the literature review and the quantitative data gathering.

5.2 PARTICIPANTS, DATA COLLECTION AND DATA PREPARATION FOR ANALYSIS

The process of sampling and data gathering was described in detail in Chapter 3 (cf. Point 3.4) and will be summarised briefly.

5.2.1 Participants

A sample was drawn from 79 *"senior students"* who were enrolled in the undergraduate medical programme at the time of the interviews. The intensity sampling method was used. The students were selected based on three criteria:

• Unusual educational background (for instance, music or accounting)
• Married or older than the average age
• Students with poor or very good academic performance in the medical programme

A total of 31 students participated in the structured interviews. The researcher also aimed to have an equal number of participants from each academic year. There were nine students who were enrolled in the second year, seven from the third year, eight from the fourth year and seven from the fifth year at the time of the interviews. To

ensure anonymity of the students, but also to be able to interpret the answers of the student with reference to the phase of the programme the student was enrolled in at the time of the interview, each student was assigned a random number and a letter according to the year of the medical programme that he/she was enrolled in:

- Second year [A1-9]
- Third year [B1-7]
- Fourth year [C1-8]
- Fifth year [D1-7]

The participants were between 20 and 42 yeas old at the time of the interview.

5.2.2   Data gathering

The researcher conducted the interviews in the language preference of the participant. This resulted in 19 Afrikaans and 12 English interviews. To ensure a consistent data collection, the researcher made use of an interview guide (cf. Appendix A3). The interviews were audio recorded and transcribed by an independent (typist) staff member of the School of Medicine, University of the Free State.

5.2.3   Data preparation for analysis

The researcher and an independent researcher controlled the transcriptions of the semi-structured interviews. To be able to analyse and summarise the findings, the researcher read through each interview and grouped the different answers on each question into categories. The categories were divided into different themes, which were defined by the researcher. A schematic overview of the process of the interview analysis is shown in Figure 3.2.

5.3   REPORTING OF THE RESULTS

Before advancing to the reporting of the results of the interview, a description of the interview is given to provide insight into the different stages and questions of the interview. Appendix A3 shows the interview guide that was used. The interview started with some introductory questions, to collect information about the background of the student and his/her career so far. The students were also asked about their

academic performance firstly to set the scene, but also to assess the ability to evaluate their own performance. Thereafter, the interview consisted of three main questions:

1. Did your previous studies prepare you for your medical studies?
2. What are the main differences between *"senior students"* and the other students?
3. Which other factors are having an influence on your academic performance at the moment?

Because of the open-natured questions of the interview, the participants answered each question in a great variety of themes. The same themes also emerged at different stages of the interviews with the participants. The researcher decided to present and analyse the findings to each question separately, to ensure that the meaning of the answers is not changed in any way.

For example, if student A answered the first question by saying he/she was more mature because of the previous studies, and student B answered the second question by saying he/she was more mature than a student who comes from matric, the same theme (maturity) has emerged from two different questions. However, these answers cannot be grouped together because the meaning or reason behind the answers (previous educational background causing maturity and noticing a difference in maturity) may be different.

At the end of the interview the students were asked about their financial situation and they were given the opportunity to add anything to the conversation.

The findings of the qualitative data gathering are described in Point 5.3. Starting with a description of the educational background and career of the participants in Point 5.3.1. Thereafter, in Point 5.3.2., the academic performance of the students is compared with their own interpretation. The findings of three main questions are presented, for each question separately in Point 5.3.3, 5.3.4 en 5.4.5. This is followed by a report on the financial situation of the students in Point 5.4.6. The chapter will be concluded with comments that the students found valuable for the study or the undergraduate medical programme.

5.3.1 Prior tertiary education background of the participants

A total of 14 students applied for medicine, but did not get selected (A1, A2, A4, A7, A8, A9, B5, B6, B7, C7, D1, D5, D6, D7). Of those students, ten decided to study one year B.Sc. to try for selection after one year; nine of them got selected (A1, A7, A8, A9, B5, B6, B7, C7, D5). One student thought she liked the B.Sc. (D6); only in her third year she decided medicine would be better for her, so she applied and was selected. Three of the 14 students decided to study nursing and try for selection after one year (A2, A4, D7). Two were selected and one (D7) was not selected. One of the students who applied for medicine but was not selected the first time went on to do optometry, completed his degree and came back to do medicine (D1).

There were five students who did one year B.Sc. to get considered for medicine, and applied for the first time after that, and got selected (A3, B2, C5, D2, D4).

Nine students completed a bachelor's degree (A5, A6, B1, B4, C4, C6, D1, D2, D7), and three of them also an honours degree (B4, C4, D2). One of these (D2) had to do one year B.Sc. to get considered for medicine. One of the students who completed a degree wanted to study medicine before even starting with the degree, but never got selected, so completed his degree in the meantime (D7).

Ten of the interviewees realised they wanted to do medicine while they were studying something else (A6, B1, B3, B4, C1, C2, C6, C8, D3, D6); four of these students decided to complete the degree before applying (A6, B1, B4, C6), and the other seven decided to quit their studies and apply for medicine. There were five students who worked for several years before they decided to apply for medicine (A5, B6, B7, C4, C3). Two of them had a B.Sc. degree (A5, C4), and two (B6, B7) had to do one year B.Sc. to get considered for medicine and the other one had done several other degrees and programmes, and got selected on that basis.

Only three students did B.Sc., but not with the motivation of getting selected for medicine with that degree (A5, C4, C8). Two of them completed their degree and worked for a few years (A5, C4) and one of them (C8) applied to study medicine after one year.

Two students wanted to do medicine but their financial situation did not allow it, so they only applied for the first time later (B6, B7). Three students did not have the required matric marks, and did not qualify for selection initially (C1, C2, C3). Two of them did extra matric examinations (C1, C2), and the other student decided to study something else and only after a few years decided to apply for medicine (C3).

To summarise, the background of the students is displayed in Table 5.1. The academic background is divided into four categories, namely: Health Profession, Medical Science, Non-Medical Science, Non-Science. Four students worked apart from their prior tertiary education before enrolling into the medicine programme.

TABLE 5.1: BACKGROUND OF THE STUDENTS

Background	Students	
Health Profession	A2, A4, C6, D1, D3, D7	
Medical Science	(B.Sc. for 1 year)	A1, A3, A7, A8, A9, B1, B2, B5, B6, B7, C2, C5, C7, C8, D2, D4, D5
	More than 1 year	A5, A6, C3, C4, D6
Non-Medical Science	A1, A3, B3, C1	
Non-Science	A5, B1, B4, C3, D2	
Work	A5, B6, B7, C3	

A number of students appear in more than one background category because of the long journey they had before beginning with the undergraduate medical programme. To be able to have a reference of the background of the students when analysing the data, new coding was added to the codes that were already allocated to the students.

TABLE 5.2: BACKGROUND CODES

Code	Background
W	Work
H	Health Profession
M	Medical Science
Nm	Non-Medical Science
Ns	Non-Science

5.3.2   Academic performance of the participants

The academic performance of the *"senior students"* who participated in the interviews is presented in Table 5.3. Each year's average is compared to the class average of that year; the points that the student goes above or below the class average are

displayed in columns that are named St vs. class. The academic record of the student was compared to the answer the student gave when he/she was asked the question "How are you performing in your medical studies?" The "*senior students'*" achievements in the first year are on an average 3,42 points above the class averages. The second year, the "*senior students'*" perform within 1 point of the class averages, but further into the programme, the "*senior students*" performance gets weaker.

Most of the students that said that they are performing very well actually perform with more than or close to 10 points above the average of the class. The students who feel that the studies are getting difficult are scoring below average. Some of them have performed better in the previous years, but were struggling at the time the interviews were held. The one student, who is performing the best of the sample, was very modest when she said she is doing well. Other students would have said "very well". Overall, though, the students have a fairly good idea of where they are standing as far as academic performance is concerned.

TABLE 5.3: ACADEMIC PERFORMANCE

Student	Student comment	Average 1st year	St vs class	Average 2nd year	St vs class	Average 3rd year	St vs class	Average 4th year	St vs class
A1M	Average	70,14	3,03						
A2H	Good	66,14	-0,97						
A3NMM	Difficult	61,29	-4,27	52,50	-9,46				
A4H	Average	73,57	5,97	60,33	-5,43				
A5NSMW	Very good	83,71	16,60						
A6M	Average	81,71	14,60						
A7M	Very good	81,29	14,18						
A8M	Average	71,57	4,46						
A9M	Average	64,14	-2,97						
B1NSM	Good	76,29	8,69	70,14	5,75				
B2M	Difficult	63,43	-4,71	51,50	-12,25				
B3NM	Average	71,29	3,69	65,67	-1,22				
B4NS	Good	83,43	15,83	85,08	18,20				
B5M	Average	66,57	-1,57	55,14	-7,75				
B6WM	Very good	74,86	7,26	71,83	4,95				
B7WM	Average	63,29	-4,31	67,92	1,03				
C1NM	Very good	79,00	10,86	76,50	10,49	76,30	9,95		
C2M	Average	74,57	6,43	73,63	7,62	65,40	-0,95		
C3NSWM	Difficult	75,00	6,86	63,08	-2,92	61,40	-4,95		
C4M	Very bad	67,29	-0,85	64,83	-1,17	61,50	-4,85		
C5M	Difficult	62,57	-2,98	54,86	-5,60	61,20	-5,15		
C6H	Very good	78,86	10,72	83,83	17,83	75,60	9,25		
C7M	Average	68,57	0,43	63,42	-2,59	63,60	-2,75		
C8M	Average	64,86	-3,28	56,92	-9,09	56,50	-9,85		
D1H	Average	63,29	-2,27	59,58	-5,69	57,80	-6,80	62,80	-1,67
D2NSM	Difficult	68,83	3,07	62,25	0,08	56,33	-10,77	66,40	1,93
D3H	Difficult	66,71	2,14	65,42	3,25	63,90	-2,92	55,40	-11,15
D4M	Difficult	59,86	-5,69	58,08	-7,19	59,30	-5,30	54,40	-10,07
D5M	Difficult	67,29	2,71	65,25	3,08	56,50	-10,32	50,20	-16,35
D6M	Average	70,29	5,71	53,75	-8,42	59,17	-9,03	59,20	-5,27
D7H	Very bad	66,18	-3,25	57,25	-8,42	57,50	-7,92	53,67	-11,22

5.3.3 Preparation for medical studies in prior tertiary education

The first main question of the semi-structured interview was: "Did your previous studies prepare you for your medical studies?" The answers that were given could be divided into six categories, namely;

- Transition
- Maturity
- Motivation
- Learning style
- Social life
- Content of previous studies

The participants' responses were divided into themes and are presented in tables. As far as the themes are concerned, students who mentioned a theme as well as some quotes are presented in the rest of this section. The responses of Afrikaans students were translated by a professional language practitioner and are presented in italic writing after the Afrikaans quotes are given. Direct quotes are used in the presentation of the findings. The quotes are not edited for language to enhance the trustworthiness of the data. After the presentation of the findings for each category, the researcher gives a summary and points out interesting findings.

5.3.3.1 *Category 1: Transition*

In Category: Transition, different themes were mentioned. The themes are presented in Table 5.4. The researcher decided to include quotes in the tables to enhance the trustworthiness of the study. Most students pointed out that their previous studies had prepared them in different ways for the undergraduate medical programme. A total of 10 students emphasised that their previous studies had prepared them for the volume of work. Nine of these students had done the B.Sc. programme prior to M.B.,Ch.B. Two students, one with a B.Sc. background and one with a Non-Science background, had the completely opposite idea, and found it very difficult to adjust to the volume of work in M.B.,Ch.B. after having studied something else. Four other students stated that they were better prepared for the stress and deadlines because of their previous studies. These students came from diverse tertiary backgrounds. Three students mentioned that they learned how to study during their previous studies.

Previous exposure to the university environment was a positive factor for six students. They had a good experience because the environment was not strange to them. One student disagreed on this point:

"If I would have come straight from high school it would have been much easier, because now I am used to campus and have a lot of friends, so I have less time to study."

Other points related to exposure to the university environment were mentioned, such as being used to the technology that is used at the university, and knowing the way around university, were also seen as positive factors in the preparation for the undergraduate medical programme.

The responses on the themes came from students who were enrolled in the different years of the M.B.,Ch.B. programme at the time of the interviews. Based on these findings, one could conclude that opinions about the preparation for the transition to the undergraduate medical programme do not change when the students advance in their studies.

TABLE 5.4: CATEGORY 1 – TRANSITION (Table continues on next page)

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Prepared me for (the transition to) the volume of work	A6M, A8M, A9M, B3NM, B5M, C1NM, C5M, C7M, D4M, D6M	
	B5M	"It prepared me for the amount of work. When I got here I was already used to it because I did B.Sc. for a whole year, so the amount of work was not as shocking as it would have been."
	D6M	"If I had started with medicine directly after high school I wouldn't have been able to manage the volume of work, so starting with B.Sc. first and finding some stability before coming here helped me."
Didn't prepare me for the volume of work	B2M, A3NMM	
	B2M	"Having to adjust to how you learn here. Like here it's like it's only going to be a small session, just to find out it's like five chapters. Nobody prepares you for that unless if you have like other senior students and friends here who know what's going on."
	A3NMM	"Ons het baie werk gehad in aktuarieel, maar ek het nooit so oorweldig gevoel deur die werk soos wat ek twee jaar terug gevoel het toe ek begin het met die tweede jaar nie." *We had a lot of work to do in actuarial, but I never felt as overwhelmed by the work as I did two years ago when I started the second year.*
Prepared me for the stress and deadlines	D5M, C3NSWM, D3H, B4NS	
	D5M	"The pressure would have been too high for me."
	D3H	"I'm not stressed like the other students, I know tests are coming and things like that."

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Having been exposed to the university environment has a positive influence	C5M, B5M, D5M, D4M, A6M, A9M	
	D5M	"B.Sc. prepared me with adapting to the tertiary institution environment and having to learn how to work under pressure".
	A6M	"I know how lectures work, I understand that I'm not going to get spoonfed. The environment wasn't strange for me.
	A9M	"Ek het nou maar so bietjie gemaklik geraak met die universiteit en so aan en ek was meer gesettle in die koshuis en so, so dit was meer soos; ek kon net swot, hulle moes eers gewoond raak weer aan die universiteit en begin cope en goeters." *I've become more comfortable with the university and so on and I was more settled in the residence and so it was more like I could just study; they had to get used to the university again and learn to cope and other things.*
Taught me how to learn	D2NSM, C1NM, B3NM	
	D2NSM	"B.Sc. het gehelp plain omdat ek net weer moes leer hoe om agter 'n boek te sit, hoe om te swot." *B.Sc. helped simply because I just needed to learn how to sit behind a book again; how to study.*
	B3NM	"I'm doing way better than I would have. I know how to work; there is this huge volume of work and you can't study it all, but I know how to pick what's important and summarise my work well."
Having been exposed to the university environment has a negative influence	D3H	
	D3H	"If I would have come straight from high school it would have been much easier, because now I am used to campus and have a lot of friends, so I have less time to study."
I got used to the technology of the faculty	C5M, B3NM	
	C5M	"I was acquainted to the technology that is used by the faculty"
	B3NM	"I got used to blackboard, the system."
I know my way around	C5M, B5M	
	C5M	"I knew how to find my way around."
	B5M	"Settling into the university environment helped me a lot, because I could just study and didn't have to try to find where the next lecture is, or where the study centre is etc."

5.3.3.2 *Category 2: Maturity*

Six students described how their previous studies made them more mature, and ready to study medicine. Therefore, Maturity is presented as a category. Two themes emerged in this category as presented in Table 5.5. The second theme, having studied made me more mature, was only mentioned by students who were further in their medical studies. Students with a Non-Medical, Non-Science and Health Profession background were interestingly the ones who mentioned these themes at this stage of the interview.

TABLE 5.5: CATEGORY 2 – MATURITY

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
After high school I wouldn't have been mature enough to be a good medicine student	D2NSM, B1NSM, A6M	
	D2NSM	"Na skool was ek nog nie heeltemaal volwasse om medies te doen, ek sou medies opgeneuk het, ek sou nie regtig voluit daarvoor gegaan het soos nou nie." *After school I was not yet mature enough to study medicine- I wouldn't really have given everything like now.*
	A6M	"You're really young to make the decision to do medicine for the rest of your life when you study medicine straight out of school. You put in so much and you find yourself in third year or second year and there's just no going back because you've worked so hard."
THEME	**STUDENTS WHO AGREED/ QUOTES**	
Having studied before made me more mature Having studied before made me more mature	D7H, D1H, C1NM	
	C1NM	"Ek het baie hoë eise aan myself gestel, niemand het my gevra om iets te doen nie, dit het absoluut van myself afgehang. Dit is maar waarop dit neerkom op varsity, niemand gaan jou smeek nie, jy moet net die regte mentaliteit hê en besef dat dit hang van jouself af." *I demanded a lot of myself; no one requested me to do anything - it all depended absolutely on my own efforts. That is what it boils down to at varsity – no one is going to beg you; you must have the right mentality and realise that it depends on you.*
	D1H	"It helped me to grow as a person, to understand myself more and understand my study methods. Compared to most people in my class, I'm older and more mature."

5.3.3.3 *Category 3: Motivation*

There were two students who replied to the question by mentioning motivation, which is the third category of findings. The responses and themes are presented in Table 5.6. One student speaks about the more intrinsic-motivation as he emphasises the fact that he is very sure about his study choice and is therefore more motivated. The other student is motivated by the fact that she is older, as well as the financial support from her parents. She feels that she cannot afford to fail because of these motivational factors. She speaks more about extrinsic motivators.

TABLE 5.6: CATEGORY 3 – MOTIVATION

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Motivation has influence on performance	B1NSM	"As ek nie seker was, sou ek nie lus wees nie, en dan sou dit moontlik gewees het dat ek werk afskeep en nie leer nie. Maar nou omdat ek wil, sal ek nou maar die tyd wat ek het tot volle benut". *If I wasn't sure, I wouldn't feel like it and then maybe I would neglect work and not learn. But now because I want to, I might just as well make the most of the time I have available.*
I'm motivated by different things now	A6M	"There are many motivational factors. I'm old, I can't afford to fail, my parents are very supportive but I can't afford to drag them for longer than they have to."

5.3.3.4 ***Category 4: Learning styles***

Within the fourth category, nine students pointed out how the previous studies prepared them in terms of learning style. These responses were based on two opposite experiences. Three students found that they identified their learning style during their previous studies and this was a positive thing. Two students replied that it had a positive influence to know how much you must study to get a certain output. Whereas four students described how they identified or got used to a certain learning style during their first studies, but had to change their learning style and methods to be able to learn facts. The students who mentioned these themes were all in different stages of the M.B.,Ch.B. programme and most of them had done a B.Sc. or a Non-Medical Science programme. The findings are presented in Table 5.7.

TABLE 5.7: CATEGORY 4 - LEARNING STYLES (Table continues on next page)

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
The previous studies prepared me for learning at university level	A7M, A1MNM, C1NM	
	A7M	"Die eerste jaar het my voorberei om te leer, meer logies te dink en in 'n spektrum te redeneer in plaas van net, jy kom uit hoërskool uit, jy word nog gespoonfeed, en dan word jy in die diepkant ingeskop en moet jy net leer om te swem." *The first year prepared me for learning, helped me think more logically and reason from a wider spectrum rather than just, you are just out of high school, you are still spoonfed, and then you are kicked into the deep end and just need to learn how to swim.*
	C1NM	"Dit het my geleer hoe om te leer, en dit was nie so groot aanpassing nie. Ek het klaar die aanpassing gemaak soos met die hoeveelheid werk." *It taught me how to learn and it was not such a huge adaptation. I had adapted already, as with the of work.*
Because of previous study experience I know now how much I must learn to get a certain output.	C8M, B5M	
	C8M	"Dit het my gehelp om te weet hoeveel ek moet leer om deur te kom. Waar ek weet ek sal veilig wees, sal my vriende soos net aanhou en aanhou leer." *It has helped me to know how much I must learn to pass when I know I'll be safe, my friends will still continue learning and learning.*
I had to change learning style twice	C4M, A9M, D6M, A3NMM	
	A9M	"Ek het op 'n ander manier op my vorige studies geleer, so dit het bietjie gesuck, dit was meer soos kry net massas werk in jou kop, dit was nie soos leer elke feit 100% nie, so in daai way moes ek anders leer as op skool en toe ek weer eerstejaar medies begin toe moes ek weer leer soos hoe ek geleer het op skool." *I learned in a different way in my previous studies, so it sucked a bit; it was just like just get masses of work into your head, it was not like learn every fact 100%. So in that way, when I started first year medicine I had to learn again the way I did in school.*

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
I had to change learning style twice	D6M	"Thinking that you have another degree and have this all figured out, you might think you have medicine figured out."
	A3NMM	"My brein was baie ingesteld om wiskunde te kan doen en my brein het 'n bietjie verleer hoe om actually te sit en leer, so dit was 'n baie groot aanpassing gewees. *My brain was very much tuned into doing mathematics and my brain had forgotten how to acutally sit down and learn, so it was a huge adaptation.*

5.3.3.5 *Category 5: Social life*

Social life is the fifth category and the findings are shown in Table 5.8. Having had a first-year to party was seen as positive preparation for the medical programme. A total of four students mentioned this. They explained that they can focus on their medical studies now because they had their time to have fun in their prior studies.

TABLE 5.8: CATEGORY 5 - SOCIAL LIFE

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Fun is not a priority anymore	A6M, C7M, C6H, B3NM	
	A6M	"I've been though varsity life, enjoyed slacking and bunking and all those things when I did my undergrad. So right now it's not a priority for me anymore."
	C7M	"Ek weet nie of ek my eerste jaar sou gemaak het as ek nie 'n senior student was nie. Ek was meer geïnteresseerd in die buitelewe en als anders, so as ek nie die alles in my eerste jaar gehad het nie, sou ek dit alles in my eerstejaar medies wou gedoen het, en dan sou dit chaos gewees het, so ek dink dit was vir my soos 'n fase om die balans te kry." *I don't know if I would've made my first year if I weren't a senior student. I was more interested in life outside and everything else. So if I did not have everything in my first year, I would've wanted to do it in my first medicine year – Which would've been chaos, so I think it was like a phase to find balance for me.*
Fun is not a priority anymore	C6H	"Ek het gekom swot, toe is ek vir vyf jaar in die koshuis, en al die jare op die komitee gewees, en ek was 'n HK gewees, en ek het sport gedoen, ek het rond gedonner en alles gedoen, en toe begin ek medies swot, toen is ek mos nou op-gestudent- eks oud, al my mense werk of is getroud, dis nou nie asof ek in die middel van die week wil gaan suip saam met tjommies en goed soos wat dalk hierdie mense doen nie." *When I started studying I was in the residence for five years and on the committee all the time. I was an RC and participated in sport and roamed around and did everything; and so when I started studying medicine then I was completed "studenting"; I'm old and all my people are working or married and it's not like I want to go out drinking in the middle of the week with friends and do things that those people do.*
	B3NM	"I got all that first-year stuff out of the way, all the partying and stuff, I got that out of my system and was more like a focused person, which helped me immensely."

5.3.3.6 *Category 6: Content of previous studies*

Table 5.9 presents a summary of the answers of the "*senior students*" gave with regard to the content of their previous studies or background.   Some students did not mention the content of their studies. But most students could point out which subjects helped them during their medical studies.   Most of the students with a Health Profession or medical science background mentioned some subjects or skills that were helpful in their medical studies.   A few students pointed out that the B.Sc. course is more in-depth, where the same concepts are taught in medicine in a more superficial manner.

The students with a Non-Medical or even Non-Science background explained that their studies had not helped them in an academic way, but one student found that some skills that she learned were useful in studying medicine.

TABLE 5.9: CATEGORY 6 - CONTENT OF PREVIOUS STUDIES (Table continues on next page)

BACKGROUND	STUDENT	EXPERIENCE
Work	A5	
	B6	
	B7	Analysing skills
	C3	
Health Profession	A2	Anatomy, practical skills
	A4	Modules are similar
	C6	Anatomy, Physiology, clinical reasoning, working with patients
	D1	
	D3	More or less the same thing
	D7	Basic concepts
Medical Science (B.SC. for 1 year)	A1	Physics, Chemistry helped with Biochemistry
	A3	
	A7	Chemistry helped with Biochemistry, Biology
	A8	Biology, Physics, Chemistry helped with Biochemistry
	A9	Human Biology
	B1	Mathematics, Biology
	B2	B.Sc. was in depth, medicine is superficial.
	B5	Microbiology, Chemistry
	B6	Biology, Chemistry, B.Sc. was more in depth.
	B7	B.Sc. prepared me
	C2	(did one preparation year in America for medicine). Psychology and Biology.
	C5	Biochemistry and Zoology. Physics and Maths were not useful.
	C7	
	C8	
	D2	
	D4	No subjects prepared me at all.
	D5	

BACKGROUND	STUDENT	EXPERIENCE
Medical Science More than 1 year	A5	Having had Physiology was advantageous
	A6	Terminology is familiar, science is much more clinical in medicine.
	C3	Psychology background did help
	C4	
	D6	
Non-Medical Science	A1	
	A3	
	B3	None of the subjects helped, maybe law for medical law.
	C1	Only from an academic perspective did it help. It was not in the medical field
Non Science	A5	
	B1	Drama didn't prepare me for medicine at all.
	B4	Music prepared me to cope with my performance anxiety. And the memorising in music trains your brain.
	C3	
	D2	

5.3.4 Differences between senior students and other students

The second main question of the semi-structured interview was: "What are the main differences between you, as a *"senior student"*, and the other students?" The formulation of the question invited the students to think about themselves and to compare themselves with the other students. Most students answered the question in that way, but some students would still talk about *"senior students"* in general when answering the question. This makes it difficult to categorise and generalise the answers. Therefore the findings will be analysed against the background of the students as well.

The answers that were given could be divided into 6 categories.

- Maturity
- Age
- Social factors
- Motivation
- Stress
- Learning style
- Academic performance

The categories are described and presented in the following sections.

5.3.4.1 *Category 1: Maturity*

In Category: Maturity, a few different themes could be identified. These themes are presented in Table 5.10. Four students emphasised that they were more mature than the matric-students. They described it in different ways. One student pointed out that she was more certain about herself and by growing older learned that you have other priorities in life besides studying. Another student found the medical students much more mature than students in other programmes; he thought that this was because the students get selected for this programme.

Many interviewees responded by saying that the matric students were very intimidated by the university and hospital environment. This is mostly noticed during examination times, when the matric-students are much more stressed than the *"senior students"*. The *"senior students"* feel that they are more relaxed when they have to write an examination, because they know what to expect and that they will do fine with the preparation they put into it, and even if they do not get a great mark, they know it is all relative to the broader perspective of life.

Other themes that emerged within this category were priorities and responsibilities. Two students found the matric-students occupied themselves with things other than studying most of the time, so they stated that *"senior students"* could prioritise better. One student's priorities were motivated by the fact that she cannot afford to waste time. Two students emphasised that they have many more responsibilities compared to the other students; family responsibilities and financial responsibilities were mentioned. The students that mentioned the responsibilities are both married and one has children.

Lastly, there were two students who described how the matric students are much more competitive than *"senior students"*, which they bring with them from high school.

When looking at the background of the students, students who come from a variety of backgrounds presented each theme.

TABLE 5.10: CATEGORY 1 - MATURITY

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
"Senior students" are more mature	D5M, D1H, B4NS, D4M	
	D1H	"I have a better outlook on life, a more mature outlook and I know how to prioritse."
	B4NS	"As mens ouer raak dan worry jy nie meer soveel wat mense van jou dink nie. Met eksamens en so stress hulle baie baie meer, waar ek al geleer het mens kan nie altyd 'n vol 100% doen nie, jy kan nie altyd onbeskikbaar wees vir die lewe daar buite nie." *As one grows older, you don't worry so much about what other people think of you. With examinations and so they stress a lot more, whereas I've learned that one cannot always be unavailable to the world out there.*
Matric students are more intimidated by the university and hospital environment. Especially during examinaton-times.	C5M, D5M, A4H, A1MNM, C5M, A2H	
	C5M	"When they come in initially they are intimidated by the whole university environment and also in the hospital."
	D5M	"When it is test time; you know how to calm down and then your mind can function better than that very same colleague of yours that is stressing out and stuff like that".
	A2H	"Die jonger studente is soos baie gespanne voor toetse en hulle weet nie lekker wat aangaan nie, dan is ek half rustiger." *The younger students are like very stressed for tests, and they don't really know what is happening, that's when I am more relaxed.*
"Senior students" have different priorities than matric students	C5M, D2NSM, D1H, A1MNM, A6M	
	C5M	"They always want to get things over and done with so they can do something much more important or relaxing".
	A1MNM	"As ek moet swot dan sal ek vir enigiets nee sê, waar eerstejaars nie noodwendig so is nie." *When I have to study, I can say no to anything – which is not necessarily the case with first years.*
	A6M	"We have different priorities, I can't afford to waste time, maybe they can relax because one year is not a train smash for them, for me every year counts, I feel like I have more to lose."
"Senior students" have more responsibilities	A5NSMW, D1H	
	A5NSMW	"I've got a lot more responsibilities. Kids, and a wife to look after. And I can't phone my daddy to ask for money or something like that."
	D1H	"I have more things to do, more responsibilities."
Matric students are more competitive	C5M, C7M	
	C5M	"They still have that competitive feel about them, like you know in high school you had to do better, so they do not know that environment where they are put into teams and have to work with other people."

5.3.4.2 *Category 2: Age*

The second category is age. *"senior students"* are at least a year older than the other students. Five students did not think age was a source of difference between them and the matric-students, while five students emphasised that their age had a positive

influence on their studies. The findings within this category are displayed in Table 5.11.

TABLE 5.11: CATEGORY 2 - AGE

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Age is not a factor	D7H, B7WM, B6WM, D6M, A5NSMW	
	B7WM	"Hulle is oor die algemeen baie volwasse, ek voel nie noodwendig altyd dat ek tien jaar ouer is as hulle nie." *In general they are very mature; I do not necessarily feel as if I am ten years older than what they are.*
	B6WM	"Meeste van die studente wat in my klas is sien my nie regtig as veel ouer nie. Dis asof daar geen gaping is nie." *Most of the students in my class do not really see me as much older. It is as if there is no gap.*
	A5NSMW	"I thought it would be more of a challenge. But not at all, really. What is also favourable for me is the fact that I am not the only older or senior student, there are actually quite a few."
I have more life experience than the matric students, which is a positive factor	C4M, B7WM, A1MNM, A3NMM, C2M	
	B7WM	"Jy leer menseverhoudinge, jy leer hoe om mense beter te hanteer, jy leer goed soos jy vat nie nee vir 'n antwoord nie en jy hou aan probeer, ek dink nogal dat dit is die rede hoekom ek ingekom het by medies omdat ek het aangehou en aangehou." *You learn human relations; you learn how to handle people better. You learn things like you do not take no for an answer and you keep on trying – I actually think that is the reason I was selected for medicine – I persevered and persevered.*
	A1MNM	"Ek weet wat is belangrik, veral soos met die stres situasie, soos net om te weet okay die lewe is meer as medies." *I know what is important, especially with things like the stress situation – like just knowing, okay, life is more than medicine.*
	A3NMM	"Ek dink dis baie goed as jy 'n jaar afvat, want daar is baie issues wat mens eers uitsorteer. Dit is lekker om 'n senior student te wees, al my snaaksighede is klaar uitgesort, ek het klaar 'n ou wat ek baie gelukkig mee saam is, sulke tipe goed." *I think it is really great if you take a year off, because there are many things that you sort out first. It is great to be a senior student; all my jerks have been sorted out and I am very happy with my boyfriend in my life – thinks like that.*

5.3.4.3 *Category 3: Social factors*

Many of the responses could be grouped into a category called social factors. The themes and quotes are presented in Table 5.12. One student who is doing his clinical years now mentioned that the fact that he had done a previous degree enriched his ability to work with the other professions in a team, whereas students who come from matric do not have that broader view of the profession and tend to see it as a hierarchy.

One student found it very frustrating to work in a group with young students; he always preferred to work with *"senior students"*. For two other students the group work was no problem at all. They work well together with the younger students.

Social interaction between *"senior students"* and the matric-students is difficult for four students. The reasons are very broad. Three students feel that the age difference is a problem. One of them does not want the other students to think that she is their age, and treat her like that. Another student explained that it felt as if the social interaction is difficult from both sides. The students think she is old, and she feels uncomfortable because they are her younger brother's age. The fourth student expressed her feelings towards the students who were directly from high school. She feels judged, or uncertain because she had to apply for selection twice, and therefore feels stupid. She sees herself befriending *"senior students"* as well as students who have repeated a year, because she can relate to them. The students that mentioned the social interaction were in their second and third year.

The last theme that falls under this category was mentioned by a student who stated that *"senior students"* are more settled. As mentioned in Point 5.3.3.5, *"senior students"* do not feel the need to party anymore, because they have done that already, and are more settled now.

TABLE 5.12: CATEGORY 3 - SOCIAL FACTORS (Table continues on next page)

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
I have a better overall view of the work, and the people I work with in a team.	C5M	
	C5M	"Having done some years like a B.Sc. allows you to meet certain people, and it makes you more aware that there are other programmes out there, for instance radiography or nursing. Therefore I see them as part of a team. But students who come straight from matric see it as a hierarchy."
Group work is frustrating	D2NSM	
	D2NSM	"Groepwerk is moeilik, mens sien nie dieselfde nie, mens praat nie dieselfde nie. As daar senior studente is, werk ons maar altyd saam. Nou is dit baie beter aan die einde van die kursus, maar in die eerste semester was dit vir my baie frustrerend om saam met jongmense te werk." *Group work is difficult; you do not see things in the same way, you talk differently. If there are senior students, we always work together. It is much better now at the end of the programme but in the first semester I found if very frustrating to work with young people.*

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Group work is no problem	B6WM, C5M	
	B6WM	"Dit is eintlik baie lekker. Ek sien geen verskil." *It is actually very nice, I don't see any difference.*
	C5M	"Daar is 'n paar ander senior studente, aan die begin werk ons maar saam in groepe en leer mekaar ken, maar dit het nou nie meer 'n invloed nie, almal werk nou saam." *There are a few other senior students; in the beginning we worked together and got to know one another, but now it does not have an influence, now we all work together.*
Social connection between senior and the other students is not always there	B4NS, B5M, A3NMM, A7M	
	B4NS	"Dit voel regtig of hulle uit 'n ander generasie uitkom." *It really feels as if they are form a different generation.*
	B5M	"All of my friends in class have repeated previously or are senior students, because then I feel like I can relate to them and I won't feel judged, like the younger ones, they're young and they're smart and I feel like 'oh my goodness, I'm so stupid."
	A3NMM	"Sosiaal kan ek nie meer so lekker met hulle verkeer nie. Partykeer kan ek agterkom dat hulle half skrikkerig is omdat hulle dink ek is soveel ouer, so dit lyk of dit vir hulle moeilik is om met my te interact. Dis ook maar moeilik vir my om met hulle wat soveel jonger is, hulle is so oud soos my boetie, so dis moeilik om soms te dink mense so oud soos my boetie sit saam met my in die klas." *I find it more and more difficult to be with them socially, sometimes I can sense that they are almost afraid because they think I'm so much older, so it seems to me as if they find it difficult to interact with me. For me it is also difficult to relate to them, who are so much younger. They are the same age as my baby brother, so it's difficult to think that I'm in class with people the same age as my brother.*
	A7M	"Dit is ongemaklik, want almal sien jou as hulle ouderdomsgroep. Ek wil nie soos 'n kind voel nie. Ek's al bietjie ouer en ek het al 'n jaar alleen gebly, moes vir myself sorg. Ons pas nie so maklik sosiaal aan nie, ons het baie moeiliker met hulle aangepas as wat ons met ons eie ouderdomsgroep aangepas het." *It is uncomfortable, because everyone sees you as their age group. I don't want to feel like a child. I'm a little older and I've been on my own for a year and had to take care of myself. We don't adapt so easily socially; we found it much more difficult to fit in with them than with our own age group.*
"Senior students" are more settled	B4NS	"Ek kon daai proses deurmaak, klaar gekuier en als. Ek het nou 'n vaste kêrel, so ek hoef nie uit te gaan en te gaan soek vir die wêreld daar buite nie." *I was able to finish that process; done partying and all. I now have a boyfriend so I don't have to go out and search the world out there.*

5.3.4.4 *Category 4: Motivation*

The fourth category was mentioned by half of the interviewees. The responses that were grouped into Category: Motivation, are presented in Table 5.13. Seven students were of the opinion that *"senior students"* are more motivated than matric students.

Two of them see it as a privilege to be able to study medicine. Another student emphasised that *"senior students"* are really sure that they want to study medicine, which affects their motivation. Other students were motivated by the fact that they have had a long journey to get to where they are now, and now they do not let anything stop them from completing their studies.

Two students had a totally opposite viewpoint. They observed the matric students and found them very smart and motivated, because of their ability to focus totally on their studies. The students who pointed this out both feel that they do not have this ability.

Two other students were of the opinion that there is no difference in motivation between them and the other students. And three students found that students who are selected for medicine straight out of matric might have uncertainties about their choice of study, because extrinsic motivators motivated them when they started with their studies.

TABLE 5.13: CATEGORY 4 – MOTIVATION (Table continues on next page)

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
"Senior students" are more motivated	D2NSM, A9M, C4M, D7H, D6M, C6H, A1MNM	
	D6M	"When you come from another degree it's more like a privilege because you didn't get accepted initially, so you have to do your utmost best."
	A1MNM	"As 'n senior student terugkom om medies te swot dan, ek meen dit vat nogal van jou, dit is finansieel moeiliker, dis nie net iets… Jy doen dit nie net omdat jy plek gekry het nie, jy wil dit rêrig hê en jy het dit deurgedink so jy is baie seker." *When a senior student returns to study medicine, then, I mean it takes something, financially it is more difficult, it's not just something… You don't just do it because you were now selected; you really want it and you thought it through and so you are really sure.*
Matric students are more motivated	C3NSWM, A4H	
	C3NSWM	"Baie van hulle is baie meer gemotiveerd as ek, want hulle sit en swot die heeldag. Ek het nie die dryfkrag om tot 2 uur in die nag te swot nie." *Many of them are more motivated than what I am. I don't have the motivation to study until 2 in the morning.*
	A4H	"They are very smart, they are very driven and I like to see how they can rise above everything and just give it their all, but with us- we do just enough to get by." (that is the case with a few of the senior students that I know now.)
There is no difference in motivation between *"senior students"* and other students	D4M, C8M	
	C8M	"Ek dink elke persoon het maar sy motivering, irrelevant van wanneer af hy studeer het." *I think every person has his/her motivation, irrespective of when they started studying.*

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Matric students are not sure about their study choice	B1NSM, C1NM, B6WM	
	B1NSM	"Van hulle is dalk onseker, soos moet hulle dit swot, wil hulle ouers eintlik hê hulle moet dit swot nie." *Some of them may be unsure; for instance, about whether they should study medicine, whether their parents want them to study it or not.*
	B6WM	"Ek dink dit is nogals 'n groot aanpassing, veral direk uit matriek uit. Ek dink baie van die mense wat swot weet nou nog steeds nie regtig wat hulle wil doen nie." *I think it is really a huge adaptation, especially directly out of matric. I think many of the people who are studying now still don't know what they really want to do.*

5.3.4.5 *Category 5: Stress*

Two students mentioned that *"senior students"* have more to lose, which results in stress. This category and theme are presented in Table 5.14. The students both have studied B.Sc., one of them studied for three years in the previous programme and the other one only one year.

TABLE 5.14: CATEGORY 5 - STRESS

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
"Senior students" have more to lose	A6M, C2M	
	A6M	"Senior students can't afford to fail and waste a year."
	C2M	"Ek het dit meer ernstig opgevat omdat ek 'n jaar al klaar verloor het." *I took it more seriously, because I had lost a year already.*

5.3.4.6 *Category 6: Learning style*

Five students identified a difference in learning style between *"senior students"* and matric students, which is the sixth category in this section. One student described that he had adapted his learning style during his physiotherapy studies. He has a deep learning style. The four other students state that *"senior students"* do better with time management. *"Senior students"* have less time, and use their study time effectively, and they also know when they have studied enough. The themes and quotes are presented in Table 5.15.

TABLE 5.15: CATEGORY 6 - LEARNING STYLE

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
"Senior students" have a more refined learning style	C6H	"Ek het my leerstyl al baie aangepas toe ek fisio geswot het. Ek probeer nie leer nie, ek probeer verstaan." *I've adapted my learning style when I studied Physio. I don't try to learn, I try to understand.*
"Senior students" do better with time management	A4H, A1MNM, B3NM, C8M	
	A4H	"I can discern from my time that this is for books and this is for everything else."
	A1MNM	"Die eerstejaars werk baie oneffektief, ek dink een van die groot verskille tussen senior studente is omdat ons gewoonlik baie ander goed aan die gang het, en dan is ons effektief as ons swot, ek doen in 'n uur wat ander dalk in drie ure doen." *The first-years work very inefficiently. I think that one of the major differences between senior students is that we often have other things going on as well and then we are efficient when we study; I do in an hour what other do in maybe three hours.*

5.3.4.7 *Category 7: Academic performance*

The last category that was raised in the answers to the second main question is about academic performance; the responses are presented in Table 5.16. Four students did not see any difference in academic performance between senior and matric students. One of them said: "I've never done medicine before, so to a huge extent things are also new to me".

Two students are of the opinion that *"senior students"* do better academically. One of them pointed out that his motivation has an impact on his academic achievement.

One student mentioned the last theme in this category. She noticed that students who come to study medicine straight from matric have the idea that they will perform as well as how they did in high school as a top-5 student.

TABLE 5.16: CATEGORY 7 - ACADEMIC PERFORMANCE (Table continues on next page)

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
There is no difference in academic performance between senior and matric students	A8M, A2H, D4M, A6M	
	A8M	"Ek sien nie eintlik 'n verskil in akademiese prestasie." *I don't really see a difference in academic performance.*
	D4M	"Soos die studies aangaan het dit nie meer 'n verskil gemaak nie, nou maak dit glad nie meer 'n verskil nie. Daar is ook nie 'n prestasieverskil tussen senior en eerstejaar studente nie." *As studies progressed, it did not make any difference anymore; now there is no difference anyore. There is also no performance difference between senior and first-year students.*
	A6M	"I've never done medicine before, so to a huge extent things are also new to me."

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
"Senior students" perform better academically	C2M, C1NM	
	C2M	"As mens kyk na die prestasies het die senior studente goed gedoen. Uit die top 5 van die afgelope paar jaar was ontrent drie van hulle senior studente gewees." *If you look at the achievement, the senior students did really well. There were about three senior students among the top 5 the past few years.*
	C1NM	"My motivering het 'n inpak op my akademiese prestasie, ek is meer doelgerig en gemotiveerd om beter te doen, so uit die aard van die saak gaan jy beter doen." *My motivation has an impact on my academic achievement; I'm more purpose-driven and motivated to do better, so it goes without saying that you will do better.*
Matric students expect to perform the same in medicine	D6M	
	D6M	"The student that comes straight from high school comes with that mentality that he/she was an A student and among the top 5. Yes, that's what got you accepted, but not to sustain you through your medical studies."

5.3.5 Other influencing factors

The third main question of the semi-structured interview was: "Which other factors have a positive or negative influence on your academic performance at the moment?" The students responded with a wide range of themes that could be divided into 15 categories.

- Spirituality
- Age
- Accommodation
- Class
- Finances
- Physical
- Friendship
- Facilities
- Motivation
- Work
- Family and relationships
- Social life
- Discipline
- Learning style
- Curriculum

Each category is described and the themes and examples of the students' responses presented in this section.

5.3.5.1 *Category 1: Spirituality*

Three students pointed out that church and the people from church have a positive influence on their academic performance. They find inspiration and support in their church. Quotes and the students who mentioned this are presented in Table 5.17.

TABLE 5.17: CATEGORY 1 - SPIRITUALITY

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Church and people from church have a positive influence on my studies	C5M, A4H, B2M	
	C5M	"Sharing experiences with people form church helps to put things behind to be ready for the following week."
	A4H	"Church really inspires me to do what I do, and that affects my studies as well."

5.3.5.2 *Category 2: Age*

There are two students who feel that getting older has a negative influence on their studies. One of these students sounded quite stressed by this factor. The responses are displayed in Table 5.18.

TABLE 5.18: CATEGORY 2 - AGE

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Getting older is a negative factor	A6M, D1H	
	A6M	"Age is definitely a huge factor, if you come back to medicine at 25 you feel like there was no other way to go, so you kind of feel like you have to make it work."
	D1H	"Your life has to begin but you are still a student."

5.3.5.3 *Category 3: Accommodation*

A factor that has an influence on academic performance is accommodation. Eight students mentioned this factor. Two students had experienced staying with students who are not studying medicine. They explained that it had a negative influence on their studies, because they did not get any support from their roommates, because they do not know what studying medicine entails.

Two other students found staying in a residence a negative influence on their studies. One student described the experience. When she started studying medicine it was her second year of staying in a residence. To be able to get a room, she needed to serve on many committees, which took her attention away from studying.

Other negative living situations are small or chaotic houses. Two students who are still staying at home had something to say about the influence that it has on their studies. One of them found it a negative thing to live at home, but this had an influence on his emotions more than on his academic performance; this student was in his fourth year. And the last student, who was in his third year, was very happy to live at home, because he does not have to do all the chores, and could just focus on his studies. The findings that fall within this category are displayed in Table 5.19, together with some examples of quotes of the student's answers.

TABLE 5.19: CATEGORY 3 - ACCOMMODATION (Table continues on next page)

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Staying with students who are not studying medicine has a negative impact on my studies	C5M, B2M	
	B2M	"With B.Sc. at the hostels, you have a lot of support from the seniors and everything. But when you do medicine, there are not a lot of seniors in the hostels that do medicine, so immediately my roommate says, 'Ah, I don't even know what that entails, so I'm not gonna bother', so you kind of struggle, you don't get the same support as if you were doing any other degree."
Staying in a residence is negative	A9M, B5M	
	A9M	"Toe ek eerstejaar medies was was ek tweede jaar koshuis, en toe moes ek soos op al wat 'n komitee is gaan dien vir goeie skietpunte net om 'n kamer te kry, dit was maar 'n ding wat sleg was." *When I was a first-year medical student I was second-year in the residence and then I had to serve on all possible committees just to earn brownie points to get a room, which was a bad thing.*
	B5M	"I think it's time to move out. I'm the oldest there. I'm like the old tannie."
Staying in a small room or chaotic environment is negative	A3NMM, B4NS	
	A3NMM	"Op 'n stadium het ek in 'n klein plekkie gebly wat voel asof ek is vasgevang. Maar nou het ek meer spasie." *At one stage, I lived in a small little place that made me feel strangled. But now I have more space.*
	B4NS	"Ons bly in een woonstel agter in een van die huise wat my kêrel uitverhuur, en daar bly drie kindertjies en twee honde..." *We live in a flat behind one of the houses that my boyfriend rents out, and there are three small children and two dogs…*
Staying at home is negative	C8M	
	C8M	"Ek bly by my ma, maar ek wil nie meer daar bly nie, ek wil uit die huis uitkom, dis meer emosioneel negatief, nie akademies nie." *I live with my mom, but I do not want to live there anymore; I want to leave the house, it's more emotionally negative, not academic.*

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Staying at home is positive	B3NM	
	B3NM	"I don't have to do laundry, or clean. If I have to do all of that it puts a little more strain on me."

5.3.5.4 *Category 4: Class*

Five themes were mentioned which could be combined into Category: Class. A few students had negative experiences within the class or lecturers. One student explained that there are always conflicts in the class, and two other students found the lecturers very disrespectful towards students.

Two other students were very positive about the lecturers and doctors who are involved in the teaching and coaching of the students. One of these students felt that the lecturers and doctors take much more time to teach and expain things to him as a *"senior student"*; he thought that this is because he communicates more easily than the other students.

What was negative for one student is compulsory class attendance. He prefers and is much more effective when he studies at home.   Three students pointed out the positive influence of studying in study groups. These students are all in a different stage of their studies. The findings are displayed in Table 5.20.

TABLE 5.20: CATEGORY 4 – CLASS (Table continues on next page)

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Decision making within the class is difficult.	C5M	
	C5M	"There is always something to argue about in the class".
Frustrating lecturers, who have no respect for students	B7WM, A5NSMW	
	B7WM	"Ek was nou vir elf jaar onafhanklik gewees, en jy vreet nie mense se nonsense as hulle ongeskik is nie. Dit is baie frustrerend." *I've been independent for eleven years, and you don't tolerate people's nonsense when they are rude. It is very frustrating.*
	A5NSMW	"A lot of the lecturers treat everyone like kids."
Things are not tailor made towards seniors.	A5NSMW	
	A5NSMW	"As a senior guy, I don't need to always sit in class for everything. I'd be much more effective if I sit in the privacy of my home and study the work, than the three hours of class."
Studying in study groups has a positive influence	B2M, C8M, A3NMM	
	B2M	"Being in a study group I improved a lot, you get through all your work thoroughly and it gives me more understanding. I get distinctions when I'm in a study group, when I'm not in a study group I just pass."

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Teachers and doctors have a positive influence on my studies	D2NSM, A3NMM, B5M	
	D2NSM	"Die dosente en dokters werk anders met my. Dit is makliker om 'n verhouding te hê met 'n dosent as jy 'n senior student is, as wat jy 'n junior student is. En omdat hulle meer tyd spandeer om jou te leer, omdat mens makliker kommunikeer, dis asof hulle meer tyd met jou spandeer as met ander." *The lecturers and doctors treat me differently. It's easier to have a relationship with a lecturer when you're a senior student than when you're a junior student. And because they spend more time to teach you, because you communicate more easily, it's like they spend more time with you than with others.*
	A3NMM	"Die vertroue wat hulle in my gesit het, het my baie gehelp om die jaar weer te doen." *The trust they put in me helped me tremendously in repeating the year.*

5.3.5.5 *Category 5: Finances*

One third of the *"senior students"* who were interviewed described their financial situation as having a negative influence on their academic performance. Three of them mentioned how a bursary brings a lot of performance stress with it, because the students will lose the bursary, or have to pay it back if they do not perform well enough. Three students are or have been in a very critical situation with their finances. One student was, for example, unable to pay for electricity for a period. That made it difficult to study at night. One student explained that it is not easy to still be dependent when you are a *"senior student"*, but if your parents pay, it is a positive influence on the academic performance. An overview of the replies is presented in Table 5.21.

TABLE 5.21: CATEGORY 5 - FINANCES (Table continues on next page)

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Financial strain or stress has a negative impact on my studies	D5M, A6M, D3H, C4M, D7H, A1MNM, A7M, A3NMM, B6WM	
	D5M	"Financial strain is the only problem I have".
	A6M	"I don't have a bursary, and that's one of the problems with being a senior student. They just thing you're playing, you're just collecting degrees and you don't want to work. So it's harder to seek funding, you tend to be alone there financially."
	C4M	"We don't cope, we really struggle. We've got a bank loan to cover tuition fees, and our parents help a lot."
	D7H	"Daar was 'n tyd wat die krag afgesit was omdat die krag betaal moes word en sulke goed." *There was a time that the power was swiched off, because I had to (still) pay for the electricity.*
	A7M	"Geld is nogal n stres faktor." *Money is quite a stress factor.*
	B6WM	"Ek stres myself morsdood oor toetstye. As jy 'n jaar moet oordoen, dan moet jy jou beursgeld terugbetaal en dan is daar ook 'n kans dat jy jou beurs verloor. Jy voel jy moet perform." *I stress myself to death during test periodes. If you have to redo a year, then you need to repay your bursary and there is also a chance that you may lose your bursary. You feel that you need to perform.*

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
If parents pay its positive	A8M	"As jou ouers betaal, dit is ook maar moeilik, maar dis darem nie dat jy dit self hoef te betaal nie en self te werk ook nog nie." *If your parents pay it is also difficult, but it is not that you have to pay yourself and work as well.*

5.3.5.6 *Category 6: Physical*

There were two students who suffer from physical problems. They emphasised the negative influence that this has on their academic performance. Their replies are displayed in Table 5.22.

TABLE 5.22: CATEGORY 6 - PHYSICAL

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Illness	C3NSWM, A3NMM	
	C3NSWM	"My fisiese ongesteldhede het 'n negatiewe invloed, want dit affekteer my gemoed en my swot tyd." *My physical illeness has a negative influence, because it affects my mood and my study time.*
	A3NMM	"Dit is nou al die derde keer wat ek my tweede jaar doen. Ek was siek gewees. Maar nou doen ek baie goed." *This is already the third time that I'm doing my second year. I was ill. But now I'm doing very well.*

5.3.5.7 *Category 7: Friendship*

The students were very positive about friendship; it is especially positive to have older medical students as friends because they can help you. One student was very concerned, because of the four friends that she had in the beginning of the medical programme; two failed and had to quit their studies. This adds to her stress, and therefore has a negative influence on her studies. In Table 5.23, the responses with regard to friendship are presented.

TABLE 5.23: CATEGORY 7 - FRIENDSHIP (Table continues on next page)

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Friendship with older medical students has a positive influence	C3NSWM, C7M	
	C3NSWM	"Die feit dat ek met senior studente en ouens wat nou al interns is vriende is kan my party keer bietjie leiding gee.' *The fact that I'm friends with senior students and guys who are interns already provides guidance sometimes.*
	C7M	"My nefie is vyfdejaar, dit help baie, en ek ken baie van sy vriende, senior studente help baie." *My cousin is fifth-year, which helps a lot, and I know several of his friends; senior students help a lot.*

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Study friends who fail is negative	B5M	"I had four friends in the beginning, two of them didn't make it and they are out of the programme. Now there's only me and my one friend left. Now I keep on thinking will I be next?"
Support from friends has a positive influence	D6M	"Support that I get from my friends and family affects my academic performance positively."

5.3.5.8 *Category 8: Facilities*

One student pointed out that the challenges he has with finding a place to study, and poor facilities has a negative influence on his studies. He cannot study at home because he has children. His comment with regard to Category: Facilities is presented in Table 5.24.

TABLE 5.24: CATEGORY 8 - FACILITIES

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Place to study	A5NSMW	"I have had some challenges with finding a place to study. They don't make places available to study over here, like the libraries are only open till four o'clock. Because obviously I have to get out of the house if I want to go study. The computer facilities are probably the worst that I've ever seen in any place in the world. It takes me like an hour and a half to try and print something!"

5.3.5.9 *Category 9: Motivation*

Three students mentioned motivation as an influencing factor. Two students stated that they were not very motivated, while the third student explained that he sometimes loses his motivation because of the never-ending volume of work. These two themes that fall within Category: Motivation, are presented in Table 5.25.

TABLE 5.25: CATEGORY 9 - MOTIVATION (Table continues on next page)

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
I'm not very motivated	A4H, A8M	
	A4H	"I could definitely do better, but what's the difference between an A-doctor and and NA-doctor, they are both doctors. I will be working in the rural areas, so it won't really count how much I passed with."
	A8M	"Negatiewe invloed op my akademiese prestasie sou ek net sê, ek moet dalk meer gemotiveerd wees." *Negative influence on my academic achievement; let me just say I should probably just be more motivated.*

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
The volume of work is demotivating	B7WM	
	B7WM	"Dit voel dat jou lewe gaan by jou verby en jy leer en jy leer, maak nie saak hoeveel jy leer nie, jy kan nooit genoeg leer nie, jy kom nooit op 'n punt wat jy kan se maar nou is jy klaar nie... *It feels as if your life is passing you by, and you learn and you learn and you can never study enough; you ever reach a point where you can say you're done learning.*

5.3.5.10 *Category 10: Work*

Within Category: Work, two students shared their opinions, which can be found in Table 5.26. One student who works 15 hours per week mentioned that having to work was a negative influence on his studies - although he enjoys it. The other student found work a positive influence, because she found it important to meet Non-Medical students and get a bit of income.

TABLE 5.26: CATEGORY 10 - WORK

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Having to work is negative	A4H	"The work is demanding, but I'm surviving."(works 15h per week)
Having to work is positive	A3NMM	"Dit is eintlik 'n lekker ding om bietjie met nie-mediese studente in aanraking te kom en dit is 'n klein bietjie inkomste so dit help ook." *It's actually nice to meet some Non-Medical students, and it brings in a bit of money, so it helps.*

5.3.5.11 *Category 11: Family and relationships*

A factor that has a strong influence is family and relationships. A total of twelve students had something to say on this topic. Table 5.27 presents the themes and quotes on this category. A total of four students were married at the time of the interviews. Being married or being in a relationship has, according to four students, a negative influence on their studies. They say it takes a lot of time and there are many expectations, which makes it difficult. Five students, however, find it a positive influence to have a supportive spouse or boyfriend/girlfriend. Note that two of these students also stated that being married has a negative influence on their studies. One student explained that his wife actually convinced him to study medicine.

Four students emphasised the negative influence of family issues on their academic performance. Two students could point out family issues as the cause of failing one year. Support from family and friends, was mentioned by two students as having a positive influence on their studies.

Lastly, having children requires a lot of discipline. The student who mentioned this was a very disciplined person, so he did not struggle too much. He pointed it out, though, as a factor that obviously has an influence on academic performance.

TABLE 5.27: CATEGORY 11 - FAMILY AND RELATIONSHIPS

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Being married has a negative influence on my studies	B1NSM, D1H	
	D1H	"When you're married, there is less time, where when you are dating you can always go home but when you're married you are always together and you have to be a husband and a student. Just being a student is much easier."
Being in a relationship has negative influence	A7M, C5M	
	A7M	"Verhoudings is baie moeilik. Jy kan nie met ander om jou ernstige verhoudings hê nie, daar is nie tyd daarvoor nie." *Relationships are really difficult. You can't have serious relationships with those around you; there is no time for that.*
	C5M	"Ek sien my girl nooit, dit is 'n negatief vir my." *I never see my girl; that's a negative for me.*
A supportive spouse/ boyfriend/ girlfriend has a positive influence on my studies	B1NSM, D1H, A5NSMW, B4NS, B3NM	
	B1NSM	"My man ondersteun my." *My husband supports me.*
	D1H	"She understands and I think if it wasn't that way it would have been much more difficult."
	A5NSMW	"She's very supportive, she was the one that convinced me to actually go and do medicine."
Support from family is positive	D6M, A3NMM	
	D6M	"Support that I get from my friends and family affects my academic performance positively."
Family issues have a negative influence on my studies	D7H, B2M, D6M, C4M	
	C4M	"If there's strain in the family, between me and my wife or my son, any strain within the family when I leave home or when I get home, that has an impact, I can't always focus on the studies and everything."
	D7H	"Toe ek in tweede jaar was, is my pa skielik oorlede en moes ek alles daar waarneem, want ek is die oudste, ek moes reël vir almal wat hom wou besoek. Toe moet ek die tweede jaar oorgedoen het. *When I was in my second year, my dad passed away unexpectedly and I had to take care of everything there, because I'm the eldest; I had to arrange for everyone who wanted to visit him. Then I had to repeat the second year.*
	D6M	"My parents got divorced so I just focused on that and ended up failing that year."
Support from family is positive	D6M, A3NMM	
	D6M	"Support that I get from my friends and family affects my academic performance positively."
Kids restrict the time I have for studying	A5NSMW	
	A5NSMW	"It comes down to a lot of discipline and routine. Weekends are out, between four and five and half past eight is also out."

5.3.5.12 *Category 12: Social life*

Within the Category: Social life, two themes were mentioned, which are presented in Table 5.28. Firstly, maintaining a social life is difficult and has a negative influence on academic performance according to two students. One student noticed that the other students expect a lot of her, for she is older and had done her B.Sc. degree, the other students ask a lot of help from her. This puts on a positive pressure for her to keep her work up to standard, to be able to help them.

TABLE 5.28: CATEGORY 12 - SOCIAL LIFE

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Maintaining social life is difficult and has a negative impact on my studies	D3H, B3NM	
	D3H	"I would leave work to days beforehand and then go out with friends, But that changed after I failed a year. Now I have less time with friends and more time with books."
	B3NM	"Trying to maintain social life puts a little strain on the work and a bit of stress."
There is social pressure to help the other students which has a positive influence on my studies	A6M	"Because you're older, people ask you for a lot of help, so that kind of forces you to be one up or forward, because you don't wanna refuse, because they do look up to you in a certain way. You must be up to standard with your work, so that has been a positive"

5.3.5.13 *Category 13: Discipline*

Three students stated that they were more disciplined or focussed because of their previous study experience. Two students explained how they learned to focus and not get distracted. These responses are presented in Table 5.29.

TABLE 5.29: CATEGORY 13 - DISCIPLINE

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Having studied before makes me more disciplined or focussed.	A5NSMW, D4M, D6M	
	D4M	"Nou doen ek niks behalwe studeer nie, ek dink in die 6 jaar wat ek al studeer het, het ek als so eenkant toe gestoot wat my aandag aftrek, so teen nou is daar niks meer wat my aandag aftrek nie." *I now do nothing but study. I think in the 6 years that I've studied so far, I pushed everything aside that distracts me, so now there's nothing that distracts me anymore.*
	D6M	"I learned not to let anything interfere with my studies, I will kind of put it to the side until after my studies."

5.3.5.14 *Category 14: Learning style*

In this category, one student found that his learning style has a very positive influence on his studies. He had done programming before, so he thinks in patterns. This skill is very helpful in his medical studies. His explanation is presented in Table 5.30.

TABLE 5.30: CATEGORY 14 - LEARNING STYLE

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Knowing your learning style is positive	B7WM	"My leerstyl het baie verander van dat ek begin het. Jy moet aanpas want die volumes werk raak net soveel meer. My leerstyl kom maar van die analisering ding af. Ek is geneig om patrone maklik te herken. Ek kan met pattern recognition 'n klomp data op 'n manier vinnig bymekaar sit om dit vinnig in te neem." *My learning style has changed quite a bit since I started. You need to adapt because the volume of work just increases so much. My style of learning follows from the analysis thing. I tend to see patterns easily. By means of pattern recognition I can sort a bunch of data quickly to take it in quickly.*

5.3.5.15 *Category 15: Curriculum*

Within Category: Curriculum, four students pointed out that the first year was frustrating for them, because it felt like repetition or the modules felt unnecessary for *"senior students"*. They would have liked to get exemptions for this part of the programme. One student expressed his appreciation for the integrated assessments. Because he really enjoys the way it makes him think and apply his knowledge. The responses of this category are presented in Table 5.31.

TABLE 5.31: CATEGORY 15 - CURRICULUM

THEME	STUDENTS WHO VOICED THE THEMES WITH SELECTED QUOTES	
Not getting exemptions makes the first year frustrating for senior students	B4NS, A1MNM, D1H, C5M	
	B4NS	"Hier kry jy glad nie vrystelling nie.. Dit is partykeer frustrerend om goed oor en oor te doen" *Here you don't get exemptions at all… It's sometimes frustrating to do things over and over.*
	D1H	"The first six months of our studies, I don't think that those modules are necessary for senior students, as they do stuff like general skills. It is demotivating. But maybe that's just for me, because I came from a health sciences background.
Integrated assessments are positive	A5NSMW	"It's great for me, because the whole time it teaches me to think and not to just put things together."

5.3.6   Finances

The final question in the interview was: "How do you finance your studies?" Thirteen students have a bursary. The families of 16 students pay for their studies. One student takes care of his own finances, and one student has a sponsor. The grouping of the various answers are presented in Table 5.32.

TABLE 5.32: FINANCES

SOURCE	STUDENTS
Bursary	C5, D2, C5, A5, B2, A9, C7, D6, B5, D3, C4, B7, B4
Family	C5, D5, C3, C1, D4, A3, D2, B3, B1, C8, A2, D1, A8, A1, A6, C2
Self	E1
Sponsor	A4

5.4   CONCLUSION

In this chapter, the findings of the semi-structured interviews were presented and summarised. The students were coded and the layout of the interviews was described. The researcher presented the participants by describing the background and their academic performance in the medical programme. The answers to the three main questions were categorised and themes that emerged were presented and explained.

In the next chapter, Chapter 6, **Interpretation and discussion of the results and findings**, the results and findings of the quantitative and the qualitative phase of this study will be merged, interpreted and discussed.

CHAPTER 6

DISCUSSION OF THE RESULTS AND FINDINGS

6.1 INTRODUCTION

With a mixed-methods approach, quantitative as well as qualitative data were gathered. The available quantitative data on the academic performance of *"senior students"* between 2000 and 2012 were analysed and presented in Chapter 4. Also, semi-structured interviews provided the study with qualitative data, which were presented in Chapter 5. In this chapter, the meaning of the findings will be discussed as the results of the quantitative and qualitative data gathering are combined and interpreted. The aim is to identify factors that influence the academic performance of *"senior students"* who study medicine at the University of the Free State. The researcher will also discuss the strengths and limitations of the study in this chapter.

6.2 THE ACADEMIC PERFORMANCE OF SENIOR STUDENTS

Before looking at factors that have an influence on the academic performance of *"senior students"*, the academic performance itself was measured. This was done to gather information on the performance of the *"senior students"*, and to identify any trends if they were present. The results of the *"senior students"* were compared with the academic performance of the class.

The academic performance of medical students decreases as the programme continues. And *"senior students"* follow that trend. The average performance of *"senior students"* is close to the class average in most years. The *"senior students"* perform above the class average (2,6% average) in the first year, but in the years that follow, they perform the same or a little bit below the class average and end with minus 1,7% in fifth year (cf. Point 4.3.3). Richardson (1995:9-13) found that mature students are more likely to use a meaning orientated study approach instead of a reproducing orientation. But, according to Richardson, does a meaning orientated learning approach not necessarily reflect in academic performance. He found the academic performance of mature students at least as good as the non-mature students. The same is found in the current study.

The pass rate in the first years of the medical programme has been decreasing amongst *"senior students"* since 2007, when the new curriculum was introduced. This trend could not be compared with the rest of the class (cf. Point 4.3.4). Simultaneously, the phase of the medical programme in which the students discontinue was found to shift towards the beginning of the programme (cf. Point 4.3.5). This change is also due to the new curriculum, which has become more difficult and compact in the first phase of the medical programme. The positive side is that students who are not equipped to study medicine will discontinue in an earlier stage, and not only after years of trying.

In the semi-structured interviews, the *"senior students"* were asked how they perform academically. Their answers were compared to the data on their performance, and it could be concluded that the students have a good idea of their performance (cf. Point 5.3.2). When the students were asked about the differences between *"senior students"* and the other students who enter medical school after matric, two *"senior students"* were of the opinion that they perform better than the other students, and four *"senior students"* said that there is no difference in academic performance (cf. Point 5.3.4.7).

6.3 THE INFLUENCE OF PREVIOUS TERTIARY EDUCATION ON ACADEMIC PERFORMANCE

In this study, a *"senior student"* is defined as a student who has had prior tertiary education experience before entering medical school. The influence of previous education was analysed to measure the influence of this experience on the academic performance in the medical programme. The type of previous studies was analysed as well as the impact of the number of previous courses and the total years that the student studied before starting his/her medical studies. The opinion of *"senior students"* on how their previous tertiary education experience helped them with the transition into the School of Medicine was also recorded.

6.3.1 Type of previous studies

In the analysis of the influence of the type of previous education on the academic performance, the researcher made use of categories, namely: Biomedical studies, Health Professions and Non-Science studies. The criteria of each group were described

in Point 4.2.4.1. It was discovered that students with a Health Profession background perform significantly better than the students with a Biomedical background in the first year. Later, however, the academic performance of the Health Profession students converged with the other students. The small group that consisted of Non-Science students also started their studies with a high performance compared with the Biomedical background but they performed far under class average by the time they completed the fifth year (cf. Point 4.4.1).

These findings stand in contrast with what is found in recent literature (cf. Point 2.4). Grey *et al.* (2001:92) found no significant differences in academic performance caused by the previous study subjects and courses. But De Clercq *et al.* (2001:431-422) showed in their study that a nursing (Health Profession) or arts background is likely to result in non-satisfactory results in the first-year assessments.

Craig *et al.* (2004:1166-1167) divided the types of previous studies into Health Profession, Biomedical science, other Biology, physical science and Non-Science studies and compared the students' academic performance in one of the four themes that run through the medical programme, namely: the basic and clinical sciences theme in the first three years of the curriculum. They had similar results, namely that students with a Health Profession background perform significantly better than the students with Biology and Biomedical science backgrounds in the beginning of the programme. This difference tended to converge with time. The similar results support the findings of this current study. However, Craig *et al.* (2004:1166) also found that students from a Non-Science background performed below average but their performance improved with time.

Before the results can be compared it must be kept in mind that Craig *et al.* (2004:1165-1166) only looked at the academic performance on one of four themes of the curriculum and also only the first three years; they do not give any indication of the academic performance in the other three themes and years. Other research studies are also difficult to compare to this current study. Because studies are done in different countries, the students, medical programmes and admission requirements are different to begin with. The researchers also studied different factors and used other academic results to measure the influence of these factors within their study. The semi-structured interviews were conducted to bring extra information and depth into this study.

In the semi-structured interviews, the students were asked how their previous studies influenced their medical studies (cf. Point 5.3.3.6). Many students referred to the content of their previous studies in their answers. The students with a Health Profession or medical science background could list subjects or skills that gave them an advantage over the other students. But the students with a Non-Medical or Non-Science background found that their studies had helped them in other ways. For example, one student mentioned that she thought that the memorising part of studying music trained her brain and she learned to cope with performance anxiety during her music study, which was of great help in her medical studies.

The initial success of Non-Science students in this study could not be explained with literature. But the overall idea that the Non-Science students gave the researcher in the interviews was a very motivated, serious about studying and driven group of students. These students might be very aware of the gap in knowledge that they start their medical studies with, and put more effort into the learning of the theory. But when these students proceed to the clinical phase, where the students have to apply the facts that they studied in the first number of years, the Non-Science students appear to be at a disadvantage. Here, the students with a Health Profession background have the advantage of having had experience in clinical practice.

The above average performance in early years of Non-Science students has not been reported on in recent studies. Zeleznik *et al.* (1983:26-33) also find no difference in academic performance between medicine students with different prior tertiary degrees. They do, however, find a difference in the choice of specialisation. Science students more often chose internal medicine, but students with a humanities or social science background (who were included in the Non-Science group in the current study) chose psychiatry more often (Zeleznik *et al.* 1983:26-33). Schwartz *et al.* (2009:372-380) summarise the literature between 1980 ad 2009 about the influence of humanities on academic performance of medical students. They showed that most literature did not find differences in academic performance between students from a Humanities background and other academic backgrounds. The only difference was that students from a Humanities background more often earn Medical Honor Society membership and graduation awards and honours.

The very good performance of Non-Science students in this study could add to the discussion about skills that the student needs to study medicine. The very low

performance in the final years is, however, worrying. These students might benefit from extra support in these years. More research should be done to verify the results of this study and to identify the exact problems of these students.

6.3.2   Duration and number of previous courses

In the literature only the fact that a student has had previous tertiary education is used as factor worth measuring. In the literature that was found, the duration or number of the previous course(s) are not specified and measured on their own.

The number of previous tertiary courses has little influence on the academic performance. The students with two or more previous courses perform better than the students with only one previous course in the entire medical programme. They also perform above the class average in every year except for the fifth year, whereas the students with only one previous course perform above the class average in the first year only. These findings did not reach significance (cf. Point 4.4.2). It could be part of further studies to investigate this difference in the academic performance of students with one or more previous courses.

The duration of the previous studies did not have an influence on the academic performance of the students, except if the previous studies were undertaken over a period of more than five years. These students were found to perform far above the class average (>7%) in the first two years. Their performance decreased in the following years, but always stayed above the class average. A minimal of five years of tertiary education has a significant influence (p = 0,0243) on the academic performance in the second year of the medical programme. A significant difference in pass-rate in third year was found with the multiple comparisons, the probability of passing in one attempt was higher for students with one year compared to students with two to four years of previous tertiary education (cf. Point 4.4.3). These findings could not be compared or supported with literature references, and this influencing factor should, therefore, be investigated further in new research studies.

6.3.3   Transition

In the semi-structured interviews, half of the *"senior students"* mentioned how their previous studies had helped them in the transition to medical school. The students felt

that their previous tertiary education had prepared them for the volume of work and for stress and deadlines. Three students described how their previous studies had taught them how to learn (again). And a number of students found having been exposed to the university environment a positive thing. To be familiar with the buildings, the technology, how the lectures work and also being settled in the residence resulted, according to the *"senior students"*, in the ability to focus more on studies. A few individuals were of the opinion that their previous tertiary education experience had not helped in the transition to medical school, because they had gotten used to a different volume of work, and one student described how he had already made many friends in his prior studies, which distracted his focus (cf. Point 5.3.3.1). None of the articles that were found mention the influence of previous tertiary education on academic performance with regard to the transition to the medical programme.

6.4 DIFFERENCES BETWEEN SENIOR AND OTHER STUDENTS

Other differences between *"senior students"* and the other students are discussed at this point. These differences were mostly found in the qualitative data gathering, where the *"senior students"* were asked what they notice as differences between them, as *"senior students"*, and the other students. The findings will be discussed and compared to the literature.

6.4.1 Maturity

Students mentioned maturity in different stages of the interview. Six students said that their previous studies made them more mature, which was helpful in their medicine studies (cf. Point 5.3.3.2). Four students said that they are more mature when they compare themselves with the other students. They see that the students who come straight from high school are very intimidated by the university, the hospital environment and with the examinations. The *"senior students"* also feel that they have different priorities and more responsibilities than the students who come from high school, which forces them to handle their studies in a more mature way (cf. Point 5.3.4.1). Frischenschlager *et al.* (2005:63) found a relationship between maturity and superior academic performance. Five students also mentioned that they have more life experience than the matric students, which influences their studies in a positive way. In the literature, Richardson (1995:13) concluded that life experience promotes a deep

learning approach. This might be a reason why the *"senior students"* feel that life experience has a positive influence on their academic performance. Other results with regard to the maturity and age of *"senior students"* are presented further in this chapter, in Point 6.4.2.

6.4.2 Social Factors

In the semi-structured interviews that Todres *et al.* (2012:329) conducted under high-achieving and re-sitting medical students to identify their perceptions of the factors influencing their academic performance, social engagement with peers, they found that the ability and opportunity to socialise with fellow students has an important positive impact on learning (Todres *et al.* 2012:329).

A number of students who participated in the semi-structured interviews during the current study mentioned social factors as differences between them and the students who enter medical school directly after high school (cf. Point 5.3.4.3). Some *"senior students"* felt a social division in the class or during group work. Four of these students missed a social connection with the rest of the class. But two students have no problem working together with younger students. When looking at the academic performance of these students, no difference could be seen. Unlike the conclusion of Todres *et al.* (2012:329), the academic performance of these students does not seem to be influenced by the social interaction with other students.

One student mentioned a difference in the way he approaches working in the hospital compared to the students who have no experience in working in the hospital yet. He notices that the younger students see working in the hospital as a hierarchy, whereas he likes to work together with the hospital personnel as a team (cf. Point 5.3.4.3).

A total of five students described another social difference, namely, the fact that *"senior students"* no longer see fun as a priority. They had their time to party and have fun with friends during their previous studies, so now they can focus on their medical studies, which obviously has a positive influence on their work (cf. Point 5.3.3.5).

6.4.3 Motivation

Motivation is difficult to measure, but nonetheless half of the *"senior students"* mentioned motivation in the semi-structured interviews (cf. Point 5.3.4.4). Seven *"senior students"* felt that they are more motivated than the other students. Two students disagreed; they said that matric students are more motivated because they see how matric students never stop studying. Two students did not see any difference in motivation between the students. A few students described how their motivation is driven by intrinsic factors now that they are older, for example.

"When a senior student returns to study medicine, then, I mean it takes something, financially it is more difficult, it's not just something… You don't just do it because you were selected now; you really want it and you thought it through and so you are really sure." (citation A1MNM, Table 5.13)

Three of the *"senior students"* also notice how the students from matric are less sure about their study choice. They have got the feeling that some of these students study medicine because they were selected or because their parents want them to study medicine.

The *"senior students'"* idea that they are more motivated is also held by two research studies. Murphy and Roopchand (2003:253-255) found that mature students have significantly higher levels of intrinsic motivation towards learning. They explain these findings by stating that mature students have a clearer perspective on the purpose of their education because they have more life experience. Rolfe *et al.* (2004:781-782) found the same, namely, that students who entered medical school straight after high school are more motivated by parental expectation, whereas tertiary entrants showed a more intrinsic motivation (to be independent or prevent disease).

6.4.4 Learning style

In different studies, the influence of learning style was mentioned. Researchers used different tests in which different learning styles were tested. Richardson (1995:13) found that maturity is connected to deep or meaning oriented learning. Subsequently, the deep and strategic learning approach was an indicator for more knowledge in the

clinical student (McManus *et al.* 1998:347). Todres *et al.* (2012:328) concluded that students who are more aware of their learning styles perform academically better.

In the semi-structured interviews in the current study a few students mentioned their learning style (cf. Point 5.3.4.6). Three *"senior students"* were of the opinion that their previous studies helped them to identify their learning style, or to adjust to learning at the university. These students performed between three and 14% above the class average in the first year. Four students had an opposite opinion; they said that their previous learning experience did not help them in studying medicine, because they felt that they had to adjust their learning style twice. These students' average performance in the first year was between -4,2 and 5,7 compared to the class average. Their academic performance in the second year was an average of -6,35% of the class average and two of the three who did their second year had to repeat it. Most of the students in both groups studied medical science. These findings give reason for further investigation into the influence of awareness of one's learning style on the academic performance of the students. The type of learning style of the students was not tested in this study; therefore, no comparison could be made with the literature.

6.5   DEMOGRAPHIC AND OTHER FACTORS

The demographic factors were analysed in this study to identify factors that have an influence on the academic performance of senior and medical students.

6.5.1   Gender

The influence of gender on the academic performance has been measured in many research studies. The majority of conclusions state that female gender has a positive influence on academic performance in medical school (Craig *et al.* 2004:1166, James & Chilvers 2001:1059, Yates & James 2006:1011). The quantitative data from the current study shows the same (cf. Point 4.5.1). When only looking at the *"senior students'"* gender, females rise above the males and this probability even reaches significance in the third till the fifth year. Compared to the class, the females begin their medical studies above the class average, but this performance converges with the class by fifth year. The males perform above class average in the first year only; thereafter their performance drops to more than 3% below class average. To measure if this significant influence of gender is specific for *"senior students"*, the same analysis

should be done for the whole class. These data were not available at the time of this study. In 2011, De Klerk conducted a study on the selection criteria of medical students at the University of the Free State. She touched on the influence of gender on the academic performance of medical students and found that female students performed on average 3,12% ($p = 0.003$) above their male counterparts in the first year. She appropriately mentions that these results will not have any impact on decision making at the School of Medicine, because the University of the Free State's policy states equal selection of males and females (De Klerk 2011:118-119).

6.5.2   Age or maturity

Except for having studied in tertiary education before entering the medical programme, another thing the *"senior students"* have in common is an older age. In the quantitative data analysis, the *"senior students"* of 28 years and older were found to under perform. Their performance was almost 6% under the class average in the fifth year, where the probability also reached significance. The 28+ group was very small (12 students between 2000 and 2012), which makes these results less reliable. The rest of the students performed closer to the class average, beginning above the class average and descending to a less than two points below the class average in the final years. Students in the age group of 22-27 perform a little bit better than the other age groups in the first two years (cf. Point 4.5.2).

Research articles show in different ways how maturity or age has a positive influence on academic performance. Reasons that are mentioned are deep/meaning oriented learning approach and the fact that the students have more to lose from failing (Frischenschlager *et al.* 2005:63; James & Chilvers 2001:1058; Richardson 1995:13; Yates & James 2006:1011). These results do not support the quantitative findings of this study. The qualitative data analysis might bring some light on the reasons for the weak performance of older students. The *"senior students"* who were interviewed did not feel that age had an influence on their performance; however, it became apparent that the *"senior students"* felt more stress caused by different factors, for example: financial strain, marriage, children, feeling older, social pressure and family (cf. Point 5.3.5). These factors will be discussed in the next pages.

6.5.3   Language

The quantitative data show that language has a significant influence on academic performance (cf. Point 4.5.3). The reason is that many students at the University of the Free State study in a language other than their home language. The English class performs weaker because of the high portion of students that do not speak English as a first language. But when only looking at students who study in their mother language, the performance between the English and Afrikaans class is much the same. Frischenschlager *et al.* (2005:60) also show that students with German as mother tongue, perform significantly better in their medical studies at the University of Vienna, Austria.

6.5.4   Finances

Only one article was found that analysed the influence of finances on the academic performance of medical students, and found that finances have a positive influence when the students feel financially secure (Frischenschlager *et al.* 2005:61). In the current study, *"senior students"* from different stages of the medical programme felt that financial strain has a negative impact on their studies (cf. Point 5.3.5.5). The students who were in their last year(s) and struggled financially did also perform weakly, but it is difficult to say if their performance is much weaker compared to the other *"senior students"* in that year, because the overall performance of the *"senior students"* is lower in the last year(s). And the performance of students who were enrolled in the first years, at time of the interview, and felt that financial strain has a negative impact do actually perform above the class average. Interesting to mention is the high representation of Non-Science backgrounds in the group of students who say that they struggle financially. Five out of nine students came from a Non-Science background, which means that 25% (5/19) of the Non-Science students have financial struggles. The language as well as ethnicity was evenly distributed in the group.

6.5.5   Curriculum change

The recent change of curriculum in 2007 has had an influence on the academic performance of students who have been enrolled in both curricula, which included a total of 12 *"senior students"* (cf. Point 4.4.5). These students had a significantly lower score than the other students. No difference could be found in the performance of

"senior students" who were enrolled for either the old or the new curriculum. These significant results do not have any implication for the curriculum.

6.5.6 Number of applications for the medical programme

Researchers have found a relationship between the time of admission to medical school and academic performance (Frischenschalger *et al.* 2005:65; Yates & James 2006:1011). There was no data available on the time of admission for the senior medical students at the University of the Free State. Therefore, the number of applications before a student was accepted into the medical programme was analysed. The analyses showed that the number of applications does not have an influence on the academic performance of *"senior students"* (cf. Point 4.4.4).

6.5.7 Family

Family is a strong influencing factor according to the *"senior students"* (cf. Point 5.3.5.11). A total of four students were married, others were in a relationship at the time of the semi-structured interviews. Four students were of the opinion that being married or in a relationship has a negative influence, because of the responsibilities and expectations. However, a supportive spouse/boyfriend/girlfriend was seen as a positive factor at the same time. Family issues had had a negative influence on the academic performance of four students. And having children has a negative influence on academic performance. It requires a lot of discipline to study if you have children.

6.6 STRENGHTS AND LIMITATIONS OF THIS STUDY

The following strengths and limitations of this study were recognised by the researcher.

6.6.1 Qualitative data enhanced holistic results in the research study

Most studies about the factors that influence the academic performance of students make use of quantitative data only (Ferguson *et al.* 2003:429-432; McManus *et al.* 1998:345-350; White *et al.* 2009:445-464; and many more). The use of qualitative data ensured comprehensive data gathering and analysis to enhance holistic results. In the semi-structured interviews the students were able to explain their poor

performance or the reasons for their educational career. Combining the semi-structured interviews with the quantitative data improved the validity and reliability of the study because information could be double checked, interpreted and understood better than when using only one method of data gathering. With more time and resources, other indicators of success should be measured with tests such as personality and learning style. Further studies could include these factors.

6.6.2 Data unreliability

The data that were available on the academic background of medical students were not complete and sometimes even incorrect. In different instances the reliability of the data needed to be questioned. The results of many students were not (yet) captured on the system and were manually added into the excel sheet to prevent having to exclude too many students from the study. When looking at the highest previous academic achievement of students, there were students who had studied only one year and achieved an honours degree according to the University's database. In the semi-structured interviews it became clear that some students had a much broader academic background than was recorded on the database of the University of the Free State. Unfortunately the researcher was not in the position and able to verify the data about the academic careers of each student, and so the available data were used in this study. The marital status of the medical students as recorded on the database was also not up to date, which was therefore not used in the quantitative data analysis. The validity of the study could be, to a certain extent, compromised because of these incomplete and incorrect data. The researcher, however, has done everything in her ability to assure the use of the most reliable data possible.

6.6.3 Complex quantitative data preparation for analysis

The quantitative data were not ready to use when it was gathered from the University's database. Numerous calculations had to be made to get to average year marks and comparable data because of the two different curricula that were used in the period 2000-2012. Inconsistent and diverse types of modules and marks had to be altered to be able to use and compare the data. Every step of the data preparation was explained in Chapter 4, which ensures reliability of the study. A qualified biostatistician did the statistical analysis. The *"senior students"* versus class average should have been calculated with a weighting factor, because in the results that were

used the "*senior students'*" performance is compared to the class-average. But the "*senior students*" also account for a part of the class average, which was not included in the calculation. This might cause a slightly inaccurate presentation of academic performance of "*senior students*".

6.6.4 Sampling

The researcher did not use any sampling with the quantitative data; only incomplete student records that could not be fixed were excluded from the study. Of the 211 "*senior students*" that were identified, a total of 200 students' study records were used for the quantitative data analysis. This strengthens the study, as all possible results were used.

For the semi-structured interviews, the researcher used sampling because of time constraints. The sampling method was explained in Point 5.2.1. Of 79 students a total of 31 students were interviewed. This is a fairly high number compared to the sample that was used in the study conducted by Todres *et al.* (2012:328), where 18 students were participants in a semi-structured interview to investigate the medical students' perceptions of the factors influencing their academic performance.

6.6.5 Studies conducted in other countries do not compare fairly

The findings in this study were supported by literature where possible. But because of the specific characteristics of medical students in South Africa, in terms of their preparation for university and personal demographics, comparing the results of this study with a study conducted in the UK, Australia or Austria is not fair or very valuable. Factors influencing the South African children's education are very specific, and will have a big influence on their academic performance in their medical studies. These factors should be measured in future studies and taken into account when comparing results with the literature.

6.6.6 Separation of factors that influence senior students specifically or the class as a whole was not possible

Due to complex data preparation and time constraints the factors that were identified as having influence on academic performance of "*senior students*", could not be

analysed to determine if these factors are specific for *"senior students"* or if they play a role under the medical students in the whole class. The first-pass rate (the percentage of students passing a year in one attempt) was only measured for *"senior students"* because the first-pass rate of the whole class was not readily available. The factors that were found could not be measured against the class first-pass performance. Therefore these factors might not be applicable to *"senior students"* only.

The average academic performance of *"senior students"*, however, was compared with the average performance of the class to rule out factors that influenced the whole class and caused yearly variations. The class was used as the standard to compare the results with. This does not rule out applicability of the found factors in the total class. But the fact that the academic performance of the class was taken into account when the results were measured for the *"senior students"* did enhance the validity of the study.

6.7   SUMMARY OF PREVIOUS KNOWLEDGE AND NEW KNOWLEDGE

The previous knowledge with regard to characteristics of "*senior students"* and the influence of previous tertiary education and demographic factors on the academic performance of "*senior students"* is summarised in Table 6.1. The table includes references to the literature review in Chapter 2.

TABLE 6.1: WHAT WAS ALREADY KNOWN (table continues on next page)

What was already known	Reference
"*Senior students*" present with a set of specific characteristics	**2.2**
- Deep or meaning orientated learning (enhances performance) - Intrinsic motivation (enhances performance) - Higher self-esteem (enhances performance) - Specific stressors (finances, commitments, time)	**2.3.4/2.5.2.2** **2.5.2.3** **2.5.2.1** **2.5.2.4**
Prior tertiary education has limited influence on academic performance in medical programmes.	**2.4**
Types of previous tertiary studies that prepare well for medical school: - Health Profession (perform significantly better than Biology or Biomedical science students) - Physics (perform at average or above) Types of previous tertiary studies that have a negative influence on academic performance in medical school: - Nursing - Arts - Non-Science	

What was already known	Reference
Demographic factors that influence academic performance	**2.5.1**
- Female students perform better	**2.5.1.1**
- Studying in mother language predicts success / international students perform lower / non-white ethnicity is a predictor for struggling.	**2.5.1.2**

Table 6.2 presents a summary of the most significant findings of this study.

TABLE 6.2: WHAT THIS STUDY CONFIRMS/DISPROVES AND ADDS

What this study confirms/disproves and adds	Reference
"*Senior students*" present with a set of specific characteristics	
- Intrinsic motivation (confirmed), and more motivation	**6.3.3**
- "*Senior students*" feel more mature	**6.3.1**
- A few of the "*senior students*" felt a social division in the class or during group work.	**6.3.2**
- Awareness of learning style has positive influence	**6.3.4**
Specific stressors:	
- Financial strain has a negative influence (confirmed)	**6.4.4**
- Family commitments (negative influence, but family is also great support)	**6.4.6**
Prior tertiary education has limited influence on academic performance in medical programmes.	
- Two or more tertiary courses has positive influence (not significant)	**6.2.2**
- More than five years of tertiary education has a significant positive influence in second year.	**6.2.2**
- 50% of "*senior students*" is of the opinion that their previous studies helped them in the transition to medical school	**6.2.3**
Types of previous tertiary studies that prepare well for medical school:	**6.2.1**
- Health Profession (perform significantly better than Biology or Biomedical science students in first and second year) (confirmed for first year)	
- Non-Science (perform significantly above average in the first years, but this decreases fast)	**6.2.1**
Types of previous tertiary studies that have a negative influence on academic performance in medical school:	
- Biomedical science background had a significantly lower pass-rate in first year compared to the one-year B.Sc. students.	**6.2.1**
- Non-Science students perform far below average in the fifth year	**6.2.1**
Demographic factors that influence academic performance	
- Female students perform better	**6.4.1**
- Older age has a negative influence (significant in fourth and fifth year)	**6.4.2**
- Studying in mother language predicts success (confirmed)	**6.4.3**

6.8 CONCLUSION

In Chapter 6, the findings of the quantitative and the qualitative data analysis were merged and an interpretation of the meaning of the data was given as well as a discussion with regards to relevant literature. The strengths as well as the limitations of the study were discussed, and a summary of previous and new knowledge was presented.

In the last chapter, Chapter 7, **Conclusion and recommendations**, the study will be concluded and recommendations will be provided for the application of the findings of this study.

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

An in-depth study was undertaken to investigate the academic performance of students with prior tertiary education, and to analyse factors that influence the performance of these students. This was done to provide the School of Medicine, Faculty of Health Sciences at the University of the Free State with scientific facts, which can be used in future decision making regarding student selection for the medical programme.

This chapter will provide an overview of the study design and summarise the significant results that were found. Recommendations will be made to enhance the evidence based selection process of the School of Medicine at the University of the Free State. Other recommendations will be made with regards to the specific needs of "*senior students*" that were identified in this study.

7.2 OVERVIEW OF THE STUDY

In Chapter 1, the need for information about the academic performance of medical students who have done a previous tertiary course was identified. These students are called "*senior students*" in this study. The School of Medicine at the University of the Free State wanted to know if "*senior students*" have specific challenges with medical education, and which factors have an influence on their performance. A gap in knowledge was found in the literature, where studies only touch on the influence of previous studies on academic performance but never identified factors that are specific to "*senior students*". In Point 1.3 the research questions were presented, followed by an overall goal, aim and objectives of the study. The research questions were as follows:

1. *How can student learning and student selection be conceptualised and contextualised to form a theoretical base to understand the academic performance of students with prior tertiary education?*

2. *How did students with prior tertiary education perform in their undergraduate medical studies between 2000 and 2012?*

3. *Which other factors influence student learning, and what is the importance of each factor?*

4. *What is the influence of previous tertiary studies on the academic empowerment of students and their academic performance during medical studies?*

A literature review, quantitative data analysis and qualitative data analysis were done to provide the study with the information to answer these questions.

7.2.1   Literature review

A literature review was presented in Chapter 2. The literature review was conducted to explain concepts with regard to student learning and determine factors that were found to have an influence on academic performance of (senior) medical students. The characteristics, specific learning needs and study approaches of "*senior students*" were described and explained in Point 2.2 and 2.3.

Relevant and recent studies were used to make a platform of the knowledge that is already available with regard to the influencing factors on academic performance for medical students. The studies that were found in the literature did not focus on "*senior students*" specifically. Many studies mentioned prior tertiary education or maturity as a factor that has influence on the academic performance of medical students. The wide range of factors that were studied and the diversity of research designs and methods made it difficult to compare these study results.

7.2.2   Research design, methods and instruments

To answer the other three research questions that arose from the research problem, two types of data gathering and analysis were done. In Chapter 3, the research design, methods and instruments were presented. Most studies measuring influencing factors for academic performance use a quantitative research design. To increase the reliability and present holistic results, the researcher decided to combine quantitative with qualitative data, and use a mixed-methods approach for this research problem. The Triangulation Mixed-Methods design was chosen where quantitative and

qualitative data were collected at the same time. The data were mixed during the interpretation of the findings, to compare and integrate the results.

7.2.3   Quantitative data gathering and analysis

The quantitative data gathering, analysis and findings are presented in Chapter 4. In the quantitative retrospective cohort study, data on the academic performance, previous tertiary education, and demographic factors were gathered. No sampling was done, because of the limited number of *"senior students"* who could be included in the study. Only students of whom proof of prior tertiary education was captured on the database of the University of the Free State and who were enrolled between 2000 and 2012 were used in the quantitative data analysis. The data of a total of 200 "*senior students*" were used. The steps that had to be taken to collect reliable data and to prepare the data for analysis are described in Point 4.2.1. and 4.2.2. The goal of the quantitative data analysis was to:

- Analyse the available data on academic performance of *"senior students"* in their undergraduate medical studies between 2000 and 2012;
- List the factors that influence student learning and indicate the importance of every factor;
- Evaluate the influence of previous tertiary studies on the academic empowerment of the *"senior students"* and their performance during medical studies.

The data were analysed with the help of a biostatistician from the Department of Biostatistics at the Faculty of Health Sciences, University of the Free State. This is described in detail in Point 4.2.2.3. The demographic presentation of the sample was described in Point 4.2.3.

7.2.4   Qualitative data gathering and analysis

Semi-structured interviews were conducted to gather qualitative information. The qualitative data gathering, analysis and findings are presented in Chapter 5. The qualitative data were valuable because more information could be gathered about the background of "*senior students*" and they could give explanations for factors that have an influence on their performance currently or in the past. The data were also used to explain or disprove factors that were found in the quantitative data analysis.

A total of 79 "*senior students*" were enrolled in the undergraduate medical programme at the time of this study. By using the intensity sampling method (which is explained in detail in Point 5.2.1) a total of 31 students were selected for the semi-structured interview. The data were prepared for analysis by grouping each answer into categories and themes as described in Point 5.2.3. The data were analysed by the researcher and the supervisor, and an independent researcher controlled the process to enhance the reliability of the study.

7.2.5 Discussion of findings

Chapter 6 focused on combining and interpreting the findings of the quantitative and qualitative data analysis and the meaning of the findings were discussed. The strengths and limitations of the study were also discussed in Chapter 6. The next Point (7.3) will deal with the conclusions of the results of this study.

7.3 CONCLUSION

The academic performance of "*senior students*" was measured in this study. It was found that "*senior students*" perform remarkably similar to the rest of the class. The average performance of the "*senior students*" between 2000 and 2012 starts 2,5% higher compared to the class average in the first year, but decreases to -1,7% in the fifth year. This trend was seen in most calendar years. The pass rate of "*senior students*" in the first year has been decreasing since 2007. The same year has seen a shift in discontinuation rates, which previously happened in later stages of the medical programme, but has shifted towards the beginning of the programme. These two changes can be explained by the new curriculum that was introduced in 2007.

With no extreme differences in academic performance between "*senior students*" and the other medical students or inexplicable trends, the academic performance of "*senior students*" was found to be normal. However, due to the specific characteristics of "*senior students*", the factors that have an influence on the academic performance were expected to be different, specifically for these students. To investigate this hypothesis, a mixed-methods research study was designed.

A literature review was conducted to identify factors that were found to have an influence on academic performance. A summary of these factors was given in Table 6.1 in Point 6.7, including references to the literature review in chapter 2.

Deep or meaning orientated learning, intrinsic motivation as well as higher self-esteem were found to be specific characteristics of "*senior students*". These students are experiencing stress because of other things (finances, commitments and time management) compared to students who enter medical school directly from high school.

The literature also shows that students with a Health Professional background perform better, and Physics students perform average or above average in their medical studies. Nursing, Arts and Non-Science is found to have a negative influence on the academic performance in medical school. Furthermore, demographic factors that influence academic performance are gender (female students perform better) and language (studying in mother language has positive influence on academic performance).

Quantitative data as well as qualitative data were collected and analysed. The results were merged and interpreted and compared to the literature. The significant results were presented in Table 6.2. A number of specific characteristics of "*senior students*" were found or confirmed.

"*Senior students*" are more often motivated by intrinsic factors and feel more mature, which has a positive influence on their studies. Maturity was linked to life experience, responsibilities and priorities. A small number of "*senior students*" feel a social division in the class, or during group work, but no influence could be measured on the academic performance of these students. "*Senior students*" were found to have some specific stressors: financial strain and family commitments, which both have negative influence on the academic performance. But the support of family or partner was a positive factor for many "*senior students*".

The influence of previous tertiary education was investigated in terms of type of previous studies in most research studies that were found in the literature. In this current study, the duration and number of previous courses were found to have little influence on academic performance. Students who studied more than five years

before entering medical school performed significantly better in second year. And students with two or more previous courses perform better in every year except fifth year. Half of the students who were interviewed were of the opinion that their previous studies had helped them in some way with the transition into medical school.

Students with a Health Profession or Non-Science background performed significantly better than students with Biomedical science backgrounds in the first year. This superior performance of students with a Health Profession background was also found in the literature. A reason for their better performance could be the familiarity with terminology and course content. The experience of these students in the medical field might have a positive influence on their academic performance in many aspects of the medical programme. These students have a clearer idea of what they need to be able to do and know to be able to practice as a doctor in future, and might therefore study more effectively. The hospital environment is not new to them and they are aware of other professionals with whom they need to work together.

The superior performance in the first year of students with a non-scientific background was not described in the studies that were found in the literature. The literature states that there is no specific difference between students with a humanities background and the others. The high performance could be explained with different theories. These students enter medical school with a set of specific skills, which might have positive influence in medical education, as mentioned by the students in the semi-structured interviews. These students are also very aware of their disadvantage and will therefore put more effort into learning the theory to prove themselves as medical students. This might be an explanation for their superior performance in the first years. Unfortunately they do not continue or manage to keep this up through the course. In the clinical phase when the students need to apply the theory, they perform far below the class average. The students might not be able to keep up anymore, or a shortcoming in their skills might cause this. The small number of Non-Science students that could be used in this study, reduces the validity of the findings.

The university advises students who do not get selected into medical school to study a B.Sc. with the chance of getting accepted the following year. The very average performance of students who studied B.Sc. for one year shows that this advice is good, because the students blend in with the students who enter from high school. But because these students have studied applicable subjects for medicine and one year

longer than the others, this advantage would be expected to show in the performance of these students. This is not the case, however.

A significantly low first-pass-rate for the first and third year was determined for the students who studied B.Sc. for more than one year compared to the students who studied only one year B.Sc. When looking at the first-pass-rate of students who studied one year and students with two to four years previous tertiary experience, the percentage of students passing in one attempt is higher for students who studied one year. This difference is significant for the third year. But the students with more than five years perform much better in terms of pass-rate as well as average marks. There might be a relationship between these findings. But this could not be measured due to the limited number of students.

The demographic factors that have an influence on the academic performance of "*senior students*" were gender, age and language. Female students' average marks performance was significantly better in third, fourth and fifth year. Students older than 28 performed significantly lower in fourth and fifth year compared to the younger students. And students who study in their mother language perform significantly better in every year when looking at average marks as well as pass-rates. These findings should be compared with the rest of the class, to determine if these factors are specific for "*senior students*" or not. This could unfortunately not be done in this current study because these data were not readily available at the University of the Free State.

7.4 CONTRIBUTION AND SIGNIFICANCE OF THE RESEARCH

This study made a valuable contribution by providing new knowledge about specific factors that influence the academic performance of medical students who had prior tertiary education. In the introduction of this research study, the need for information regarding the academic performance of "*senior students*" was identified. The study addressed this problem, and identified factors that influence the academic performance of "*senior students*". This comprehensive study covered not only quantitative research but included qualitative data also, which enriched the results with more complete background, feelings and ideas of "*senior students*". The findings were merged, interpreted and discussed. The mixed-method enhanced accuracy and credibility and

validity of the research study. The data gathering, analysis and interpretation was described in detail, which enhances the reliability of the study. The study has discovered new factors that influence academic performance of "*senior students*", confirmed the influence of factors that were already known and also disproved or questioned factors that are presumed to influence academic performance. The results of this study can initiate further research projects. Many factors need further investigation to explain results of this study. The findings can be used in decision making with regard to student selection. But the results are also valuable for student support and development purposes. The recommendations with regard to application and further research are presented in Point 7.5.

7.5 RECOMMENDATIONS

After the presentation, interpretation and discussion of the findings of this research study, recommendations must be made in order for the study to be valuable and significant. Recommendations can be made with regard to student selection, student support and development and further research:

Student selection:
- The findings of this study should be submitted to the Selection committee of the School of Medicine, Faculty of Health Sciences, University of the Free State, to enhance evidence-based practice with regard to the selection of "*senior students*".
- The following influencing factors could be considered with the selection of "*senior students*":
  - o Consider giving students with Health Profession backgrounds preference, because of their strong and continuous academic performance.
  - o Care should be taken with selection of "*senior students*" of 28+ age.

Student support and development:
- The findings of this study could be presented to the Student Academic Support section of the Division of Health Sciences Education, Faculty of Health Sciences, University of the Free State, to provide information and pointers to areas of concern to "*senior students*".
- The following "*senior students*" could benefit from support:
  - o Students who are not aware of their learning styles
  - o Students who feel a social division in the class, during group work, etc.

- o Students who struggle financially
- o Students with family commitments
- o Students from a Non-Science background (struggle in the clinical years)
- o Students who are 28 years or older
- o Students who study in a language that is not their home language.

Further research

- The influence of the following factors should be measured for the whole class, to determine if these are factors that influence "*senior students*" only, or if they influence the whole class.
  - o Intrinsic motivation
  - o Learning style (awareness thereof)
  - o Financial strain
  - o Gender
  - o Age
  - o Language
- The influence of duration and number of previous courses could be investigated further, by using bigger samples.
- The influence of learning styles could be investigated further by using learning style tests.
- The academic results of previous courses could be investigated for having influence on academic performance in the medical programme.
- The influence of standards of high schools and universities could be investigated.

7.6 CONCLUSIVE REMARKS

This study has covered a less studied subject and made a valuable contribution to the knowledge base of Health Professions Education. The findings will enrich the quality of medical students when the findings are used for decision making with regard to student selection or if the findings are used for student support and development purposes. This study can also be a base for further research, which will increase the knowledge base and further decisions regarding senior medical students and their performance in medical education.

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APPENDIX A

(INCLUDING APPENDICES A1-A3)

APPENDIX A1:   **LETTER OF INVITATION TO PARTICIPATE IN A SEMI-STRUCTURED INTERVIEW**

APPENDIX A2:   **FORM OF CONSENT: SEMI-STRUCTURED INTERVIEWS**

APPENDIX A3:   **INTERVIEW GUIDE FOR SEMI-STRUCTURED INTERVIEWS (ENGLISH AND AFRIKAANS)**

APPENDIX A1   LETTER OF INVITATION TO PARTICIPATE IN A SEMI-STRUCTURED INTERVIEW

Dear Student,

I would like to invite you to participate in an interview for senior students who study medicine. The interview will give me information for my research project about the factors that have influence on the academic performance of students with prior tertiary education. I am very interested in what you have to say about the topic. With the information that I gather in the interviews, I hope to be able to give the School of Medicine insight into your performance, the problems that you face as a senior student and the influence of your previous studies on your academic performance as a medical student.

Your input will be very valuable because there is a very limited number of senior students and every student has his own story.

Please note that participation is voluntary and that you may withdraw at any time. Furthermore, the information you give has no implications for you, your studies, marks, or what so ever. All the information will be kept strictly confidential. The interview will be recorded and results of the study may be published. No costs or remuneration will be involved.

The interview will take no longer than 30 minutes. The questions that I will ask are attached to this letter so that you can have a look and think about your answers. Please know that the questions might change slightly.

I would really appreciate your time and input to my research.

With regards,

Esther Berghout

Magister student in Health Professions Education

University of the Free State

Student number: 2010143721

ECUFS nr: 143/2012

You may contact me any time if you have questions about the research.

Email: esther_berghout@hotmail.com, phone number: 0718922610

APPENDIX A2   FORM OF CONSENT: SEMI-STRUCTURED INTERVIEWS

CONSENT FORM

Project title: *'Factors that influence the academic performance of medical students with prior tertiary education'*

I have been informed about the study by Esther Berghout.

I understand the purpose of this project and that participation in the interview will not affect me or my studies in any way. No remuneration will be given.

I understand that the interview will be recorded and that the information will be kept confidential.

I understand that participation in this interview is voluntary and that I may withdraw at any time.

I know that the results of the study may be published.

I hereby agree to participate in this study.

Name	Signature	Date

APPENDIX A3   INTERVIEW GUIDE FOR SEMI-STRUCTURED INTERVIEWS ENGLISH AND AFRIKAANS

	Semi-structured interview
1.	How old are you?
2.	Are you married?
3.	Do you have children?
4.	Why (and when) did you decide to study medicine?
5.	How did you perform in high school? (Science, Maths, English, Biology, Other)
6.	What did you do after high school?
7.	What did you study previously? Where?
8.	a. What was the outcome of your previous studies? b. If you quit your studies, why?
9.	How are you performing in your medical studies?
10.	Did your previous studies prepare you for your medical studies?
11.	What would you say, are the main differences between you, as a senior student, and the other students? (being older, having more academic and life experience, personal situation, learning style, motivation, …)
12.	And how do these (see Q11.) differences influence your academic performance?
13.	Which other factors are influencing your academic performance negatively or positively at the moment?
14.	How do you finance your studies? Do you work? How many hours per week?
15.	Is there anything you want to add to this conversation?

	Semi-gestruktureerde onderhoud
1.	Wat is jou ouderdom?
2.	Is jy getroud?
3.	Het jy kinders?
4.	Hoekom (en wanneer) het jy besluit om medies te studeer?
5.	Hoe het jy gevaar op hoërskool? (Wetenskap, Wiskunde, Engels, Afrikaans, Biologie, ander)
6.	Wat het jy gedoen na hoërskool?
7.	Wat het jy voorheen gestudeer? Waar?
8.	a. Wat was die uitkoms van jou vroeëre studies? b. As jy jou studies gestaak het, hoekom?
9.	Hoe vaar jy in jou mediese studies?
10.	Het jou vorige studies jou voorberei vir die mediese studies?
11.	Wat sou jy sê is die grootste verskille tussen jou, as a senior student, en die ander studente? (ouderdom, meer akademiese en lewenservaring, persoonlike situasie, leerstyl, motivering, …)
12.	Hoe beïnvloed hierdie (sien Q11.) verskille jou akademiese prestasie?
13.	Welke andere faktore het tans 'n negatiewe of positiewe invloed op jou akademiese prestasie?
14.	Hoe finansier jy jou studies? Werk jy? Hoeveel ure in die week?
15.	Is daar enige iets wat jy nog wil noem in hierdie gesprek?

APPENDIX B

(INCLUDING APPENDICES B1 and B2)

APPENDIX B1:   **CURRICULUM 8370**

APPENDIX B2:   **CURRICULUM 8371**

APPENDIX B1   CURRICULUM 8370

DIAGRAMMATICAL REPRESENTATION OF THE STRUCTURE OF THE PROGRAMME 8370

	PHASE I				PHASE II			PHASE III	
	Year 1 (128C)		**Year 2 (144C)**		**Year 3 (184C)**		**Year 4 (200C)**	**Year 5 (200C)**	
	Sem 1	Sem 2	Sem 3	Sem 4	Sem 5	Sem 6	Sem 7 & 8	Sem 9 & 10	
	Health Psychology MEB113 **12C**	Health Policy and Service Provision MEG123 **12C**	Principles of therapy and imaging MFN214 **16C**	Urinary system GUS224 **16C**	Gastrointestinal system MEU314 **16C**	Human diversity MEZ324 **16C**	Internal Medicine [Cardiology/Neurology] INM419/429 9w **52C**	Internal Medicine INM519/529 9w **44C**	
	The doctor and his environment MEC113 **12C**	Epidemiology and Biostatistics MEH123 **12C**	Musculoskeletal System MEO214 **16C**	Immunology and Haematology MEQ224 **16C**	Health and disease in populations MEX314 **16C**	Human life cycle MAE324 **16C**	Surgery [Otorhinolaryngology/ Ophthalmology] CHM419/429 9w **48C**	Surgery CHM519/529 9w **56C**	
	Concepts of Health and Disease MED113 **12C**	Molecules of the Body MEI123 **12C**		Cardiovascular system MIS224 **16C**	Respiratory System MFW314 **16C**	Ethical and Legal aspects of medicine MDD324 **16C**	Paediatrics PEM418/428 6w **32C**	Child Health & Psychiatry PEM517/527 6w **28C**	
	Tissues of the Body MEE113 **12C**	Development of the Body MEJ123 **12C**	Metabolism GMB214 **16C**	Infections MJR224 **16C**	Genital system MEY314 **16C**	Reproduction GRE324 **16C**	Obstetrics & Gynaecology GOB418/428 6w **32C**	Gynaecology & Urology GOB517/527 6w **28C**	
	Structure of the Body MEF113 **12C**	Electrical Systems of the Body MFK123 **12C**	Membranes and Receptors GMR214 **16C**	Mechanisms of Disease MFP224 **16C**	Exocrine and endocrine glands GEE314 **16C**	Nervous System MGB324 **16C**	Psychiatry[Oncology] OSM418/428 6w **36C**	Family Medicine & Anaesthesiology HAN518/528 6w **32C**	

Phase II span: Special study module** GSM211 (**4C**) and GSM221 (**4C**) (2 WEEKS)

Phase III span: Compulsory residency with an approved general practitioner – 2w **8C** (electives) 2 weeks — Weeks 2

EXAM MODULES

INM592	8K
CHM592	8K
PEM591	4K
GOB591	4K
OSM591	4K

General Skills MEA112 * **8C**

Level 8a
TOTAL Credits: 856
Notional Hours: 8560

Clinical skills Module
Commences as GKV211 (**4C**), GKV221 (**4C**) in second year and evaluated as GKV311 (**4C**), GKV321 (**4C**) at the end of third year of study.

*   MEA112 is integrated in the modules of Phase I (Semester 1)
**   Commences as GSM211 in Semester 3 and assessment of project takes place in Semester 5 as GSM312 (**8C**)
C   = Credits
W   = weeks

In semester 7-10 academic afternoons will be scheduled. (Elective themes) (24 Credits per year)

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Yearbook 2009: School of Medicine, University of the Free State

(UFS 2009:12).

APPENDIX B2   CURRICULUM 8371

DIAGRAMMATIC REPRESENTATION OF THE STRUCTURE OF THE M.B.,Ch.B. PROGRAMME 8371

Semester examinations at the end of Sem. 9 and 10 and in Family Medicine (HAN578/588) only at the end of Sem. 10.

Compulsory residency with an approved general practitioner – 2 weeks electives

Academic afternoons are being scheduled in semester 7-10 (diverse elective themes) (24 credits per annum included in module credits)

	PHASE I			PHASE II			PHASE III			
	YEAR 1			YEAR 2		YEAR 3	YEAR 4 (196C)		YEAR 5 (200C)	
	Semester 1 (84C)	Semester 2	Semester 3 (152C)	Semester 4 (88C)	Semester 5 (104 C)	Semesters 6 (36C)	Semester 7 (52C)	Semester 8 (52C)	Semester 9	Semester 10
	MEB153 (12C) Health Psychology	GMR124 (0C) ** Membranes, Receptors and Principles of Pharmacotherapy	GMR218 (32C)	GUS264 (16C) Urinary System	MFW354 (16C) Respiratory System	MEG323 (12C) Health Policy and Service Provision	INM479 (52C) Internal Medicine	INM489 (52C) Internal Medicine	IAM579 (48C) Internal Medicine and Anaesthesiology	IAM589 (48C) Internal Medicine and Anaesthesiology
	MEC153 (12C) The Doctor and the Environment	MEO124 (0C) ** Structure and Development of the Body (dissection program)	MEO218 (32C)	MEQ264 (16C) Haematology and Immunology	MEX354 (16C) Health and Disease in Populations	MAE323 (12C) Human Life Cycle	CHM479 (48C) Surgery (Otorhino-laryngology / Ophthalmology / Orthopaedics)	CHM489 (48C) Surgery (Otorhino-laryngology / Ophthalmology / Orthopaedics)	CHM579 (56C) Surgery (Orthopaedics, Urology and Trauma)	CHM589 (56C) Surgery (Orthopaedics, Urology and Trauma)
	MED153 (12C) Concepts of Health and Disease	MEI124 (0C) ** Molecules of the Body Metabolism	MEI218 (32C)	MIS264 (16C) Cardiovascular System	MGB354 (16C) Nervous System	GRE323 (12C) Reproduction	PEM478 (32C) Paediatrics	PEM488 (32C) Paediatrics	PEM578 (24C) Paediatrics	PEM588 (24C) Paediatrics
	MEE153 (12C) Tissues of the Body		MFP214 (16C) Mechanisms of Disease	MEY264 (16C) Genital System	GEE354 (16C) Endocrine System	INM323 (0C)** Internal Medicine (Psychiatry)	GOB478 (32C) Obstetrics and Gynaecology	GOB488 (32C) Obstetrics and Gynaecology	GOB578 (24C) Obstetrics and Gynaecology	GOB588 (24C) Obstetrics and Gynaecology
	MEF153 (12C) Structure and Development of the Body		MJR214 (16C) Infections and Antimicrobial Drugs	MEI264 (16C) Gastrointestinal System	MEZ354 (16C) Human Diversity, Human Rights and Legal Ethics	CHM323 (0C)** Surgery (Anaesthesiology) / PEM323 (0C)** Paediatrics	OSM478 (32C) Psychiatry (Oncology)	OSM488 (32C) Psychiatry (Oncology)	HAK578 (32C) Family Medicine	HAK588 (32C) Family Medicine
	MEA153 (12C) General Skills	GSM124 (0C) ** Epidemiology, Biostatistics and Special Study Module (SSM)	GSM213 (12C)	GSM262 (0C)	GSM352 (8C)	GOB323 (0C)** Obstetrics and Gynaecology / OSM323 (0C) ** Psychiatry			OSM578 (16C) Psychiatry	OSM588 (16C) Psychiatry
				Epidemiology, Biostat. and SSM	Epidemiology, Biostat. and SSM					
	Level 8 Total Credits: 860 Notional Hours: 8600	Development Programme (LDP) of 6 months for candidates that failed		GKV264 (0C) ** Clinical Skills	GKV353 (12C) Clinical Skills					

IMA 113 (12C) Integrated Medical Assessment

IMA 213 (12C) Integrated Medical Assessment

IMA 313 (12C) Integrated Medical Assessment

IMA190 Integrated Medical Assessment Module Mark

IMA290 Integrated Medical Assessment Module Mark

**Continuation

(UFS 2013a:15).

APPENDIX C

APPENDIX C: **DISTRIBUTION OF STUDENTS PER FACTOR**

APPENDIX C   DISTRIBUTION OF STUDENTS PER FACTOR

		Age at first year			Gender		Nr of years studied			Type of previous studies				Nr of previous courses	
		19-21	22-27	28+	M	F	1	2 to 4	5+	Health Professions	Biomedical Science	Non-Science	One year BSc	1	2+
Age at first year	19-21	130			58	71	113	17	0	10	18	7	84	117	10
	22-27		18		31	22	13	31	8	9	23	3	10	25	28
	28+			52	11	7	6	8	4	7	2	2	5	9	10
Gender	Male	58	31	11	100		68	26	6	14	19	8	50	81	19
	Female	71	22	7		100	64	30	6	12	24	4	49	72	28
Nr of years studied	1	113	13	6	68	64	132			9	10	7	99	131	1
	2 to 4	17	31	8	26	30		56		12	27	5	0	22	34
	5+	0	8	4	6	6			12	5	6	0	0	0	12
Type of previous studies	Health Profession	10	9	7	14	12	9	12	5	26				16	10
	Biomedical science	18	20	2	19	24	10	27	6		43			19	24
	Other Biology	5	2		3	4								4	3
	Physical Science	4	1		1	4								3	2
	Non-Science	7	3	2	8	4	7	5	0			12		8	4
	Science not specified	6	4	2	5	3								5	3
	One year BSc	84	10	5	50	49	99	0	0				99	98	1
Nr of previous courses	1	117	25	9	81	72	131	22	0	16	19	8	98	153	
	2+	10	28	10	19	28	1	34	12	10	24	4	1		47