The South African financial skills shortage: Exploring solutions to bridge the gap

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DECLARATION

I, Zanele Valencia Sobopha declare that **"The South Africa financial skills shortage: Exploring solutions to bridging the gap."** is my own work; that all sources used or quoted have been indicated and acknowledged by means of complete references, and that this dissertation was not previously submitted by me or any other person for degree purposes at this or any other university.

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ABSTRACT

Key words: Accounting education, academic performance, accounting training, professional accountant, skills shortage.

Various studies have highlighted the financial skills shortage dilemma faced in South Africa. The need for financially skilled individuals keeps on rising and affects the growth of South Africa. Studies indicate that the financial skills shortage is due to the few number of graduates universities produce.

The aim of this study is to bridge the gap between the number of graduates produced and the demand for financial skills in practice. This is therefore done by an investigation of the admission requirements used by the universities to predict the academic success in accountancy studies. The research is of a quantitative nature and the core required grade 12 subjects such as Accounting, Mathematics and English (including the required APS) are tested for correlations with the success of the accountancy studies. Quantitative procedures were used to analyse relationships between different variables.

The findings were that the admission requirements may predict the success of the accountancy studies. Correlations were found between grade 12 subjects and the admission requirements against the success of the accountancy studies. The use of the Receiver Operating Characteristics curve helped with the optimum cut-off mark that could predict the success. The Receiver Operating Characteristic curves were for the factors that affect success such as the grade 12 Accounting, First Language, Mathematics, school average and the APS scores. It was also used for the university's Financial Accounting modules for all the accountancy programmes offered by the university.

The study concluded by providing useful recommendations and by acknowledging the limitations of the study.

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NOMENCLATURE

AAT	**Association of Accounting Technicians South Africa**
ACCA	**Association of Chartered Certified Accountants**
APS	**Admission Point Score**
BCTA	**Bridging Certificate in the Theory of Accounting**
CA	**Chartered Accountancy**
CAT	**Central University of Technology**
CIMA	**Chartered Institute of Management Accountants**
CPUT	**Cape Peninsula University of Technology**
CTA	**Certificate in the Theory of Accounting**
CU	**Comprehensive University**
d	**Effect size (practical significance for nominal variables in statistics)**
DBE	**Department of Basic Education**
DHE	**Department of Higher Education**
DHET	**Department of Higher Education and Training**
DUT	**Durban University of Technology**
f/N	**Frequency (in statistics)**
FASSET Training	**Financial and Accounting Services Sector Education and**
FET	**Further Education and Training**
HE	**Higher Education**

HESA	**Higher Education South Africa**
IAC	**Institute of Accounting and Commerce**
ICB	**Institute of Certified Bookkeepers**
ICSA	**Southern African Institute of Chartered Secretaries and Administrators**
IFAC	**International Federation of Accountants**
IRBA	**Independent Regulatory Board of Auditors**
M	**Mean (in statistics)**
MUT	**Mangosuthu University of Technology**
NMMU	**Nelson Mandela Metropolitan University**
NSC	**National Senior Certificate**
NWU	**North-West University**
p	**See "Sig"**
PA	**Professional Accounting**
RU	**Rhodes University**
SA	**South Africa**
SAICA	**South African Institute of Chartered Accountants**
SAIPA	**South African Institute of Professional Accountants**
SAQA	**South African Qualifications Framework**
SC	**Senior Certificate**
Sig (or p)	**Statistical significance (in statistics)**
SPSS	**Statistical Package for the Social Sciences**

SU	Stellenbosch University
t-test (t)	Levene's statistical test of comparing two means (in statistics)
TU	Traditional University
TUT	Tshwane University of Technology
UCT	University of Cape Town
UFH	University of Fort Hare
UFS	University of the Free State
UJ	University of Johannesburg
UK	United Kingdom
UKZN	University of KwaZulu-Natal
UL	University of Limpopo
UNISA	University of South Africa
UNIZULU	University of Zululand
UoT	University of Technology
UP	University of Pretoria
UWC	University of the Western Cape
VUT	Vaal University Technology
WITS	University of the Witwatersrand
WSU	Walter Sisulu University.

CHAPTER1: INTRODUCTION AND PROBLEM DEFINITION

1.1   BACKGROUND OF THE STUDY

The local shortage of accounting professionals in practice is alarming to all parties involved in business. The South African Institute of Professional Accountants (SAIPA) emphasised that South Africa has been experiencing a shortage of financial skills, not only in the financial sector, but also in many other sectors of the economy (SAIPA, 2014). The lack of financial skills refers to a scarcity of individuals with the ability to make more sensible and effective decisions regarding financial and other economic resources (Kurihara, 2013:92). The shortage of financially literate individuals was also highlighted by the South African Institute of Chartered Accountants (SAICA) in 2008. Their research found that a skill deficiency exists in the financial management, accounting and audit (that is the accountancy profession) fields which could seriously hamper the growth of the South African economy (SAICA, 2008).

The lack of financially skilled professionals obstructing the economic growth of South Africa, a country that is in desperate need of an economic uprising, is mainly because there is an increasing gap between the financial skills needed to ensure economic growth and the supply thereof (South African Press Association, 2013). According to Nor *et al*. (2013:601), the accounting pedagogy has been undergoing several reforms in creating human capital for the accounting profession to ensure that the supply of accountants can accommodate the development of the country.

Despite this on-going reform that accounting education has been undergoing in recent years to ensure that the supply of financially skilled individuals meet the demand from the marketplace, several factual issues exist that are contributing to this shortage gap, namely:

The poor matric results achieved during the 2014 matriculation examination delivering unskilled individuals who should have filled the several scarce skill occupations which the accountancy profession forms part of (Molefi, 2014; Marshall, 2014);

- An inadequate pipeline of prospective professional accountants which is caused by higher education not producing enough graduates to meet the market demand for new entrants (Odendaal & Joubert, 2011:24; Wessels & Steenkamp, 2009:119); and

- Universities in South Africa are facing capacity restrictions which have an effect on their ability to ensure that enough graduates complete their financial degrees and subsequently start filling the gap that exists between the financial skill shortage and the supply thereof by universities (Marshall, 2014).

1.2   PROBLEM STATEMENT

Accounting is the measurement, processing and communication of financial information about economic entities (Berry *et al.,* 2008:4). Accountants play an important role in the development and economy of any country in that they:

Build the capacity to ensure that the necessary capacity is developed within the international accounting bodies; they are strong believers of global standards to encourage transparency and easy comparison in transactions that cross borders and jurisdiction; bring sustainability in which they believe all major entities (public and private sectors) should report all the impacts of their activities on environments and societies in which they operate in publicly; and provide integrated reporting in corporate reports aimed at different audiences that are usually not connected (ACCA, 2012).

A study has indicated that South Africa has a severe shortage of adequately trained accountants and amongst the factors contributing to the shortage is the quality of students recruited into accounting programmes by South African universities (Gloeck, 2008:4).

Since the twentieth century, the matriculation examination results are used as the main criteria for admission to universities in South Africa (Fresen & Fresen, 1987:492; Samkin, 1996). It is however noted that higher education institutions in South Africa are faced with a problem of admitting the right talented students, due to constraints such as financial problems, pressure to support the family and lack of adequate information for the prospective students, who will perform well academically and complete the programme to address the shortage of accounting professionals.

1.3   RESEARCH QUESTION

From the introduction and the problem statement, the research questions can be stated as:

- Do higher education institutions in South Africa admit capable students who will meet the demanding requirements of professional accountant training to ensure optimal use of scarce resources?

1.4   RESEARCH OBJECTIVES

To support the research question above, the study proposed the following research objectives.

1.4.1   Primary objective

The primary objective of this study is to establish whether the admission requirements to universities in South Africa adequately predict academic success in the professional accounting field to enable optimal use of scarce resources in practice. The primary objective will be achieved by the following theoretical and empirical objectives.

1.4.2   Theoretical objectives

The following theoretical objectives helped achieve the primary objective of the study:

- To review the literature and provide the definition and scope of the accounting profession;
- To establish the demands of skilled professional accountants training in South Africa; and
- To provide literature and review the admission policy of the South African higher education system.

1.4.3   Empirical objectives

The following empirical objectives have assisted to achieve the primary objective of the study:

- To determine the success rate of students at each level of study;
- To identify students who are at risk according to the academic level pass mark;
- To establish if there is a correlation between grades in Grade 12 and university success rate;
- Identify possible predictors of academic success of students at entry point into an accounting programme at tertiary level; and

- To conclude and to make recommendations on the predictor(s) for the academic success of students at the entry point into an accounting programme at tertiary level in an attempt to close the gap between the financial skills needed to ensure economic growth and the supply thereof.

1.5   RESEARCH DESIGN AND METHODOLOGY

The study comprises a literature review and an empirical study to achieve the above objectives. Quantitative research, using various statistical analysis methods, will be used for the empirical segment of the study. The research methodology is discussed in more detail in chapter 3.

1.5.1   Literature review

The literature review was based on the published sources which include relevant textbooks, journal articles, newspaper articles and the Internet. This was performed to develop the theoretical background that the study provides and to address the following theoretical objectives namely:

- To review the literature and provide the definition and scope of the accounting profession;
- To establish the demands of skilled professional accountants training in South Africa; and
- To provide literature and review the admission policy on the South African education system.

1.5.2   Empirical research

The empirical study was performed on the gathered data of registered students at a South African university. Only students registered in the accounting programmes offered by the institution were selected during the years 2012, 2013 and 2014. The following empirical research objectives were achieved in this segment of the study:

- To determine the success rate of students at each level of study;
- To identify students who are at risk according to the academic level pass mark;
- To establish if there is a correlation between grades in Grade 12 and university success rate;

- Identify possible predictors of academic success of students at entry point into an accounting programme at tertiary level; and

- To conclude and to make recommendations on the predictor(s) for academic success of students at entry point into an accounting programme at tertiary level in an attempt to closing the gap between the financial skills needed to ensure economic growth and the supply thereof.

The empirical study comprises the following methodology dimensions:

1.5.3   Target population

The population consists of all students enroled in the undergraduate accounting programmes at all the South African universities. Secondary data such as the students' academic records were considered for the undergraduate graduation outcomes for the years 2012, 2013 and 2014 and were obtained from the university archives. Three years were selected due to several changes in the school curricula as well as the fluctuations in the matric examination results over the last few years. By doing the latter, bias acts towards a specific year group will be mitigated and the reliability of the results will be improved.

1.5.4   Sampling frame

The study will be based on the distinct accounting programmes at undergraduate level offered at the specific university (referred to as University A). By purposefully including all campuses of the university, it is expected that the representation of the population will be achieved as these campuses are geographically situated in different locations with distinctly different surrounding populations and students.

1.5.5   Sampling method

The sampling method used is purposeful sampling, selecting students from a particular University. The sample, however, includes all students in the database at that university. The simple sampling technique was used, whereby the mean, median and standard deviation were calculated as measures of central tendency and distribution.

1.5.6   Sample size

Loseke (2013:101) defined sample size as a subset of the population; it can refer to study participants, places, times, survey questions and documents. Kumar (2014:382) defines sample size as the number of individuals, usually denoted by *n*, from whom you obtain the required information. Therefore, the sample size of the study is all the registered third year students in years 2012, 2013, 2014 of the identified university equalling some 1945 students.

1.6   MEASURING INSTRUMENT AND DATA COLLECTION

1.6.1   Data collection

Data collection is an important part of the research study. Data collection methods can be either surveys, questionnaires, interviews, focus groups, observation and existing data (Christensen *et al*., 2011:28). Surveys require asking people for information, using either verbal or written questioning (Zikmund, 2000:167). Interviewing is a two-way conversation in which the interviewer asks the participants questions to collect data and to learn about the ideas, beliefs, views, opinions and behaviours of the participants (Maree & Van Der Westhuizen, 2013:87). Focus groups interviews are an unstructured, free-flowing interview with a small group of people which is in a flexible format that encourages discussions (Zikmund, 2000:109). Observation is the systematic process of recording the behavioural patterns of people, objects and occurrences without questioning or communicating with them (Zikmund, 2000:27). The existing data can be in a form of documents, physical data or archived research data (Christensen *et al.*, 2011:61).

The existing data collected for this study helped achieve the empirical objectives. The existing data was in a form of archived data that was collected from the university student records repository. Application was made to the information management section of the university completing the necessary approval documents. Detail was provided as to what data was needed. The data were drawn from the system and supplied in Microsoft Excel format.

1.6.2   Statistical analysis

Malhotra (2010:486) states the more frequently used statistics related to frequencies are, "measures of location (mean, mode, and median), measures of variability (range, interquartile range, standard deviation, and coefficient of variation), and measures of shape

(skewness and kurtosis)". According to Babbie (2013:460), there are two statistical types namely, descriptive and inferential statistics.

Descriptive statistics refers to a standard used for describing data in controllable ways, whereas, inferential statistics is defined as a statistical measure that enables an investigator to make sense, assume and make conclusions or declarations about normally large populations from which samples were drawn. Descriptive statistics is a group of statistical methods used to summarize, describe or display quantitative data (Collis & Hussey, 2014:341). Descriptive statistics enables researchers to describe and compare variables numerically (Saunders *et al*., 2000:351). Therefore, descriptive statistics helps to describe the data when analysed.

Inferential statistics is a group of statistical methods and models used to draw conclusions about a population from quantitative data relating to a random sample (Collis & Hussey, 2014:342). According to Gray (2009:139), inferential statistics is used to make inferences from a sample chosen to a larger population. Inferential statistics relies heavily on probability theory (Maree & Van Der Westhuizen, 2009:198). Therefore, inferential statistics deals with a probability method to choose a sample from the population.

The data collected was analysed through the Statistical Package for Social Science (SPSS) Version 23, together with the services of a statistical consultant. To analyse the data, a number of statistical tests were conducted. The descriptive statistics was used to assess the population whereby the measures of central tendency were used to calculate the mean and the mode, and the measures of dispersion were used to calculate the standard deviation, the minimum and maximum values of the variables. Correlation analysis was used to measure the degree of correlation between tested variables using the Spearman's Correlation Coefficient. The non-parametric statistics such as T-tests were used as the statistical techniques to compare groups. The Receiver of Operating Curves was used to find the optimally acceptable cut-off for the variables tested such as the APS and Mathematics.

1.7   ETHICAL CONSIDERATIONS

The research study will benefit the South African Higher Education Institutions by accepting the students who will be academically successful in their accounting programmes. The author has to protect the rights and the identity of the participants so that no harm is caused to them.

This was done by obtaining permission from the university to collect and use the data through a formal application process. The data provided did not identify any individual student.

1.8   CHAPTER CLASSIFICATION

This study comprises the following five chapters:

Chapter 1: Introduction and background to the study

This chapter provides a background to the study and formulates the problem statement, outlines the purpose, significance and the objectives of the study. The chapter is concluded by providing an outline of the chapters included in this study.

Chapter 2: The shortage of financial skills in South Africa

The chapter investigates and identifies predictors of academic success of students at the entry point into an accounting programme at tertiary level. This chapter addresses the theoretical research objectives.

Chapter 3: Research design and methodology

Chapter 3 discusses the research method adopted; the data collection method and provides a framework to ensure the reliability and validity of the research findings.

Chapter 4: Results and findings

In addressing the empirical objectives this chapter will identify possible predictors of academic success in the professional accounting programmes at university level.

Chapter 5: Conclusions and Recommendations

Chapter 5 contains the final conclusions and recommendations proposed on the predictors for academic success of students at entry point into an accounting programme at tertiary level, which may assist in closing the gap between the financial skills needed to ensure economic growth and the supply thereof. This will also point to factors to be used to identify students who are at risk. Chapter 5 will, therefore, conclude on the overall primary research objective. Recommendations based on the findings of the study will also be made.

1.9   SUMMARY

Chapter 1 introduced the reader to the background of the study and the problem statement, the research question, research methodology as well as the set objectives of the study. The objectives of the study are however divided in two: the empirical and theoretical objectives. The theoretical objectives are achieved by a literature review presented in Chapter 2 and the empirical objectives are achieved by empirical research presented in chapter 4. Chapter 1 concluded with an outline of chapters of the study. The factors contributing to the financial skills shortage are looked into in the next chapter, along with criteria used to identify student success.

CHAPTER 2: THE SHORTAGE OF FINANCIAL SKILLS IN SOUTH AFRICA

2.1 INTRODUCTION

This chapter provides a review of existing literature about the financial skills shortage and predictors of academic success in the South African Higher Education Institutions (HEIs). International and national published academic articles, conference proceedings, paper and electronic media and published books were reviewed.

Section 1.4 (chapter 1) presented the research objectives of this study. The main aim of Chapter 2 is to address the following theoretical research objectives.

- To review the literature and provide the definition and scope of the accountancy profession;
- To establish the demands of skilled professional accountants training in South Africa; and
- To provide literature and review the admissions policy on the South African Higher education system.

Chapter 2 provides the literature review of the study. The reader is introduced to the scope, disciplines and profession in accountancy. The chapter continues with a discussion of South African education also referring to other countries. Before the conclusion of the chapter, the shortages of accountants and factors contributing to the shortages are discussed. Possible factors influencing student success are also identified.

2.2 DEFINITION AND SCOPE OF THE ACCOUNTANCY PROFESSION

Accountancy refers to the broader education involving all subjects such as accounting, auditing, financial management and taxation (Gloeck, 2008:4). Accountancy is defined as the work of an accountant (Collin *et al.*, 2001:5). Accountancy professionals in business assist with corporate strategy, provide advice and help businesses to reduce costs, improve their top line and mitigate risks (IFAC, 2013). Buys (2010:59) defines accountancy as a practical skill to be used in a business environment; the application of such a skill becomes dependent on the accountants' values and perception to the accounting theory). From this definition, accountancy encompasses all activities that take place in the accounting professionals/accountants practice; these include the practice of accountancy disciplines.

Within the accountancy profession, the accounting professionals practice the following disciplines, namely Taxation, Financial Accounting, Management Accounting, Financial Management, Auditing and Strategy, Risk Management and Governance (SAICA, 2014:20).

2.3   DIFFERENT DISCIPLINES WITHIN ACCOUNTANCY

This section elaborates on the disciplines in accountancy.

2.3.1   Financial Accounting

Accounting is defined as a services activity of which its function is to provide quantitative information which is primarily financial in nature, about economic entities (Van Vuuren *et al*., 2005:234). Financial accounting is also defined as a system that communicates a message about the financial effects of all decisions made in adding to the business in the past (Kew *et al*., 2006:8). Berry *et al.* (2008:4) define financial accounting as the orderly and systematic identification and recording of the monetary values of the economic transactions. Therefore, accounting is a system that provides financial information to add in the decision-making of the entity. Accounting as an information system provides and satisfies the information needs of the shareholders, management, employees, governments, creditors and other groups such as the community and customers (Glautier & Underdown, 2001:10). The purpose of accounting is to keep records of transactions and reports of business operations to provide information which is useful for making economic decisions (Kew *et al.*, 2003:28). The following is the process by which accounting provides information to the users in accordance (Reeve *et al.*, 2012:15):

Figure 1: The Accounting cycle
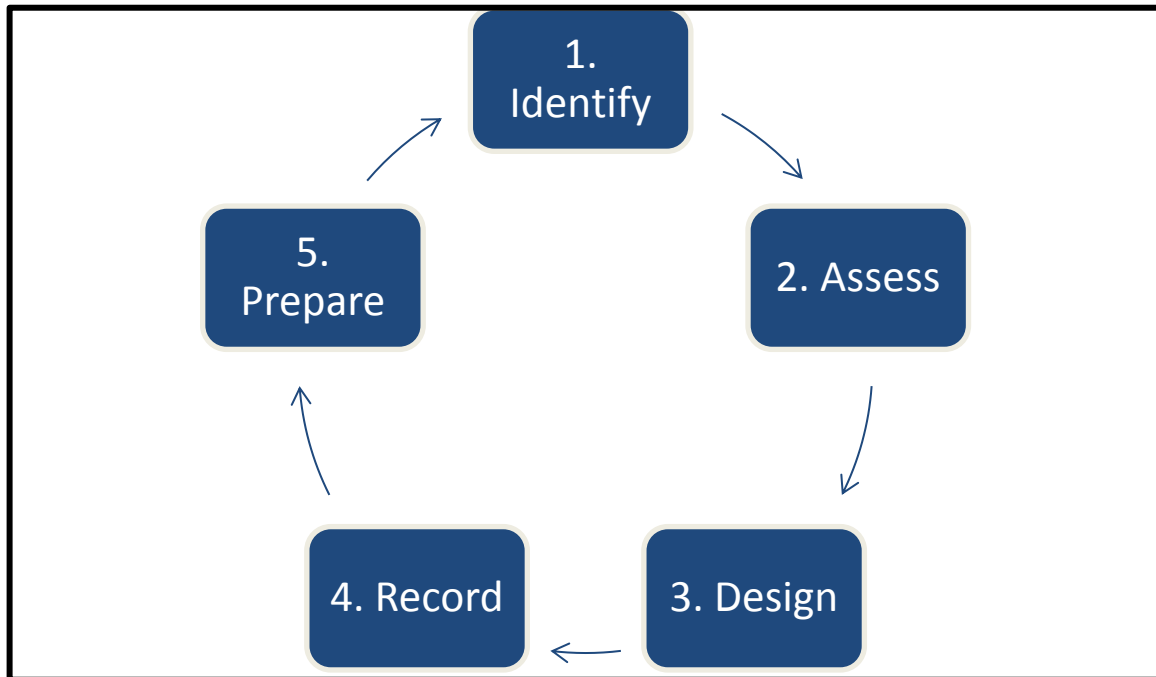
Source: (Reeve *et al.,* 2012:15).

The first step in the accounting process is to identify the users of the financial statements. The users are, therefore, divided into two groups namely the internal and external users. The internal users include the employees and the management. In the second step, the information is assessed according to the users' needs. Thirdly, the accounting information is designed to meet the needs of the users. The fourth step is to record the economic data about the business activities and events. Lastly, prepare the accounting reports for its users (Reeve *et al.*, 2012:15).

2.3.2 Auditing

Auditing is a systematic process of objectively gathering and evaluating evidence relating to two assertions about economic actions and events in which the individual or organisation making the assertions has been engaged, to ascertain the degree of correspondence between those assertions and established criteria, and communicating the results to users of the reports in which the assertions are made (Porter *et al*., 2014:3). Cloete (1995:4) defines auditing as the examination of records of financial transactions by a qualified, independent person to ascertain the regularity of the income and expenditure transactions performed by the specific persons or institutions. Fox and Meyer (1995:10) define audit as an examination of evidence including records, facilities, inventories, and systems to discover or verify desired information, in addition, they say it is a written report. Auditing is, therefore, a procedure of finding evidence, through the examination of

financial records and systems to verify the information provided with the evidence. The person who performs principles of auditing is therefore called an auditor. An auditor is responsible for forming and expressing an opinion on the statements (Marx *et al.*, 2011:15).

The main objective of audits is to enable the auditor to express an opinion as to whether or not the financial statements fairly present all requirements by an identified financial reporting framework and the statutory requirements (Puttick & Van Esch, 2003:35). ISA 200 states that the purpose of an audit is to enhance the degree of confidence of the intended users in the financial statements (SAICA, 2013; ISA 200-2). The ISA 200 requires that the auditor exercises professional judgement and maintain professional scepticism throughout the planning and the performance of the audit and to also: i) Identify and assess risk of material misstatement based on an understanding of the entity and its environment; ii) Obtain sufficient appropriate audit evidence about whether material misstatements exist and; iii) Form an opinion on the financial statements based on the conclusions drawn from the audit evidence obtained.

2.3.3 Taxation

Taxation is a financial contribution that is paid to the government of the State Revenue Fund and is part of the taxpayer's expense (Matsheru, 1991:1). SAICA (2014:25) defines taxation as a competency related to taxation planning, compliance and reporting for various entities. Taxation, therefore, deals with the compliance and reporting of the finances and the contributions made as an expense. Collin *et al.* (2001:269) define taxation as the money paid to the government or taken by an official body to pay for government services. Taxation includes tax compliance and reporting, and tax-planning and implementation strategies for both corporate and personal taxpayers, and an understanding of the administrative processes (Chartered Professional Accountants, 2013:13). The tax legislation has the following acts namely Income Tax Act no. of 68 of 1962, Value-Added Tax Act no. 89 of 1991, Estate Duty Act no. 40 of 1949, Securities Transfer Tax Act no. 26 of 2007 and the Tax Administration Act no. 28 of 2011 (SAICA, 2014:3).

2.3.4 Management accounting

Management accounting measures, analyses and reports financial and non-financial information that help managers make decisions to fulfil the goals of an organisation (Horngren *et al.*, 2012:26). Management accounting is concerned with how cost information and other financial and non-financial information should be used for planning, controlling, and decision-making

(Hansen & Mowen, 2000:2). Management accounting is defined as a competency related to the identification of information needs, and to the development and use of decision-making tools in achieving the entity's strategies (SAICA, 2014:25). Management accounting therefore helps the organisation with decisions and operations that are financially or non-financially related. According to Hilton (2008:18) the following are the objectives of management accounting:

- Providing information for decision-making and planning, and participating in the management teams for decision-making and planning process.
- Assisting management in directing and controlling operational activities.
- Motivating managers and other employees toward the organisational goals.
- Measuring the performance of activities, subunits, managers and other employees within the organisation.
- Assessing the organisation's competitive position and working with other managers to ensure the organisation's long-term competitiveness in its industry.

2.3.5   Financial management

Financial management primarily focuses on decision-making about investment and financing decisions of a business enterprise (Correia *et al*., 2011:36). According to Rao (1995:5) financial management is the art and science of making decisions for the firm; these decisions are investing and financing and are the responsibility of a manager. SAICA (2014:25) defines financial management as a competency related to the management of financial assets, treasury and assessment of an entity's value. Bartlett *et al.* (2014:2) define financial management as the managerial activity that is concerned with planning and controlling an entity's financial resources. Financial management, therefore, provides the financial and non-financial information to be used for the decision-making and operations of an organisation. Financial management involves making the best decisions with regards to the capital budgeting, capital structure and working capital management (Du Toit *et al.*, 2010:7). The goal of financial management is to maximise profits by increasing sales, increasing market share, minimising costs, increasing growth in profits, avoiding insolvency and surviving (Du Toit *et al*., 2010:7). The following deduced to be the role of the financial manager is to be a buyer of capital who seeks to minimise its cost and a seller of financial securities who tries to maximise their value (Vernimmen *et al.*, 2011:3).

2.3.6   Strategy, risk management and governance

These are the competencies related to the development and evaluation of an entity's ability to make decisions and maximise its organisational performance including policies and resources (SAICA, 2014:25). Strategy within accounting is defined as the raising of funds needed by an organisation in the most appropriate manner and managing the employment of those funds within the organisation, including the decision to reinvest or distribute any subsequent profits generated (Bender & Ward, 2009:4). Bartlett *et al.* (2014:91) define strategy as a referral to the long-term plans and tactics that entities follow to achieve their goals and objectives. Strategy can, therefore, be defined as the plan and procedures to manage an entity in a manner that will help it to achieve all the goals.

Risk management is a structured, consistent and continuous process across the organisation to assist management in identifying, evaluating and managing risk (Coetzee *et al.*, 2010:19). Risk management is also the practice of identifying and analysing the risks associated with the business and, where appropriate, taking adequate steps to manage these risks (Institute of Directors in Southern Africa, 2009:73). Bartlett *et al.* (2014:86) define risk management as the coordinated activities, architecture and methods that are used to direct the entity and control the many risks that can affect the entity's ability to achieve its objectives. Risk management is, therefore, a discipline that provides strategies, techniques and an approach to recognise and confront any threat faced by the company, but also take advantage of any opportunities that may come along in fulfilling its mission (Janse van Vuuren, 2006:17). Risk management is also defined as the identification and evaluation of actual and potential risk areas as they pertain to the company as a total entity, followed by a process of termination, transfer, acceptance or mitigation of each risk (Puttick & Van Esch, 2003).

Corporate governance is the process used to direct and manage the business and affairs of the organisation with the objective of balancing the attainment of corporate objectives, the alignment of corporate behaviour with the expectations of society and the accountability to recognised shareholders (Coetzee *et al.*, 2010:2). Marx *et al.* (2011:4.5) define corporate governance as the system whereby entities are managed and controlled by the characteristics such as transparency, accountability, responsibility and fairness. Corporate governance relates to accounting and management systems of a company and can be in the means of reducing business risk (Bender & Ward, 2009:102). These three competencies work well together and can be integrated to maximise the overall performance of the entity. There is a need for a strategy to keep the business

running, risks need to be managed to be at a minimal acceptable level and the entity needs to be governed by policies and procedures to keep it running.

2.4   THE PROFESSION AND THE PROFESSIONAL ACCOUNTANT

In the previous section disciplines found within the accountancy profession were defined. In this part of the study information is provided to give a clear definition of a person practising the disciplines found within accountancy.

According to De Vos *et al*. (2011:14) a profession is an occupation that properly involves a liberal education or its equivalent and mental rather than manual labour.

A professional accountant is, therefore, a person, who holds a bachelor's degree or a post graduate qualification in the fields of accounting, auditing and cost management accounting, or taxation (Van Zyl, 2008:369). SAICA (2009) also refers to a professional accountant as a person with a National Qualifications Framework (NQF) level 7 qualification and full membership of any of the professional accounting bodies in South Africa which include some of the bodies such as SAICA or CIMA. According to the South African Qualifications Framework (SAQA) (2012:10) a person holding an NQF level 7 qualifications should possess the following characteristics namely:

Table 1: Characteristics of NQF level 7 qualification holder.

Characteristic	Details
i. Scope of knowledge	Demonstrate integrated knowledge of the central areas of one or more fields, disciplines or practices. This was discussed in section 2.3.
ii. Knowledge literacy	Ability to demonstrate an understanding of knowledge as contested and the ability to evaluate types of knowledge and explanations within the area of study.
iii. Method and procedure	The ability to demonstrate an understanding of a range of methods of enquiry in a field and their suitability to specific investigations and methods to resolve problems.

Characteristic	Details
iv. Problem solving	Ability to identify, analyse and evaluate, critically reflect on and address complex problems, applying evidence-based solutions and theory-driven arguments.
v. Ethics and professional practice	Ability to take decisions, act ethically and professionally and the ability to justify those decisions and actions drawing on appropriate ethical values and approaches within a supported environment.
vi. Accessing, processing and managing information	Demonstrate the ability to develop appropriate processes of information gathering for a given context and independently validate the sources of information and evaluate and manage the information.
vii. Producing and communicating information	Demonstrate the ability to develop and communicate his or her ideas and opinions in well-formed arguments, using appropriate academic, professional or occupational discourse.
viii. Context and systems	Demonstrate the ability to manage processes in unfamiliar and variable contexts, recognising that problem-solving is context and system bound and does not occur in isolation.
ix. Management of learning	Demonstrate the ability to identify, evaluate and address his or her learning needs in a self-directed manner and to facilitate collaborative learning processes.
x. Accountability	Demonstrate the ability to take full responsibility for his or her work, decision-making and use of resources and limited accountability for the decisions and actions of others in varied or ill-defined context.

Source: SAQA, 2012:10.

Accountancy professionals in business assist with corporate strategy, provide advice and help businesses to reduce costs, improve their top line and mitigate risks (IFAC, 2013). According to

Weirich *et al*. (2009:1) these are also individuals involved with the investigation and analysis of an accounting, auditing, or tax issue whilst formulating a clear definition of the problem, using professional databases to search for the relevant authorities, reviewing literature, evaluating alternatives, drawing conclusions and communicating results. Accountancy professionals, therefore, assist the entity with a wide range of matters. The professional bodies governing the Accounting profession in South Africa are discussed next.

2.4.1   Professional bodies governing the Accounting profession in South Africa

Professional accountants need the professional accounting bodies because they (accounting bodies) have the mandate of representing, promoting and enhancing the global accountancy profession (IFAC, 2013). FASSET (2014:26) adds that the accounting and finance professional bodies perform self-regulatory and professional functions to uphold standards, enhance the quality of services and strengthen the investors' confidence in the economy.

At the national level, the professional accounting body is the voice for the nation's professional accountants; this includes all professional accountants both in practice and in business (Cooraaf, 2015). Because accountants play different roles in the society, the overall status of the accountancy profession can only be strengthened when both professional accountants in practice and those in business are well-perceived by society (IFAC, 2013).

Accounting bodies also have essential roles to play in the development and application of consistent global professional and ethical standards, in promoting good corporate governance, and supporting economic development through access to finance (ACCA, 2011:3). Table 2 discusses the main professional accounting bodies found in South Africa, their location and membership size.

Table 2: The main accounting bodies in South Africa

Accounting Body	Details
AAT (SA) - Association of Accounting Technicians South Africa	AAT (SA) is a professional body dedicated to the education, development, regulation and support of accounting technicians in South Africa (AAT (SA), 2015). AAT (SA) has approximately 120000 members (AAT, 2015).

Accounting Body	Details
ACCA - The Association of Chartered Certified Accountants	ACCA is the largest accountancy body recognised by statute in the United Kingdom. The qualification as a certified accountant is internationally accepted (Flynn & Koornhof, 2008:4). ACCA has about 178000 members and 455000 students in 180 countries world-wide (ACCA, 2015).
CIMA - Chartered Institute of Management Accountants	A CIMA qualification is internationally recognised and administered in London, the emphasis is on management accounting and finance but a thorough knowledge of financial accounting is necessary (Flynn and Koornhof, 2008:3). CIMA, founded in 1919, is the world's leading and largest professional body of management accountants, with over 218000 members and students operating in 177 countries (CIMA, 2014).
IAC - Institute of Accounting and Commerce	The IAC is a professional institution for financial professionals who strive towards utilising their skills-base more effectively, while developing their qualification and careers. Since 1927, it has provided professional education and advancement for its members (IAC, 2015).
ICSA - Southern African Institute of Chartered Secretaries and Administrators	This is the formal institute for the enabling of corporate governance and secretaryship. It is a recognised qualification for the accounting officer post required regarding the Close Corporation legislation. The qualification is recognised in 70 international countries. The ICSA has approximately 70000 members (ICSA, 2015).
ICB - Institute of Certified Bookkeepers	The ICB is a bookkeeping institute in the South Africa. It promotes and maintains the standards of bookkeeping as a

Accounting Body	Details
	profession, through the establishment of a series of relevant qualifications and the award of grades of membership that recognise academic attainment, working experience and competence (ICB, 2015). ICB has 2396 members (ICB, 2014).
IRBA (previously PAAB) - Independent Regulatory Board of Auditors	The IRBA is the statutory body controlling that part of the accountancy profession involved with public auditing in the Republic of South Africa; its membership size is 4350 (IRBA, 2015).
SAICA - South African Institute of Chartered Accountants	SAICA is a specialist qualification in practical accounting. SAICA currently has 39128 members (SAICA, 2015).
SAIPA - South African Institute of Professional Accountants	SAIPA is a South African accountancy institute; its qualification is registered at level 8 on the NQF. SAIPA provides its members who are in public practice with mandatory Professional Indemnity (PI) insurance (SAIPA, 2015). SAIPA has more than 6000 members and 1500 trainees (SAIPA, 2015).

2.4.2   The demands of skilled professional accountants training in South Africa

The South African private and public sectors are affected by the financial skills shortage and the topic has been debated for decades now (SAIPA, 2014; FASSET, 2013; SAICA, 2010). Education also plays a role in contributing to the shortage of financial skills as there is a poor Mathematics pass rate (Molefi, 2014). In the FASSET Sector Skills Plan update for the period 1 April 2014 to 31 March 2019, it is indicated that the shortage of financially skilled professionals accounts for 66% of the professional scarce vacancies; these individuals are those who possess accounting skills and who are accounting and auditing trainees (FASSET, 2014:16). More detail on accounting education in South Africa specifically follows next.

2.5   ACCOUNTING EDUCATION IN SOUTH AFRICA

The study investigates the shortage of financial skills in South Africa as presented in chapter 1. To determine the factors that influence the scarce talent, the South African education system was investigated in more detail. The South African universities are facing a high failure rate leading to a very high drop-out rate from enrolments in commerce education (Tewari, 2014:233). The following sections give an overview of the South African education system and the South African Higher Education systems with specific reference to accounting education.

2.5.1   The structure of the South African education system

The South African education system consists of the following three components namely General Education and Training, Further Education and Training, and Higher Education and Training. Firstly, General Education and Training: grade R up to and including grade 9 comprise the compulsory school years; secondly, Further Education and Training (FET): grade 10 up to and including grade 12 which comprises further academic schooling as well as intermediate vocational education at technical colleges and private colleges; thirdly, Higher Education and Training (HET) (2010) after grade 12.

2.5.1.1   General Education and Training

Primary school

**   i.   Foundation phase**

The foundation phase begins in Grade R (reception) and is up to (including) grade 3. This phase focuses on basic skills such as reading, writing and arithmetic and development of language skills. A second language is also learned in this phase (EP-Nuffic, 2015:7; DBE, 2015).

**   ii.   Intermediate phase**

The intermediate phase begins in Grade 4 up to (including) Grade 6. The phase concentrates on reading and speaking skills in the home language and the second language (DBE, 2015).

Secondary school

iii. Senior phase

The senior phase begins with grade 7 up to (including) grade 9. After the end of grade 9 students have a choice either to continue with the formal academic schooling up to grade 12, or to pursue further vocational training (North & Zewotir, 2006; EP-Nuffic, 2015:7).

2.5.1.2 Higher Education and Training

Higher education in South Africa can be classified into five categories, namely: Technical, Vocational, Education and Training (TVET); Private Institutions / Universities; Universities of Technology; Comprehensive Universities; and Traditional Universities as indicated in figure 2. For the purpose of this study, TVET institutions and private higher education institutions will not be considered further and the focus will be placed on public universities. The focal point in the study is the accountancy programmes offered at public universities.

There are 23 public universities in South Africa, which are made up of 11 Traditional Universities, 6 Universities of Technology and 6 Comprehensive Universities (DHET, 2015). These institutions offer a variety of qualifications that are ranked at different National Qualifications Framework (NQF) HEQF levels namely: Undergraduate diplomas and certificates (one year duration), undergraduate diplomas (three year duration), general academic first bachelors' degrees (three year duration), professional first bachelors' degrees (four years and more duration), post-graduate diploma, post-graduate bachelors' degrees, honours degrees, masters degrees and doctorate degrees (South African Accounting Association (SAAA) & International Association for Accounting Education & Research (IAAER, 2015).

Figure 2: The South African universities

South African Higher Educational Institutions

Technical and Vocational Educational Institutions

Traditional Universities
North-West University
Rhodes University
University of Cape Town
University of Fort Hare
University of the Free State
University of KwaZulu-Natal
University of Limpopo
University of Pretoria
Stellenbosch University
University of the Western Cape
University of the Witswatersrand

Comprehensive Universities

Nelson Mandela Metropolitan University
University of Johannesburg
University of South Africa
University of Venda
University of Zululand
Walter Sisulu University

Universities of Technology
Cape Peninsula University of Technology
Central University of Technology
Durban University of Technology
Mangosuthu University of Technology
Tshwane University of Technology
Vaal University of Technology

Source: DHET, 2015

Figure 2 shows all the public universities found in South Africa. Some of these institutions provide accountancy programmes to students at their own acceptance requirements which will be clearly discussed in tables 4 to 6. The latter tables will provide the different accountancy programmes and minimum entry under each type of university classification. The financial skills shortage is a dilemma in South Africa. To address the financial skills shortage in South Africa, it is thus important that the public higher education institutions be closely monitored regarding accessibility (Terblanche & De Clerq, 2015:38). The next section of the study shows the comparison of accessibility in the accountancy programmes offered at the public higher education institutions.

2.5.2   Accessibility of higher education

For South Africa to realise its optimal economic potential, it is important that an abundant number of accountants graduate each year to ease the shortages (Terblanche, 2014:20). The most common measures of accessibility in higher education are: Participation rate, Education attainment rate, Education equity index and Gender parity index (Terblanche, 2014:30; Usher & Medow, 2010:40; Usher & Cervenan, 2005:17).

There are different methods to calculate the participation rate namely: Gross Enrolment Rate, Net Enrolment, Net Entry Rate and Initial Participation Rate. The gross enrolment rate method is the most commonly used method and is used by international publications such as The European Union EU, United Nations Educational, Scientific and Cultural Organisation (UNESCO), the Organisation for Economic Co-operation and Development (OECD) and the World Bank (Terblanche, 2014:36).

Figure 3: The gross enrolments in the accountancy programmes in South African universities for the period 2009-2012
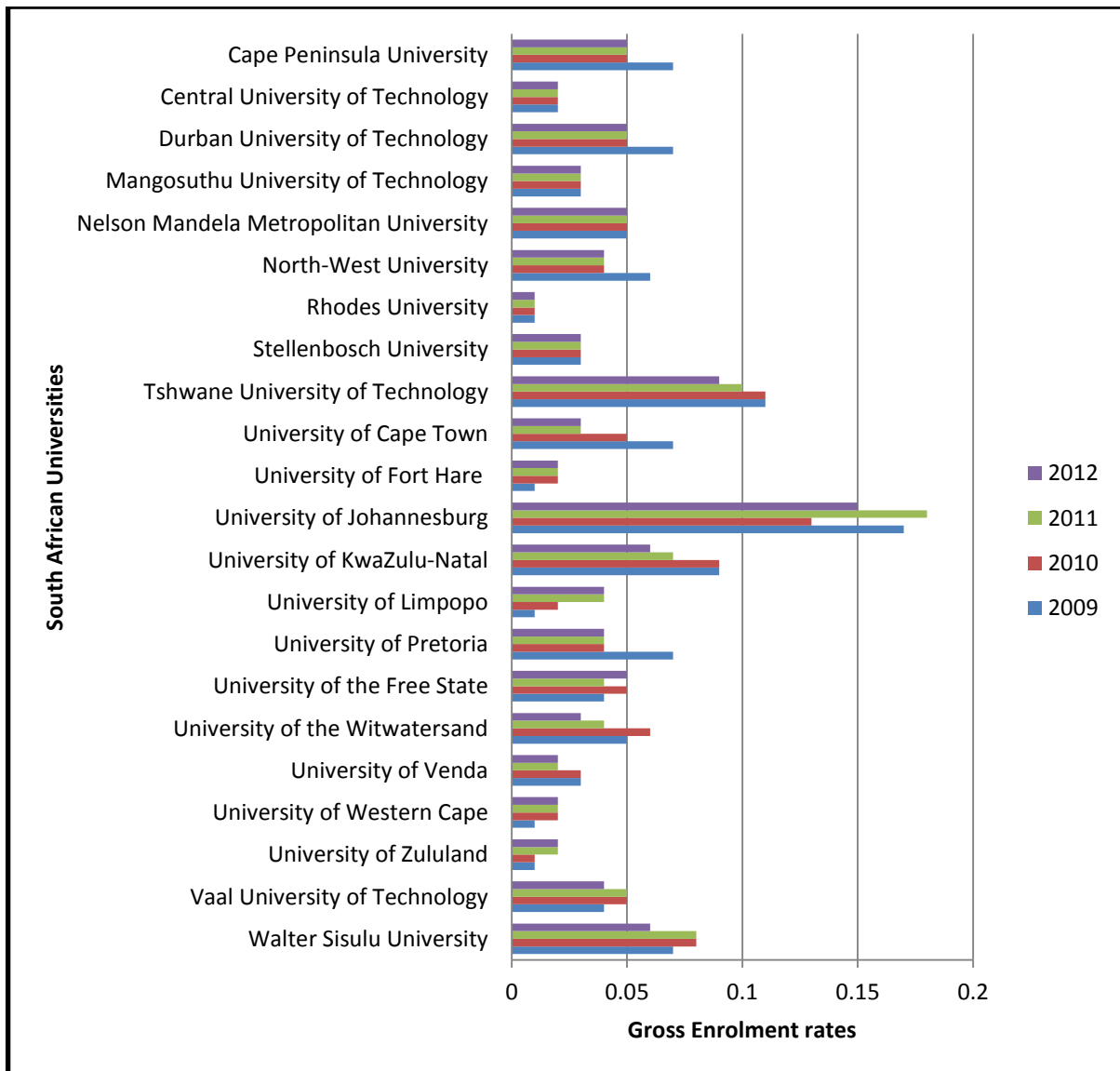
Source: Terblanche & De Clerq (2015:43).

The data used in figure 3 was obtained from the Department of Higher Education. Terblanche and De Clerq used the gross enrolment rates method to calculate the participation rate of students enrolled in the accountancy programmes in the South African public institutions. The gross enrolment rates were calculated by using the following formulae:

$$\frac{\text{Total number of headcount enrolments at each of the public universities in SA}}{\text{Population size in the } 20-24 \text{ year age interval in SA}} \times 100$$

and

$$\frac{\text{Total number of headcount enrolments of the public universities in SA in total}}{\text{Population size in the } 20-24 \text{ year age interval in SA}} \times 100$$

Figure 3 shows the enrolment rates in percentages over the period 2009-2012 in the accountancy programmes offered at the South African universities. UNISA is excluded from figure 3 as it operates differently from other universities. It is not purely based in South Africa and operates through a distance learning method. It will, however, be analysed on its own.

Rhodes University has the least headcount enrolments over the four-year period. The latter university has stagnant enrolments rates for the period 2009 to 2012 together with the Central University of Technology, Mangosuthu University of Technology, Nelson Mandela Metropolitan University and Stellenbosch University. The cause to the stagnant enrolment rates might be that the university can only accommodate a certain number of students in the accountancy programmes.

The Cape Peninsula University, Durban University of Technology, North-West University and University of Pretoria had the same enrolments rates in the last three years of the period and had the highest number of enrolments in 2009. This means that these universities did not accept students to their maximum capacity in the last three years.

The University of Fort Hare and the University of Western Cape had the same number of enrolments over the last three years of the period and their lowest in the year 2009. The university of Johannesburg, despite a decrease of about 6% in enrolments from 2009 to 2010, remains the best with student enrolments in the accountancy programmes. The second best university over the period 2009 to 2012 is Tshwane University of Technology. It has managed to +increase the number of student enrolments in the first two years and the next two years remained the same at 12%.

Figure 4: The accountancy programmes gross enrolments at UNISA for the period 2009-2012
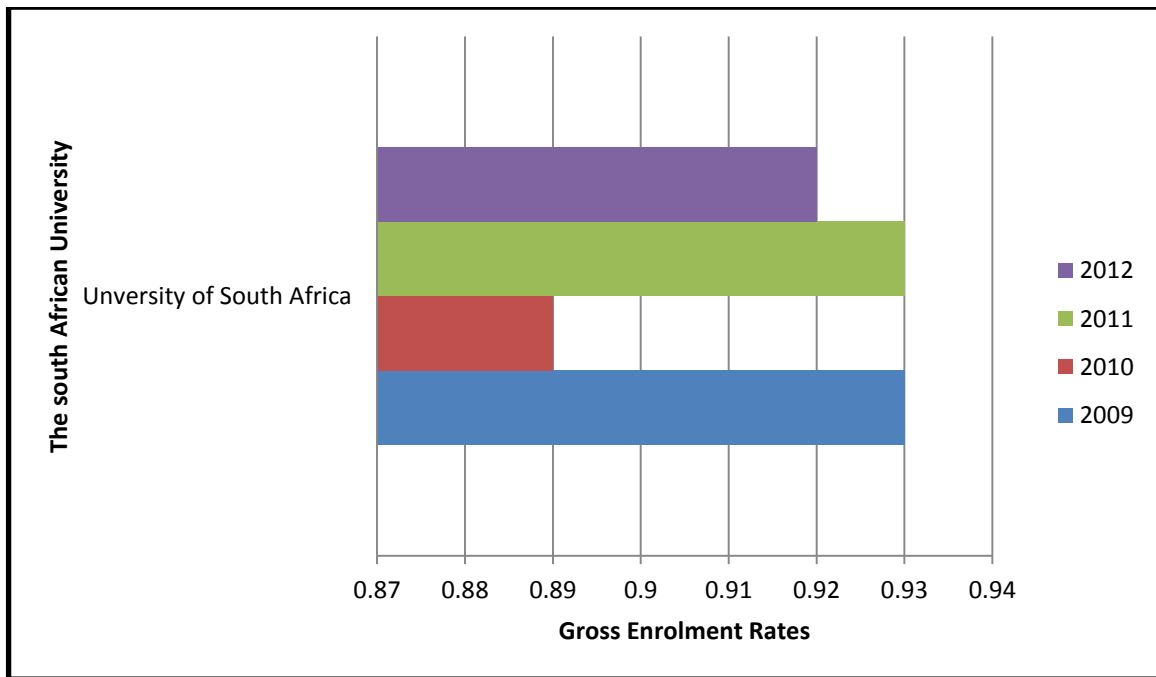
Source: Terblanche & De Clerq (2015:43).

UNISA is the only university that operates internationally. The university accepts students that are not physically in the country. The latter is, therefore, the result of the high number of student enrolments. The student enrolments ranged from 89% to 93%.

The overall headcount over the years 2009 to 2012 had a decline; this may be the consequences of students not performing well in their enrolled courses to qualify them into accountancy programmes at the universities. Even though UNISA has kept high headcount rates over the years contributing with thousands of students to the statistics, however, the overall statistics are showing a slight decline. This may be further investigated to identify the factors influencing the decline in enrolments. The graduation rates will be discussed next with the comparison to the enrolment rates.

The graduation rates were therefore measured by using methods from the educational attainment rate. The methods used to calculate the education attainment rate are the level of attainment, graduation rates, estimate graduation in lifetime and estimate graduation in a given period of time. Terblanche and De Clerq (2015:45) used the graduation rates in order to calculate the educational attainment rate; the method was used because the other three methods had limitations

such as the specific age cohort data over a period. To calculate the graduation rates amounts the following formulae were used:

$$\frac{\text{Total number of graduates at each of the public universities in SA}}{\text{Total number of all headcount enrolments at each of the 23 public universitties in SA}} \times 100$$

and

$$\frac{\text{Total number of graduates at the public universities in SA}}{\text{Total number of all headcount enrolments at each of the 23 public universitties in SA in total}} \times 100$$

The formulas were used to calculate the graduate rates whose results are reflected in figure 5. The graduation rates were from the period 2009 to 2012 and were only accountancy related programmes.

Figure 5: The accountancy programmes graduation rates of public universities for the period 2009-2012
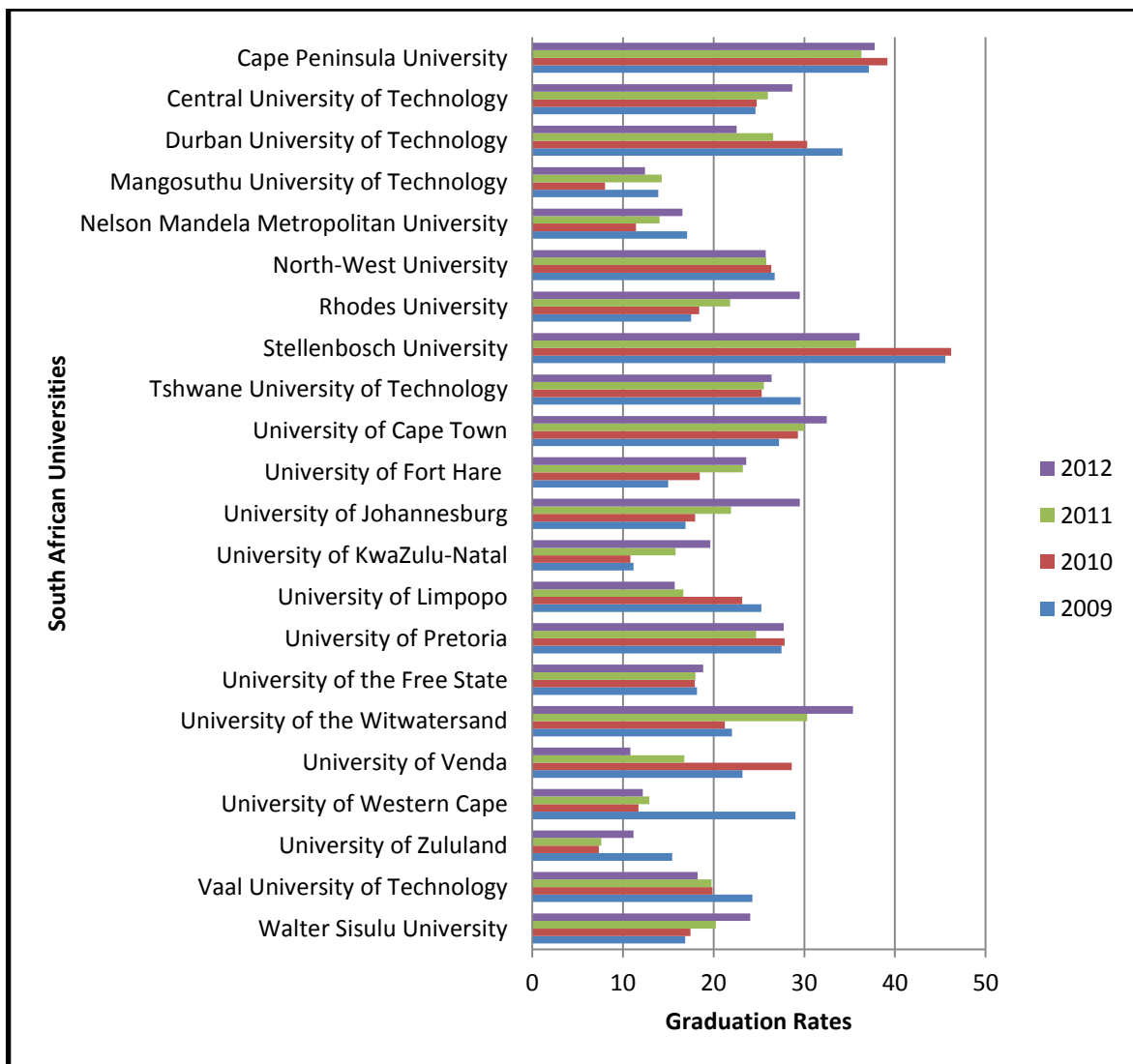
Source: Terblanche and De Clerq (2015:46).

Figure 5 indicates the graduation rates over the period 2009 to 2012. The results show higher percentages of graduation rates compared to the headcount enrolments over the same period. The overall graduation rates had a slight increase of 0.69% from 14.96% in 2009 to 15.65% in 2012. Cape Peninsula University remained the best performing university on average over the period. The latter had its best years in 2011 and 2012. Stellenbosch University was the highest performing university in the years 2009 and 2010. The following universities had an increase of graduation rates over the period: the Central University of Technology, University of Fort Hare, University of Johannesburg, University of Western Cape and Walter Sisulu University. The University of Johannesburg and the Witwatersrand University had its great increase in 2012.

The Durban University of Technology, University of Limpopo and University of Venda had decreased graduation rates over the period 2009 to 2012; North-West University had a minimal decrease each year of the period.

Figure 6: The accountancy programmes graduation rates at UNISA for the period 2009-2012.
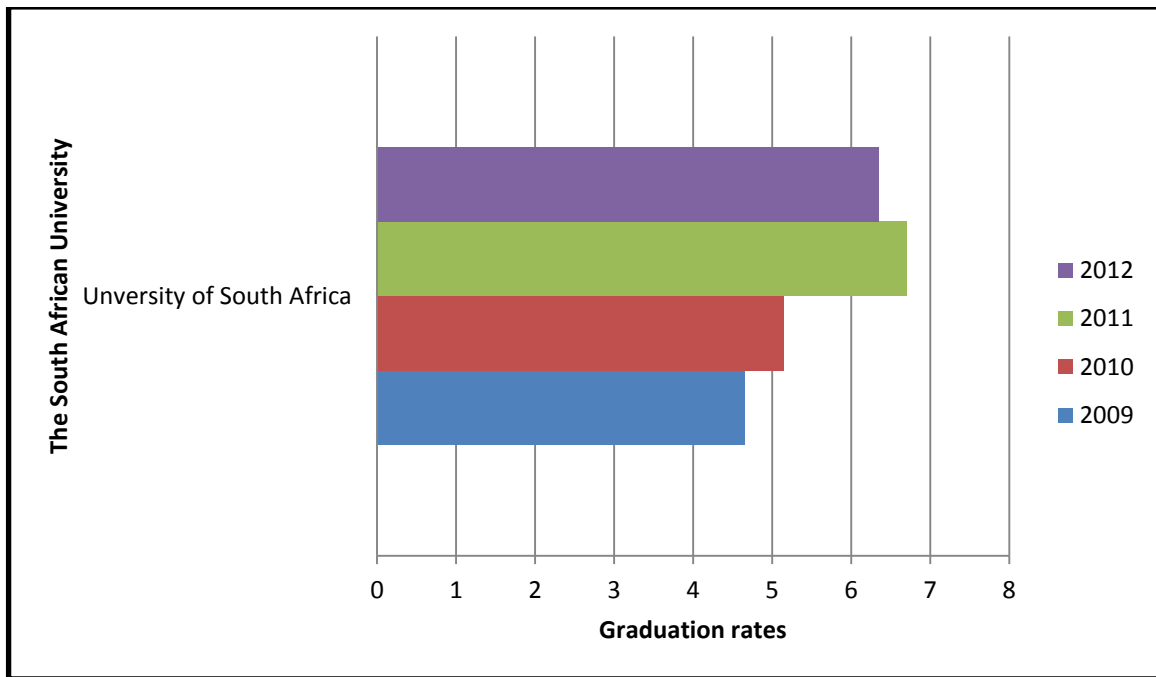
UNISA had the greatest percentage of headcount enrolments but the graduation rates results are however not complimenting; it has the lowest graduation rates compared to other universities that had the high number of enrolments. It provides access to accountancy programmes to many students, but cannot produce a high number of graduates to help ease the demand for financially skilled professionals. Though the enrolments decreased in 2010, it still managed to have about a 0.4% increase from 2009. The biggest increase comes in 2012 where it had about 5.1% in 2010 and rose to about 6.8% in 2012. In 2011, the graduation rates decreased again. The correlation between the headcount enrolments and the graduation rates needs to match, some of the universities need to find strategies to increase the number of enrolments as they have the means to produce a great number of graduates, vice versa.

In this section, we saw that there was no match with the enrolment rates and the graduation rates. This matter can be further investigated. The section that follows deals with how new students are accepted in the accounting programmes at the South African universities.

2.5.3   Admission requirements to universities

Since 2008, the admission rating has changed from using the Swedish Point System to using the Admission Point Score. The Admission Point Score (APS) is a system that allocates point values to the levels of achievement obtained for applicants' Grade 12 subjects (NMMU, 2015). Each university has its admission requirements which will be discussed after explaining how universities calculate the APS.

Table 3: Admission Point Score

NSC Scale	APS Score
8 (90-100%)	8
7 (80-89%)	7
6 (70-79%)	6
5 (60-69%)	5
4 (50-59%)	4
3 (40-49%)	3
2 (30-39%)	2
1 (0-29%)	1

All universities use the same APS calculator, whereby each Grade 12 subject is weighed according to the NSC scale percentage and the corresponding APS score will be given. Some universities only use the total APS as a standard to accept students in the universities, whereas some require an overall APS and a certain level for each subject. The following tables indicate the admission requirements into accountancy programmes at all the 23 public higher education institutions.

i. Traditional universities

The traditional universities offer basic formative degrees such as Bachelor of Arts (BA), Bachelor of Science (BSc), Bachelor of Commerce (BCom) and Bachelor of Medicine and Bachelor of Surgery (MBChB), at postgraduate level offer honours degrees, and a range of master and doctoral degrees (DHET, 2012; Centre for Higher Education and Training (CHET, 2010). The table below shows the minimum entry requirements into the South African traditional universities' accountancy programmes.

Table 4: Minimum accountancy requirements at the traditional universities

University	Details
North-West University (NWU)	The university offers various accountancy programmes. To be accepted for the Forensic Accountancy programme a minimum APS of 36 with Mathematics and the language of learning at level 5 (60-69%). For the Chartered Accountancy programme a minimum of 30 APS score with Mathematics and Accounting at level 5 (60-69%). The Management Accountancy programme requires an APS of 30 with Mathematics at level 5 (60-69%). For the Financial Accountancy programme, a minimum APS of 28 with Mathematics at level 4 (50-59%) is required. The General Accountancy programme requires an APS of 24 and Mathematics at level 3 (40-49%). The university also provides extended programmes. The requirements for the Chartered Accountancy extended are an APS of 26 together with Mathematics at level 3 (40-49%). The Financial Accountancy extended programme requires an APS of 24 With Mathematics at level 3 (40-49%) or Mathematical literacy at level 7 (80-90%), the extended programmes require a level 4 (50-59%) in the language of learning (NWU, 2015).
Rhodes University (RU)	A minimum APS of 40 and above is required, with Mathematics at level 4 (50-59%). No Mathematical literacy is considered (RU, 2015).

University	Details
University Cape Town (UCT)	To be accepted at UCT the following is required: an APS of 48 with English (Home Language) at level 4 (50-59%) or English (First Additional Language) at level 5 (60-69%) and Mathematics at level 5 (60-69%) (UCT, 2015).
University of Fort Hare (UFH)	To qualify for a degree at UFH the minimum requirements are an NSC pass with a level 4 (50-59%) pass in four subjects. To qualify for a Diploma an NSC pass of four subjects in level 3 (40-49%) (UFH, 2015).
University Free State (UoFS).	There are different accounting programmes at this university. For the three-year programme, an acceptable APS of 30 with Mathematics and the official language of instruction at level 4 (50-59%). For the four-year programme Mathematics is acceptable at the level 4 (50-59%) and level 4 (50-59%) for the language of instruction (UoFS, 2015).
University of KwaZulu-Natal (UKZN).	The university offers a four-year programme and the minimum requirements include Mathematics at level 5 (60-69%) and English and Life Orientation at level 4 (50-59%). Applicants with a level 4 (50-59%) for Mathematics will be streamed into the foundation year (UKZN, 2015).
University of Limpopo (UL)	The university offers different accounting programmes. The Chartered Accountancy Programme is four years long with an APS of 30. The non-Chartered Accountancy stream requires an APS of 28. Both programmes require English and Mathematics at level 4 (50-59%). UL also offers an extended programme with an APS of 26 with English and Mathematics at level 4 (50-59%) (UL, 2015).
University of Pretoria (UP)	The university offers the BCom Accountancy programme with an APS of 35 as a minimum requirement (UP, 2015).
Stellenbosch University (SU)	The university offers different accountancy programmes. For the Chartered Accountancy programme, an NSC pass with level 6 (70-79%) pass for Mathematics or Mathematics at level 5 (60-69%) and Accounting at level 6 (70-79%). Both programmes require the Home Language and the First Additional Language to be

University	Details
	level 4 (50-59%).
	The Financial and Management Accountancy programmes require at least level 5 (60-69%) for Mathematics and level 4 (50-59%) for the Home language and the First Additional Language (SU, 2015).
University of Western Cape (UWC)	For the university Financial Accountancy requires an APS of 30 with level 4 (50-59%) for English, Mathematics and Accounting and level 3 (40-49%) for the additional language.
	For the Chartered Accountancy programme in addition to the above requirements, Mathematics is acceptable at level 5 (60-69%) (UWC, 2015).
University of Witwatersrand (WITS)	For the university's Chartered Accountancy programme an APS of 42 is required with English and Mathematics at level 5 (60-69%).
	In addition to the above requirements, for the non-Chartered Accountancy programme an APS of 37 is required (WITS, 2015)

ii. Universities of Technology

The Universities of Technology offer mainly vocational or career-focused undergraduate diplomas and Bachelors of Technology which serve as a capping qualification for diploma graduates. Offers of masters and doctorate programmes are limited in number (DHET, 2012; Centre for Higher Education and Training (CHET, 2010). Below is a table showing the minimum entry requirements into the Universities of Technology accountancy programmes.

Table 5: Minimum accountancy requirements at the universities of technology

University	Details
Cape Peninsula University of Technology (CPUT)	To be accepted at this university the following are the minimum requirements, at least level 4 (50-59%) in at least four NSC subjects.
	For the National Certificate Vocational (NCV) the minimum requirements are English, Life Orientation, Mathematics at level 4 (50-59%) or Mathematical Literacy at level 5 (60-69%), in addition at least four vocational subjects at level 5 (60-69%)

University	Details
	(CPUT, 2015).
Central University of Technology (CAT).	The following are the minimum requirements for this university accountancy programmes, an APS of 22, Accounting, English and Life Orientation at level 4 (50-59%) (CAT, 2015).
Durban University of Technology (DUT).	To be accepted at DUT, a level 4 (50-59%) is required for English (additional language) and Accounting, level 3 (40-49%) for English (Home language) and Mathematics and level 5 (60-69%) for Mathematical Literacy (DUT, 2015).
Mangosuthu University of Technology (MUT).	This university accepts an NSC pass. N3 pass with English and Mathematics at level 4 (50-59%) (MUT, 2015).
Tshwane University of Technology (TUT)	The acceptance requirement at TUT to their accountancy programmes are an APS of 24, English and Accounting at level 4 (50-59%) and Mathematics at level 3 (40-49%) or Mathematical Literacy at level 4 (50-59%) (TUT, 2015).
Vaal University Technology (VUT).	This university also offers different accounting programmes, for the Financial Informatics Systems an APS of 26 is required with English and Mathematics at level 4 (50-59%) and Life Orientation at level 3 (40-49%). For the Cost and Management Accounting and Internal Auditing an APS of 25 with Mathematics and APS of 26 with Mathematical Literacy. English and Mathematics at level 4 (50-59%) and Mathematical literacy at level 3 (40-49%). For both programmes, it is required that in addition subjects should total an APS of 11 (VUT. 2015).

iii.   Comprehensive University

The Comprehensive Universities offer programmes typical of both the university as well as programmes typical of universities of technology (DHET, 2012; Centre for Higher Education and Training (CHET, 2010). Below is a table indicating the minimum entry requirements for the Comprehensive Universities accountancy programmes.

Table 6: Minimum accountancy requirements at comprehensive universities

University	Details
Nelson Mandela Metropolitan University (NMMU)	NMMU requires an APS of 32 with level 3 (40-49%) for the home language and First Additional Language. Level 4 (50-59%) for Mathematics and level 6 (70-79%) for Mathematical Literacy.
	An average of 60% for those who obtained a higher certificate in accountancy.
	Degree Admission Points Score of 38. Minimum NSC requirements for degree entry must be met. English, Afrikaans or isiXhosa (home language or First Additional Language) on at least level 3 (40-49%). NSC achievement rating of at least 5 (60-69%) for Mathematics (NMMU, 2015).
University of Johannesburg (UJ)	For the Bachelor of Accounting (CA) an APS of 35 is required with level 5 (60-69%) for Mathematics, level 4(50-59%) for the language of learning and two additional subjects, level 3 (40-49%) for Life Orientation and any additional subject, level 2 (30-39%) for an additional language.
	For the non-Chartered Accountancy programme, an APS of 30 is required with level 4 (50-59%) for the language of learning, Mathematics and two additional subjects, level 3 (40-49%) for Life Orientation and one additional subject.
	For the extended programme an APS of 27 with Mathematics is required and an APS of 30 with Mathematical Literacy is required. Also language of learning and two additional subjects at level 4(50-59%), Mathematics at level 3 (40-49%) or Mathematical Literacy at level 6 (70-79%).
	For those enrolled for a Diploma an APS of 22 with Mathematics at level 3 (40-49%) or APS of 24 with Mathematical Literacy at level 5 (60-69%). Also language of learning should be at a level of 3 (40-49%), Additional language at level 2 (30-39%), Life Orientation and two additional subjects at level 3 (40-49%) and two additional languages at level two (30-39%) (UJ, 2015).

University of South Africa (UNISA)	To qualify for a diploma in accountancy at UNISA the following is required, 50% pass rate in the language of learning and Mathematics. To qualify for a degree a minimum of 50% is required for the language of learning and 60% for Mathematics (UNISA, 2015).
University of Zululand (UNIZULU)	The acceptance requirements at the university are an APS of 24, Mathematical Literacy at level 3 (40-49%) and English at level 4 (50-59%). The university does offer extended programmes but only for those who completed matric before 2008 (UNIZULU, 2015).
Walter Sisulu University (WSU)	To qualify for the Chartered Accountancy stream in WSU an APS of 32 with English and Mathematics at level 5 (60-69%) are required. To qualify for the non-Chartered Accountancy degree, an APS of 28 with English and Mathematics at level 4(50-59%) are required. The minimum requirements for a Diploma in accounting require that all subjects should be passed at level 3(40-49%). For the NCV the minimum requirements are 50% pass rate in three fundamental subjects and Mathematics, 60% pass rate in the language of learning and 70% in Mathematical Literacy (WSU, 2015).

In this section, the admission requirements at the South African universities were presented. The following section presents the comparative admission requirements in other countries.

2.6   COMPARATIVE ANALYSIS WITH OTHER COUNTRIES

Rotberg (2006:60) reported the following on the schooling systems for some countries:

- England has a tradition of administering examinations at age 16 to determine which students will move on to the A-level (advanced level) in secondary schools. The examination results, therefore, determine if the students will attend university.
- Germany has a stratified education system which is divided into three types namely: Gymnasium, Realschule and Hauptschule. This system tracks students from grade 5. Gymnasium provides an academic, university education; Realschule provides a general and vocational education which occasionally permits students to transfer to Gymnasium, and the Hauptschule provides a lower level general and vocational education that results in unemployment. Placement is determined by parents and teachers. Students who attend

Gymnasium through to grade 13 receive a school leaving certificate called Abitur which provides access to universities after passing the final examination.

- China uses national exams as a way to ensure objectivity and avoid favouritism that might occur if the system permitted greater subjectivity in university admission decisions.

- In his report Agnew (2010, 90) stated that in New Zealand a successful year 12 accounting completion had an enduring positive for all university grades and there is a correlation between high school accounting education performance and first year tertiary accounting performance since the first year tertiary curriculum and the secondary accounting curriculum are closely aligned.

- There are different high school rating systems. For instance South Africa uses the APS and other countries use systems such as the Cambridge system which has the following ratings O/IGCSE-level (Ordinary level and International General Certificate of Secondary Education), A-levels or AS-levels (Advanced levels or Advances Subsidiary levels);

IB HL/SL (International Baccalaureate Higher Level or Standard Level) and the NSSC HL/OL system (Namibian Higher Secondary School Certificate Higher Level or Ordinary Level). The table below will show how a student from another country with the above rating systems would be accepted at a South African university. Table 7 shows how each level weighs against the South African APS.

Table 7: The conversion table

Conversion Table										
APS	Scale	Senior Certificate HG	Senior Certificate SG	NSSC HL	NSSC OL		AS level	A level	IB HL	IB SL
					Grade 11	Grade 12				
10								A	7	
8	(90-100%)							B	6	
7	(80-89%)	A		1		A	A	C	5	7
6	(70-79%)	B	A	2		B	B	D	4	6
5	(60-69%)	C	B	3	A	C	C	E	3	5
4	(50-59%)	D	C	3.5	B	D	D		2	4
3	(40-49%)	E	D	4	C	E	E		1	3
2	(30-39%)	F	E		D/E	F				2
1	(0-29%)	G	F		F/G	G				1

Source: NWU, 2015.

The Senior Certificate was a South African National Senior Certificate for those who completed matric in 2008 and before. The senior certificate was divided into Higher Grade and Standard

Grade. The strict admission requirements could limit the number of students who attended university and consequently affected the number of financially skilled individuals.

In the next section, the shortage of financially skilled individuals are highlighted and further stressed.

2.7   SHORTAGE OF PROFESSIONAL ACCOUNTANTS

In an article written by Pato and Spira (in SAICA, 2008), the SAICA executive presidents said "The future looks bleak, given especially that economic growth is so reliant on people in the financial occupations. We are actively seeking solutions" (SAICA, 2008). Before one can understand why there is a shortage of professional accountants, you need to understand firstly how qualifications are obtained. It can be through a university or a university of technology. The table below indicates the total number of years a student needs to invest to qualify ultimately as a Chartered Accountant in South Africa.

Table 8: Different approaches to qualify as a Chartered Accountant

BCom in Accounting degree		Diploma in Accounting	
Course	**Duration**	**Course**	**Duration**
1. BCom / BAcc	3 years	1. Diploma	3 years
2. BComHons / CTA	1 year	2. Advance Diploma	1 year
3.Serve Articles	3 years	3.BCTA	1 year
		4. CTA	1 year
		5.Serve articles	3 years
Total Years	7 years	**Total Years**	9 Years

Source: SAICA, 2015

A student pursuing Chartered Accountancy studies needs to invest a great deal of time and financial resources (Sekhukhune, 2006:29) in their studies. From the information in table 8 it can be concluded that it takes a minimum of 6 to 7 years to be a qualified Chartered Accountant via university and up to 9 years to be a qualified Chartered Accountant by studying from a university of technology. On completion of Certificate in the Theory of Accounting (CTA) the student qualifies to write their first board exam and the next board exam will be written after completion of 18 months, of the 36 months, of practical training at a training office registered at the SAICA. On completion of the training and the board exams, the candidate will now be regarded as a

Chartered Accountant. This results in a shortage of Chartered Accountants as many students may not have the patience and resources to complete the programme. The following table illustrates the steps to follow to be a SAIPA accredited professional accountant.

Table 9: Different approaches to qualify as a Professional Accountant

Academic Requirements		
Course		**Duration**
1. Bachelor of Commerce		3 years
Total		3years
Practical requirement		
2. Three years learnership training at an Accredited Training Centre.	Or Six years' experience based on institute's official training logbook verified by employers	Or training programme from other accredited professional training bodies such SAICA, CIMA
Total years	6 years	9 years	6 years

Source: SAIPA, 2015

The table above illustrates the steps to follow to qualify as a professional accountant. The student needs to enrol and obtain the Bcom accounting degree that is SAIPA accredited. On completion of the qualification, the candidate will have to seek training with the right service provider over a three year period. Once the training is completed, the candidate will qualify for the qualifying board exam and if successful the candidate will be regarded as a professional accountant.

Table 10: Steps to qualifying as a Chartered Management Accountant

Programme	Duration
Bachelor of Commerce	3 years
Exams	1 year or more
Three years practical training	3 years
Total number of years	**7 years**

Source: CIMA, 2015

To qualify as a CIMA professional accountant or Chartered Global Management Accountant, a candidate needs to complete a business or accounting degree that is CIMA accredited. Upon completion of the qualification, 11 exemptions will be given (from the certificate, operational and management levels). This leaves the three strategic level papers plus the case study to be completed. This would result in a total of five papers to be completed as follows:

- Gateway assessment
- Enterprise strategy
- Performance strategy
- Financial strategy
- Professional competence level Part B (case study).

If successfully completed together with the success of three years practical training, the candidate obtains the status of a CIMA professional accountant.

These steps to follow in order to qualify as a professional accountant take almost the same period of years, approximately seven years to be fully qualified.

2.7.1   Other factors influencing the shortage of professional accountants

The next few sections elaborate on other factors contributing to the shortage of financially skilled individuals.

2.7.1.1   School related matters

Accounting and Mathematics

Güngörmüş and Uyar (2011:141) found having studied high school accounting, and mathematics in high school is an important predictor of performance. They found a positive correlation between students' class attendance and performance (Güngörmüş & Uyar, 2011:141; Javaraza *et al.,* 2013:288). In a study performed by Gul and Fong (1993:36) in Hong Kong on first year accounting students it was established that the predictors of academic achievement were personality type, grades achieved at high school in mathematics and accounting. A poor level of training in accountancy at school contributes to the school related matters (Sadler, 2003:27). Another challenge is that students were allowed to take accounting and maths literacy at school and when they reach university they are initially not allowed in the three year programmes and settle for Humanities (Higher education and training, 2011).

Other

Joubert (2010:53) found that language influences student academic success as some students have difficulty solving accounting problems because of reasons such as ineffective reading skills and strategies, inability to apply knowledge to solve a problem; these are mostly experienced by students who had English as their first, second or third additional language. Terblanche and De Clerq (2015:40) add that high tuition costs, lack of sufficient financial aid to students also lead to inaccessibility of accountancy programmes which results in the financial skills shortage. The delay also contributes to the shortage of financially skilled people.

The above references indicate that the school related factors contributing to the financial skills shortage cannot be controlled by the higher education institutions but can help diminish these factors by introducing career workshops at schools to learners as soon as they begin their Grade 8 or Grade 9 education. This will make it better for them to start choosing the right subjects in Grade 10 to begin their career.

2.7.1.2   Career related and other factors

Yusoff *et al.* (2011:58) state that the shortage of professional accountants is due to the low starting salaries, difficulty to fill in the membership form, high cost of membership, no added benefits and lack of ambition since a career is a long process. Sadler (2003:27) added the following to the problems faced while studying towards their qualification: (i) Language problems: tests, assignments and examinations have to be written in English; (ii) Little support given from employers concerning respondent studies; (iii) Learning environment not conducive to effective learning. The other factors contributing to the shortage of accountants (specifically black accountants) are that they experience considerable financial pressure from their families upon completion of their undergraduate studies (Sadler, 2003:19). From the above it can be concluded that career related factors affect everyone enrolled in higher education somehow. These can be taken as the stumbling blocks on the road to success. This study does not focus on these factors.

2.7.1.3   Biographical backgrounds

The biographical factors are known as the age and ethnicity. Below these biographical factors will be discussed.

Age: According to Du Plessis *et al.* (2005:696) students older than 30 are less likely to succeed than students between 17 and 30 in their accounting studies. To the contrary, Joubert (2010:65)

stated that older students who pay for their tuition and do not want to waste money work harder to succeed. This is, therefore, inconclusive in saying there is a relationship between age and academic success because it is up to an individual to perform up to their best capacity.

Ethnicity: Ethnicity as a predictor of academic success is a sensitive and controversial issue in the South African context (Joubert, 2010:66). Other authors disagree with Joubert and have written on ethnicity. Most South African universities state that the throughput rates for black students are rather low because of reasons such as: (i) Black students are less financially literate than their white university mates; (ii) Black students do not write in their first or second languages; (iii) Social issues such as family responsibilities; and (iv) the lack of exposure to computers (De Clerq & Venter, 2009:50; Sadler & Erasmus, 2005:33).

Most universities in South Africa battle with lower throughput rates for black students (Sadler & Erasmus, 2005:35). Some of the reasons cited are that black students do not write examinations in their first or second languages, social issues such as family responsibilities, not having the luxury to study full time, and a lack of exposure to computers (Sadler & Erasmus, 2005:36). De Clercq and Venter (2009: 55) also found that black Chartered Accountants students are significantly less financially literate than their white university mates.

Other general factors influencing student achievement are, for example, motivation and finances. The factors that influence students to be financially skilled professionals according to De Villers and Van Zyl (2011:63) are:

- The influence of other professionals: The influence of other individuals who are already qualified can change the mind-set of a student to achieve the goals.
- Potential earnings after qualification are obtained: Remuneration plays a role in motivating one to achieve all their academic objectives.
- Employment availability: The trends show that there will always be a need for individuals who possess financial skills; this provides the chances of employability and job security.
- Influence of social status: This is because of the social acceptability and the status of being respected and accepted in personal and professional capacity.

2.8   SUMMARY

In this chapter, the background of the financial skills shortage issue was provided whereby, the accountancy profession is discussed regarding the education needed, training and overall period of years to invest to qualify as a professional accountant.

The literature on the definition and the scope of the accountancy professions were provided. This chapter also elaborated on the demanding requirements and training to finally qualify as a professional accountant in South Africa. Furthermore, the literature on the education system in South Africa and the admission requirements to the universities in South Africa were also investigated.

It was stated that the accountancy profession is broad and has different competencies to it. The core competencies of the accountancy profession are Audit, Financial Accounting, Financial Management, Management Accounting, Taxation and Strategy, Risk Management and Governance. This means after the completion of the accountancy studies and training; one has a choice on which competency to focus on and practice its profession.

Before one can qualify as a professional accountant, time, money and other resources need to be invested. About four years of studies, three years of training and efforts put in the qualifying examinations need to be planned for. It is a difficult process that needs finances, support and hard work.

For a student who has a vision to be a university student and ultimately become a professional accountant, it begins with the high school education. South Africa universities use high school examination results or equivalent as a scale to accept learners. The South African universities use the Admission Point Score as a measure of their requirements to the accountancy programmes. Some universities have additional requirements such as Grade 12 Accounting, English and Mathematics. Requirements differ according to each university and country. From the literature review, various factors have been identified as the influencers to the academic success of accountancy programmes. The identified factors have therefore been used as objects of the empirical study presented in Chapter 4. The method of how the research will be undertaken is discussed in the next chapter, chapter 3.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

Through an overview of the financial skills shortage, Chapter 2 identified the possible indicators of academics success in order to bridge the financial skills shortage in South Africa.

The purpose of Chapter 3 is to provide the reader with an understanding of the research methodology used in this study. The term research methodology is defined as an approach to the process of the research encompassing of a body of methods (Collis & Hussey, 2014:342). According to Mouton (2001:55) it is a plan or blueprint of how you intend on conducting the research (Mouton, 2001:163).

To showcase how the research methodology was developed to answer the research questions formulated in Chapter 1, the research paradigms used in the study will be discussed first followed by the research approaches and design. The design will include explanations of the target population, the sampling frame as well as the sampling method and size. This is followed by a discussion on how the relevant data was obtained and analysed. Finally, the reliability and validity of the data obtained will be presented as well as the necessary ethical considerations in conducting research.

3.2 RESEARCH PARADIGMS WITHIN SOCIAL SCIENCES

Philosophy means the use of abstract ideas and beliefs that inform our research (Creswell, 2013:16). Social science research is broadly viewed as providing substantial benefits to individuals and local, regional, national and international communities (Smith, 1998:3). Research in social sciences is often conducted in situations where you cannot select the kinds of samples used in large-scales. It is the observation of social life for the purpose of finding and understanding patterns among what is observed.

The study will focus on the factors that influence the students' academic success and the main focus will be on the results/marks. To meet the objectives, it is important to explore the philosophical paradigms used in the study. According to De Vos *et al*. (2011:5) there are seven paradigms to social sciences research namely Positivism, Post-positivism, Constructivism, Interpretive approach, Critical approach, Feminism and Postmodernism. There are some research

paradigms but for the purpose of this study only the two main research paradigms, positivism and interpretivism, will be focused on. These two paradigms are a complete opposite of each other.

A research paradigm is a general organising framework for the theory and research that includes basic assumptions, key issues, models of quality research and methods for seeking answers (Neuman, 2011:9). Terhoeven (2009:45) defines the research paradigm as a world view that includes certain philosophical assumptions about the nature of knowledge. Babbie (1999:3) defines the research paradigm as the measurement and analysis techniques employed within the logical systems of research methods. Therefore, the research paradigms are guiding factors used in the study to create an understanding of something.

Positivism's only objective is to base the science on observable facts (Maree & Van Der Westhuizen, 2009: 21). Collins and Hussey (2014:343) define positivism as a paradigm that rests on the assumption that social reality is singular and not affected by the act of investigating it. Positivism involves the belief that there is a real world available for study through scientific means similar to those developed in the physical sciences (Gall *et al*., 2009:15). Neuman (2000:66) stated that positivist researchers emphasize "precise quantitative data" that are gathered by carefully analysing experiments, surveys and statistics: they employ exact measures by carefully analysing numbers for their measures. Juma'h (2006:90) explains that positivism is a theory of knowledge that allows statements that are based on empirical data collected through experience.

Interpretivists believe that the subject matter of the social sciences is fundamentally different from that of the natural sciences (De Vos *et al.*, 2011:311). An interpretivist researcher is of the assumption that reality can only be accessed through social constructions but is not limited to language and the shared meaning that people assign to it (Maree, 2007:59). Henning *et al.* (2004:20) stated that interpretive researchers encourage a variety of data and different sources and analytical methods because the measurement is fallible. The interpretive studies require the researcher to go beyond simply describing or explaining what a phenomenon is also to interpret the phenomenon to the reader (McNabb, 2010:229).

There are two main philosophical assumptions that differentiate the research paradigms; these assumptions are the ontology and epistemology (Saunders *et al*., 2000:200; Neuman, 2011:91).

Neuman (2011:100) refers to ontology as an area of philosophy that deals with the nature of being, the philosophy that asks what is and what the fundamental categories of reality are. Also

he refers to epistemology as an area of philosophy concerned with the creation of knowledge which focuses on how we know what we know or what are the most valid ways to reach the truth. Gray (2009:17) adds that ontology is the study of being, the nature of existence while epistemology provides a philosophical background for deciding what kinds of knowledge are legitimate and adequate. Terre Blanche and Durrheim (1999:7) add that ontology specifies the nature of reality that is to be studied and what can be known; epistemology specifies the nature of the relationship between the researcher and what can be known. Bryand and Hanekom (2008:4) define ontology as the study of reality and the improvement of the understanding of phenomena in the social world by the generation of knowledge regarding the nature of being.

Therefore, ontology refers to what exists in life and epistemology refers to what the knowledge means. A comparison between the two philosophical assumptions is set out in table 11.

Table 11: The ontological and epistemological dimensions of positivism and interpretivism paradigms

Ontological dimensions	Epistemological dimensions	Relationship between researcher and the study
Realist: external reality is stable.	Positivist (modern)	Research is objective and a detached observer.
Nominal: respondents' internal and subjective experiences are important.	Interpretive (postmodern)	The researcher is empathetically and inter-subjectively immersed in the research.

Source: Maree and Pietersen (2014:33)

The main beliefs of positivism are adopted because the positivism is a theory of knowledge which allows statements that are based on empirical data; the positivists hold a deterministic philosophy in which causes determine effects or outcomes (Creswell, 2014:7). The researcher's will is unbiased and has no personal attachment or conflict of interest to the study and the outcomes. The main objective of the study is to establish whether the university admission requirements accurately predict the academic success of the accountancy programmes. This will be done using a statistical analysis of student records obtained from the university. This study is, therefore, performed within the boundaries of the positivism paradigm.

3.3   TYPES OF RESEARCH APPROACHES

There are three recognised approaches for the procedures for conducting research namely quantitative, qualitative and mixed methods (Maree & Van der Westhuizen, 2013:261). De Vos *et al*. (2011:66) deduced that the quantitative approach takes the epistemological roots in positivism and the qualitative approach takes the epistemological roots in interpretivism.

Quantitative research designs are either experimental or non-experimental studies. McMillian and Schumacher (2014:29) define the quantitative research method as a design that emphasises objectivity in measuring and describing phenomena. As a result, maximise objectivity by using numbers, statistics, structure, and control. De Vos *et al*. (2011:65) mention the quantitative approach is used to answer the questions about relationships among measured variables with the purpose of explaining, predicting and controlling phenomena. According to Maree and Pietersen (2014:263) in a quantitative research study, the investigator relies on numerical data to test the relationships between the variables. Therefore, the quantitative approach in research involves data that is quantitative in nature and is analysed through statistical methods.

The qualitative approach according to De Vos *et al*. (2011:65) is used to answer questions about the complex nature phenomena, with the purpose of describing and understanding the phenomena from the participants' point of view. Also, McMillian and Schumacher (2014:30) mention the qualitative research design as systematic but with emphasises on gathering data on naturally occurring phenomena. Maree and Van der Westhuizen (2013:265) state that qualitative research is an inquiry process of understanding where a researcher develops a complex, holistic picture, analyses words, reports detailed views of informants and conducts the study in a natural setting. Therefore, the qualitative approach explores and attempts to understand an occurrence that is difficult to understand or explain.

The mixed methods research builds on both quantitative and qualitative approaches. The mixed method approach includes, at least, one quantitative and one qualitative element, whereby neither type of method is inherently linked to any particular inquiry paradigm (Gray, 2009:199). The mixed method involves combining of qualitative and quantitative research and data in a research study because the qualitative data tends to be open-ended without predetermined responses while quantitative data includes closed-ended responses (Creswell, 2014:14). Creswell and Plano (2007:4) define mixed methods as a research design that uses both the quantitative and qualitative methods and can assume worldviews.

The differences in the two research approaches will be listed in table 12.

Table 12: The differences of the two main research approaches

Quantitative research	Qualitative research
Researchers test the hypothesis that is stated at the beginning.	Researchers capture and discover meaning once they become immersed in the data.
Concepts are in the form of distinct variables.	Concepts are in the form of themes, motifs, generalisations and taxonomies.
Measures are systematically created before data collection and are standardised.	Measures are created in an ad hoc manner and are often specific to the individual setting or researcher.
Data are in the form of numbers from the precise measurement.	Data are in the form of words and images from documents, observations and transcripts.
The theory is largely causal and is deductive.	Theory can be causal or non-causal and is often inductive.
Procedures are standard and replication is frequent.	Research procedures are particular and replication is very rare.
The analysis proceeds by using statistics, tables or charts and discussing what they show relates to the hypotheses.	The analysis proceeds by extracting themes or generalisations from evidence and organising data to present a coherent, consistent picture.

Source: Neuman (2011:174)

This study is based on positivism with a quantitative methodology since relationships between variables and success in accounting studies are investigated. Quantitative data can be captured at various points in time, in different contexts and is associated with a positivist methodology and results in findings with a higher degree of reliability (Collis & Hussey, 2014:131). According to Saunders *et al.* (2007:151), the positivist is more likely to follow a deductive research approach and the following are the characteristics of deductive research:

- The researcher is likely to make use of a very structured research methodology to enable others to replicate the research.

- In this study, the methodology is based on the literature review and the empirical findings used to lay a foundation for measuring the predictors of academic success leading to the shortage of financial skills in South Africa.

- The researcher should be seen as independent from the research.

  - All the data used and/or analysed in this study is done in a way that the research is independent and free from biasness.

- Concepts should be operationalized to allow facts, figures and data collected to be measured quantitatively.

  - The concept of the financial skills shortage in South Africa as mentioned and understood by other researchers was done in Chapter 2, and Chapter 4 will provide the statistical results and figures from the data collected.

The research approach used in this study is, therefore, a quantitative approach and emphasises the deductive approach as explained above with the characteristics. The quantitative research approach will aid in achieving the empirical research objectives as stated in Chapter 1.

3.4   RESEARCH DESIGN

The research design is a plan or blueprint of how you intend conducting the research (Mouton, 2001:55). It is the overreaching plan for the collection, measurement and analysis of data (Gray, 2009:131). Research design is the plan according to which we interact with research participants and collect information from them (Welman *et al.,* 2005:52). The design process for this study primarily includes the target population, sample frame, sample size, sampling methods, data collection methods and instruments of the study. Each of these design elements, and how these relate to this study will be discussed next.

3.4.1   Target population

McMillian and Schumacher (2014:5) define population as a group of individuals or events from which a sample is drawn and to which results can be generalised. According to Zikmund *et al*. (2013:387), it is essential to define the target population as it gives the researcher direction on where to find proper sources from which appropriate data can be collected. The population is defined as the total number of possible units or elements that are included in the study (Gray,

2009:148). The population is, therefore, the total number of units used as sources of data. The population is referred to in this study is all the students registered for the years 2012, 2013 and 2014 in accounting programmes at all the 23 South African Higher Education Institutions.

3.4.2 Sample frame

A sample frame is a record of the population from which a sample can be drawn (Collis & Hussey, 2014:344). Loseke (2013:105) defines a sample frame as the process of developing a probability sample which must begin with a list of every element in the population. The sample frame is a list of population elements and sometimes the sample frame can be larger than the population (Gray, 2009:148). A sample frame is the actual list of sampling units from which the sample is selected (Babbie, 1999: 201). A sample frame is, therefore, a record of all possible elements of the population. The sample frame for this study is all three campuses of a South African University. These students are registered in all the accounting programmes offered by the institution and were registered as third years in the years 2012, 2013 and 2014. The figure below indicates from where the sample is drawn.

Figure 7: Process of selecting a sample frame
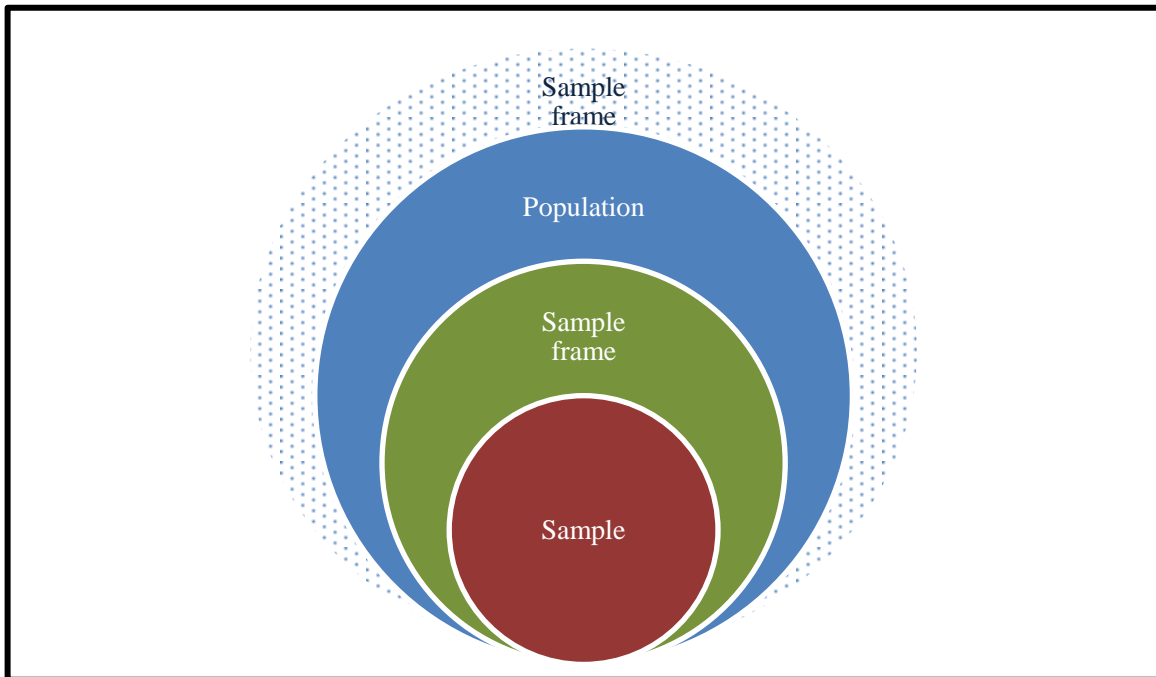
Source: Gray (2009:149)

According to Gray (2009:149) the figure above illustrates the process of selecting samples. As noted earlier, sometimes the sample frame can be larger than the population. This may happen in

cases such as the population comprises all registered students but the student records may have missed some of the students by mistake, while late applicants and registered students have not been entered into the database. Zikmund *et al.* (2013:385) define a sample as a small part of the larger population. This is, therefore, the small portion of the population and the various sampling techniques used will affect the size of the sample. Bless and Higson-Smith (2000:84) defined a sample as a subset of the population investigated by the researcher and whose characteristics will be generalised to the whole population. The sample and sample size of this study are discussed in more detail later in this Chapter after the discussion on the various sampling methods available to the researcher.

3.4.3   Sample method

Sampling can be defined as a smaller set of cases a researcher selects from a larger pool and generalise to the population (Neuman, 2006:219). There are alternative techniques of taking a sample which may either be probability or non-probability sampling techniques.

Figure 8: The sampling methods
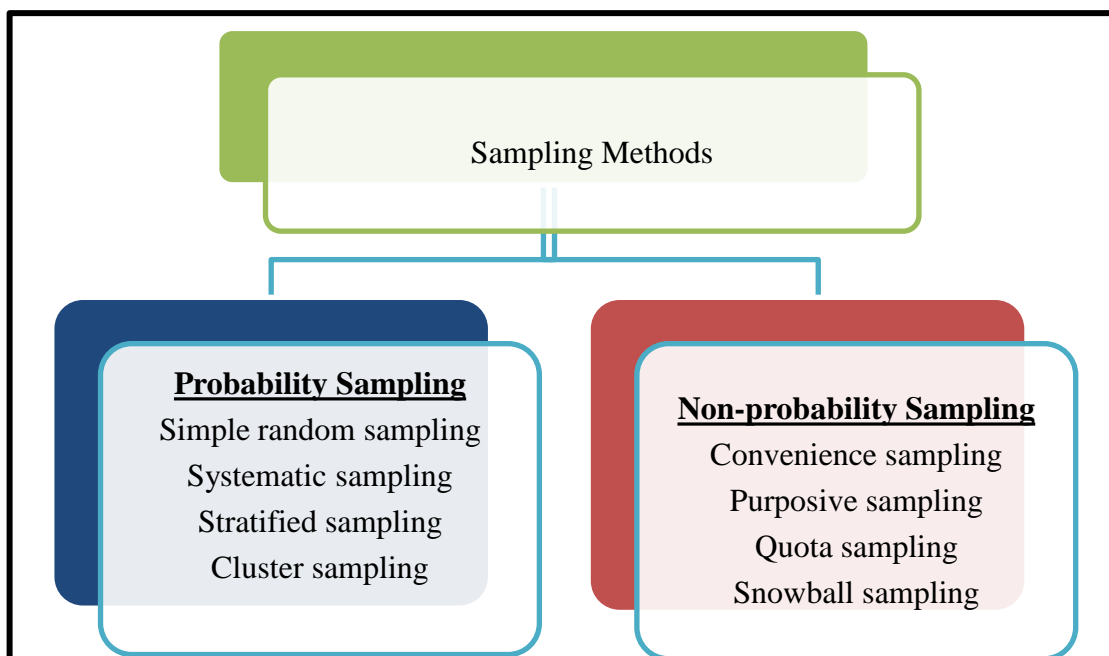
Source: Christensen *et al.* (2011:157)

This figure presents the two types of sampling methods: probability and non-probability sampling. Probability samples also called the representative samples and random samples, are the kinds of samples required if researchers want to use inferential statistics to talk about the characteristics of a population based on the findings from a sample (Loseke, 2013:103). In

probability sampling, every element in the population has a known non-zero probability selection while the non-probability sampling the probability of any particular member of the population being chosen is unknown (Zikmund, 2000:351). In simple terms, Terre Blanche and Durrheim (1999:276) define probability sampling as, where every element in the target population must have a chance of being selected into the sample. Thus, probability sampling means the possible chance for a population's element to be selected. Probability sampling occurs when the probability of including each element of the population can be determined (Bless & Higson-Smith, 2000:86).

Non-probability samples are not governed by detailed rules and should be justified as logical given research questions; characteristics obtained samples should be justified as adequate to explore research questions (Loseke, 2013:103). Terre Blanche and Durrheim (1999:279) define non-probability sampling as where the samples are not selected according to the principle of statistical randomness but selected according to other principles such a convenience and accessibility. Non-probability sampling is often used in situations where one cannot select the kinds of probability samples used in large- scale social surveys (Babbie, 1998: 94). For the purpose of this study non-probability sampling (purposive sampling) is used. Purposive sampling is used whereby the researcher deliberately selects the subjects against one or more traits to give what is believed to be a representative sample (Gray, 2009:152). The principle employed to select a sample is to use expert judges to select cases with a specific purpose in mind (Terre Blance & Durrheim, 1999:281). Babbie (1998:95) explains that purposive sampling is appropriate to be used in selecting a sample based on the knowledge of the population, its elements and the nature of the research aims. University A was chosen because it has various accounting programmes and is an institution that provides accounting programmes across all three campuses.

3.4.4   Sample size

Loseke (2013:101) defined a sample as a subset of the population; it can refer to study participants, places, times, survey questions and documents. Burns (2000: 93) points out that the larger the sample, the better, this is because the larger sample tends to have minimal errors although it does not guarantee the accuracy of results. Therefore, the sample size of the study is all the registered accountancy third-year students in years 2012, 2013, 2014. This amounted to 1945 students. Presentation of the information obtained from the sample will be discussed in Chapter 4.

3.5   MEASURING INSTRUMENT AND DATA COLLECTION

3.5.1   Data collection

Data collection is an important fragment of the research study. Data collection methods can be either surveys, questionnaires, interviews, focus groups, observation and existing data (Christensen *et al.*, 2011:28). Surveys require asking people for information, using either verbal or written questioning (Zikmund, 2000:167). Interviews is a two-way conversation in which the interviewer asks the participants questions to collect data and to learn about the ideas, beliefs, views, opinions and behaviours of the participants (Maree & Pietersen, 2014:87). Focus groups interviews are an unstructured, free-flowing interview with a small group of people which is in a flexible format that encourages discussions (Zikmund, 2000:109). Observation is the systematic process of recording the behavioural patterns of people, objects and occurrences without questioning or communicating with them (Zikmund, 2000:27). The existing data can be in a form of documents, physical data or archived research data (Christensen *et al.*, 2011:61).

The data collected for this study will help achieve the empirical objectives. The archived data was collected from the university student records repository. Application was made to the information management section of the university completing the necessary approval documents. The detail was provided as to what data was needed. The data was drawn from the system and supplied in Microsoft Excel format.

3.5.2   Statistical analysis

Malhotra (2010:486) states the more frequently used statistics related to frequencies are, "measures of location (mean, mode, and median), measures of variability (range, interquartile range, standard deviation, and coefficient of variation), and measures of shape (skewness and kurtosis)". According to Babbie (2013:460), there are two statistical types namely, descriptive and inferential statistics. Descriptive statistics refers to a standard used for describing data in controllable ways, whereas, inferential statistics is defined as a statistical measure that enables an investigator to make sense, assume and draw conclusions or declarations about a normally large population from which the sample was drawn. Descriptive statistics is a group of statistical methods used to summarise, describe or display quantitative data (Collis & Hussey, 2014:341). Descriptive statistics describe and compare variables numerically (Saunders *et al.,* 2000:351). Therefore, descriptive statistics analyses data to help describe it.

Inferential statistics is a group of statistical methods and models used to draw conclusions about a population from quantitative data relating to a random sample (Collis & Hussey, 2014:342). According to Gray (2009:139), inferential statistics is used to make inferences from the sample chosen to a larger population. Inferential statistics rely profoundly on probability theory (Maree & Van der Westhuizen, 2009:198).

The data collected was analysed through SPSS Version 23 together with the services of a statistical consultant. The descriptive statistics was used to assess the population whereby the measures of central tendency were used to calculate the mean and the mode and the measures of dispersion were used to calculate the standard deviation, the minimum and maximum values of the variables. Correlation analysis was used to measure the degree of correlation between tested variables using the Spearman's Correlation Coefficient. The non-parametric statistics and T-tests were used as the statistical techniques to compare groups. It is, therefore, clear that both descriptive and inferential statistics were used in this study.

The validity and reliability are discussed next.

3.6   VALIDITY AND RELIABILITY

According to Zikmund (2000:279), there are three major criteria for evaluating measurements namely; reliability, validity and sensitivity. Saunders *et al.* (2000:203) revealed that reliability can be assessed by posing the following questions: (i) Will the measure yield the same results on different occasions? and (ii) Will similar observations be made by different researchers on different occasions? Reliability measures the consistency or repeatability of a measure or instrument (Maree & Van der Westhuizen, 2009:147). Reliability is an indication of consistency between two measures of the same thing (Gray, 2009:158). Reliability is, therefore, a measurement that is consistent if repeated the results will be the same.

Validity is concerned with whether the findings are really about what they appear to be about; is there a causal relationship? (Saunders *et al*., 2000:101). Validity occurs when a measure or instrument is said to be valid if it measures what it is supposed to measure (Maree & Van der Westhuizen, 2009:147). Validity is the extent to which a test measures what the researcher wants it to measure and the results reflect the phenomena under study (Collis & Hussey, 2014:345). Validity, therefore, ensures that the instrument used measured what it was intended to measure. The data was collected by obtaining student records from the university. The data was then handled in a specified way to achieve the set primary and secondary objectives. In this study, we

investigate the contribution that predictors of academic success in accountancy studies have on the shortage of financial skills. This is done by testing all the identified factors and having an outcome from each factor using the SPSS statistical system. From the process mentioned above the method used is therefore seen as reliable and valid because the researcher is independent throughout the process and the SPSS system is realible.

3.7   ETHICAL CONSIDERATIONS

McMillan and Schumacher (2001:196) deduce that research ethics are generally considered to deal with beliefs about what is right or wrong, proper or improper and good or bad. Adams *et al.* (2009:35) mention that an ethical person is a person who is being responsible, honest when doing something with the necessary level of integrity. Ethics can be defined as being responsible, honest and when doing something, doing it in an honest manner with the necessary level of integrity (Adams *et al*., 2009:35). Thus, ethics is the way of right or wrong conduct when someone is acting up on something.

3.7.1   Potential benefit

The research study will benefit the South African Higher Education Institutions specifically University A by accepting the students who will be academically successful in their accounting programmes. The author has to protect the rights and the identity of the participants so that no harm is caused to them. No data that could identify students were requested. The research project was approved by the ethics committee at the North-West University.

3.8   SUMMARY

In summary, the researcher discussed the research methodology applied. In this Chapter the reader was first introduced to the research methodology definition and the research paradigms found within the social sciences namely Quantitative, Qualitative and Mixed methods. The research design which included the population, sampling method, sample frame and size was mentioned.

The method of collecting data and the measuring instrument were also discussed. The methodology approach used in this study is quantitative in nature. The population in this study is defined as all the universities in South Africa offering the accountancy programmes. A specific university which offers various accounting programmes will, therefore, be selected as the sample for this study.

Records of the third year students who were registered in the years 2012, 2013 and 2014 were obtained from the institutional archives. The student records were analysed using SPSS to find the statistical correlation between the enrolments, dropout and graduation. This will help in predicting the academic success from the beginning of the students' accounting studies.

The next chapter, Chapter 4, provides the empirical research findings from the methods used that were discussed in this Chapter.

CHAPTER 4: EMPIRICAL RESEARCH ANALYSIS AND FINDINGS

4.1   INTRODUCTION

The factors contributing to the shortage of financially skilled people were discussed in Chapter 2. These factors found were primarily school related matters which included factors such as having had Accounting at school, Mathematics and other subjects at school level. In Chapter 3, the research methodology applied in this study was discussed.

The study follows the quantitative research approach. This chapter presents the student academic records analysis and the findings are discussed. The following empirical objectives will be achieved in this chapter as noted in chapter 1:

- To determine the success rate of students at each level of study;
- To identify students at risk according to the academic level pass mark;
- To identify possible predictors of academic success of students at entry point into an accounting programme at tertiary level; and
- To conclude and to make recommendations on the predictor(s) for the academic success of students at the entry point into an accounting programme at tertiary level in an attempt to close the gap between the financial skills needed to ensure economic growth and the supply thereof.

The presentation of the empirical findings commences with the presentation of descriptive statistics of the Home Language, Gender, Participants in the accountancy programmes, APS scores, School Averages, Mathematics, Accounting and Languages. This is followed by a discussion of the success in the accountancy programmes where success in the financial accountancy modules at all the levels is presented. The chapter concludes with gender success in the accountancy programmes; correlation of the secondary subjects with success of the accountancy programme; and lastly, the results on findings which focus on the secondary school variables tested to find the acceptable optimum cut-offs.

4.2 DISCRIPTIVE STATISTICS

The findings in Chapter 4 are presented in the form of descriptive statistic tables and Receiver of Operating Characteristics. In the tables that follow, the biographic profile of the students included in the sample population are presented.

4.2.1 Home language

Table 13: Home language distribution of sample

Home language	Frequency	Percentage
Afrikaans	1144	59%
English	127	6%
SeTswana	293	15%
Other	381	20%
Total	1945	100.0%

From our sample, the English speaking students have the least number with 6%. The other languages include all other languages such as the African languages, Asian languages and many others found in the world. The other languages are the second largest size in our sample with a percentage of 20% following the majority spoken language, Afrikaans at 59%. SeTswana takes the third position at 15%. From the information above there were no missing values.

4.2.2 Gender

Table 14: Gender distribution of the sample

Gender	Frequency	Percentage (%)
Male	830	43%
Female	1106	57%
Total	1936	100%

*Missing values= 9

The sample size from the original data is 1945 but 1936 are represented on the table above. This is because no gender information could be found for 9 of the students included in the sample. Of the 1936 students where information in connection with gender was available, females take up the largest portion of 57% (1106 females) and males take up 43% (830 males).

4.2.3 Participants in different accounting programmes

The following will present the students enrolled in the different undergraduate accounting programmes.

Table 15: The enrolments in different accountancy programmes

Programme	Frequency	Percentage (%)
Chartered Accountancy	854	44%
Financial Accountancy*	935	48%
Forensic Accountancy	140	7%
Other	16	1%
Total	**1945**	**100%**

* As the Financial Accountancy and Management Accountancy programmes are mostly identical at undergraduate level, these were combined.

The total number of students in the study were (n= 1945). The Financial Accountancy programme has the majority of the enrolments with 48% followed by Chartered Accountancy with 44%. The Forensic Accountancy and the other programmes have the least size with 7% and 1% respectively. The other includes the basic accounting and the accounting and informatics programmes offered. The basic accounting programmes for the basic knowledge of the accountancy profession and the BCom Accounting and Informatics combines business and technical knowledge of computer science and focuses on the development and support of a company's information systems. The knowledge and skills acquired will allow the student to recognise and maximise business opportunities within the dynamic field of technology and will ensure that an organisation's information system requirements are met to improve business operations (NWU, 2015).

In the following tables, table 16 to table 21, the tables show the mead and the standard deviation. According to Levine *et al.* (2006: 147) the mean represents balancing point in the data set and is calculated by adding together all the marks divided by the number of students. The standard deviation measures how the data is distributed. It measures how data is scattered around the mean. The information presented in these tables does not include the other programme because it is not material enough.

4.2.4   Admission Point Score

The presentations of the APS of the students in the different programmes are reported in table 16.

Table 16: The APS distribution amongst accountancy programmes

Programme	N	Mean	Standard deviation
Chartered Accountancy	829	35.19	6.51
Forensic Accountancy	140	37.68	5.29
Financial Accountancy	920	29.81	5.37
Total	**1936**		

*Missing values= 9 (the Chartered Accountancy programme had 6 missing values and the Financial Accountancy had 3 missing values).

The information above shows the APS obtained by the students in each of the programmes. The highest average APS obtained is 37.68 in the Forensic Accountancy programme while the average in the Chartered Accountancy programme was 35.19 and 29.81 in the Financial Accountancy programme. This compares well to the minimum APS required in the programmes below:

- Forensic Accountancy – APS 36
- Chartered Accountancy – APS 30
- Financial Accountancy – APS 28

From the above it shows that the maximum APS score was greater than that of the minimum required. The required APS score for the programmes is also presented in Chapter 2.

4.2.5 School averages

Table 17: Distribution of school averages

N	Mean	Standard deviation
1904	68.85%	11.53

*Missing values= 41

Only data for the 1904 (98%) students from the 1945 sample could be obtained. The highest school average obtained was 93.8. The data resulted to a mean of 68.85% and the standard deviation of 11.53.

4.2.6 Mathematics

Table 18: Mathematics distribution from the sample

N	Mean	Standard deviation
1853	66.14%	15.09

Mathematics is used as a compulsory entrance requirement at the chosen university's accountancy programmes. Some mathematic marks were not available. The highest mark obtained for mathematics was 100 (100%). The mean was calculated to be at 66.14% and the standard deviation is 15.09.

4.2.7 Accounting

Accounting is sometimes used as a requirement for the accounting studies acceptance at universities. It is however not a requirement at University A. Table 19 shows the results for those students who had Accounting in their grade 12 studies. The data below will indicate the marks obtained, mean and the standard deviation.

Table 19: Distribution of accounting subject from the sample

N	Mean	Standard deviation
1737	70.45%	14.18

Although accounting is not a prerequisite in the accountancy programmes at University A, students still take Accounting in their Secondary (High school) education. Of the 1945 students in

the sample 1737 (89%) students had Accounting as a subject during their high school studies. The highest mark obtained was 100%. The mean for Accounting is 70.45% and a standard deviation of 14.18.

4.2.8 Language

The following presents the English and First Language at secondary school level.

Table 20: Grade 12 English

N	Mean	Standard deviation
1902	69.54	12.19

The total number of students who had English at secondary school was 1902. The samples mean was 69.54 and standard deviation of 12.19.

Table 21: Grade 12 First Language

N	Mean	Standard deviation
1876	71.17	11.97

The mean for the First Language score for the sample amounted to 71.17 with a standard deviation of 11.97.

Paragraph 4.2.1 to 4.2.8 presented the distribution on the biographical factors. The results were from the sample of 1945. The distribution showed how diverse the students are. The following section presents the success in the accountancy programmes, however, the presentation is limited to the success of the financial accounting modules at all levels.

4.3 SUCCESS IN ACCOUNTANCY PROGRAMMES

Success in this study is regarded as an achievement to continue to the next level. Therefore, a successful mark is at 50% and above. This 50% mark is used as the threshold for success test (where applicable) in the study.

4.3.1 Success in accountancy modules

The average mark for each student is calculated. Success in accountancy modules is regarded as a 50% average in the two semester modules (if applicable). Success in the third year is regarded as an average of the third year subjects above 50%. Due to data limitations the time frame for which the student was registered was not considered. The data will be presented in two groups, for those who have 50% and above will be considered successful and those who have obtained less than 50% will be considered unsuccessful. The third year marks are only considered for the table below.

Table 22: Performance in the third year studies

Measure	<50%	≥ 50%
N	215	1720

The table above divides the students into two groups namely successful in their third-year studies (≥50%) and those who were not successful (<50%). Only 1720 of the 1945 students were successful in their third year. The number amounts to 88% of the sample. 11% of the sample failed to complete their accountancy studies in their third year. The remaining 10 (1%) from the sample is regarded as students that discontinued their studies, because no information of their third-year studies could be obtained. The success of financial accounting module is presented next.

4.3.2 Success in the financial accounting module

The study focuses on only the two main financial accounting modules at the university. There is financial accounting for the Chartered Accountancy and Forensic Accountancy streams (ACCC) and other streams use ACCF. Table 23 will present the success of ACCC (Chartered Accountancy and Forensic Accountancy streams).

Table 23: Success in Chartered Accountancy and Forensics Accountancy streams financial accounting module

Level	< 50%	%	> 50%	%
First year	86	7%	1234	93%
Second year	46	4%	1095	96%
Third year	24	3%	878	97%

A successful student progresses to the second year level and those unsuccessful have the option to repeat or change to other accountancy streams. In the first year 86 (7%) students were not successful and 1234 (93%) students were successful to continue to the next level. In the second year level, there was a decrease in both the successful and unsuccessful students, 1095 (96%) from 1234 in the first year were successful and 46 (4%) were unsuccessful. The decrease computes to an 11% reduction in successful rates and a reduction of 47%% in unsuccessful rates. In the third year, both measures decreased again, with 878 successful and 19.82% reduction rate, 24 not successful and a reduction rate of 48%. The information, therefore, shows there is a decrease in the number of students that are successful for each level and for those that are not successful at each level. The following table will analyse the success of the financial accounting (ACCF) module at each level.

Table 24: Success in other streams of financial accounting

Level	<50%	%	≥50%	%
First year	32	3%	680	73%
Second year	20	3%	766	97%
Third year	40	4%	865	94%

In the first year 680 (73%) of the original intake of 935 students passed their first year financial accounting module and 32 (3%) students failed. The students who were successful could continue with second year level. In the second year 766 students were successful (13% increment rate) and in the third year 865 (13% increment rate) students were successful. The number of students taking this financial accounting module kept on increasing due to those students who were not successful in the CA and Forensic stream joining other programmes. The number of unsuccessful students fluctuated over the years, in the second year from the first year there was a 38% reduction and a 100% increment in the third year.

The success of Financial Accountancy was measured by a 50% threshold. From table 22 to table 24, the presentation of the two financial accounting modules was discussed. The success was measured for each level of study (from the first to the third year). The number of students that are unsuccessful decreased while the successful number of students also decreased at each level for the Chartered Accountancy and Forensic Accountancy programmes. The opposite happened for the other Financial Accountancy programmes. The number of unsuccessful students

fluctuated over the three levels while the number of successful students increased at the three levels. This is mainly because many students do migrate from Chartered Accountancy and Forensic Accountancy to Financial Accountancy. The following section shows the gender success rates in the accountancy programmes.

4.4 GENDER SUCCESS IN THE ACCOUNTANCY SUCCESS

It is of importance that students perform well academically so as to progress to levels ahead. The researcher focused on one of the core modules in accountancy, Financial Accounting, as a basis for exploring the academic performance of students. This section provides information about the academic success rates of females and males in the financial accounting module and success up to the third year at University A.

Table 25: T-tests on comparing males and females success

Subject Success Level	Gender	N	Mean	Standard Deviation	Standard Error Mean	Effect Size *d*
Success THIRD YEAR	Male	830	55.19	13.17	0.46	0.22
	Female	1106	58.05	11.53	0.35	
Success ACCC 1	Male	591	58.07	17.06	0.70	0.13
	Female	798	60.32	16.35	0.58	
Success ACCC 2	Male	503	56.94	16.33	0.73	0.11
	Female	694	58.77	15.02	0.5	
Success ACCC 3	Male	386	57.21	16.08	0.82	0.01
	Female	553	57.35	14.57	0.62	
Success ACCF 1	Male	350	54.16	19.32	1.03	0.01
	Female	434	54.35	19.94	0.95	
Success	Male	368	54.26	14.65	0.76	0.11

Subject Success Level	Gender	N	Mean	Standard Deviation	Standard Error Mean	Effect Size d
ACCF 2	Female	458	55.854	15.10	0.71	
Success	Male	415	54.2	13.36	0.66	0.22
ACCF 3	Female	509	57.24	10.80	0.48	

Table 25 shows the significant difference in males and females performance of their financial accounting level one to three, as well as in the overall third year. This is indicated by the effect size (*d*) which indicates the practical significance of the difference between male and female students.

A natural way to comment on practical significance is to use the standardised difference between the means of two populations, for example, the difference between the two means divided by the estimate for the standard deviation (Ellis & Steyn, 2003:52). Effective size does not only make the difference in the independent of units and sample size but also relates to the spread of data (Ellis& Steyn, 2003:52).

Cohen (1988) (*In* Ellis and Steyn, 2003:54) provided the guidelines for the interpretation of the effect size (a) small effect: *d* = 0.2, (b) medium effect: *d* = 0.5 and (c) large effect: *d* = 0.8. The data with *d* >/= 0.8 is considered to be practically significant. It is clear that there is no practically significant difference between male and female students, with the largest effect size being 0.22, which is small. The t-tests for the independent variables will be discussed next. This will show the variables' significance and its mean difference from the sample.

Table 26: The independent sample's test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | 95% Confidence Interval of the Difference | |
		F	Sig.	t	df	Sig. (2-tailed) p	Mean Difference	Std. Error Difference	Lower	Upper
Success THIRD YEAR	Equal variances assumed	3.661	.056	-5.07	1934	.000	-2.86	.56	-3.96	-1.75
	Equal variances not assumed			-4.98	1647	.000	-2.86	.57	-3.98	-1.73
Success ACCC 1	Equal variances assumed	.164	.69	-2.49	1387	.013	-2.26	.90	-4.03	-.49
	Equal variances not assumed			-2.48	1240.56	.013	-2.26	.91	-4.04	-.47
Success ACCC 2	Equal variances assumed	.41	.52	-2.001	1195	.046	-1.826	.91	-3.62	-.036
	Equal variances not assumed			-1.97	1026.64	.05	-1.83	.93	-3.64	-.011
Success ACCC 3	Equal variances assumed	.528	.47	-.13	937	.89	-.137	1.01	-2.12	1.84
	Equal variances not assumed			-.13	775	.89	-.137	1.02	-2.15	1.88
Success ACCF 1	Equal variances assumed	.36	.55	-.13	782	.89	-.1876	1.41	-2.96	2.59
	Equal variances not assumed			-.13	756.29	.894	-.19	1.40	-2.95	2.58

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed) p	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Success ACCF 2	Equal variances assumed	.13	.72	-1.53	824	.13	-1.59	1.04	-3.64	.45
	Equal variances not assumed			-1.53	795.56	.13	-1.59	1.04	-3.64	.45
Success ACCF 3	Equal variances assumed	1.81	.18	-3.76	922	.000	-2.99	.79	-4.55	-1.43
	Equal variances not assumed			-3.68	789.93	.000	-2.99	.81	-4.58	-1.39

The independent sample t-tests compare the mean between success in the accountancy programme (independent variable) and the academic levels (dependent variable) for each programme. Table 26 presents the independent sample t-tests. The statistical significant values (p) for the success third year ACCC1, ACCC2, ACCF2 and ACCF3 are lower than 0.05; we can conclude that there is a statistically significant difference between the mean and the variable tested against when they have equal variances and when they have not. With the variables that have the statistical significance values that are greater than 0.05, we can conclude that there is no statistically significant difference between the variables and the mean. The next part of the study will show correlations between all the tested variables.

4.5   THE CORRELATION OF VARIABLES USED IN THE STUDY

The correlation between certain Grade 12 scores and first year to third-year success is shown in table 27 next.

Table 27: The correlations between secondary school subjects and third year success

Subject		Success Third year	Success ACCC1	Success ACCC2	Success ACCC3	Success ACCF1	Success ACCF2	Success ACCF3	Mathematics	English	Accoun-ting	School average	APS score
Success Third year	Correlation Coefficient	1.00	0.51	0.63	0.86	0.29	0.55	0.78	0.36	0.32	0.41	0.44	0.44
	Sig. (2-tailed)(p)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N	1936	1386	1197	939	779	821	924	1846	1895	1730	1897	1897
Success ACCC1	Correlation Coefficient	0.51	1.00	0.61	0.49	0.11	0.07	0.19	0.51	0.43	0.61	0.62	0.61
	Sig. (2-tailed)(p)	0.00		0.00	0.00	0.06	0.22	0.00	0.00	0.00	0.00	0.00	0.00
	N	1386	1389	1162	899	310	336	426	1334	1360	1275	1360	1360
Success ACCC2	Correlation Coefficient	0.63	0.61	1.00	0.63	0.32	-0.48	-0.05	0.39	0.33	0.43	0.46	0.45
	Sig. (2-tailed)(p)	0.00	0.00		0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.00
	N	1197	1162	1197	919	167	125	220	1146	1169	1114	1169	1169

Subject		Success Third year	Success ACCC1	Success ACCC2	Success ACCC3	Success ACCF1	Success ACCF2	Success ACCF3	Mathematics	English	Accoun-ting	School average	APS score
Success ACCC3	Correlation Coefficient	0.86	0.49	0.63	1.00	0.15	0.21	0.26	0.26	0.17	0.34	0.31	0.30
	Sig. (2-tailed)(p)	0.00	0.00	0.00		0.12	0.42	0.15	0.00	0.00	0.00	0.00	0.00
	N	939	899	919	939	110	17	33	899	916	869	916	916
Success ACCF1	Correlation Coefficient	0.29	0.11	0.32	0.15	1.00	0.49	0.26	0.73	0.17	0.29	0.26	0.26
	Sig. (2-tailed)(p)	0.00	0.06	0.00	0.12		0.00	0.00	0.48	0.00	0.00	0.00	0.00
	N	779	310	167	110	784	660	657	732	765	652	767	767
Success ACCF2	Correlation Coefficient	0.55	0.07	-0.48	0.21	0.49	1.00	0.50	0.15	0.15	0.19	0.22	0.21
	Sig. (2-tailed)(p)	0.00	0.22	0.00	0.42	0.00		0.00	0.00	0.00	0.00	0.00	0.00
	N	821	336	125	17	660	826	805	781	811	696	813	813
Success	Correlation Coefficient	0.78	0.19	-0.49	0.26	0.26	0.50	1.00	0.22	0.24	0.29	0.34	0.33

Subject		Success Third year	Success ACCC1	Success ACCC2	Success ACCC3	Success ACCF1	Success ACCF2	Success ACCF3	Mathematics	English	Accounting	School average	APS score
ACCF3	Sig. (2-tailed)(p)	0.00	0.00	0.47	0.15	0.00	0.00		0.00	0.00	0.00	0.00	0.00
	N	924	426	220	33	0.66	805	924	877	908	787	910	910
Mathematics	Correlation Coefficient	0.36	0.51	0.39	0.26	0.07	0.15	0.22	1.00	0.48	0.62	0.75	0.74
	Sig. (2-tailed)(p)	0.00	0.00	0.00	0.00	0.05	0.00	0.00		0.00	0.00	0.00	0.00
	N	1846	1334	1146	899	732	781	877	1853	1852	1688	1856	1853
English	Correlation Coefficient	0.32	0.43	0.33	0.17	0.17	0.15	0.24	0.48	1.00	0.57	0.79	0.78
	Sig. (2-tailed)(p)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
	N	1895	1360	1169	916	765	811	908	1852	1902	1735	1902	1902
Accounting	Correlation Coefficient	0.41	0.61	0.43	0.34	0.30	0.19	0.29	0.62	0.57	1.00	0.82	0.81
	Sig. (2-tailed)(p)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00

Subject		Success Third year	Success ACCC1	Success ACCC2	Success ACCC3	Success ACCF1	Success ACCF2	Success ACCF3	Mathematics	English	Accoun-ting	School average	APS score
	N	1730	1275	1114	869	652	696	787	1688	1735	1737	1737	1737
APS score	Correlation Coefficient	0.44	0.62	0.46	0.31	0.26	0.22	0.34	0.74	0.78	0.82	0.99	1.00
	Sig. (2-tailed)(p)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	N	1897	1360	1169	916	767	813	910	1853	1902	1737	1904	1904
School average	Correlation Coefficient	0.44	0.61	0.45	0.30	0.26	0.21	0.33	0.75	0.79	0.82	1.00	0.99
	Sig. (2-tailed)(p)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	N	1897	1360	1169	916	767	813	910	1853	1902	1737	1904	1904

An acceptable correlation coefficient is when it can have significant influence on the other and is shown to be significant at >0.50, but because the study is on human beings, the 0.30 correlation coefficient is acceptable and regarded as a low positive correlation (Mukaka, 2012:70). For a variable to be statistically significant (*p*) the number should equal 0.05 or less. The variables tested are the success of the third year, ACCC1, ACCC2, ACCC3, ACCF1, ACCF2, ACCF3, Mathematics, English, Accounting, APS scores and School averages.

The third year success correlates with every variable tested, except for ACCF1, and is statistically significant to all variables, meaning correlations are 0.30 and above and the significance levels are 0.05 or less.

The success of ACCC1 correlates with all variables excluding success of ACCF1, ACCF2 and ACCF3 and the success of ACCC1 is statistically significant to all variables excluding the success of ACCF1 and ACCF2. This finding is in line with the expectation as students do not customarily take any ACCC and ACCF subject together as these modules are taken in different programmes as noted earlier.

The success of ACCC2 correlates with all variables excluding the success of ACCF2 and ACCF3 and the success of ACCC2 is statistically significant to all variables excluding the ACCF3. The latter findings are also in line with the expectation for the same reason noted earlier. The small positive correlation with ACCF 1 (0.32), could be because some students had ACCF 1 in the first year and moved over the Chartered Accountancy or Forensic Accountancy programmes in their second year.

The success of ACCC3 correlates with all variables except ACCF1, ACCF2, ACCF3, Mathematics and English. The success of ACCC3 is statistically significant to all variables except the ACCF1, ACCF2 and ACCF3. These findings are also in line with the expectation discussed earlier, except for the low correlation with Mathematics and English, because Mathematics is a compulsory entry requirement at University A.

The success of ACCF1 correlates with all variables excluding the third year, ACCC1, ACCC3, and ACCF3. The only strong correlation found with the school-related variables was for Mathematics. The success of ACCF1 is statistically significant to all variables except for ACCC1, ACCC3 and Mathematics. The success of ACCF 2 does not correlate with all the variables but ACCF1 and ACCF3, and the success of ACCF2 is statistically significant to all variables excluding ACCC1 and ACCC3. The success of ACCF3 correlates with all variables

excluding the success of ACCC1, ACCC2 and English; and the success of ACCF3 is statistically significant to all variables except the success of ACCC1 and ACCC2.

From the above, it is clear that the majority of the strong correlations, which were also statistically significant, were found between:

- ACCC year levels;
- ACCF year levels; and
- School related variables and the success in ACCF and ACCC.

It could, therefore, be concluded that based on the above findings, the school-related variables does have an influence on success in accountancy studies at university. Finally, it should also be stated that the correlations between the different year levels were strong as expected, because the successful completion of year one is a prerequisite for registering for the second year module. The same is also true for the third year modules.

The next section discusses the possible cut-off levels between year levels.

4.6   THE IDENTIFIED CUT-OFFS OF THE TESTED VARIABLES

The Receiver Operating Characteristics curve was used to detect the acceptable optimal mark for the predictors of academic success. The Receiver Operating Characteristic curve plots the 1-specificity (1-true negative) on the horizontal axis versus sensitivity (true positive) on the vertical axis for various values of a decision threshold (cut-off) carried out on the scoring rule (Engelmann, 2003:7). The Receiver Operating Characteristic curve evaluates the ranking ability of the scoring rule regarding pairs of alternative operating conditions meaning that the higher the Receiver Operating Characteristic curve reaches to the upper left corner, the better the ranking ability of the scoring rule (Roberts, 2011:34).

A Receiver Operating Characteristics curve is a technique for visualising, organising and selecting classified cut-offs based on their performance (Fawsett, 2006:861). The Receiver Operating Characteristic curve will, therefore, help predict the accurate cut-offs for the predictors of academic success. The prediction point to be chosen when using the Receiver Operating Characteristic curves is a point where the sensitivity is relatively high complementing the relatively high 1-specificity. Sensitivity is the ability to the test to identify all positives correctly from the sample and specificity is the ability of the test to identify all the negatives from the

sample (Kanchanaraksa, 2008:8). With regards to the Receiver Operating Characteristic curve, the larger the area under the curve the better the performance of a diagnostic test.

The threshold used to test success was at 50%, as a 50% mark is regarded as a success in this study. The results are presented in both tables and the Receiver Operating Characteristic curves. The highlighted parts on the tables presented in Annexure A represent the cut-off points or range. The Receiver Operating Characteristic curves were determined using SPSS Version 23 (2014).

The variables in par. 4.2 were used to test and measure the predictors of success. The area under the Receiver Operating Characteristic will, therefore, give a measure of the ability of each to predict success and also to determine the accurate cut-off points for the predictors of academic success. The coordinates of the Receiver Operating Characteristic curves can be found under Annexure A as well.

In the next section of the Receiver Operating Characteristic curves and the suggested cut-off are presented and explained. This is done in the following order:

- APS score for each of the accountancy programmes;
- School averages for each of the accountancy programmes;
- Mathematics for each of the accountancy programme; and
- Accounting for each of the accountancy programme.

4.6.1 Admission Point Score (APS) per programme

4.6.1.1 Chartered Accountancy (CA)

Figure 9: Receiver Operating Characteristic curve for the Chartered Accountancy APS score

ROC Curve
Programme: CA
Diagonal segments are produced by ties.
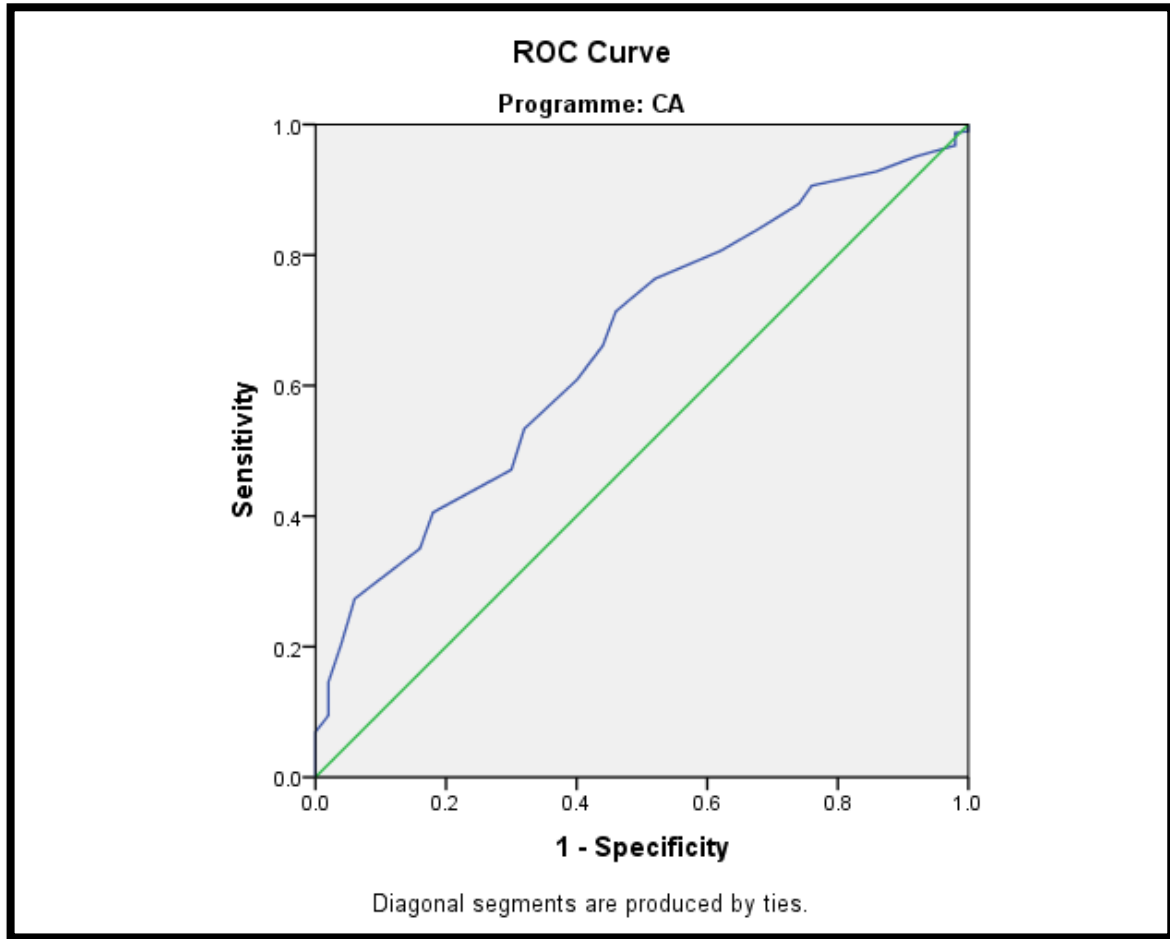
Table 28: Statistical computations for the Chartered Accountancy APS

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.66	0.04	0.00	0.59	0.74

The area under the curve is 66.3% with the confidence intervals ranging from 59% to 73.5%. The coordinates of the graph are presented in table 62 (Annexure A), which clearly shows the

optimum, cut-off at an APS score of 32 to 33. The significance level was at 0.00; this means the prediction is of statistical significance and is reliable.

4.6.1.2 Forensic Accountancy

Figure 10: Receiver Operating Characteristic curve for Forensic Accountancy APS
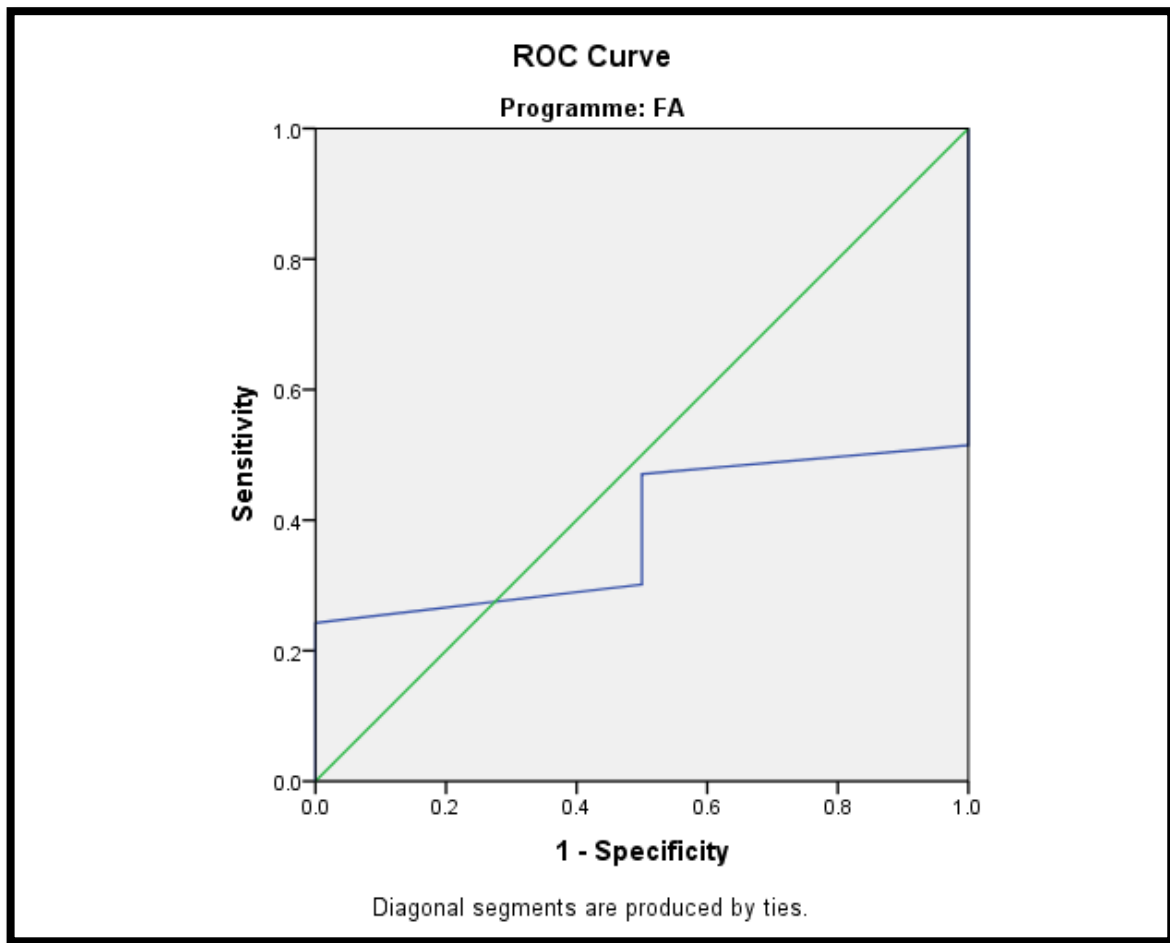
Table 29: Statistical computations for the Forensic Accountancy APS

Area	Std. Error[b]	Asymptotic Sig.[c]	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.38	0.07	0.42	0.25	0.51

The area under the curve came out to be at 38.2% and confidence level ranging from 25% to 51%. These might not be a reliable prediction if implemented. The significance level is more than 0.05 which means that the prediction for the Forensic Accountancy APS score prediction has no

statistical significance. The cut-off is identified to be 39 and the coordinates of the curve are shown in table 63 (Annexure A).

4.6.1.3 Financial Accountancy

Figure 11: Receiver Operating Characteristic curve for the Financial Accountancy APS
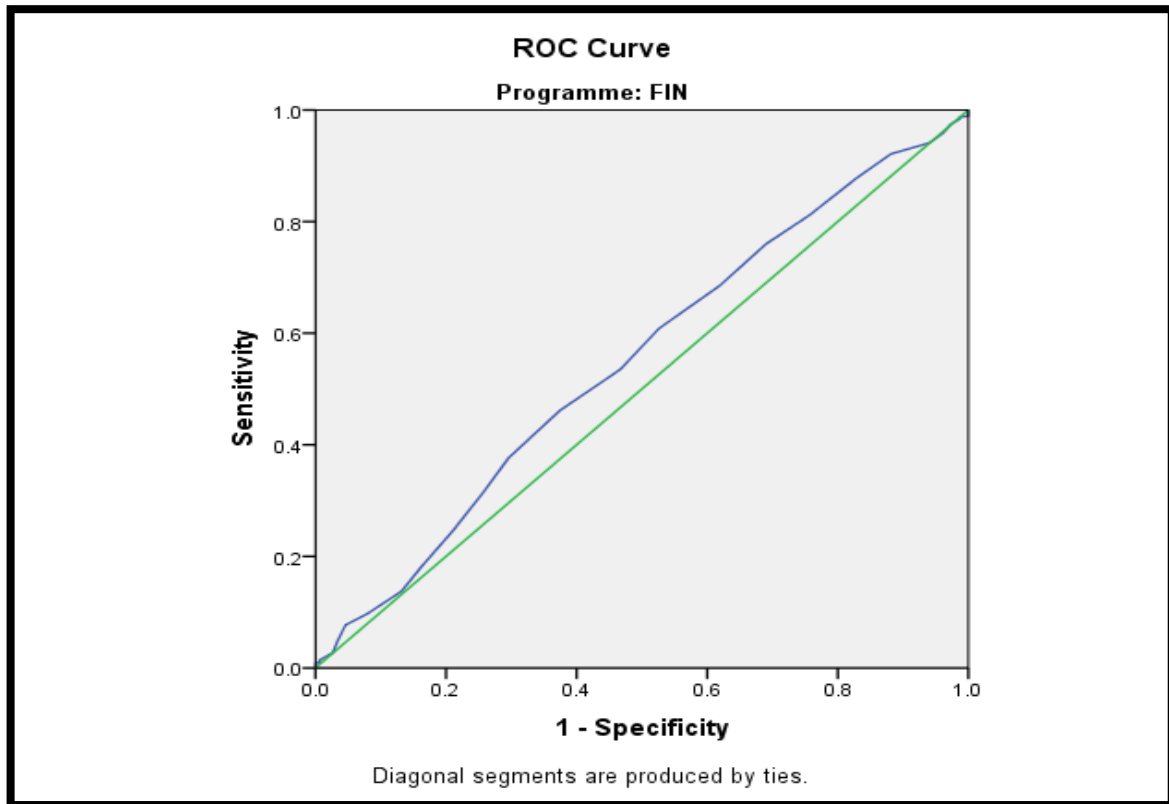
Table 30: Statistical computations for the Financial Accountancy APS

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.55	0.03	0.05	0.50	0.60

The results showed that the area under the curve to be at 55% and the confidence level stretching from 49.9% to 60%. The significance level is 0.05 indicating that Financial Accountancy APS is statistically significant though the confidence levels and area under curve make it not a dependable prediction for the Financial Accountancy. The coordinates of the graph are presented in table 64 (Annexure A). The optimum cut-off thereby is identified to be at 30.

4.6.2 School Averages

4.6.2.1 Chartered Accountancy

Figure 12: Receiver Operating Characteristic curve for the Chartered Accountancy school averages

Table 31: Statistical computations for the Chartered Accountancy school averages

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.67	0.04	0.00	0.60	0.74

Figure 12 presented the Receiver Operating Characteristic curve and the coordinates are presented in table 65 (Annexure A). The area under the curve is 67.2% with the confidence level stretching from 60.3% to 74.1%. The significance level was 0.00 which is lower than 0.05; this makes the Chartered Accountancy school averages statistically significant. These deduced the optimum cut-off of 70.

4.6.2.2   Forensic Accountancy

Figure 13: Receiver Operating Characteristic curve for the Forensic Accountancy school averages
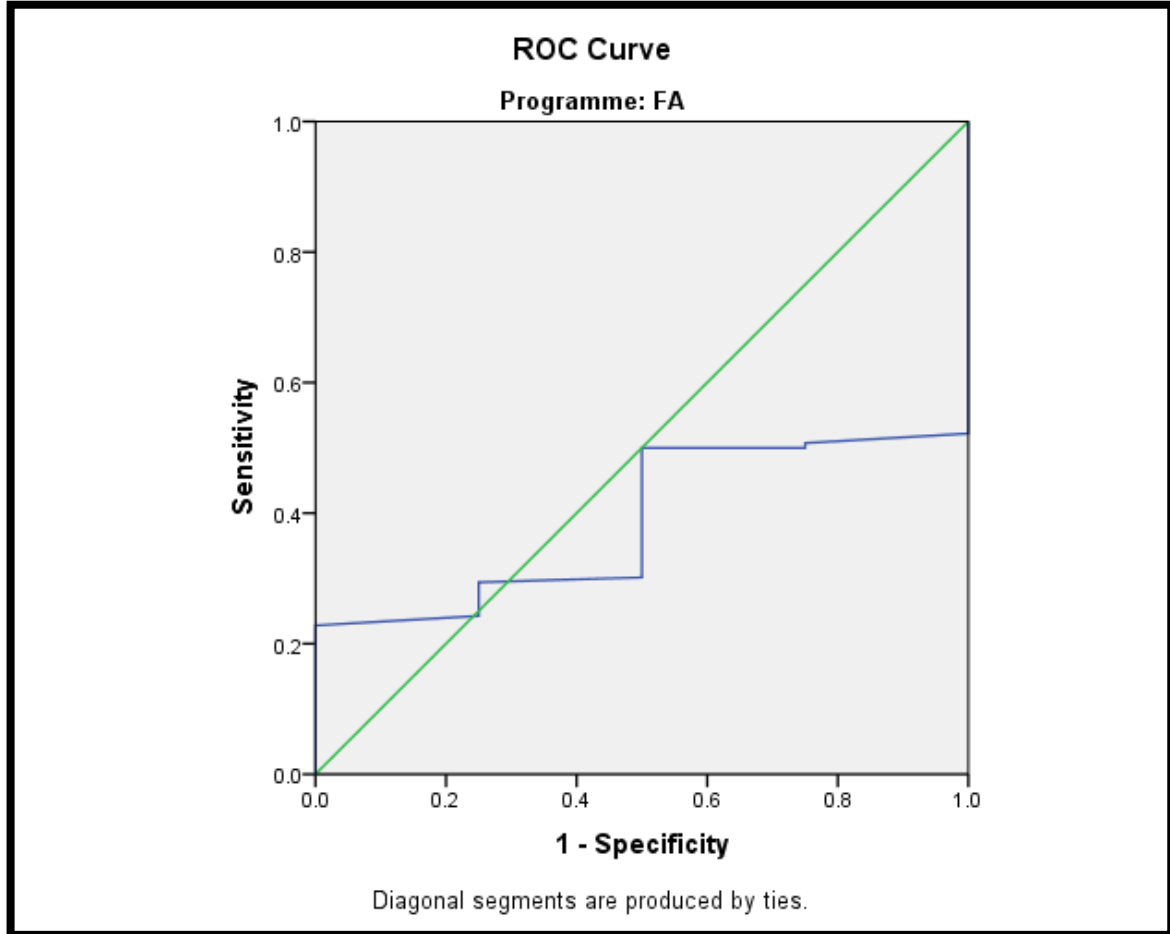
Table 32: Statistical computations for the Forensic Accountancy school averages

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.39	0.07	0.44	0.25	0.53

Figure 13 presented the Receiver Operating Characteristic curve with its coordinates presented in table 66 (Annexure A). The area under the curve is 39% with the confidence levels stretching from a low 25% up to 52.7%. Therefore, this makes it not a dependable prediction because of the low levels confidence intervals and the area under the curve. The significance level of 0.44 is

higher than 0.05, which results in the school averages for the Forensic Accountancy not to be statistically significant. The optimum cut-off is presented to be at 77.

4.6.2.3   Financial Accountancy

Figure 14: Receiver Operating Characteristic curve for the Financial Accountancy school averages

Diagonal segments are produced by ties.
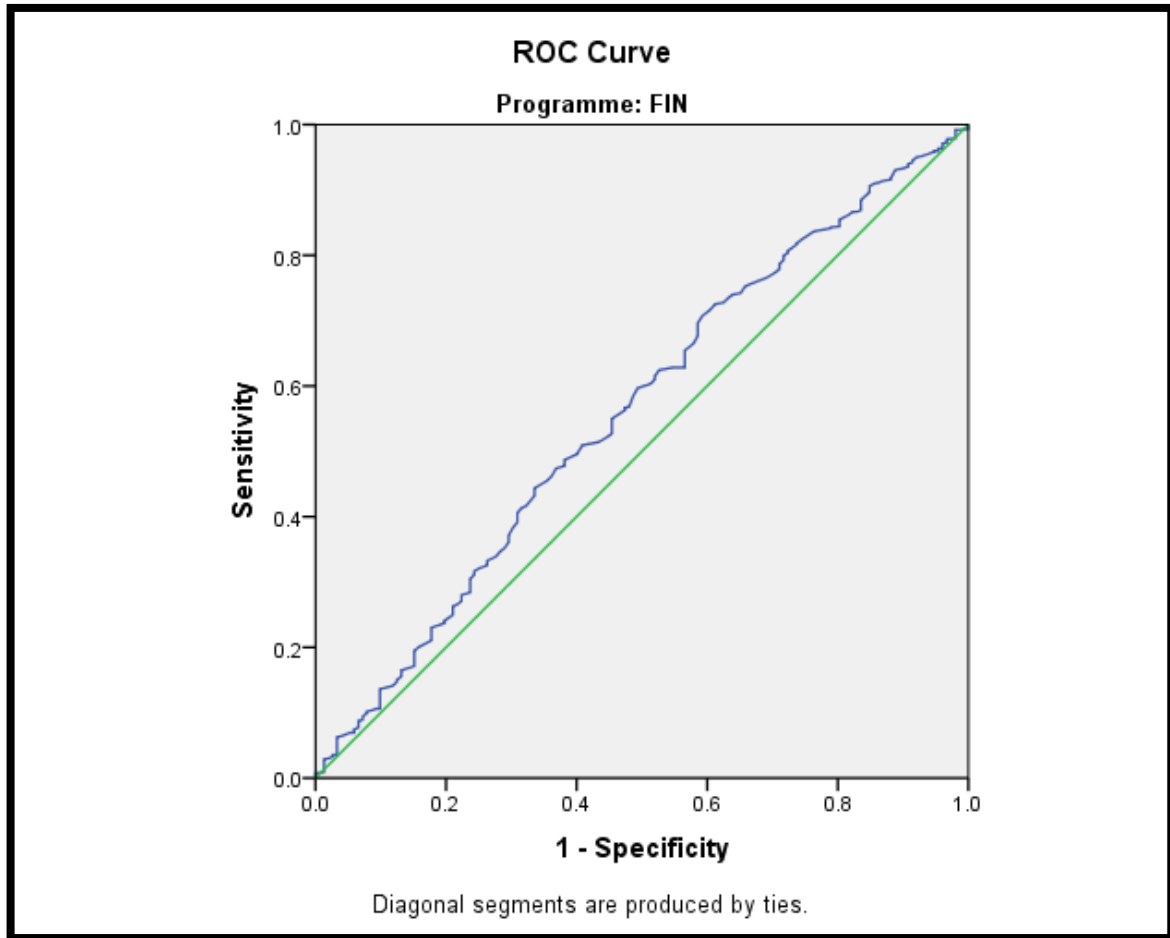
Table 33: Statistical computations for the Financial Accountancy school averages

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.56	0.03	0.02	0.51	0.61

The Receiver Operating Characteristic curve is presented in figure 14 and its coordinates presented in table 67 (Annexure A). The area under the curve is 56% with the confidence level

stretching from 51% to 61%; these make up a dependable prediction. The latter deduced the optimum cut-off of 60. The significance level at 0.26 is greater than 0.05 which therefore makes prediction of the Financial Accountancy school averages not statistically significant.

4.6.3   Mathematics

4.6.3.1   Chartered Accountancy

Figure 15 Receiver Operating Characteristic curve for the Chartered Accountancy grade 12 Mathematics
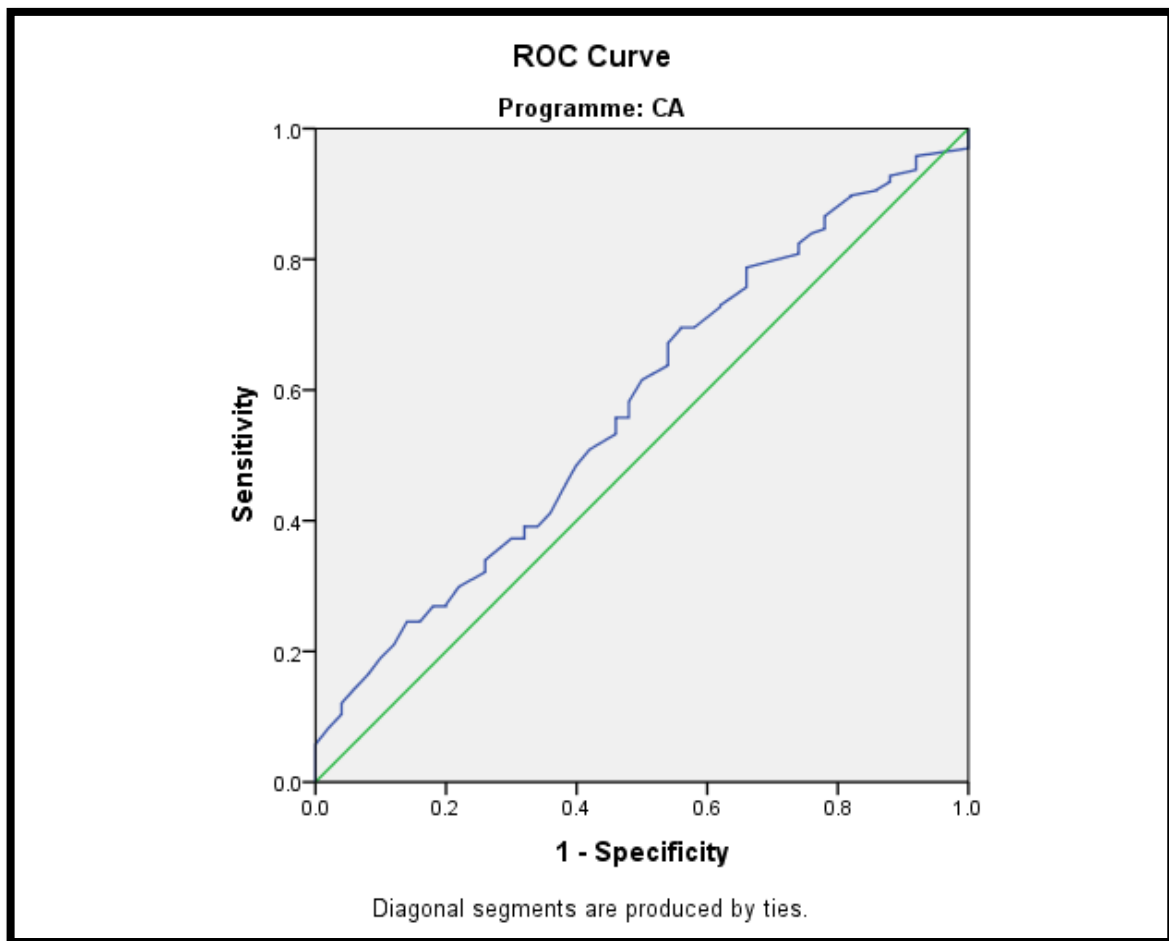
Table 34: Statistical computations for the Chartered Accountancy grade 12 Mathematics

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	**Upper Bound**
0.58	0.04	0.07	0.49	0.66

Figure 15 presented the Receiver Operating Characteristic curve for the Mathematics for those students in the Chartered Accountancy programme. The coordinates to the graph are presented in table 68 (Annexure A). The area under the curve is 58% with a 50% to 66% confidence level. Because these variables are equal to and greater that 50% they make up a trustworthy prediction. The significance level greater than 0.05 presented to be at 0.71 can be concluded that the Mathematics prediction is not statistically significant. The information mentioned deduces the cut-off for mathematics to be 65.

4.6.3.2   Forensic Accountancy

Figure 16: Receiver Operating Characteristic curve for the Forensic Accountancy grade 12 Mathematics

ROC Curve
Programme: FA

Diagonal segments are produced by ties.
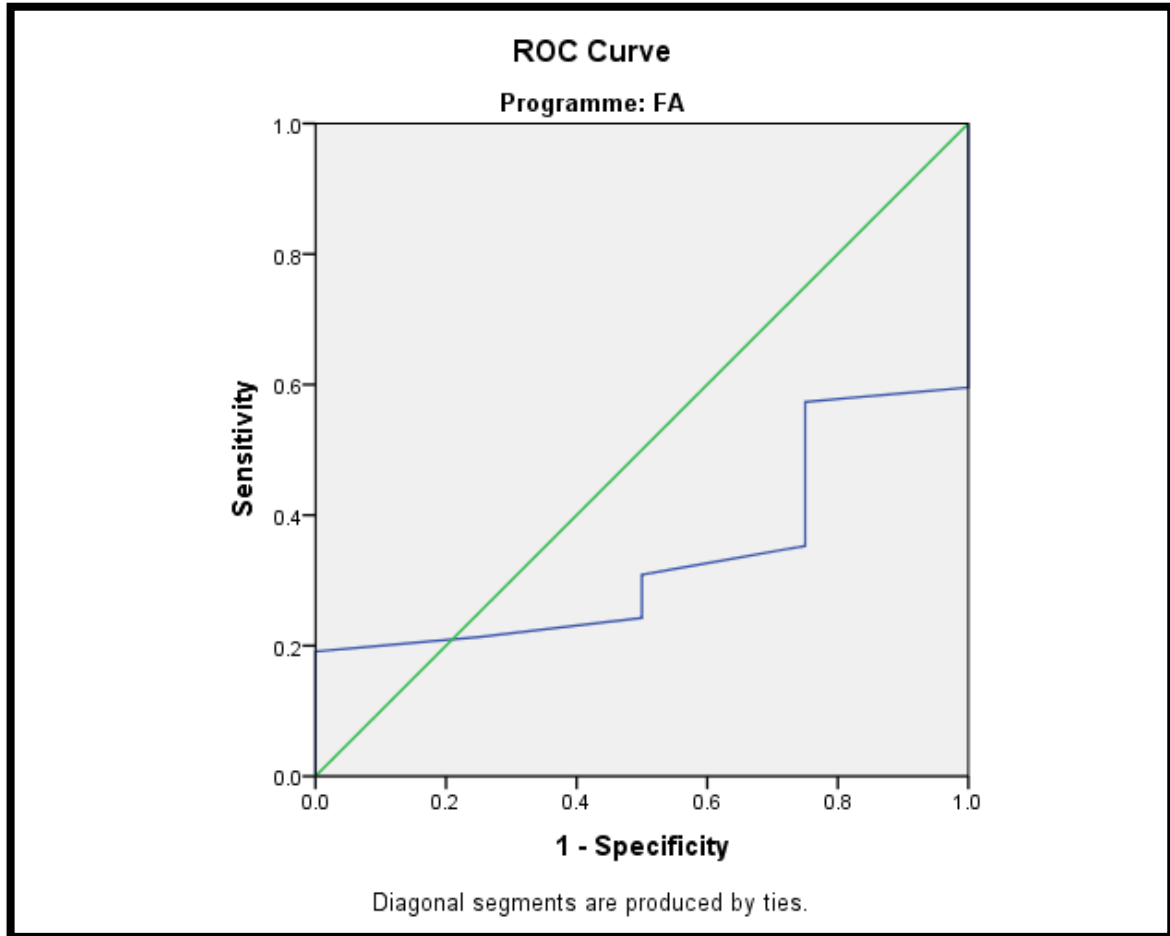
Table 35: Statistical computations for the Forensic Accountancy grade 12 Mathematics

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.34	0.08	0.26	0.17	0.40

Figure 16 presents the Receiver Operating Characteristic curve for mathematics in the Forensic Accountancy programme. The area under the curve is 34% with the confidence level stretching from 17% up to 50%. The significance level is however 0.83 which is above 0.05; this indicates that the prediction is not statistically significant. The prediction for the Forensic Accountancy

Mathematics is not reliable as the area under the curve and the confidence levels are under 50%. Table 69 presents the coordinates of the curve. The optimum cut-off is, therefore, identified at 75.

4.6.3.3   Financial Accountancy

Figure 17: Receiver Operating Characteristic curve for the Financial Accountancy grade 12 Mathematics
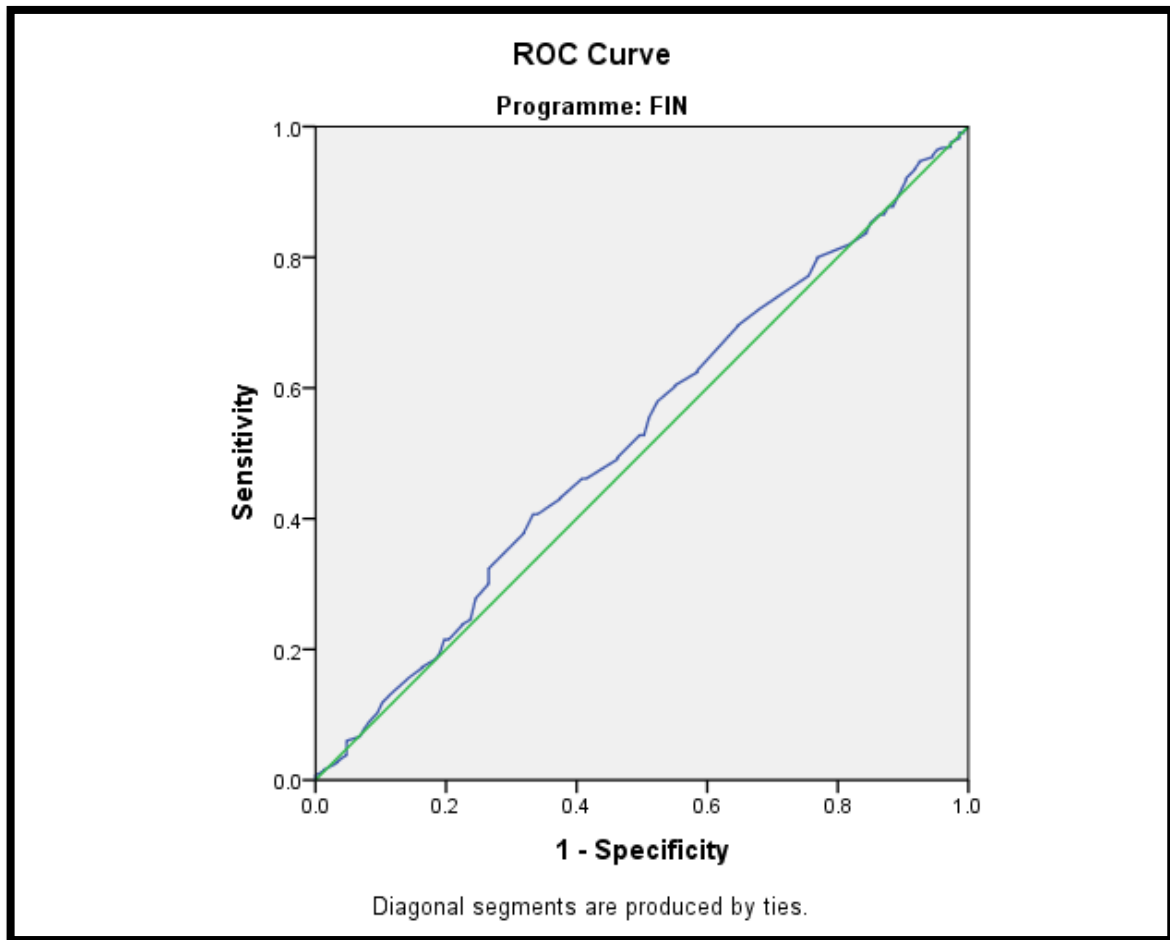
Table 36: Statistical computations for the Financial Accountancy grade 12 Mathematics

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.53	0.03	0.30	0.48	0.58

The Receiver Operating Characteristic curve is presented in figure 17 with its coordinates presented in table 70 (Annexure A). Table 36 presents the area under the curve is 53% with the confidence levels stretching from 48% up to 58%. The prediction for the Financial Accountancy programme for Mathematics is not statistically significant since the significance level is greater than 0.05 at 0.30. Therefore, the cut-off is identified at 55.

4.6.4   Accounting

4.6.4.1   Chartered Accountancy

Figure 18: Receiver Operating Characteristic curve for the Chartered Accountancy grade 12 Accounting

ROC Curve
Programme: CA

Diagonal segments are produced by ties.
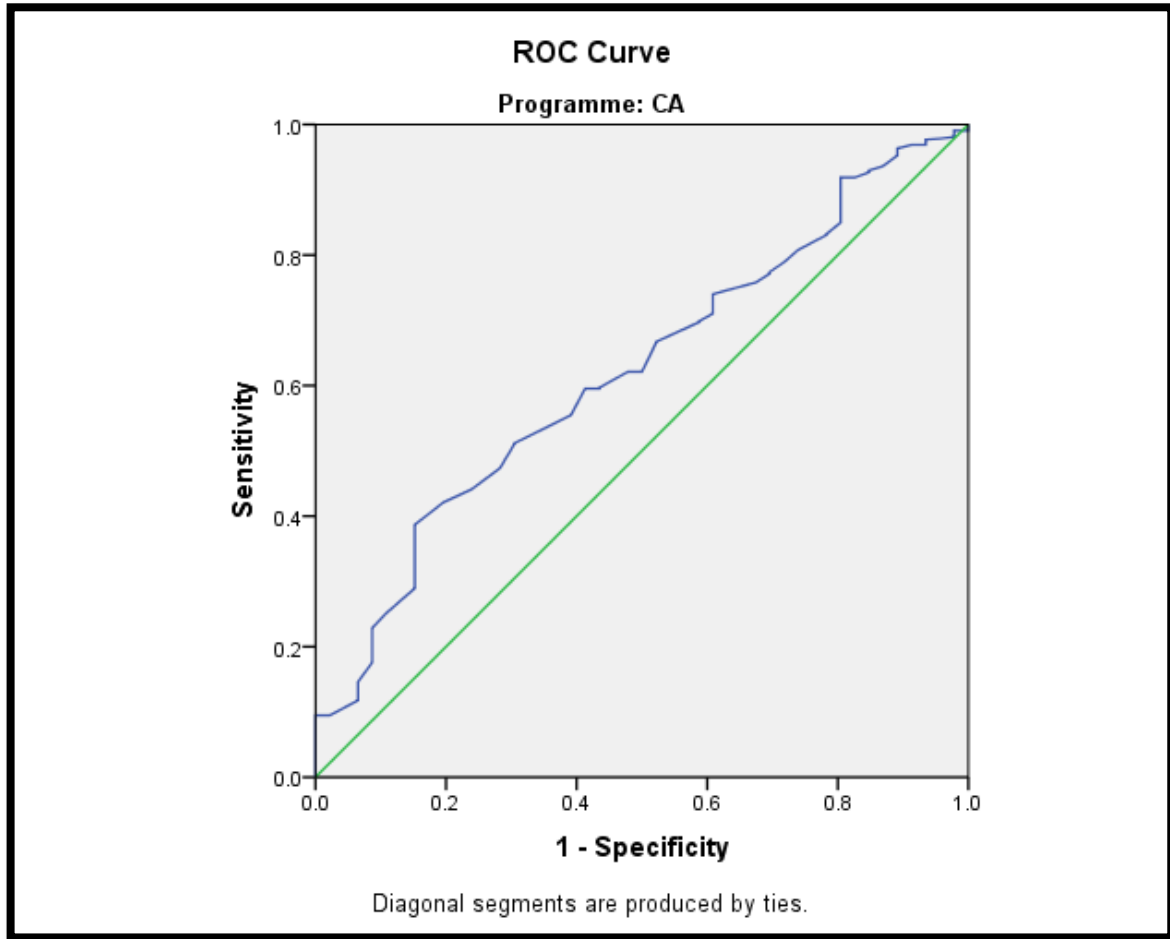
Table 37: Statistical computations for the Chartered Accountancy grade 12 Accounting

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.62	0.04	0.01	0.54	0.69

The coordinates of the Receiver Operating Characteristic curve are shown in table 71 (Annexure A) with the Receiver Operating Characteristic curve shown in figure 18. Table 37 shows the statistical computations for the Receiver Operating Characteristic curve which shows that prediction of the Chartered Accountancy programme grade 12 Accounting is statistically

significant as it is lower than the 0.05 significance level. The area under the curve is 62% with the confidence level stretching from 54% up to 70%. Results present a more reliable prediction. The optimum cut-off is therefore identified to be at as 75.

4.6.4.2   Forensic Accountancy

Figure 19: Receiver Operating Characteristic curve for the Forensic Accountancy grade 12 Accounting
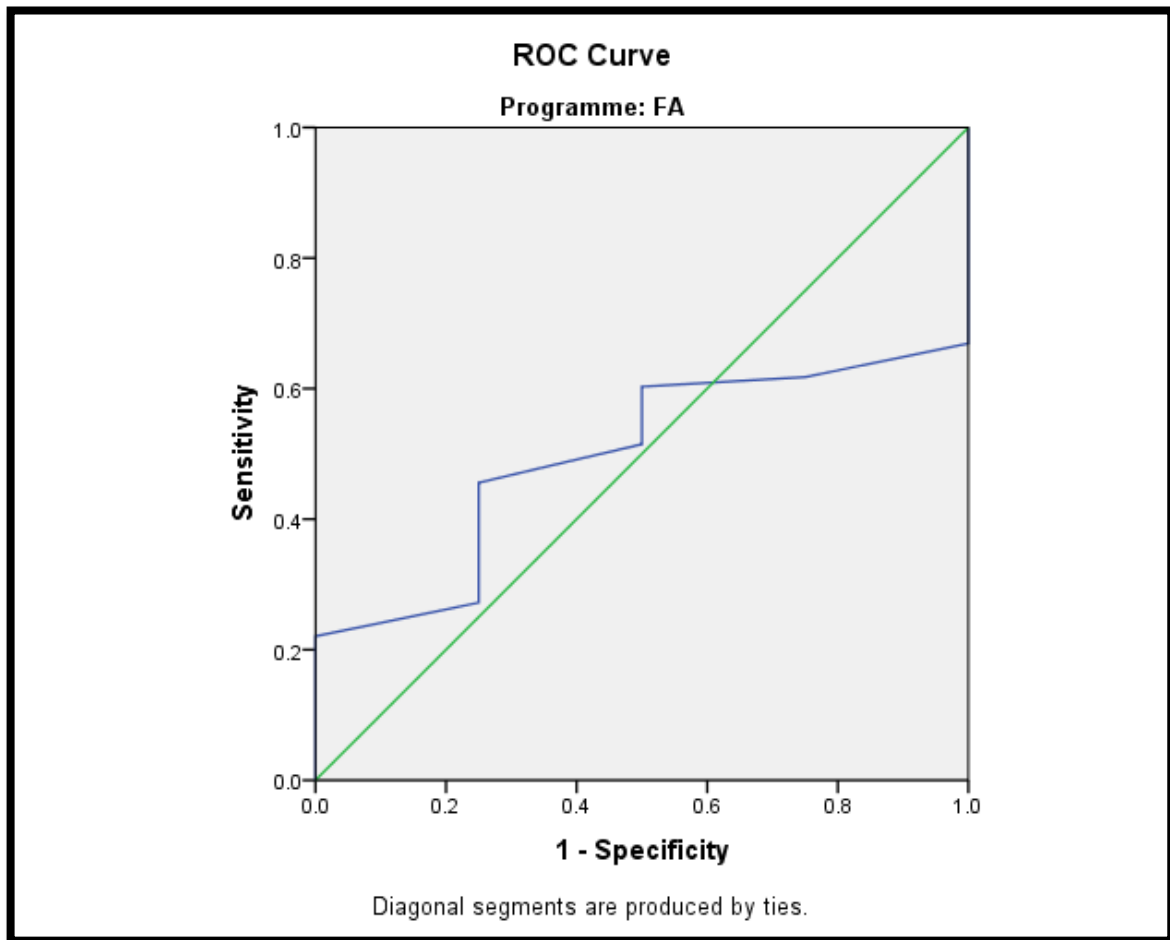
Table 38: Statistical computations for the Forensic Accountancy grade 12 Accounting

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.49	0.09	0.98	0.33	0.67

The Receiver Operating Characteristic curve is presented in figure 19 with its coordinates in table 72 (Annexure A). Table 38 shows the Forensic Accountancy prediction has no statistical significance because it is greater than 0.05. The area under the curve is 50% with the confidence level stretching from 33% up to 67% somehow present an undependable prediction. This identified the optimum cut-off of 75.

4.6.4.3 Financial Accountancy

Figure 20: Receiver Operating Characteristic curve for the Financial Accountancy grade 12 Accounting
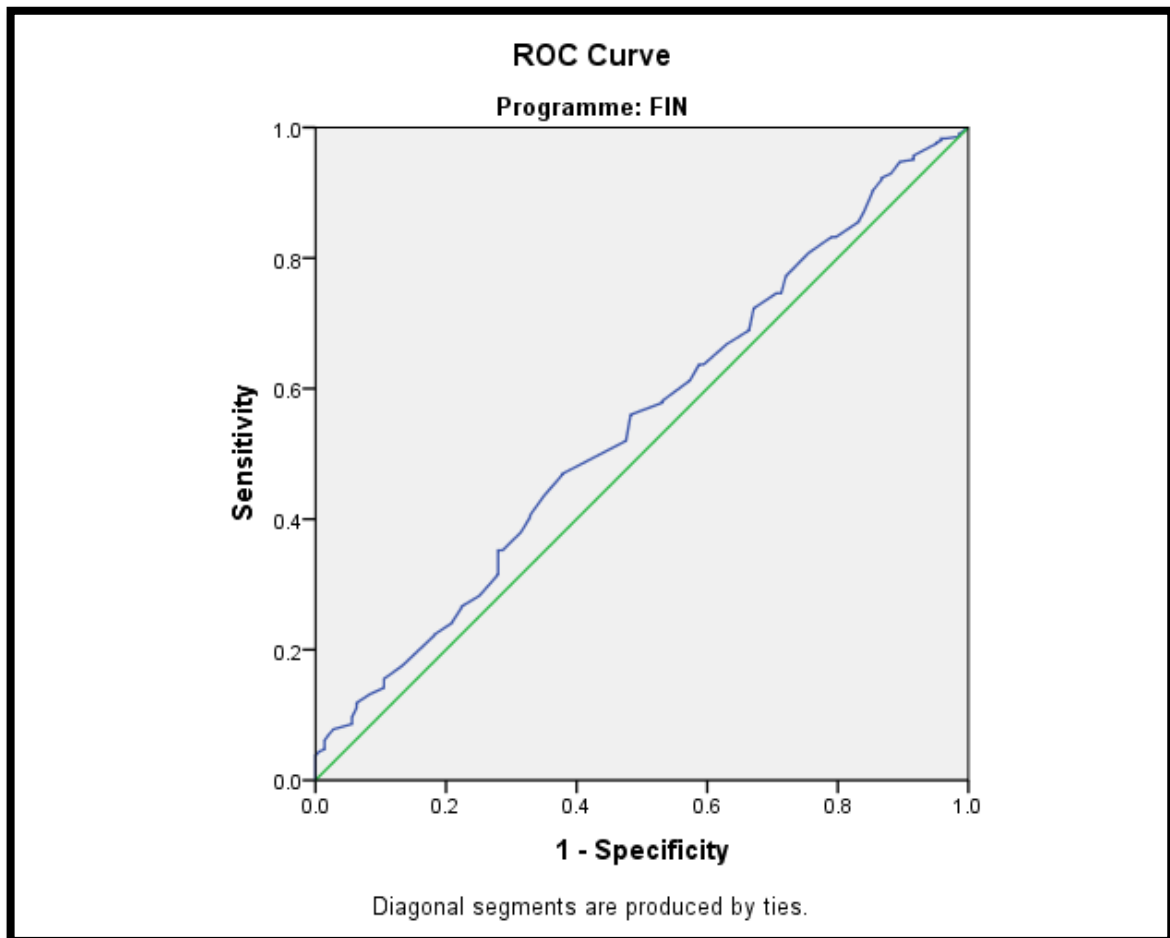
Table 39: Statistical computations for the Financial Accountancy grade 12 Accounting

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.55	0.03	0.08	0.49	0.59

Table 73 (Annexure A) shows the coordinates of the Receiver Operating Characteristic curve in figure 20. The area under the curve is 55% with the confidence levels ranging from 50% to 60%. There is no statistical significance because the prediction significance level is greater than 0.05. The optimum cut-off is identified to be at 60.

4.7   GRADE 12 FIRST LANGUAGE

In this section, The Receiver Operating Curves and the suggested cut-off are explained for each accountancy programmes and First Language.

4.7.1.1 Chartered Accountancy

Figure 21: Receiver Operating Characteristic curve for the Chartered Accountancy grade 12 First Language
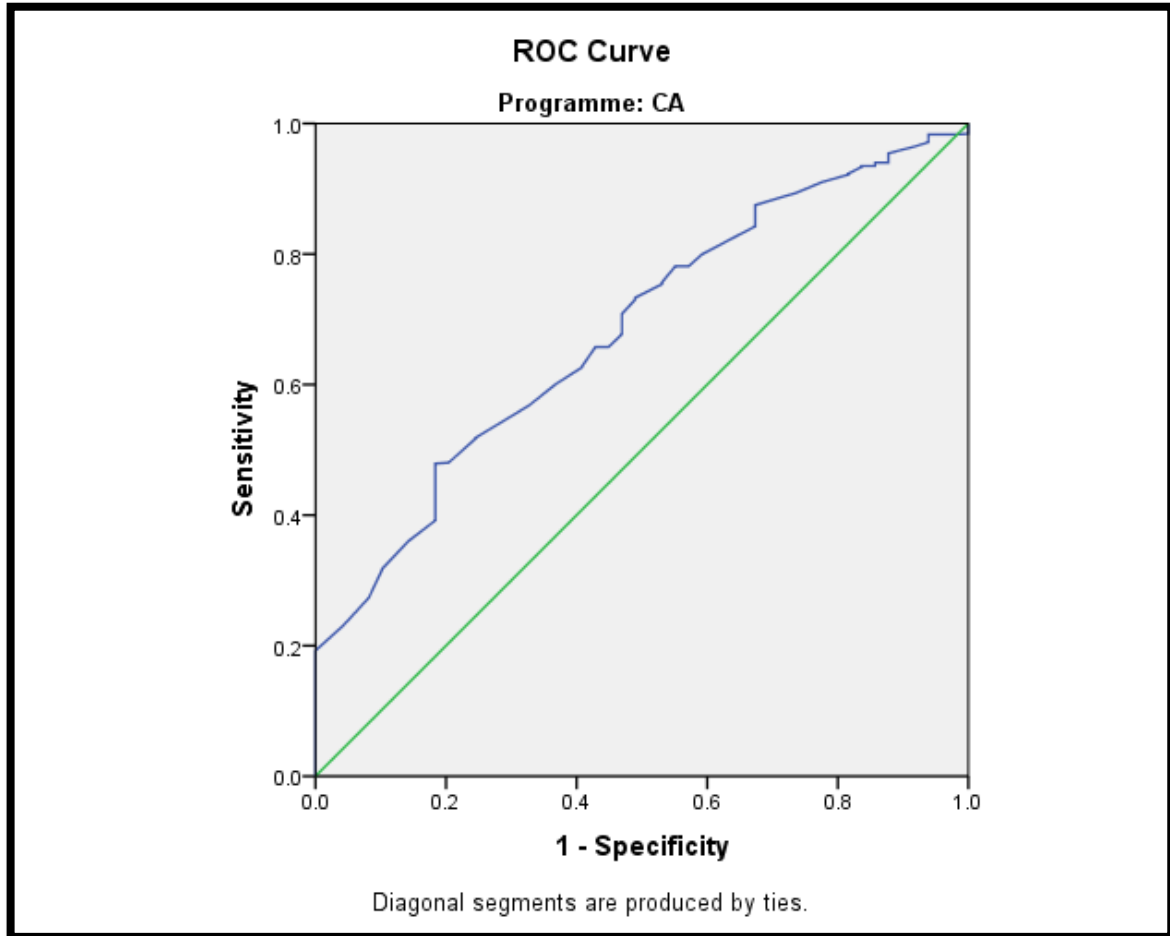
Table 40: Statistical computations for the Chartered Accountancy grade 12 First Language

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.68	0.04	0.00	0.61	0.75

Figure 21 shows the Receiver Operating Characteristic curve with its coordinates shown in table 74 (Annexure A). The area under the curve is 68% with the confidence levels stretching 61% up to 75%. The curve is of significant difference because it is lesser than 0.05. The prediction for the Chartered Accountancy grade 12 First Language is excellently reliable because

area and confidence levels that are greater than 50% and the significance level lower than 0.05. Table 74 also shows the optimum cut-off which is 70.

4.7.1.2   Forensic Accountancy

Figure 22: Receiver Operating Characteristic curve for the Forensic Accountancy grade 12 First Language
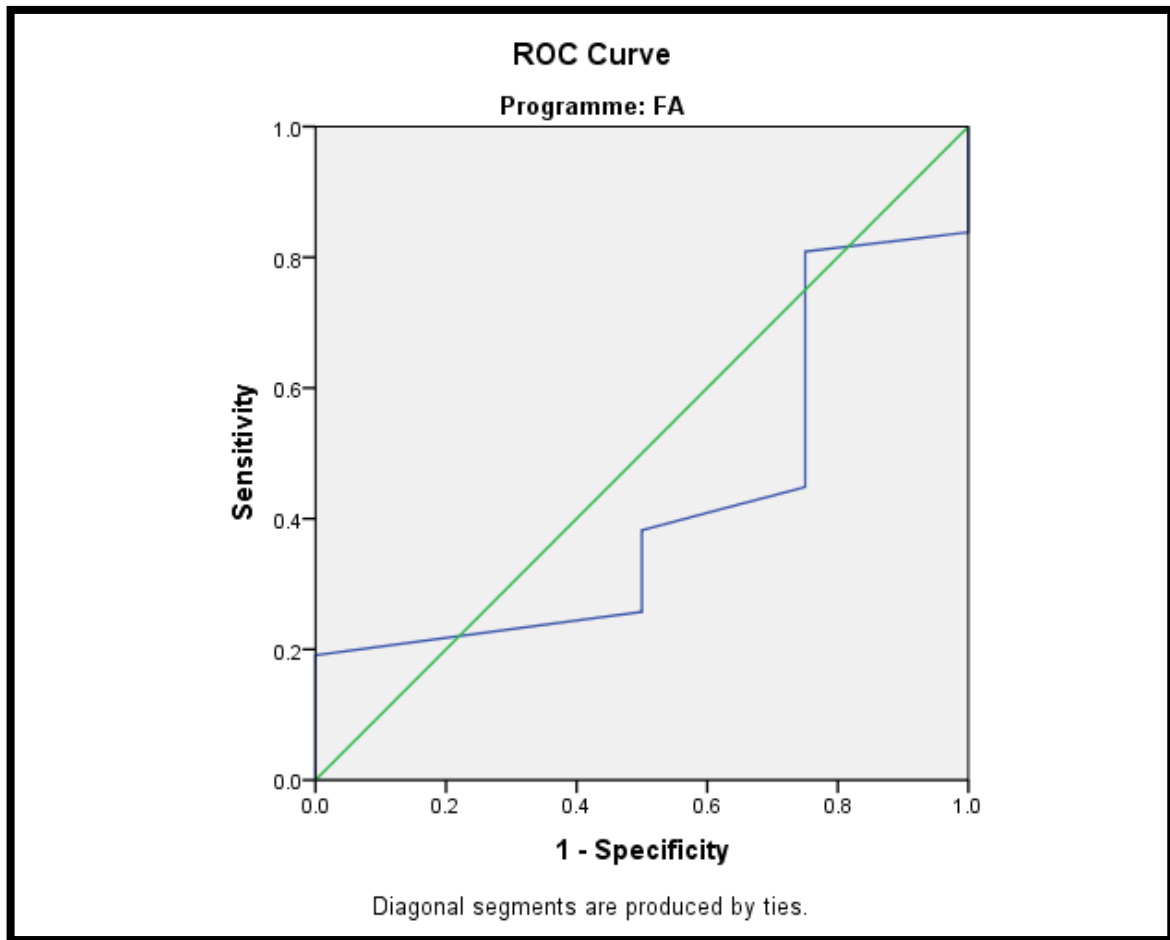
Table 41: Statistical computations for the Forensic Accountancy grade 12 First Language

			Asymptotic 95% Confidence Interval	
Area	**Std. Error**	**Asymptotic Sig.**	**Lower Bound**	**Upper Bound**
0.42	0.13	0.59	0.17	0.67

The Receiver Operating Characteristic curve is shown in figure 22 and it coordinates in table 75 (Annexure A). Table 41 shows the statistical computations, the curve does not have any

significant difference because the significance level is greater than 0.05. The area under the curve is 42% with its confidence levels stretching from 17% up to 67%. The results show a bad prediction. The optimum cut-off as presented in table 75 (Annexure A) shows it as 75.

4.7.1.3   Financial Accountancy

Figure 23: Receiver Operating Characteristic curve for the Financial Accountancy grade 12 First Language
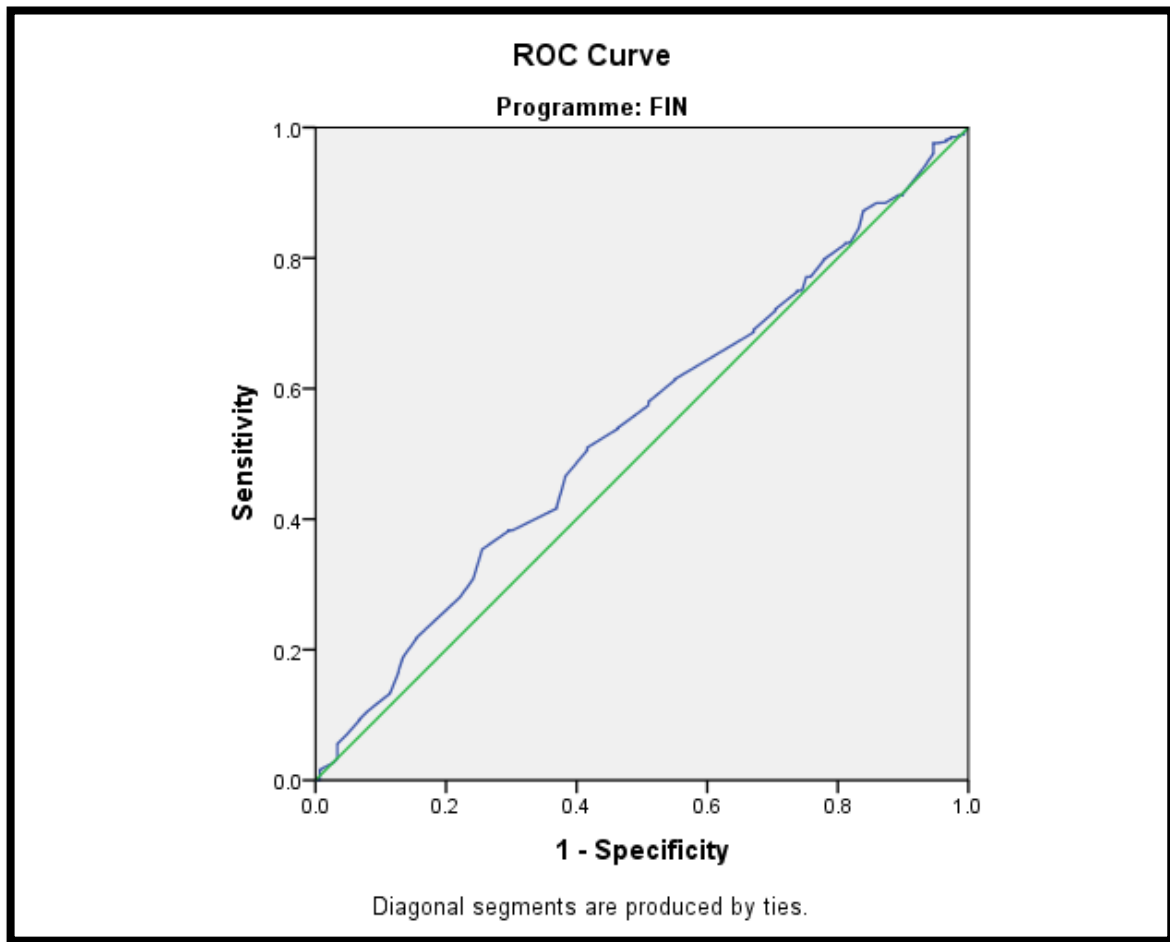
Table 42: Statistical computations for the Financial Accountancy grade 12 First Language

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.54	0.03	0.11	0.49	0.59

Figure 23 presented the Receiver Operating Characteristic curve and its coordinates shown in table 76. Table 42 presents the area under the curve at 54% with the confidence levels ranging from 49% to 59%. The curves prediction is not statistically significant because of it being greater than 0.05. The optimum cut-off as shown in table 76 (Annexure A) is 65. This is a good prediction and therefore a reliable prediction.

4.8   UNIVERSITY ACCOUNTING MODULES

The following section will only focus on the financial accounting modules as per programme. The Chartered Accountancy and the Forensic Accountancy programmes use the module code ACCC as noted earlier. All other accountancy programmes offered by the university use the financial accounting code ACCF and they are all grouped together in the results as discussed previously. These accounting modules are analysed to determine if a certain mark would be an indicator of success in the third year.

4.8.1 Chartered Accountancy

Figure 24: Receiver Operating Characteristic curve for the Chartered Accountancy (1sst year, 1st semester).

ROC Curve

Programme: CA

Diagonal segments are produced by ties.
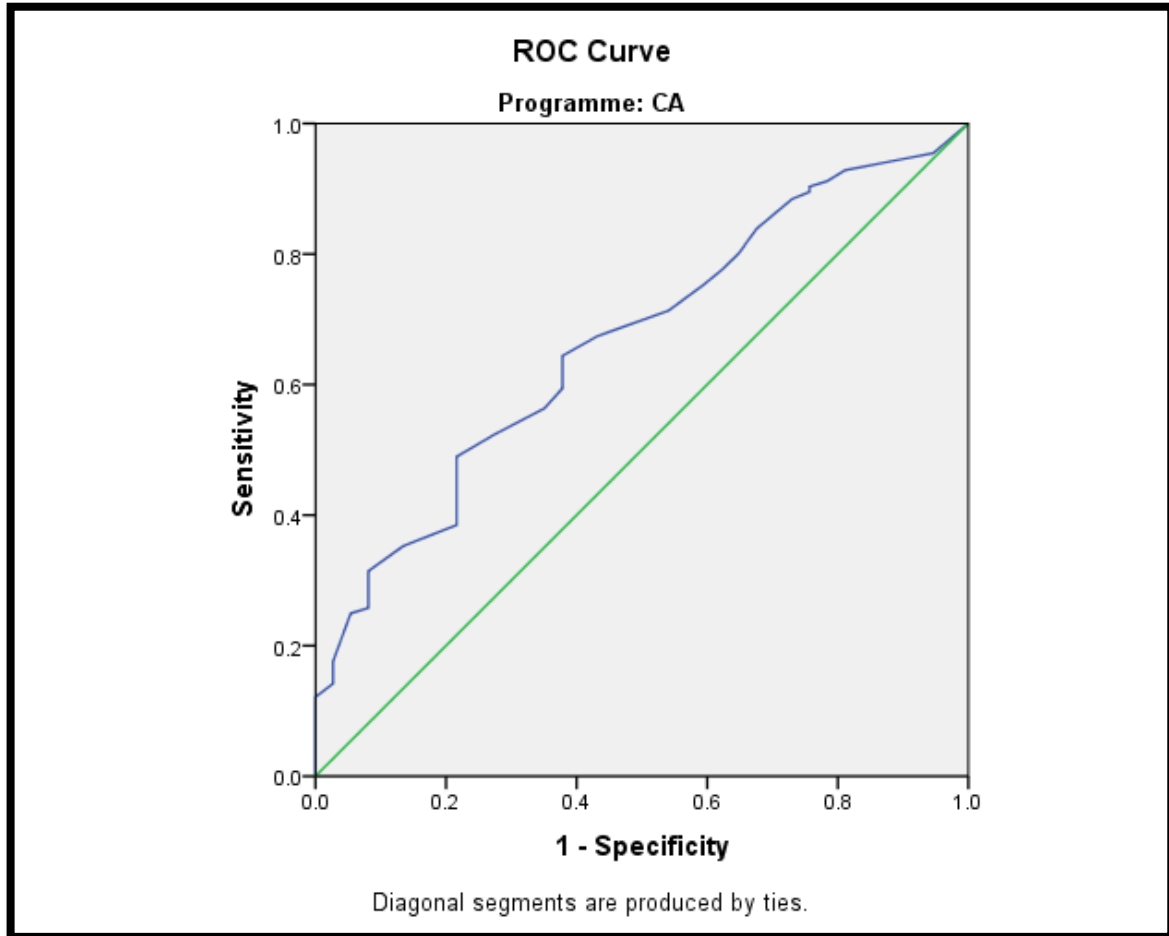
Table 43: Statistical computations for the Chartered Accountancy financial accounting (1st year, 1st semester).

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.67	0.04	0.00	0.59	0.75

Figure 24 presented the curve and its coordinates presented in table 77 (Annexure A). The area under the curve is 67% with a confidence level ranging from 59% and 75%.The curve is statistically significant as it is lower than 0.05. The optimum cut-off is, therefore, determined to

be 60 also presented in table 77 (Annexure A). Therefore, the results present a very reliable prediction.

Figure 25: Receiver Operating Characteristic curve for the Chartered Accountancy (1st year, 2nd semester)
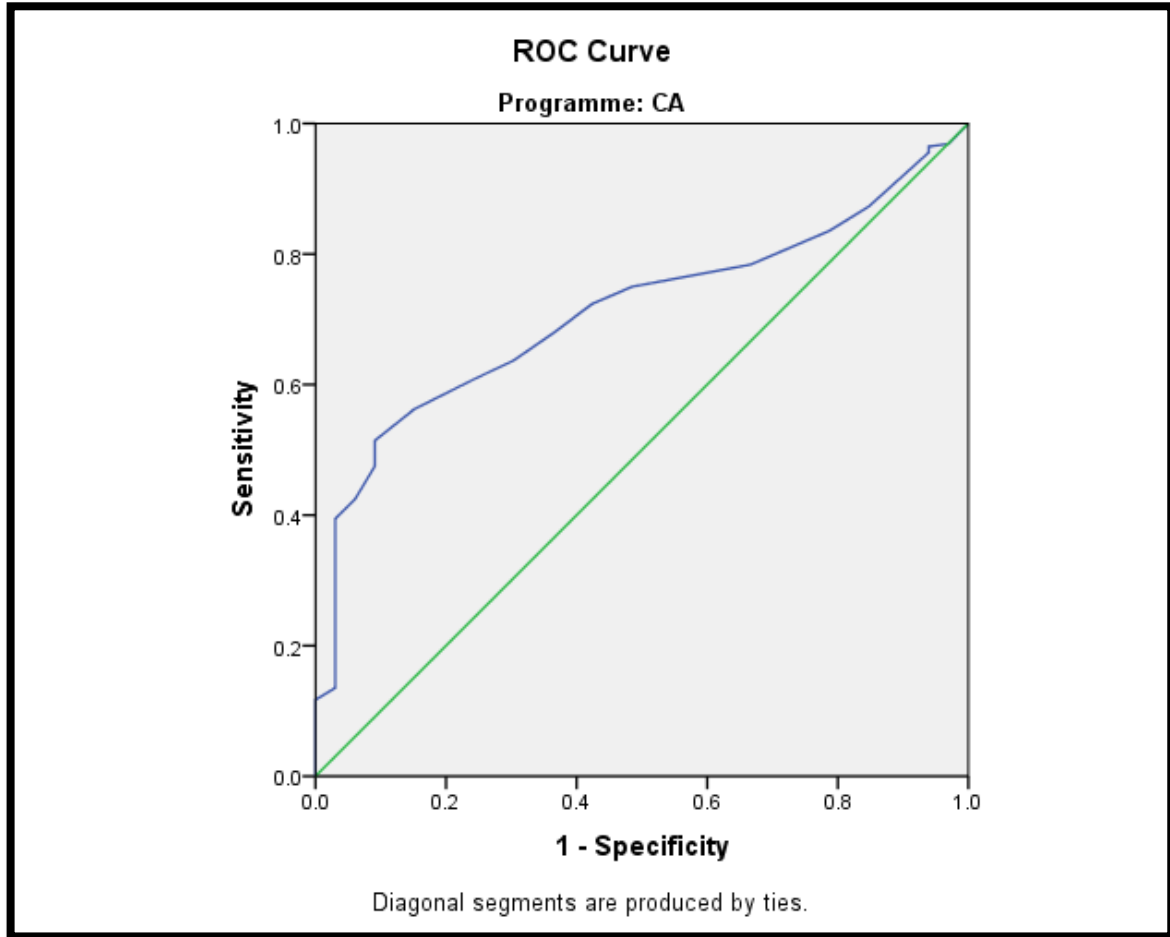
Table 44: Statistical computations for the Chartered Accountancy (1st year, 2nd semester).

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.71	0.03	0.00	0.65	0.78

Figure 25 presented the Receiver Operating Characteristic curve with it coordinates presented in table 78 (Annexure A). The area under the curve is 71% with the confidence level stretching from 65% to 78%. The curve is statistically significant because the 0.00 is less than 0.05. This indicates the identified optimum cut-off of 60. The results present a reliable prediction.

Figure 26: Receiver Operating Characteristic curve for the Chartered Accountancy 2nd year.
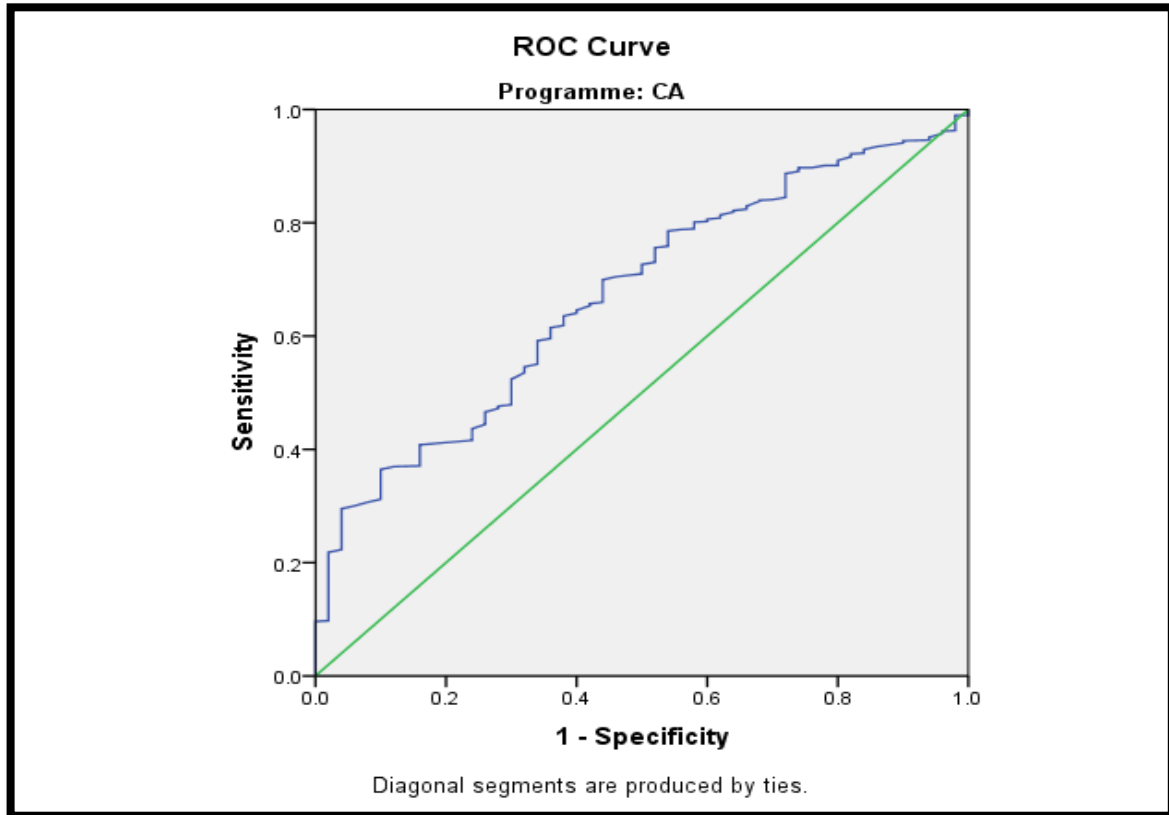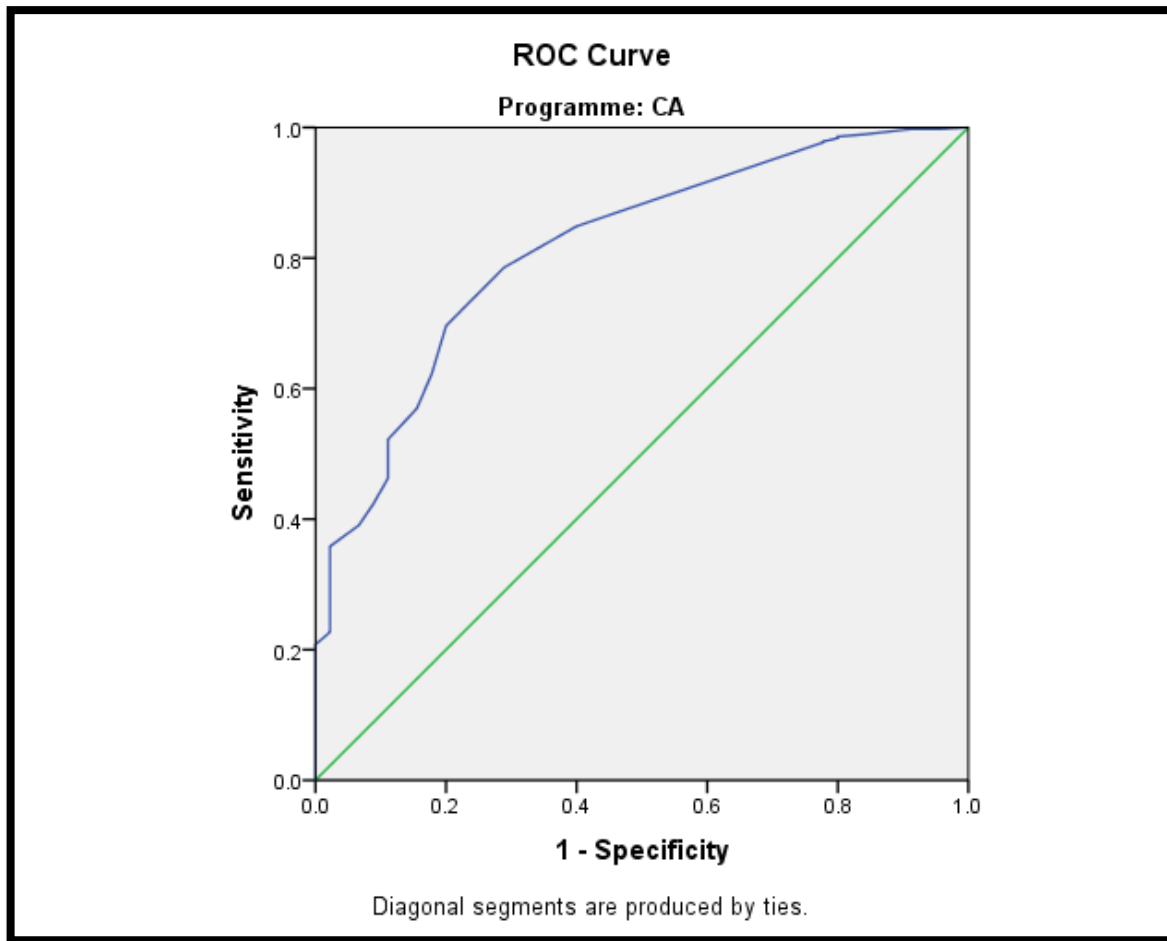

Table 45: Statistical computations for the Chartered Accountancy (2nd year).

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.82	0.03	0.00	0.75	0.88

The Receiver Operating Characteristic curve is presented in figure 26 with its coordinates presented in table 79 (Annexure A). The area under the curve is 82% with the confidence levels stretching from 75% to 88%. The area under the curve indicates the 82% probability the optimum cut-off can perform. The cut-off was identified at 55. Therefore, this is a reliable prediction.

4.8.2 Forensic Accountancy

Figure 27: Receiver Operating Characteristic curve for the Forensic Accountancy (1st year, 1st semester).

ROC Curve
Programme: FA

Diagonal segments are produced by ties.
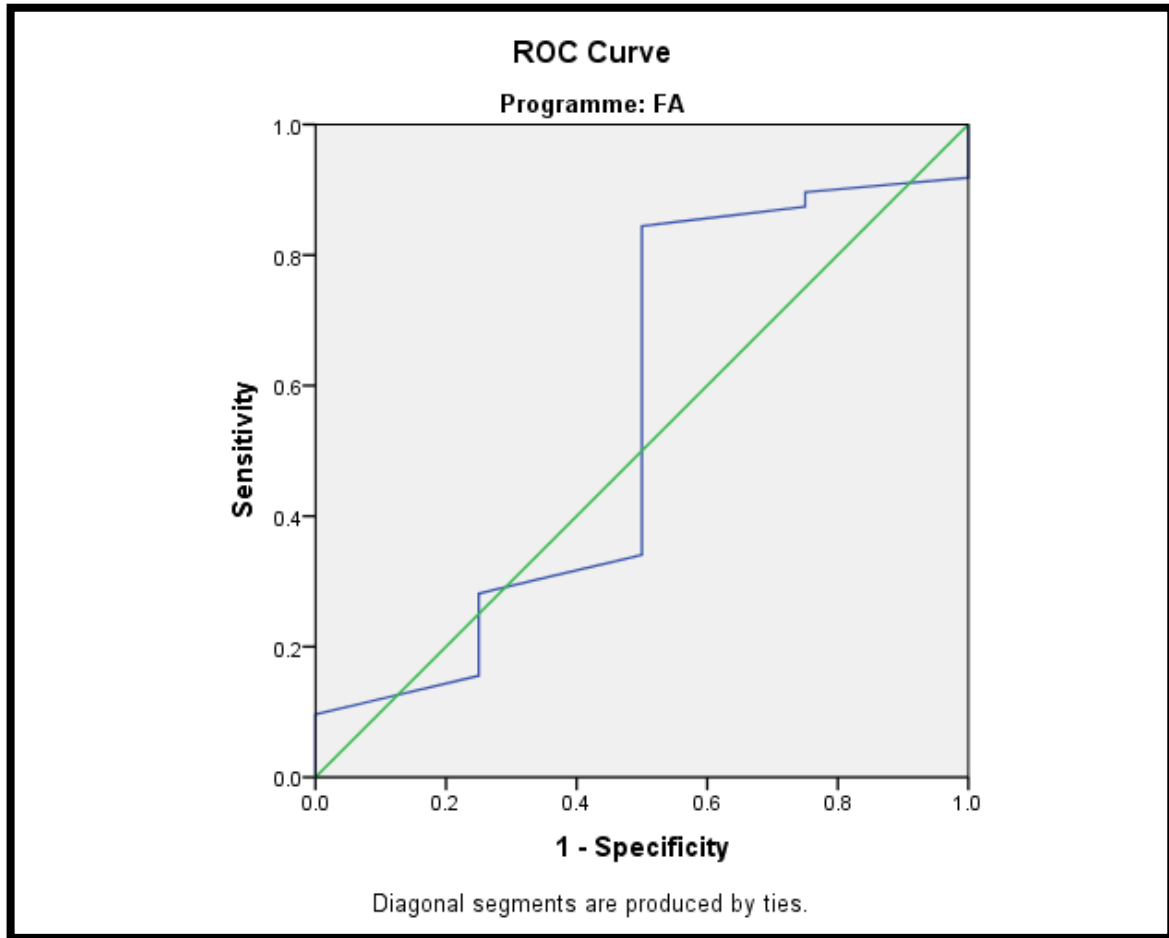
Table 46: Statistical computations for the Forensic Accountancy (1st year, 1st semester).

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.55	0.17	0.73	0.22	0.89

The area under the curve is 55% with the confidence levels stretching from a low 22% up to a high 89%. The optimum cut-off was identified at 60 as presented in table 80. Therefore, the results possess a prediction that might work and are somewhat reliable. Figure 27 presented the Receiver Operating Characteristic curve and table 80 (Annexure A) presented the coordinates of it.

Figure 28: Receiver Operating Characteristic curve for the Forensic Accountancy (1st year, 2nd semester).

ROC Curve

Programme: FA

Diagonal segments are produced by ties.
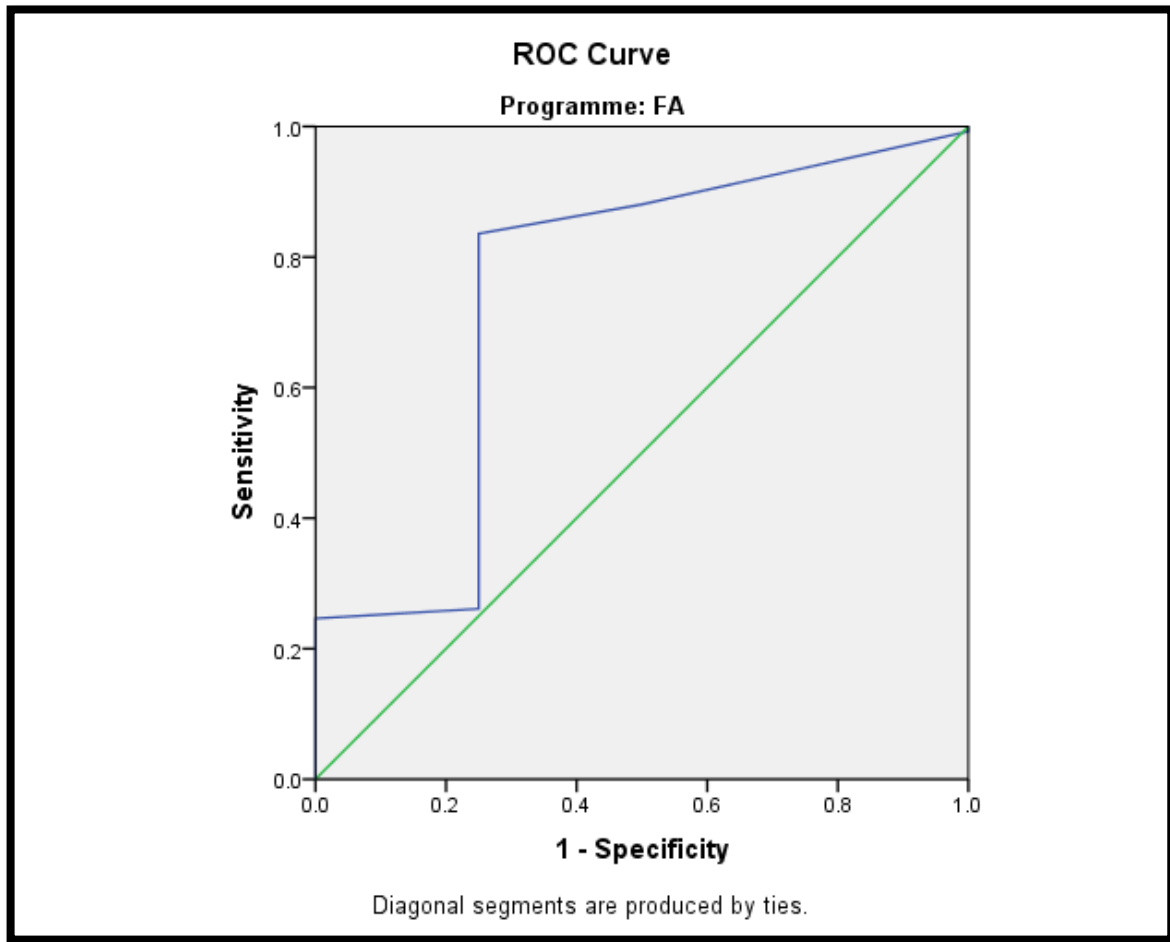
Table 47: Statistical computations for the Forensic Accountancy (1st year, 2nd semester).

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.75	0.15	0.09	0.46	1.00

The Receiver Operating Characteristic curve is presented in figure 28 with it coordinates presented in table 81 (Annexure A). The area under the curve is 75% with the confidence levels stretching from 46% to 100%. The prediction is statistically significant and the cut-off was identified at 60. This is a reliable prediction.

Figure 29: Receiver Operating Characteristic curve for the Forensic Accountancy (2nd year).
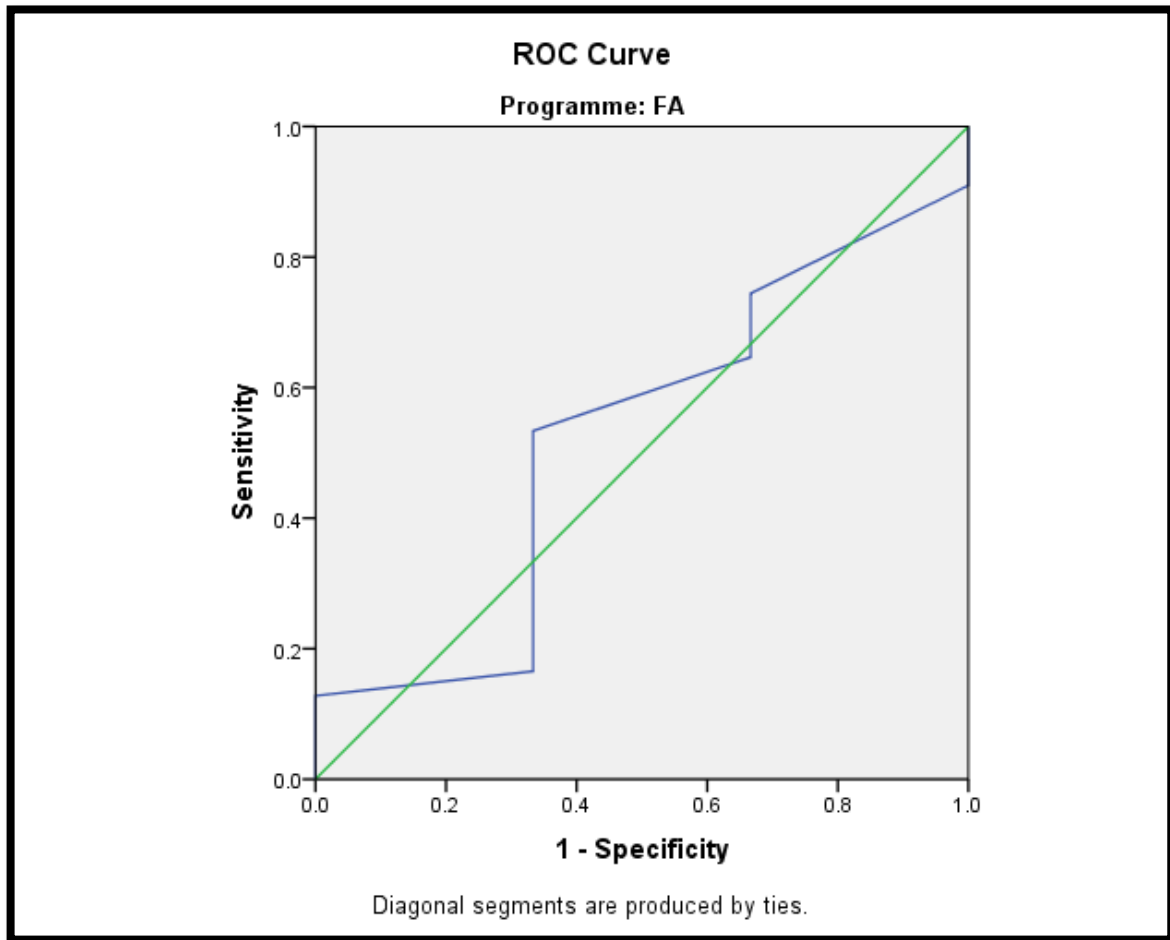
Table 48: Statistical computations for the Forensic Accountancy (2nd year).

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.52	0.17	0.90	0.19	0.85

The Receiver Operating Characteristic curve is presented in figure 29 with it coordinates presented in table 82 (Annexure A). The area under the curve is 52% with the confidence levels stretching from 19% to 85%. The curve is also not a statistically significant difference because 0.9 is greater than 0.05 and the cut-off was identified at 55. Therefore, the results do not provide a reliable prediction.

4.8.3   Financial Accountancy

Figure 30: Receiver Operating Characteristic curve for the Financial Accountancy (1st year, 1st semester).

ROC Curve
Programme: FIN

Diagonal segments are produced by ties.
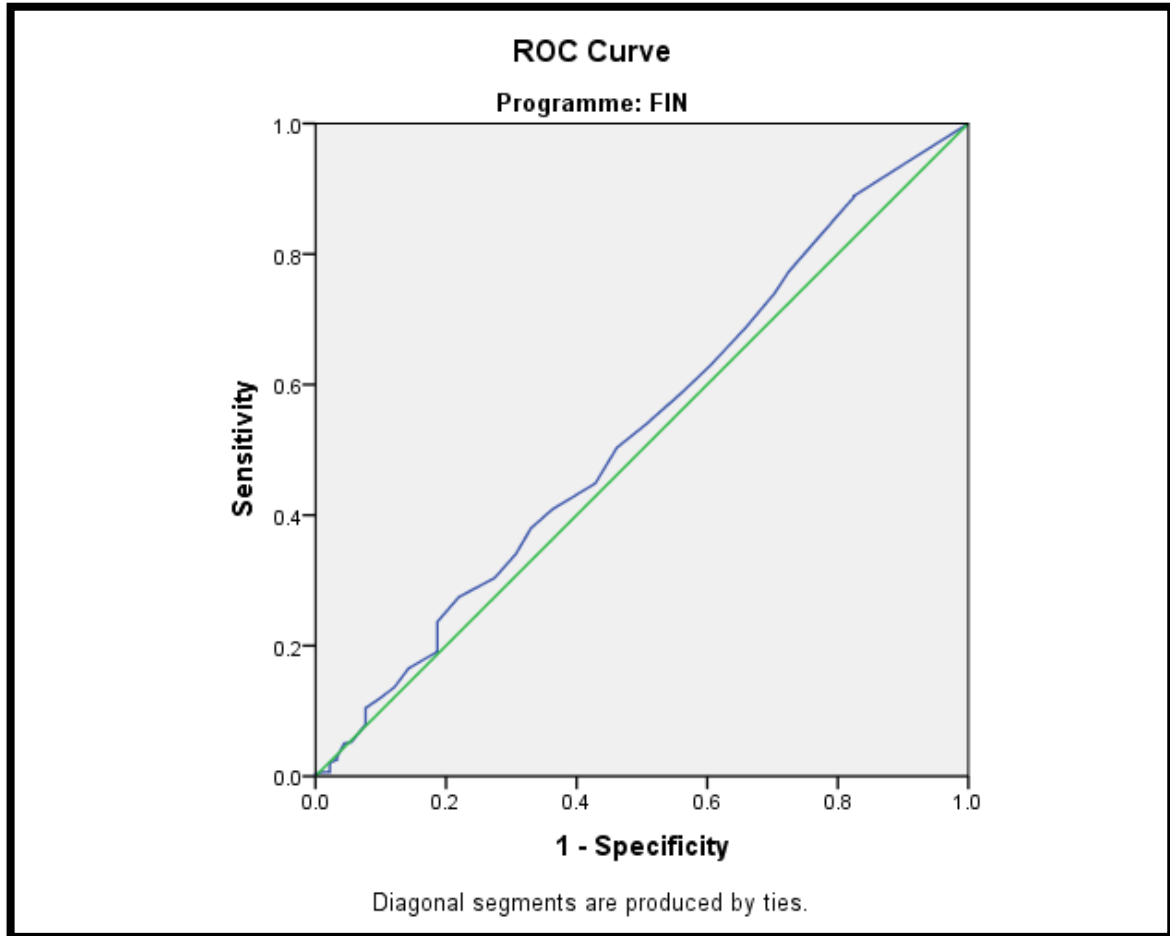
Table 49: Statistical computations for the Financial Accountancy (1st year, 1st semester).

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.53	0.03	0.33	0.47	0.59

The Receiver Operating Characteristic curve is presented in figure 30 with its coordinates presented in table 83. The area under the curve is 53% with the confidence levels ranging from 47% to 60%. The prediction is not statistically significant and the cut-off was identified at 55. Therefore, this prediction is reliable.

Figure 31: Receiver Operating Characteristic curve for the Financial Accountancy (1st year, 2nd semester).
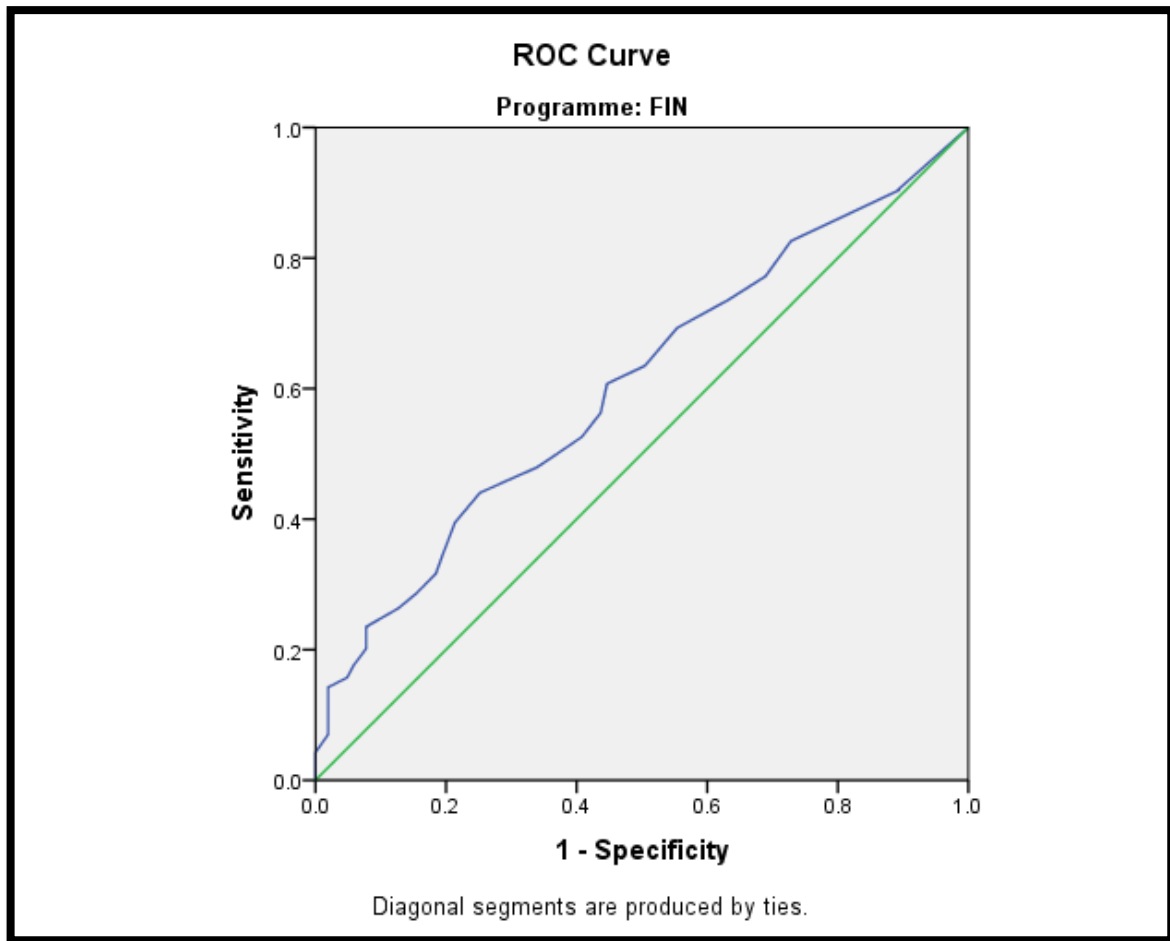
Table 50: Statistical computations for the Financial Accountancy (1st year, 2nd semester).

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.61	0.03	0.01	0.55	0.66

The Receiver Operating Characteristic curve is presented in figure 31 with it coordinates presented in table 84 (Annexure A). The area under the curve is 61% with the confidence levels stretching from 55% to 66%. The prediction is statistically significant and the cut-off was identified at 55. This presents a reliable prediction.

Figure 32: Receiver Operating Characteristic curve for the Financial Accountancy (2nd year, 1st semester).
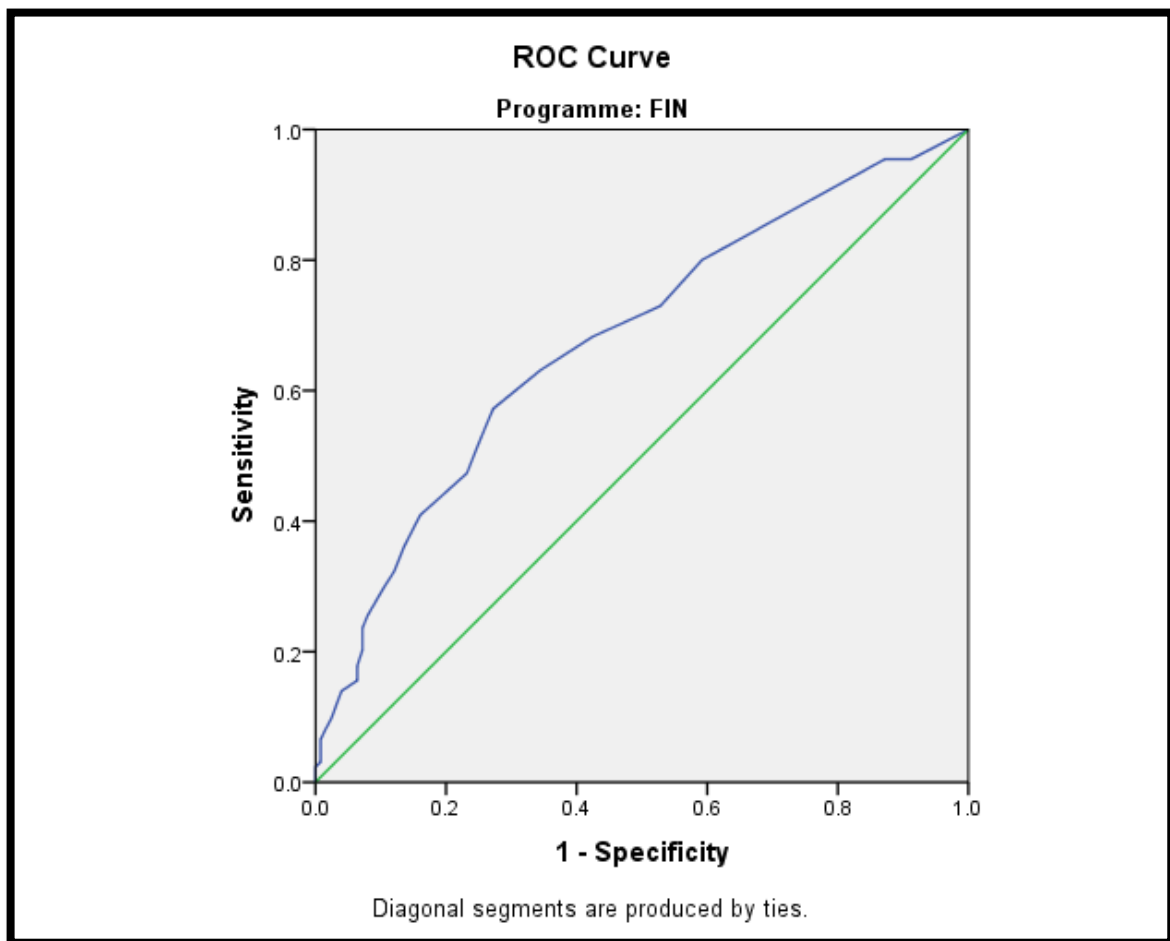
Table 51: Statistical computations for the Financial Accountancy (2ⁿᵈ year, 1ˢᵗ semester).

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.68	0.03	0.00	0.63	0.73

The Receiver Operating Characteristic curve is presented in figure 32 with its coordinates presented in table 85 (Annexure A). The area under the curve is 68% with the confidence levels stretching from 63% to 73%. The predictions' significance level of 0.0 is statistically significant because of being less than 0.05 and the cut-off was identified at 50. This results to a reliable prediction.

Figure 33: Receiver Operating Characteristic curve for the Financial Accountancy (2ⁿᵈ year, 2ⁿᵈ semester).
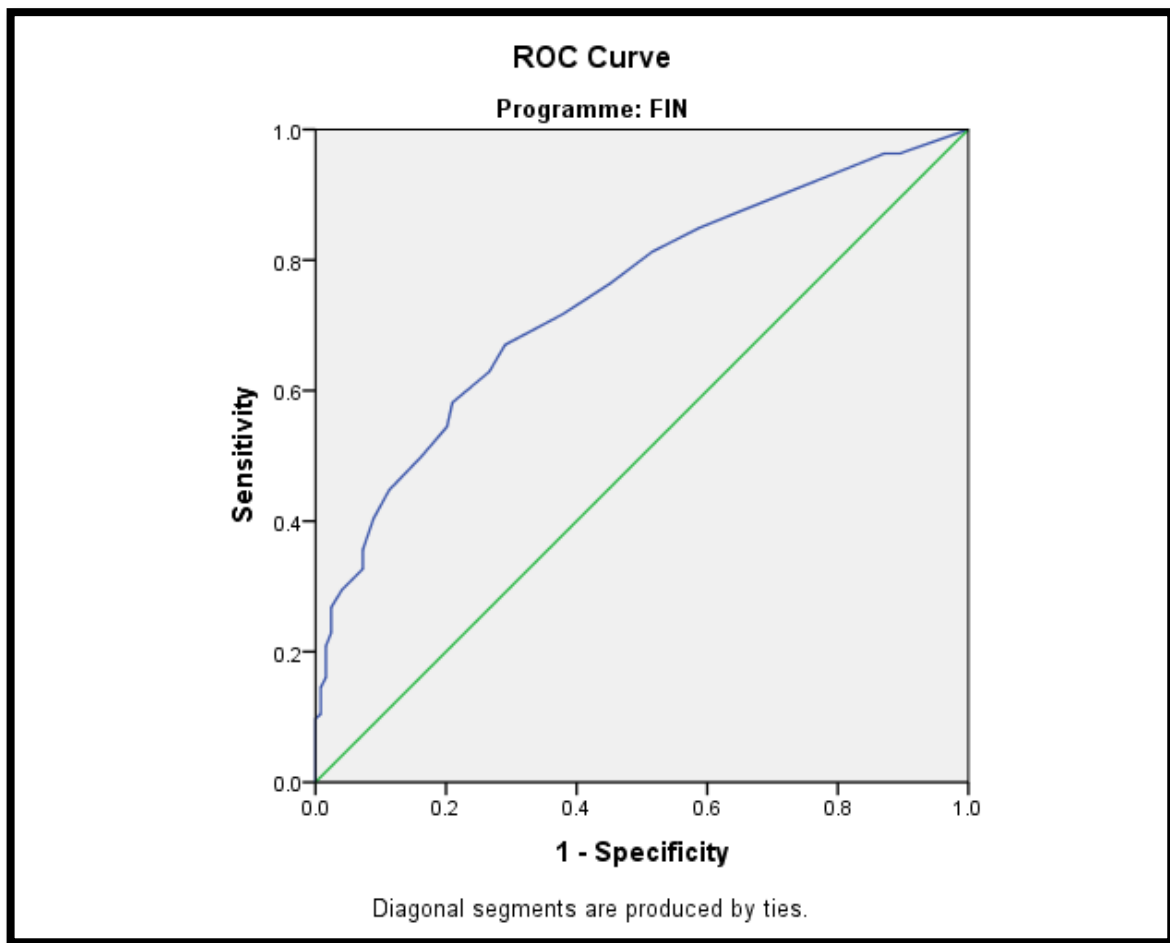
Table 52: Statistical computations for the Financial Accountancy (2ⁿᵈ year, 2ⁿᵈ semester).

Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.74	0.02	0.00	0.69	0.79

The Receiver Operating Characteristic curve is presented in figure 33 with its coordinates presented in table 86 (Annexure A). The area under the curve is 74% with the confidence levels stretching from 69% to 79%. The prediction is statistically significant as it is lesser than 0.05. The cut-off was identified at 50. Therefore, this results in a reliable prediction.

From the above Receiver Operating Characteristic curves, the following optimum cut-off points were identified, which could predict the success of students in completing their studies up to the end of their third year in each programme presented at University A:

- Predictors of success in Chartered Accountancy (table 53);
- Predictors of success in Forensic Accountancy (table 54); and
- Predictors of success in Financial Accountancy (table 55).

Table 53: Summary of predictors for success in Chartered Accountancy

Predictor	Area under graph	Confidence level	Significance	Optimal point identified
APS score	0.66	0.74	0.00	32-33
School average	0.35	0.74	0.00	70
Mathematics	0.58	0.66	0.71	65
Accounting	0.62	0.69	0.01	75
First year accounting module, first semester	0.67	0.75	0.01	60
First year accounting module, second semester	0.71	0.78	0.00	60

Second year accounting module	0.82	0.88	0.00	55

Table 54: Summary of predictors for success in Forensic Accountancy

Predictor	Area under graph	Confidence level	Significance	Optimal point identified
APS score	0.38	0.51	0.42	39
School average	0.39	0.53	0.44	77
Mathematics	0.34	0.5	0.27	75
Accounting	0.49	0.67	0.98	75
First year accounting module, first semester	0.55	0.89	0.73	60
First year accounting module, second semester	0.75	1.00	0.94	60
Second year accounting module	0.52	0.85	0.90	55

Table 55: Summary of predictors for success in Financial Accountancy

Predictor	Area under graph	Confidence level	Significance	Optimal point identified
APS score	0.55	0.60	0.52	30
School average	0.57	0.66	0.71	60
Mathematics	0.53	0.58	0.30	55
Accounting	0.55	0.59	0.78	60
First year accounting module, first semester	0.53	0.59	0.33	55
First year accounting module, second	0.61	0.66	0.01	55

semester				
Second year accounting module; first semester	0.68	0.73	0.00	50
Second year accounting module; second semester	0.74	0.79	0.00	50

4.9   SUMMARY

The aim of the study as stated in Chapter 1 was to establish whether the admission requirements in the South African universities adequately predict the success in accountancy studies. To achieve the set of empirical objectives presented in Chapter 1, descriptive and inferential statistics were used.

The results showed that the majority of the strong correlations, which were also statistically significant, were found between:

- ACCC year levels;
- ACCF year levels; and
- School related variables such and the success in ACCF and ACCC.

It was also concluded that the school-related variables do have an influence on success in accountancy studies at university.

The results from the Receiver Operating Characteristic curves presented the probability of performance, the confidence intervals both at the lower and upper bound and the area under the curve of the new cut-off points. The overall results from the Receiver Operating Characteristic curves for the school-related variables indicated the following for the area under the curve ranges from 35% and 68% meaning the results are both fair and poor respectively. This means that the identified optimum cut-off for some variables is very reliable and could be implemented.

Tables 53 to 55 present the performance summary of the variables from the first year taking the grade 12 results into consideration up to the third year. The acceptable cut-off mark for each level was, therefore, presented.

The Receiver Operating Characteristic curves for the financial accounting module (both ACCC and ACCF) were presented from figure 24 to figure 33. Their overall performance measure that is

the area under the curve ranged from 52% up to 82%. The range area under the curve indicated that the identified optimum cut-offs at each level had the greatest probability of working well and is, therefore, reliable. The ACCF module had the lowest cut-off identified that ranged from the 50 and 55 mark. The cut-off for the first year as per the statistics was identified as 55 and 50 for the second year ACCF. For the ACCC module, the identified cut-off ranged between 55 and 60. For the first year, the identified mark should be 60 and 55 for the second year.

The analysis for ACCF (Financial Accountancy and other streams) first semester was done though the results were not impressive because a mark of 50 means that the success of the module is also the same as a coin toss, there is a 50/50 chance of being successful or not. The overall test for the ACCF did not show good results and if the 50% cut-off is used, it will result in poor results. The performance of the second semester was, however, better. Although the results are not impressive the confidence levels were better than that of the first semester.

The analysis of the Chartered Accountancy programme was impressive. All the variables tested for the Chartered Accountancy programme showed that the predictions were good based on the test results variables namely the area under the curve, confidence levels which should be greater than 50% and the asymptotic significance lower than 0.05 to make a good prediction.

The analysis of the Forensic Accountancy programme was, in fact, disappointing. The cause of the disappointing results maybe the lack of data available on the programme. The identified cut-offs were always high with its area under the curve and confidence levels very low and the asymptotic significance greater than 0.05.

CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1   INTRODUCTION

Chapter 5 revisits all the previous chapters, report on the objectives, provide limitations to the study, and make conclusions and recommendations. In Chapter 1, the problem statement for the study was outlined. From the problem statement, the objectives of the study were formulated. The primary objective of the study as stated was as follows:

…to establish whether the admission requirements to universities in South Africa adequately predict academic success in the professional accounting field to enable optimal use of scarce resources in practice.

To achieve the primary objective, there were several secondary objectives divided in two namely the theoretical and empirical objectives. The theoretical objectives of the study as stated in Chapter 1 were as follows:

- To review the literature and provide the definition and scope of the accounting profession;
- To establish the demands of skilled professional accountants training in South Africa; and;
- To provide literature and review the admission policy on the South African education system.

The empirical objectives as stated in Chapter 1 were as follows:

- To identify students who are at risk according to the academic level pass mark;
- To establish if there is a correlation between grades in matric and university success rate;
- Identify possible predictors of academic success of students at entry point into an accounting programme at tertiary level;
- To conclude and to make recommendations on the most accurate predictor(s) for the academic success of students at the entry point into an accounting programme at tertiary level in an attempt to close the gap between the financial skills needed to ensure economic growth and the supply thereof.

The remainder of this chapter is set out by first providing a synopsis of the findings on each of the secondary research objectives. The latter is followed by a conclusion on the overall research

objective of the study. Next, the limitations the study is subject too are recognised followed by the overall conclusion on the study. Finally, recommendations, based on the findings of the study, are made, concluding with some identified areas for further research.

5.2 CONCLUSIONS ON THE RESEARCH OBJECTIVES

The primary objective of the study was supported by the secondary objectives. The secondary objectives will now be discussed in detail.

5.2.1 The theoretical objectives

All the theoretical objectives were achieved through a literature review presented in Chapter 1 and 2.

5.2.1.1 Review, define and provide the scope of accountancy profession (theoretical objective 1)

The review of previous research was done by using existing published articles, textbooks, newspaper articles and the internet. The accountancy profession was therefore defined as all the activities that take place in the accounting professionals/accountants practice, the practice of accountants include the practice of the accountancy disciplines which are namely: Audit, Financial Accounting, Financial Management, Management Accounting, Taxation and Strategy, Risk Management and Governance. These disciplines were broadly explored in chapter 2.

5.2.1.2 The demands of financially skilled professional accountants in South Africa (theoretical objective 2)

Chapter 1, on the background of the study, introduced the issue at hand: South Africa's demand for financially skilled individuals. The aim of the study was to investigate if the university admission requirements in South Africa adequately predict academic success in the accounting studies to meet the demand of the skills shortage. The investigation was therefore focused on the admission requirements of universities. The investigation of the admission requirements was therefore limited to testing if the entry requirements to predict the success of the accounting studies.

As stated by SAICA (2008) the need for professionals in the accountancy field could seriously hamper the growth of the economy (SAICA, 2008). The lack or shortage of financially skilled

professionals affects the economy since there are not enough financially skilled professionals to enable the growth of the economy (SAICA, 2008). The FASSET also indicated that the financially skilled professionals amount to 66% of the scarce professional vacancies (FASSET, 2014: 26). The poor throughput of graduates, therefore, increases the demands of the financially skilled professionals. This was elaborated on in Chapter 2.

5.2.1.3   The admission policy on the South African education system (theoretical objective 3)

The South African universities use the APS points system for acceptance of students into the universities. The table below indicates how the APS points are formed.

Table 56: Admission Point scores

NSC Scale	APS Score
8 (90-100%)	8
7 (80-89%)	7
6 (70-79%)	6
5 (60-69%)	5
4 (50-59%)	4
3 (40-49%)	3
2 (30-39%)	2
1 (0-29%)	1

In chapter 2 the admission requirements to the South African universities were made available. The information was presented in tables where universities were divided according to their types namely, Traditional Universities, Comprehensive Universities and Universities of Technology. All universities had specific APS points they required for admission to the accountancy programmes. The most common other requirements were Accounting, Mathematics and English

depending on the universities' preference. The admission policies were not only limited to APS score and prospective students from different education systems were also welcome. Table 7 presented a conversion table where all possible qualifications equivalent matriculation are converted to be equal to the APS score.

5.2.2 The empirical objectives

All the empirical objectives were achieved through statistical data analysis. The results of the data analysis are presented in Chapter 4.

5.2.2.1 To identify students who are at risk according to the academic level pass mark (empirical objective 1)

Based on the findings in Chapter 4, also summarised in table 53 to table 55, where the optimum cut-off levels were identified by means of The Receiver Operating Characteristic curves, the following students may be at risk of not completing their studies when:

- In the **Chartered Accountancy** programme, they score below the optimum cut-off points for each of the following predictors:
    - APS score < 32;
    - School average < 70;
    - Mathematics < 65;
    - Accounting < 75;
    - First year accounting module, first semester < 60;
    - First year accounting module, second semester < 60; and
    - Second year accounting module < 55.

- In the **Forensic Accountancy** programme, they score below the optimum cut-off points for each of the following predictors:
    - APS score < 39;
    - School average < 77;
    - Mathematics < 75;
    - Accounting < 75;
    - First year accounting module, first semester < 60;
    - First year accounting module, second semester < 60; and

- Second year accounting module < 55.
- In the **Financial Accountancy** programme, they score below the optimum cut-off points for each of the following predictors:
  - APS score < 30;
  - School average < 60;
  - Mathematics < 55;
  - Accounting < 60;
  - First year accounting module, first semester < 55;
  - First year accounting module, second semester < 55;
  - Second year accounting module; first semester < 50; and
  - Second year accounting module; second semester < 50.

5.2.2.2 To establish if there is a correlation between grades in matric and university success rate (empirical objective 3)

In Chapter 4 table 27, the correlations between school related variables affecting success at university level, as well as the Accounting modules presented at University A for each accountancy programme were presented. The variables tested for correlations and statistical significance were the success of Third Year, ACCC1, ACCC2, ACCC3, ACCF1, ACCF2, ACCF3, Mathematics, English, APS Scores and School Averages. It became evident that the matric variables do have correlations with other variables both from secondary school and university and are statistically significant. It was also concluded that the admission requirements have an influence on university success.

Finally, it was also noted that the correlations between the different year levels were strong as expected, due to the fact that the successful completion of year one, is a prerequisite for registering for the second year module and so forth.

5.2.2.3 Identify possible predictors of academic success of students at entry point into an accounting programme at tertiary level (empirical objective 3)

In Chapter 2 the factors that influence academic success were identified and discussed. The school related factors were therefore used in Chapter 4 for the statistical analysis. The optimum cut-off for all the factors were tested and presented by means of the Receiver Operating Characteristic curves. The tables below revisit these findings that indicated that the majority of

these factors could be relied upon in predicting the success in accountancy studies at University A.

Table 57: Summary of predictors for third-year success for Chartered Accountancy.

Predictor	Area under graph	Confidence level	Significance
APS score	0.66	0.74	0.00
School average	0.35	0.74	0.00
Mathematics	0.58	0.66	0.71
Accounting	0.62	0.69	0.01
First year accounting module, first semester	0.67	0.75	0.01
First year accounting module, second semester	0.71	0.78	0.00
Second year accounting module	0.82	0.88	0.00

Table 58: Summary of predictors for third-year success for Forensic Accountancy.

Predictor	Area under graph	Confidence level	Significance
APS score	0.38	0.51	0.42
School average	0.39	0.53	0.44
Mathematics	0.34	0.5	0.27
Accounting	0.49	0.67	0.98
First year accounting module, first semester	0.55	0.89	0.73
First year accounting module, second semester	0.75	1.00	0.94
Second year accounting module	0.52	0.85	0.90

Table 59: Summary of predictors for third year success for Financial Accountancy.

Predictor	Area under graph	Confidence level	Significance
APS score	0.55	0.60	0.52
School average	0.57	0.66	0.71
Mathematics	0.53	0.58	0.30
Accounting	0.55	0.59	0.78
First year accounting module, first semester	0.53	0.59	0.33
First year accounting module, second semester	0.61	0.66	0.01
Second year accounting module; first semester	0.68	0.73	0.00
Second year accounting module; second semester	0.74	0.79	0.00

5.2.2.4 To conclude and to make recommendations on the predictor(s) for academic success of students at entry point into an accounting programme at tertiary level in an attempt to close the gap between the financial skills needed to ensure economic growth and the supply thereof (empirical objective 4)

The factors that affect the shortage of professional financially skilled individual have been identified in Chapter 2. These factors were divided into school related, career related and others. These identified factors were then used for the statistical testing done in chapter 4. However, it was noted that universities do not consider all of these factors to accept students in the accountancy programmes.

It was established that the universities in South Africa use APS scores as a standard to accept students who can possibly perform in the accountancy studies. Meeting the required APS scores does not necessary predict the success of the accountancy studies. This is substantiated by the results presented in Chapter 4. It was shown that certain cut-off marks between year levels, for the Accounting subject specifically, should also be considered.

The specific recommendations are discussed in more detail later in this chapter.

5.3   CONCLUSION ON THE MAIN OBJECTIVE OF THE STUDY

The primary objective of the study was to establish whether the admission requirements at universities in South Africa predict the academic success to meet the demand of the scarce skills in practice. In order to understand why there was a low throughput of graduates to meet the demand of financially skilled individuals, it was necessary to investigate whether the university was admitting the students who will perform well academically by investigating the different admission requirements for the universities in South Africa and identify the factors that influence academic success.

The literature review showed that there are different factors, which can be managed to promote academic success and the correlations between the university enrolments and the graduation rates. The objective was achieved by a literature review to determine the factors that influence academic success and the demand for financially skilled individuals, and the analysis of student records from a specific university was done to determine whether the admission requirements had any correlation to the academic success of students. The predictors were used in statistical analysis and possible marks to predict academic success were identified. These identified cut-off marks can be applied to the prospective students and could ensure that more students enter the marketplace and start filling the shortage of financially skilled individuals.

It can, therefore, be concluded that the main research objective of the study was achieved.

5.4   LIMITATIONS OF THE STUDY

As in any research, this study was not without its limitations. The limitations of this study included the sample only to be one South African University instead of testing all the 23 South African universities. It was easier for the researcher to work with one university where the administration and access to records were not complex. The findings of this study are therefore confined to the boundaries of University A and was seen as an exploratory study.

The limitation of APS scores under 28: This is because the normal cut-off of the APS scores is 28 to be registered at the university. The study did not focus on those with a lower APS.

The study was also limited to using the admission as an instrument to predict the success of the accounting studies. Other factors that could have broadened the study are listed as recommendations for future research such as the financial plans and dedicated work ethic.

5.5 RECOMMENDATIONS FOR STUDENTS AND UNIVERSITY A

Based on the findings of the study the following recommendations are made:

5.5.1 Acceptable Minimum Secondary School requirements

Table 60: Acceptable minimum Secondary School requirements.

Programme	APS score	School Average	Mathematics	Accounting	First Language
Chartered Accountancy Programme	32-33	70	65	75	70
Forensic Accountancy Programme	39	77	75	75	75
Financial Accountancy Programme	30	60	55	60	65

The above table is recommended as a basis of acceptance requirements in the accountancy programmes at university.

5.5.2 Minimum continuation mark for the financial accounting module

Table 61: Minimum pass mark for the financial accounting module.

Programme	First year, First Semester	Second year, Second semester	Second year, First Semester	Second year, Second Semester
Chartered Accountancy Programme	60	60	55	
Forensic Accountancy Programme	60	60	55	

Financial Accountancy Programme	55	55	50	50

The table above presents the recommended continuation mark per programme at first and second-year level.

5.5.3 Financial plan

As identified in the literature review, finances are a hindrance for students to complete their studies, as these courses become more and more expensive. This was also highlighted in the October 2015 student uprising #feesmustfall. A recommendation to all prospective students is to do be proactive and do research about the fees to be paid over the 4 to 5 year period of studying and make it their priority that they do know where they will find the financial support for expenses such as tuition fees, stationery, textbooks, accommodation, computers and personal expenses.

5.5.4 Endurance and hard work

As identified in the literature the process of qualifying as a professional is quite lengthy. It has been identified that to qualify as a Chartered Accountant can take between 7 and 9 years depending on the route taken. The period it takes to qualify as a Chartered Management Accountant and Professional Accountant are approximately 6 to 7 years. It is recommended that students thinking about enrolling or those who are already enrolled in the accountancy studies have the endurance and work hard to complete their ultimate goal. It is also advised that universities promote mentorship programmes as early as the first year, to encourage and assist students in this lengthy process.

5.5.5 Extended programmes

Some of the universities do not have extended programmes. It is recommended that universities do have extended programmes for those students who have potential but are limited because of marks, for example if a university requires a 60% for Mathematics and English at 65% while the student has a 57% on Mathematics and 60% in English. This student does have potential and if the university is strict on the admission requirements, then a 4-year accountancy programme can be useful. This can even help with performance over the period of studying and increase the

number of accounting professionals that enter the workforce and start filling the shortage of financially skilled individuals.

5.5.6   Curriculum matches

It can be useful that the school curriculum is matched to that of the university especially the Grade 12 year and first year. This will help with the retention and dropout rates at first-year level and the available programmes at the university will strengthen the performance throughout other levels.

5.6   RECOMMENDATIONS FOR FURTHER RESEARCH

The following areas requiring further research were identified:

- Since almost all universities in South Africa require a prospective student to have a specific pass mark on Accounting, English and Mathematics, further research can be done in investigating the influence of these variables on the outcome of accountancy studies.
- Research indicated that most students (especially black students) do not endure the journey or process of becoming a professional accountant or professionally financially skilled individual. After their undergraduate degree is obtained, there is no further continuation of their studies. A case study or survey research can be conducted to investigate the understanding and importance of students (and prospective students) on the resources needed and the process of qualifying as a professional as well as the support of employers for their employees to study further in the accountancy field.
- An exploratory study to discover whether students that did not meet the required APS scores and have enrolled for the extended programmes have completed their studies.
- A study that can test all the required marks at the university level for all the university core modules such as Financial Management, Audit and Taxation.
- An analysis of the entry requirements to the post-graduate studies in the accountancy programmes to investigate if the required entry requirements are sufficient in predicting the academic success in these studies.

5.7   FINAL CONCLUDING REMARKS

The primary objective of this study was to establish whether the admission requirements at universities in South Africa predict the academic success to meet the demand of the scarce skills in practice. It can be concluded that the admission requirements at universities do have

correlations with the successful completion of the accountancy studies. However, possible marks students need to have for successful completion of the accountancy studies have been identified. The recommendations made in this study for the admission requirements and required year levels cut-off point, may, if implemented, assist University A in producing more graduates that are financially literate to the marketplace. The latter could, in turn, assist in ensuring that the required financial skills shortage in South Africa could be closed one step at a time.

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Annexure A - Receiver Operating Characteristic curve coordinates

Table 62: Receiver Operating Characteristic curve coordinates Chartered Accountancy APS.

Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.000	1.000	1.000
10.000	.990	1.000
20.500	.987	.980
21.500	.982	.980
22.500	.981	.980
23.500	.974	.980
24.500	.968	.980
25.500	.951	.920
26.500	.928	.860
27.500	.906	.760
28.500	.878	.740
29.500	.841	.680
30.500	.806	.620
31.500	.764	.520
32.500	.714	.460
33.500	.661	.440
34.500	.608	.400
35.500	.534	.320
36.500	.471	.300
37.500	.406	.180
38.500	.350	.160
39.500	.273	.060
40.500	.205	.040
41.500	.146	.020
42.500	.095	.020
43.500	.069	0.000
44.500	.044	0.000
45.500	.017	0.000
46.500	.006	0.000
47.500	.003	0.000
49.000	0.000	0.000

Table 63: Receiver Operating Characteristic curve coordinates Forensic Accountancy APS

Coordinates of the Curve		
Test Result Variable(s):	APS score	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.000	1.000	1.000
14.000	.993	1.000
28.500	.978	1.000
29.500	.971	1.000
30.500	.949	1.000
31.500	.904	1.000
32.500	.882	1.000
33.500	.824	1.000
34.500	.787	1.000
35.500	.699	1.000
36.500	.603	1.000
37.500	.515	1.000
38.500	.471	.500
39.500	.375	.500
40.500	.301	.500
41.500	.243	0.000
42.500	.169	0.000
43.500	.103	0.000
44.500	.037	0.000
45.500	.015	0.000
46.500	.007	0.000
48.000	0.000	0.000

Table 64: Receiver Operating Characteristic curve coordinates Financial Accountancy APS.

Coordinates of the Curve[a]		
Test Result Variable(s):	**APS score**	
Positive if Greater Than or Equal To[b]	**Sensitivity**	**1 - Specificity**
-1.000	1.000	1.000
7.000	.993	1.000
15.000	.992	1.000
16.500	.990	1.000
17.500	.988	.993
18.500	.987	.987
19.500	.984	.987
20.500	.975	.974
21.500	.958	.961
22.500	.941	.941
23.500	.921	.882
24.500	.878	.829
25.500	.812	.757
26.500	.760	.691
27.500	.685	.618
28.500	.609	.526
29.500	.535	.467
30.500	.462	.375
31.500	.377	.296
32.500	.314	.257
33.500	.246	.211
34.500	.185	.164
35.500	.137	.132
36.500	.097	.079
37.500	.077	.046
38.500	.046	.033
39.500	.027	.026
40.500	.014	.007
41.500	.010	.007
42.500	.008	0.000
44.000	.005	0.000
45.500	.003	0.000
47.000	0.000	0.000

Table 65: Receiver Operating Characteristic curve coordinates Chartered Accountancy school averages.

Coordinates of the Curve[a]		
Test Result Variable(s):	**School average**	
Positive if Greater Than or Equal To[b]	**Sensitivity**	**1 - Specificity**
-1.000	1.000	1.000
23.400	.990	1.000
47.000	.990	.980
47.750	.988	.980
48.800	.987	.980
49.650	.986	.980
51.250	.982	.980
52.650	.981	.980
52.900	.979	.980
53.150	.978	.980
53.550	.976	.980
53.900	.973	.980
54.150	.972	.980
54.500	.970	.980
54.850	.969	.980
55.150	.968	.980
55.500	.967	.980
55.750	.963	.980
56.050	.961	.960
56.500	.958	.960
56.850	.951	.940
57.100	.950	.940
57.350	.949	.940
57.600	.946	.940
57.750	.945	.900
57.900	.944	.900
58.100	.942	.900
58.250	.941	.900
58.400	.935	.860
58.600	.929	.840
58.750	.928	.840
58.900	.926	.840
59.100	.924	.840
59.250	.923	.840
59.400	.922	.820
59.600	.919	.820
59.850	.917	.820
60.150	.910	.800
60.400	.902	.800

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
60.600	.901	.800
60.750	.901	.780
60.900	.897	.760
61.100	.897	.740
61.250	.891	.740
61.350	.887	.720
61.550	.886	.720
61.850	.879	.720
62.100	.874	.720
62.250	.869	.720
62.400	.865	.720
62.600	.858	.720
62.750	.856	.720
62.850	.855	.720
63.050	.854	.720
63.250	.851	.720
63.500	.845	.720
63.750	.841	.700
63.900	.840	.680
64.100	.838	.680
64.250	.829	.660
64.350	.825	.660
64.450	.824	.660
64.600	.822	.640
64.750	.819	.640
64.900	.814	.620
65.100	.809	.620
65.250	.806	.600
65.350	.802	.600
65.450	.801	.580
65.600	.796	.580
65.750	.792	.580
65.900	.789	.580
66.100	.788	.560
66.250	.786	.540
66.400	.784	.540
66.600	.777	.540
66.750	.772	.540
66.900	.770	.540
67.100	.764	.540
67.250	.759	.540
67.400	.756	.520

Coordinates of the Curve[a]		
Test Result Variable(s):	**School average**	
Positive if Greater Than or Equal To[b]	**Sensitivity**	**1 - Specificity**
67.600	.755	.520
67.750	.747	.520
67.900	.741	.520
68.100	.737	.520
68.250	.730	.520
68.350	.727	.500
68.450	.725	.500
68.600	.721	.500
68.750	.712	.500
68.900	.710	.500
69.100	.705	.460
69.250	.700	.440
69.400	.697	.440
69.550	.688	.440
69.650	.687	.440
69.750	.684	.440
69.850	.678	.440
69.950	.677	.440
70.100	.675	.440
70.250	.669	.440
70.400	.660	.440
70.600	.657	.420
70.750	.653	.420
70.900	.646	.400
71.100	.641	.400
71.250	.635	.380
71.400	.630	.380
71.600	.619	.380
71.750	.615	.360
71.900	.611	.360
72.100	.606	.360
72.250	.596	.360
72.400	.592	.340
72.650	.575	.340
72.900	.570	.340
73.100	.564	.340
73.250	.551	.340
73.400	.546	.320
73.550	.537	.320
73.650	.535	.320
73.750	.524	.300
73.900	.519	.300

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
74.100	.513	.300
74.250	.508	.300
74.400	.504	.300
74.600	.494	.300
74.750	.487	.300
74.900	.479	.300
75.100	.476	.280
75.250	.472	.280
75.400	.466	.260
75.600	.458	.260
75.750	.452	.260
75.900	.444	.260
76.100	.436	.240
76.250	.430	.240
76.400	.424	.240
76.600	.416	.240
76.750	.412	.200
76.900	.408	.160
77.100	.402	.160
77.250	.395	.160
77.400	.390	.160
77.600	.385	.160
77.750	.374	.160
77.900	.371	.160
78.100	.370	.120
78.250	.365	.100
78.400	.358	.100
78.600	.350	.100
78.750	.341	.100
78.900	.334	.100
79.100	.322	.100
79.250	.312	.100
79.400	.307	.080
79.600	.300	.060
79.750	.295	.040
79.850	.290	.040
79.950	.289	.040
80.100	.276	.040
80.250	.273	.040
80.400	.262	.040
80.600	.255	.040
80.750	.246	.040

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
80.900	.241	.040
81.100	.237	.040
81.250	.236	.040
81.400	.230	.040
81.600	.223	.040
81.750	.218	.020
81.900	.208	.020
82.100	.194	.020
82.250	.187	.020
82.400	.180	.020
82.600	.175	.020
82.750	.172	.020
82.900	.162	.020
83.100	.155	.020
83.250	.150	.020
83.400	.142	.020
83.600	.140	.020
83.750	.136	.020
83.900	.131	.020
84.100	.127	.020
84.250	.123	.020
84.400	.122	.020
84.600	.116	.020
84.750	.114	.020
84.900	.112	.020
85.100	.108	.020
85.250	.104	.020
85.500	.100	.020
85.750	.098	.020
85.900	.096	0.000
86.100	.092	0.000
86.250	.089	0.000
86.400	.085	0.000
86.600	.083	0.000
86.750	.081	0.000
86.900	.076	0.000
87.100	.072	0.000
87.250	.071	0.000
87.400	.060	0.000
87.600	.056	0.000
87.750	.054	0.000
87.900	.051	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
88.100	.049	0.000
88.250	.044	0.000
88.400	.041	0.000
88.600	.039	0.000
88.850	.037	0.000
89.100	.035	0.000
89.250	.032	0.000
89.400	.031	0.000
89.550	.030	0.000
89.650	.028	0.000
89.850	.024	0.000
90.100	.022	0.000
90.250	.018	0.000
90.400	.017	0.000
90.600	.014	0.000
90.750	.013	0.000
91.000	.010	0.000
91.350	.008	0.000
91.650	.006	0.000
91.900	.005	0.000
92.650	.004	0.000
93.500	.003	0.000
93.750	.001	0.000
94.800	0.000	0.000

Table 66: Receiver Operating Characteristic curve coordinates Forensic Accountancy school averages.

Coordinates of the Curve[a]		
Test Result Variable(s):	**School average**	
Positive if Greater Than or Equal To[b]	**Sensitivity**	**1 - Specificity**
-1.000	1.000	1.000
30.750	.993	1.000
61.850	.985	1.000
62.500	.978	1.000
63.000	.971	1.000
63.950	.963	1.000
64.950	.956	1.000
65.600	.949	1.000
66.150	.941	1.000
66.400	.934	1.000
66.600	.926	1.000
66.850	.919	1.000
67.100	.912	1.000
67.500	.904	1.000
68.050	.897	1.000
68.500	.890	1.000
68.750	.882	1.000
69.000	.868	1.000
69.350	.846	1.000
69.850	.831	1.000
70.450	.824	1.000
70.850	.809	1.000
71.100	.801	1.000
71.250	.794	1.000
71.400	.787	1.000
71.600	.772	1.000
71.750	.765	1.000
72.000	.735	1.000
72.250	.728	1.000
72.500	.721	1.000
72.950	.713	1.000

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
73.350	.699	1.000
73.600	.691	1.000
73.750	.684	1.000
73.900	.669	1.000
74.100	.662	1.000
74.250	.647	1.000
74.550	.632	1.000
74.900	.618	1.000
75.100	.610	1.000
75.250	.603	1.000
75.400	.596	1.000
75.600	.574	1.000
75.750	.566	1.000
76.000	.551	1.000
76.350	.544	1.000
76.750	.522	1.000
77.100	.507	.750
77.250	.500	.750
77.400	.500	.500
77.600	.493	.500
77.850	.485	.500
78.100	.478	.500
78.450	.471	.500
78.750	.463	.500
78.900	.456	.500
79.100	.441	.500
79.350	.434	.500
79.600	.404	.500
79.850	.397	.500
80.100	.375	.500
80.250	.360	.500
80.500	.353	.500
80.750	.346	.500

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
80.900	.338	.500
81.150	.331	.500
81.550	.316	.500
81.900	.309	.500
82.100	.301	.500
82.350	.294	.250
82.600	.287	.250
82.750	.272	.250
82.900	.257	.250
83.150	.243	.250
83.400	.228	0.000
83.650	.213	0.000
83.900	.206	0.000
84.100	.199	0.000
84.450	.191	0.000
84.950	.176	0.000
85.250	.169	0.000
85.400	.162	0.000
85.600	.154	0.000
85.750	.147	0.000
85.900	.132	0.000
86.150	.125	0.000
86.400	.118	0.000
86.850	.110	0.000
87.250	.096	0.000
87.550	.088	0.000
87.900	.074	0.000
88.150	.066	0.000
88.500	.059	0.000
88.750	.044	0.000
88.900	.037	0.000
89.650	.022	0.000
90.800	.015	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
91.900	.007	0.000
93.500	0.000	0.000

Table 67: Receiver Operating Characteristic curve coordinates Financial Accountancy school averages.

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.000	1.000	1.000
18.000	.993	1.000
37.150	.993	.993
40.800	.992	.993
44.150	.992	.987
45.100	.992	.980
45.350	.991	.980
45.750	.990	.980
46.250	.988	.980
46.650	.987	.980
46.900	.986	.980
47.350	.983	.980
47.850	.982	.980
48.100	.980	.980
48.250	.979	.980
48.500	.978	.967
48.850	.976	.967
49.100	.975	.967
49.450	.974	.967
49.750	.973	.967
49.900	.971	.961
50.050	.963	.961
50.200	.963	.954
50.650	.962	.954
51.050	.959	.954
51.200	.959	.947
51.500	.958	.947
51.750	.952	.928
51.900	.950	.921
52.100	.945	.914
52.250	.944	.914
52.400	.942	.914
52.600	.940	.908
52.750	.937	.908
52.900	.936	.908
53.100	.933	.901
53.250	.931	.888
53.400	.919	.882
53.600	.916	.882

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
53.850	.914	.868
54.100	.911	.862
54.250	.910	.855
54.400	.906	.849
54.550	.903	.849
54.650	.899	.849
54.750	.898	.849
54.900	.897	.849
55.100	.885	.836
55.250	.874	.836
55.400	.869	.836
55.550	.866	.829
55.650	.866	.822
55.750	.861	.816
55.900	.855	.803
56.050	.848	.803
56.150	.847	.803
56.250	.844	.803
56.350	.843	.789
56.450	.842	.789
56.600	.836	.763
56.750	.823	.743
56.850	.818	.737
56.950	.817	.737
57.100	.812	.730
57.250	.808	.724
57.400	.804	.724
57.600	.800	.717
57.750	.793	.717
57.850	.787	.711
57.950	.785	.711
58.100	.779	.711
58.250	.774	.704
58.400	.766	.691
58.600	.760	.678
58.750	.755	.664
58.900	.753	.658
59.100	.742	.651
59.250	.740	.638
59.400	.734	.632
59.600	.728	.625
59.750	.725	.612

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
59.900	.717	.605
60.100	.707	.592
60.250	.696	.586
60.400	.687	.586
60.600	.677	.586
60.750	.665	.579
60.900	.654	.566
61.050	.641	.566
61.150	.639	.566
61.250	.628	.566
61.400	.628	.546
61.600	.624	.526
61.750	.615	.520
61.900	.610	.520
62.100	.603	.513
62.250	.597	.493
62.400	.585	.487
62.600	.568	.480
62.750	.567	.474
62.850	.564	.474
62.950	.563	.474
63.100	.550	.454
63.250	.546	.454
63.400	.531	.454
63.600	.527	.454
63.750	.522	.447
63.900	.514	.434
64.050	.509	.408
64.150	.508	.408
64.250	.497	.401
64.400	.496	.401
64.550	.487	.382
64.650	.486	.382
64.750	.478	.382
64.900	.474	.368
65.100	.462	.362
65.250	.455	.355
65.400	.452	.349
65.600	.444	.336
65.750	.432	.336
65.900	.416	.322
66.100	.414	.316

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
66.250	.406	.309
66.350	.401	.309
66.450	.399	.309
66.600	.391	.309
66.750	.384	.303
66.850	.372	.296
66.950	.370	.296
67.100	.366	.296
67.250	.361	.296
67.400	.352	.289
67.600	.347	.283
67.750	.339	.276
67.900	.332	.263
68.100	.327	.263
68.250	.326	.263
68.400	.321	.250
68.600	.317	.243
68.750	.312	.243
68.900	.305	.237
69.100	.301	.237
69.250	.291	.237
69.400	.284	.237
69.600	.280	.224
69.750	.271	.224
69.900	.266	.217
70.100	.263	.211
70.250	.259	.211
70.400	.250	.211
70.600	.241	.197
70.750	.237	.197
70.900	.230	.178
71.100	.224	.178
71.250	.219	.178
71.400	.211	.178
71.600	.200	.158
71.750	.195	.151
71.900	.187	.151
72.100	.181	.151
72.250	.179	.151
72.400	.171	.151
72.600	.165	.132
72.750	.162	.132

Coordinates of the Curve[a]		
Test Result Variable(s):	**School average**	
Positive if Greater Than or Equal To[b]	**Sensitivity**	**1 - Specificity**
72.900	.156	.132
73.100	.151	.125
73.250	.148	.125
73.400	.141	.118
73.600	.136	.099
73.750	.131	.099
73.900	.128	.099
74.050	.126	.099
74.150	.124	.099
74.250	.122	.099
74.350	.115	.099
74.450	.114	.099
74.600	.111	.099
74.750	.109	.099
74.900	.106	.099
75.100	.106	.092
75.350	.103	.086
75.600	.102	.079
75.750	.099	.079
75.900	.094	.072
76.100	.089	.072
76.250	.088	.066
76.400	.085	.066
76.600	.077	.066
76.750	.075	.059
76.900	.069	.059
77.100	.069	.053
77.250	.067	.046
77.400	.064	.039
77.600	.063	.033
77.750	.059	.033
77.900	.058	.033
78.150	.055	.033
78.400	.054	.033
78.600	.050	.033
78.750	.045	.033
78.900	.041	.033
79.100	.039	.033
79.250	.035	.033
79.400	.035	.026
79.600	.034	.026
79.750	.033	.026

Coordinates of the Curve[a]		
Test Result Variable(s):	School average	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
79.900	.030	.020
80.150	.029	.013
80.400	.025	.013
80.650	.024	.013
81.000	.021	.013
81.450	.018	.013
81.950	.014	.013
82.350	.013	.013
82.650	.012	.013
82.900	.010	.013
83.100	.009	.013
83.350	.008	.007
83.850	.008	0.000
84.450	.007	0.000
86.100	.005	0.000
87.600	.004	0.000
88.950	.003	0.000
90.250	.001	0.000
91.300	0.000	0.000

Table 68: Receiver Operating Characteristic curve coordinates Chartered Accountancy grade 12 Mathematics.

Coordinates of the Curve[a]		
Test Result Variable(s):	**MATHEMATICS**	
Positive if Greater Than or Equal To[b]	**Sensitivity**	**1 - Specificity**
-1.0000	1.000	1.000
13.5000	.991	1.000
31.0000	.990	1.000
37.5000	.984	1.000
40.3750	.980	1.000
41.1250	.979	1.000
42.2500	.978	1.000
43.5000	.974	1.000
44.3750	.971	1.000
44.8750	.970	1.000
45.5000	.958	.920
46.5000	.955	.920
47.5000	.951	.920
48.5000	.949	.920
49.5000	.946	.920
50.3350	.938	.920
50.8350	.937	.920
51.5000	.928	.880
52.5000	.919	.880
53.3350	.907	.860
53.8350	.906	.860
54.3750	.898	.820
54.8750	.896	.820
55.5000	.866	.780
56.2500	.857	.780
56.7500	.856	.780
57.5000	.846	.780
58.5000	.840	.760
59.5000	.824	.740
60.2500	.810	.740
60.7500	.808	.740
61.5000	.787	.660
62.5000	.778	.660
63.5000	.757	.660
64.1250	.730	.620
64.6250	.727	.620
65.3350	.696	.580
65.7100	.696	.560
65.8750	.694	.560

Coordinates of the Curve[a]		
Test Result Variable(s):	MATHEMATICS	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
66.5000	.672	.540
67.5000	.638	.540
68.5000	.615	.500
69.1250	.583	.480
69.6250	.581	.480
70.1650	.558	.480
70.5400	.558	.460
70.8750	.556	.460
71.1650	.534	.460
71.6650	.533	.460
72.5000	.509	.420
73.5000	.486	.400
74.5000	.450	.380
75.5000	.412	.360
76.3750	.391	.340
76.8750	.391	.320
77.3750	.373	.320
77.8750	.373	.300
78.5000	.340	.260
79.5000	.322	.260
80.5000	.299	.220
81.1250	.272	.200
81.2900	.270	.200
81.5000	.269	.200
81.8350	.269	.180
82.3350	.245	.160
82.8350	.245	.140
83.5000	.210	.120
84.5000	.190	.100
85.5000	.164	.080
86.5000	.143	.060
87.5000	.121	.040
88.5000	.104	.040
89.5000	.083	.020
90.5000	.058	0.000
91.5000	.045	0.000
92.5000	.034	0.000
93.5000	.026	0.000
94.5000	.013	0.000
95.5000	.008	0.000
97.0000	.005	0.000
99.0000	.001	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	**MATHEMATICS**	
Positive if Greater Than or Equal To[b]	**Sensitivity**	**1 - Specificity**
101.0000	0.000	0.000

Table 69: Receiver Operating Characteristic curve coordinates Forensic Accountancy grade 12 Mathematics.

Coordinates of the Curve		
Test Result Variable(s):	MATHEMATICS	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.0000	1.000	1.000
22.3350	.993	1.000
46.8350	.985	1.000
49.5000	.963	1.000
50.5000	.956	1.000
52.0000	.949	1.000
53.5000	.941	1.000
54.5000	.926	1.000
55.5000	.919	1.000
56.5000	.904	1.000
57.5000	.882	1.000
59.0000	.868	1.000
61.0000	.853	1.000
62.5000	.838	1.000
63.5000	.824	1.000
64.5000	.794	1.000
65.5000	.772	1.000
66.5000	.757	1.000
67.5000	.750	1.000
68.5000	.743	1.000
69.5000	.721	1.000
70.5000	.684	1.000
71.5000	.640	1.000
72.5000	.596	1.000
73.5000	.574	.750
74.5000	.515	.750
75.5000	.500	.750
76.5000	.449	.750
77.5000	.419	.750
78.5000	.404	.750
79.5000	.390	.750
80.5000	.353	.750
81.5000	.309	.500
82.5000	.279	.500
83.5000	.257	.500
84.5000	.243	.500
85.5000	.213	.250
86.5000	.191	0.000
87.5000	.169	0.000

Coordinates of the Curve		
Test Result Variable(s):	MATHEMATICS	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
88.5000	.125	0.000
89.5000	.103	0.000
90.5000	.074	0.000
91.5000	.066	0.000
92.5000	.044	0.000
94.0000	.022	0.000
95.5000	.015	0.000
97.0000	.007	0.000
99.0000	0.000	0.000

Table 70: Receiver Operating Characteristic curve coordinates Financial Accountancy grade 12 Mathematics.

Coordinates of the Curve[a]		
Test Result Variable(s):	MATHEMATICS	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.0000	1.000	1.000
4.8350	.993	.993
16.8350	.992	.993
25.3350	.990	.993
26.8350	.990	.986
28.5000	.989	.986
31.0000	.986	.986
33.0000	.984	.986
34.5000	.982	.986
35.3350	.976	.973
35.8350	.974	.973
36.5000	.973	.973
37.5000	.969	.973
38.5000	.967	.959
39.5000	.965	.952
40.1250	.956	.946
40.2900	.955	.946
40.6650	.954	.946
41.1650	.947	.925
41.6650	.946	.925
42.2500	.936	.918
42.7500	.935	.918
43.5000	.928	.912
44.1250	.921	.905
44.2900	.920	.905
44.6650	.918	.905
45.3350	.878	.884
45.8350	.878	.878
46.3750	.865	.871
46.8750	.865	.864
47.5000	.853	.850
48.1650	.838	.844
48.6650	.837	.844
49.5000	.819	.816
50.1650	.800	.769
50.6650	.799	.769
51.5000	.771	.755
52.5000	.744	.714
53.5000	.721	.680

Coordinates of the Curve[a]		
Test Result Variable(s):	MATHEMATICS	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
54.3350	.695	.646
54.8350	.694	.646
55.1650	.627	.585
55.5000	.626	.585
55.8350	.624	.585
56.2500	.604	.551
56.7500	.603	.551
57.5000	.580	.524
58.3350	.554	.510
58.8350	.552	.510
59.1650	.528	.503
59.6650	.528	.497
60.1650	.494	.463
60.5000	.493	.463
60.8350	.491	.463
61.1250	.461	.415
61.6250	.461	.408
62.1650	.431	.374
62.6650	.430	.374
63.3350	.407	.340
63.8350	.407	.333
64.3350	.380	.320
64.8350	.378	.320
65.5000	.324	.265
66.1650	.302	.265
66.6650	.301	.265
67.3350	.278	.245
67.8350	.276	.245
68.1650	.249	.238
68.6650	.246	.238
69.1250	.238	.224
69.6250	.237	.224
70.3350	.215	.204
70.8350	.215	.197
71.5000	.195	.190
72.5000	.185	.184
73.1650	.173	.163
73.6650	.171	.163
74.5000	.156	.143
75.5000	.132	.116
76.5000	.118	.102
77.5000	.103	.095

Coordinates of the Curve[a]		
Test Result Variable(s):	MATHEMATICS	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
78.5000	.088	.082
79.5000	.079	.075
80.5000	.067	.068
81.1650	.060	.048
81.6650	.059	.048
82.5000	.049	.048
83.1250	.039	.048
83.6250	.038	.048
84.5000	.034	.041
85.3350	.029	.034
85.8350	.027	.034
86.5000	.023	.027
88.0000	.016	.014
89.5000	.015	.014
91.0000	.007	0.000
92.5000	.005	0.000
93.5000	.004	0.000
94.5000	.003	0.000
96.5000	.001	0.000
99.0000	0.000	0.000

Table 71: Receiver Operating Characteristic curve coordinates Chartered Accountancy grade 12 Accounting.

Coordinates of the Curve[a]		
Test Result Variable(s):	**ACCOUNTING**	
Positive if Greater Than or Equal To[b]	**Sensitivity**	**1 - Specificity**
-1.0000	1.000	1.000
15.5000	.991	1.000
33.0000	.991	.978
36.5000	.989	.978
38.5000	.988	.978
41.0000	.986	.978
43.2500	.984	.978
43.8750	.982	.978
44.6250	.981	.978
45.5000	.978	.957
46.5000	.977	.935
48.5000	.976	.935
50.5000	.972	.935
51.5000	.970	.935
52.1250	.969	.935
52.6250	.969	.913
53.1250	.963	.891
53.6250	.961	.891
54.5000	.953	.891
55.5000	.936	.870
56.2500	.930	.848
56.7500	.928	.848
57.5000	.927	.848
58.3750	.919	.826
58.8750	.919	.804
59.5000	.904	.804
60.5000	.893	.804
61.5000	.880	.804
62.5000	.865	.804
63.5000	.850	.804
64.2500	.832	.783
64.7500	.831	.783
65.5000	.808	.739
66.5000	.789	.717
67.2500	.774	.696
67.6250	.773	.696
67.8750	.771	.696
68.5000	.758	.674
69.2500	.740	.609

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCOUNTING	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
69.7500	.739	.609
70.5000	.710	.609
71.2500	.698	.587
71.7500	.697	.587
72.3750	.667	.522
72.8750	.666	.522
73.2500	.621	.500
73.7500	.621	.478
74.1250	.597	.435
74.5000	.595	.435
74.8750	.595	.413
75.5000	.555	.391
76.1250	.512	.304
76.6250	.510	.304
77.5000	.474	.283
78.5000	.441	.239
79.5000	.421	.196
80.3750	.387	.152
80.8750	.386	.152
81.5000	.357	.152
82.5000	.317	.152
83.5000	.290	.152
84.5000	.252	.109
85.5000	.229	.087
86.5000	.206	.087
87.5000	.176	.087
88.5000	.146	.065
89.5000	.118	.065
90.3750	.095	.022
90.8750	.095	0.000
91.3350	.076	0.000
91.8350	.074	0.000
92.5000	.060	0.000
93.5000	.045	0.000
94.5000	.032	0.000
95.5000	.023	0.000
96.5000	.016	0.000
97.5000	.009	0.000
99.0000	.001	0.000
101.0000	0.000	0.000

Table 72: Receiver Operating Characteristic curve coordinates Forensic Accountancy grade 12 Accounting.

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCOUNTING	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.0000	1.000	1.000
27.0000	.993	1.000
57.0000	.985	1.000
60.5000	.949	1.000
61.5000	.941	1.000
62.5000	.926	1.000
63.5000	.919	1.000
64.5000	.912	1.000
65.5000	.890	1.000
66.5000	.860	1.000
67.5000	.853	1.000
68.5000	.824	1.000
69.5000	.816	1.000
70.5000	.801	1.000
71.5000	.728	1.000
72.5000	.706	1.000
73.5000	.669	1.000
74.5000	.618	.750
75.5000	.603	.500
76.5000	.574	.500
77.5000	.551	.500
78.5000	.529	.500
79.5000	.515	.500
80.5000	.456	.250
81.5000	.419	.250
82.5000	.360	.250
83.5000	.338	.250
84.5000	.324	.250
85.5000	.294	.250
86.5000	.272	.250
87.5000	.221	0.000
88.5000	.199	0.000
89.5000	.147	0.000
90.5000	.118	0.000
91.5000	.088	0.000
92.5000	.066	0.000
93.5000	.051	0.000
94.5000	.037	0.000
95.5000	.022	0.000

96.5000	.015	0.000
98.5000	.007	0.000
101.0000	0.000	0.000

Table 73 Receiver Operating Characteristic curve coordinates Financial Accountancy grade 12 Accounting.

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCOUNTING	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.0000	1.000	1.000
15.0000	.995	.993
32.5000	.994	.993
35.5000	.991	.986
36.5000	.989	.986
38.0000	.988	.986
39.5000	.986	.986
40.5000	.983	.965
41.8350	.983	.958
42.8350	.982	.958
43.5000	.980	.958
44.1250	.977	.951
44.6250	.975	.951
45.5000	.957	.916
46.1250	.954	.916
46.6250	.951	.916
47.5000	.948	.895
48.5000	.929	.881
49.2500	.923	.867
49.6250	.922	.867
49.8750	.920	.867
50.1250	.903	.853
50.6250	.902	.853
51.5000	.869	.839
52.1250	.857	.832
52.6250	.855	.832
53.1650	.832	.797
53.6650	.832	.790
54.5000	.808	.755
55.5000	.772	.720
56.1250	.746	.713
56.6250	.746	.706
57.5000	.723	.671
58.3750	.691	.664
58.8750	.689	.664
59.5000	.668	.629
60.3750	.637	.594
60.8750	.637	.587
61.5000	.612	.573

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCOUNTING	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
62.1250	.582	.531
62.4600	.580	.531
62.8350	.578	.531
63.1250	.560	.483
63.6250	.558	.483
64.5000	.520	.476
65.2500	.469	.378
65.7500	.468	.378
66.5000	.435	.350
67.3350	.406	.329
67.7100	.405	.329
67.8750	.403	.329
68.5000	.380	.315
69.1250	.352	.287
69.6250	.352	.280
70.5000	.315	.280
71.5000	.283	.252
72.2500	.266	.224
72.7500	.265	.224
73.3750	.243	.210
73.8750	.242	.210
74.2500	.223	.182
74.7500	.222	.182
75.5000	.175	.133
76.2500	.155	.105
76.6250	.154	.105
76.8750	.152	.105
77.5000	.142	.105
78.5000	.132	.084
79.5000	.118	.063
80.5000	.111	.063
81.5000	.097	.056
82.5000	.086	.056
83.5000	.078	.028
84.5000	.071	.021
85.5000	.062	.014
86.5000	.054	.014
87.5000	.048	.014
88.5000	.045	.007
89.5000	.038	0.000
90.5000	.008	0.000
91.3350	.005	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCOUNTING	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
91.8350	.003	0.000
93.0000	0.000	0.000

Table 74 Receiver Operating Characteristic curve coordinates Chartered Accountancy grade 12 First language.

Coordinates of the Curve[a]		
Test Result Variable(s):	**Grade 12 First language**	
Positive if Greater Than or Equal To[b]	**Sensitivity**	**1 - Specificity**
-1.0000	1.000	1.000
21.8750	.990	1.000
44.3750	.988	1.000
46.5000	.984	1.000
48.5000	.983	.980
49.5000	.983	.939
50.5000	.982	.939
51.5000	.979	.939
52.5000	.975	.939
53.5000	.971	.939
54.5000	.965	.918
55.5000	.954	.878
56.1250	.949	.878
56.6250	.948	.878
57.1250	.940	.878
57.5000	.940	.857
57.8750	.939	.857
58.2500	.935	.857
58.6250	.935	.837
58.8750	.934	.837
59.2500	.923	.816
59.7500	.922	.816
60.5000	.910	.776
61.5000	.893	.735
62.1250	.875	.673
62.3750	.874	.673
62.7500	.872	.673
63.5000	.861	.673
64.5000	.842	.673
65.5000	.799	.592
66.2500	.781	.571
66.7500	.781	.551
67.1250	.757	.531
67.3750	.755	.531
67.7500	.754	.531
68.2500	.733	.490
68.6250	.732	.490
68.8750	.730	.490
69.5000	.708	.469

Coordinates of the Curve[a]		
Test Result Variable(s):	Grade 12 First language	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
70.5000	.677	.469
71.3750	.658	.449
71.8750	.658	.429
72.1250	.628	.408
72.6250	.626	.408
73.5000	.600	.367
74.5000	.568	.327
75.3750	.518	.245
75.8750	.517	.245
76.2500	.480	.204
76.7500	.479	.184
77.5000	.430	.184
78.5000	.392	.184
79.5000	.361	.143
80.1250	.318	.102
80.6250	.316	.102
81.5000	.273	.082
82.5000	.229	.041
83.5000	.193	0.000
84.5000	.168	0.000
85.5000	.133	0.000
86.5000	.105	0.000
87.5000	.085	0.000
88.1250	.059	0.000
88.6250	.057	0.000
89.5000	.039	0.000
90.5000	.029	0.000
91.5000	.017	0.000
92.5000	.014	0.000
93.5000	.007	0.000
94.5000	.004	0.000
95.5000	.003	0.000
97.0000	0.000	0.000

Table 75: Receiver Operating Characteristic curve coordinates Forensic Accountancy grade 12 First language.

Coordinates of the Curve[a]		
Test Result Variable(s):	Grade 12 First language	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.0000	1.000	1.000
25.5000	.993	1.000
56.0000	.985	1.000
61.5000	.978	1.000
63.0000	.963	1.000
64.5000	.956	1.000
65.5000	.934	1.000
66.5000	.912	1.000
67.5000	.897	1.000
68.5000	.890	1.000
69.5000	.868	1.000
70.5000	.846	1.000
71.5000	.838	1.000
72.5000	.809	.750
73.5000	.787	.750
74.5000	.728	.750
75.5000	.691	.750
76.5000	.676	.750
77.5000	.640	.750
78.5000	.610	.750
79.5000	.566	.750
80.5000	.529	.750
81.5000	.449	.750
82.5000	.382	.500
83.5000	.331	.500
84.5000	.257	.500
85.5000	.191	0.000
86.5000	.125	0.000
87.5000	.096	0.000
88.5000	.066	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	Grade 12 First language	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
89.5000	.015	0.000
91.0000	.007	0.000
93.0000	0.000	0.000

Table 76: Receiver Operating Characteristic curve coordinates Financial Accountancy grade 12 First language.

Coordinates of the Curve[a]		
Test Result Variable(s):	Grade 12 First language	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.0000	1.000	1.000
8.4000	.992	.993
25.9000	.991	.993
38.5000	.989	.993
43.0000	.988	.987
44.5000	.987	.987
45.1250	.985	.980
45.6250	.985	.973
47.0000	.983	.973
48.5000	.981	.966
49.5000	.979	.966
50.1250	.976	.953
50.6250	.976	.946
51.2500	.972	.946
51.7500	.971	.946
52.3750	.961	.946
52.8750	.960	.946
53.5000	.951	.940
54.5000	.940	.933
55.1250	.898	.899
55.5000	.896	.899
55.8750	.896	.893
56.1250	.884	.872
56.3750	.884	.866
56.7500	.884	.859
57.5000	.872	.839
58.5000	.846	.832
59.1250	.823	.819
59.5000	.823	.812
59.8750	.822	.812
60.2500	.798	.779
60.7500	.797	.779
61.1250	.771	.758
61.6250	.771	.752
62.1250	.750	.745
62.5000	.750	.738
62.8750	.749	.738
63.2500	.722	.705
63.6250	.721	.705

Coordinates of the Curve[a]		
Test Result Variable(s):	**Grade 12 First language**	
Positive if Greater Than or Equal To[b]	**Sensitivity**	**1 - Specificity**
63.8750	.719	.705
64.2500	.690	.671
64.6250	.689	.671
64.8750	.686	.671
65.1250	.614	.550
65.6250	.613	.550
66.1250	.580	.510
66.5000	.578	.510
66.8750	.574	.510
67.3750	.540	.463
67.8750	.539	.463
68.1250	.509	.416
68.5000	.507	.416
68.8750	.505	.416
69.3750	.465	.383
69.8750	.464	.383
70.2500	.418	.369
70.7500	.416	.369
71.1250	.383	.302
71.5000	.383	.295
71.8750	.382	.295
72.5000	.354	.255
73.5000	.309	.242
74.5000	.281	.221
75.3750	.218	.154
75.8750	.217	.154
76.5000	.189	.134
77.2500	.169	.128
77.6250	.168	.128
77.8750	.166	.128
78.5000	.133	.114
79.5000	.106	.081
80.2500	.093	.067
80.7500	.092	.067
81.5000	.069	.047
82.5000	.056	.034
83.2500	.035	.034
83.7500	.033	.034
84.5000	.027	.027
85.5000	.020	.013
86.5000	.016	.007

Coordinates of the Curve[a]		
Test Result Variable(s):	Grade 12 First language	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
87.5000	.012	.007
88.5000	.011	.007
89.5000	.008	.007
90.5000	.003	.007
92.5000	0.000	.007
95.0000	0.000	0.000

Table 77: Receiver Operating Characteristic curve coordinates Chartered Accountancy (1st year, 1st semester).

Coordinates of the Curve[a]		
Test Result Variable(s):	**ACCC111**	
Positive if Greater Than or Equal To[b]	**Sensitivity**	**1 - Specificity**
-1.000	1.000	1.000
25.000	.954	.946
50.500	.928	.811
51.500	.912	.784
52.500	.903	.757
53.500	.895	.757
54.500	.884	.730
55.500	.839	.676
56.500	.801	.649
57.500	.775	.622
58.500	.753	.595
59.500	.713	.541
60.500	.674	.432
61.500	.644	.378
62.500	.594	.378
63.500	.564	.351
64.500	.521	.270
65.500	.490	.216
66.500	.457	.216
67.500	.418	.216
68.500	.385	.216
69.500	.353	.135
70.500	.314	.081
71.500	.281	.081
72.500	.258	.081
74.000	.250	.054
75.500	.177	.027
76.500	.142	.027
77.500	.121	0.000
78.500	.103	0.000
79.500	.087	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCC111	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
80.500	.070	0.000
81.500	.057	0.000
82.500	.046	0.000
83.500	.039	0.000
84.500	.030	0.000
85.500	.025	0.000
86.500	.018	0.000
87.500	.010	0.000
88.500	.006	0.000
90.500	.003	0.000
93.000	0.000	0.000

Table 78: Receiver Operating Characteristic curve coordinates Chartered Accountancy (1st year, 2nd semester).

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCC121	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.000	1.000	1.000
25.000	.969	.970
50.500	.965	.939
52.000	.961	.939
53.500	.957	.939
54.500	.956	.939
55.500	.874	.848
56.500	.836	.788
57.500	.810	.727
58.500	.784	.667
59.500	.750	.485
60.500	.724	.424
61.500	.678	.364
62.500	.637	.303
63.500	.608	.242
64.500	.563	.152
65.500	.514	.091
66.500	.475	.091
67.500	.424	.061
68.500	.395	.030
69.500	.362	.030
70.500	.320	.030
71.500	.288	.030
72.500	.246	.030
74.000	.236	.030
75.500	.184	.030
76.500	.160	.030
77.500	.135	.030
78.500	.117	0.000
79.500	.098	0.000
80.500	.076	0.000
81.500	.057	0.000
82.500	.046	0.000
83.500	.035	0.000
84.500	.029	0.000
85.500	.026	0.000
86.500	.016	0.000
87.500	.013	0.000
88.500	.007	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCC121	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
89.500	.003	0.000
91.000	0.000	0.000

Table 79: Receiver Operating Characteristic curve coordinates Chartered Accountancy (2nd year).

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCC271	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.00	1.000	1.000
23.00	.997	.956
46.50	.997	.933
48.50	.997	.911
50.50	.990	.844
51.50	.986	.800
52.50	.984	.800
53.50	.979	.778
54.50	.977	.778
55.50	.849	.400
56.50	.786	.289
57.50	.696	.200
58.50	.622	.178
59.50	.570	.156
60.50	.522	.111
61.50	.463	.111
62.50	.424	.089
63.50	.391	.067
64.50	.358	.022
65.50	.324	.022
66.50	.286	.022
67.50	.257	.022
68.50	.227	.022
69.50	.208	0.000
70.50	.182	0.000
71.50	.161	0.000
72.50	.146	0.000
73.50	.132	0.000
74.50	.131	0.000
75.50	.117	0.000
76.50	.112	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCC271	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
77.50	.087	0.000
78.50	.071	0.000
79.50	.061	0.000
80.50	.054	0.000
81.50	.042	0.000
82.50	.034	0.000
83.50	.028	0.000
84.50	.025	0.000
85.50	.024	0.000
86.50	.023	0.000
87.50	.021	0.000
88.50	.015	0.000
89.50	.011	0.000
90.50	.010	0.000
91.50	.008	0.000
92.50	.004	0.000
94.00	.003	0.000
96.00	.001	0.000
98.00	0.000	0.000

Table 80: Receiver Operating Characteristic curve coordinates Forensic Accountancy (1st year, 1st semester).

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCC111	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
49.000	1.000	1.000
50.500	.963	1.000
52.000	.919	1.000
53.500	.896	.750
54.500	.874	.750
55.500	.844	.500
56.500	.815	.500
57.500	.763	.500
58.500	.704	.500
59.500	.652	.500
60.500	.607	.500
61.500	.548	.500
62.500	.504	.500
63.500	.467	.500
64.500	.422	.500
65.500	.393	.500
66.500	.341	.500
67.500	.281	.250
68.500	.252	.250
69.500	.237	.250
70.500	.193	.250
71.500	.163	.250
73.500	.156	.250
75.500	.096	0.000
77.000	.081	0.000
78.500	.067	0.000
79.500	.059	0.000
80.500	.037	0.000
83.000	.022	0.000
85.500	.015	0.000
87.000	.007	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCC111	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
89.000	0.000	0.000

Table 81: Receiver Operating Characteristic curve coordinates Forensic Accountancy (1st year, 2nd semester).

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCC121	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
50.000	1.000	1.000
53.000	.993	1.000
55.500	.881	.500
56.500	.836	.250
57.500	.813	.250
58.500	.784	.250
59.500	.716	.250
60.500	.694	.250
61.500	.657	.250
62.500	.627	.250
63.500	.582	.250
64.500	.545	.250
65.500	.522	.250
66.500	.478	.250
67.500	.410	.250
68.500	.358	.250
69.500	.336	.250
70.500	.299	.250
71.500	.261	.250
73.500	.246	0.000
75.500	.179	0.000
76.500	.157	0.000
77.500	.119	0.000
78.500	.112	0.000
79.500	.067	0.000
80.500	.060	0.000
82.000	.045	0.000
83.500	.037	0.000
85.000	.022	0.000
86.500	.015	0.000
90.000	.007	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCC121	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
94.000	0.000	0.000

Table 82: Receiver Operating Characteristic curve coordinates Forensic Accountancy (2nd year).

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCC271	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
49.00	1.000	1.000
50.50	.932	1.000
51.50	.917	1.000
53.50	.910	1.000
55.50	.744	.667
56.50	.647	.667
57.50	.534	.333
58.50	.481	.333
59.50	.391	.333
60.50	.361	.333
61.50	.316	.333
62.50	.301	.333
63.50	.263	.333
64.50	.218	.333
65.50	.203	.333
66.50	.188	.333
67.50	.165	.333
69.50	.128	0.000
71.50	.098	0.000
72.50	.083	0.000
74.00	.075	0.000
76.00	.068	0.000
77.50	.060	0.000
78.50	.053	0.000
79.50	.038	0.000
81.00	.030	0.000
82.50	.023	0.000
85.50	.015	0.000
89.50	.008	0.000
92.00	0.000	0.000

Table 83: Receiver Operating Characteristic curve coordinates Financial Accountancy (1st year, 1st semester).

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCF111	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.000	1.000	1.000
10.500	.889	.824
35.500	.887	.824
50.500	.774	.725
51.500	.740	.703
52.500	.688	.659
53.500	.629	.604
54.500	.587	.560
55.500	.539	.505
56.500	.503	.462
57.500	.449	.429
58.500	.409	.363
59.500	.379	.330
60.500	.342	.308
61.500	.304	.275
62.500	.275	.220
63.500	.237	.187
64.500	.210	.187
65.500	.191	.187
66.500	.166	.143
67.500	.136	.121
68.500	.119	.099
69.500	.105	.077
70.500	.094	.077
71.500	.080	.077
72.500	.052	.055
74.000	.050	.044
75.500	.029	.033
76.500	.025	.033
77.500	.021	.022
78.500	.019	.022

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCF111	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
79.500	.013	.022
80.500	.006	.022
81.500	.006	.011
86.000	.004	0.000
91.500	.002	0.000
94.000	0.000	0.000

Table 84: Receiver Operating Characteristic curve coordinates Financial Accountancy (1st year, 2nd semester).

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCF121	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.000	1.000	1.000
23.500	.906	.893
48.500	.904	.893
50.500	.826	.728
51.500	.772	.689
52.500	.735	.631
53.500	.693	.553
54.500	.635	.505
55.500	.607	.447
56.500	.563	.437
57.500	.526	.408
58.500	.480	.340
59.500	.441	.252
60.500	.394	.214
61.500	.344	.194
62.500	.317	.184
63.500	.287	.155
64.500	.263	.126
65.500	.235	.078
66.500	.202	.078
67.500	.176	.058
68.500	.157	.049
69.500	.143	.019
70.500	.119	.019
71.500	.100	.019
72.500	.085	.019
73.500	.074	.019
74.500	.070	.019
75.500	.043	0.000
76.500	.035	0.000
77.500	.026	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCF121	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
78.500	.024	0.000
79.500	.020	0.000
80.500	.019	0.000
81.500	.009	0.000
82.500	.007	0.000
83.500	.006	0.000
84.500	.004	0.000
90.000	.002	0.000
96.000	0.000	0.000

Table 85: Receiver Operating Characteristic curve coordinates Financial Accountancy (2nd year, 1st semester).

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCF211	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.000	1.000	1.000
18.000	.954	.912
37.000	.954	.904
40.000	.954	.896
42.500	.954	.888
43.500	.954	.880
47.000	.954	.872
50.500	.800	.592
51.500	.729	.528
52.500	.682	.424
53.500	.631	.344
54.500	.572	.272
55.500	.515	.248
56.500	.474	.232
57.500	.409	.160
58.500	.362	.136
59.500	.322	.120
60.500	.297	.104
61.500	.256	.080
62.500	.237	.072
63.500	.203	.072
64.500	.178	.064
65.500	.156	.064
66.500	.140	.040
67.500	.119	.032
68.500	.097	.024
69.500	.082	.016
70.500	.066	.008
71.500	.056	.008
72.500	.043	.008
73.500	.032	.008

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCF211	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
74.500	.031	.008
75.500	.024	0.000
77.000	.018	0.000
78.500	.016	0.000
79.500	.013	0.000
80.500	.012	0.000
81.500	.009	0.000
82.500	.004	0.000
83.500	.003	0.000
89.500	.001	0.000
96.000	0.000	0.000

Table 86: Receiver Operating Characteristic curve coordinates Financial Accountancy (2nd year, 2nd semester).

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCF221	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
-1.00	1.000	1.000
19.00	.963	.895
38.50	.963	.887
40.50	.963	.879
46.00	.963	.871
50.50	.850	.589
51.50	.813	.516
52.50	.764	.452
53.50	.717	.379
54.50	.670	.290
55.50	.629	.266
56.50	.582	.210
57.50	.545	.202
58.50	.498	.161
59.50	.448	.113
60.50	.404	.089
61.50	.356	.073
62.50	.327	.073
63.50	.295	.040
64.50	.268	.024
65.50	.250	.024
66.50	.230	.024
67.50	.209	.016
68.50	.184	.016
69.50	.161	.016
70.50	.146	.008
71.50	.121	.008
72.50	.105	.008
74.00	.097	0.000
75.50	.071	0.000
76.50	.059	0.000

Coordinates of the Curve[a]		
Test Result Variable(s):	ACCF221	
Positive if Greater Than or Equal To[b]	Sensitivity	1 - Specificity
77.50	.054	0.000
78.50	.052	0.000
79.50	.046	0.000
80.50	.035	0.000
81.50	.031	0.000
82.50	.022	0.000
83.50	.019	0.000
84.50	.018	0.000
85.50	.015	0.000
87.00	.010	0.000
88.50	.009	0.000
89.50	.007	0.000
91.00	.006	0.000
92.50	.004	0.000
94.00	.003	0.000
96.00	.001	0.000

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27 November 2015

TO WHOM IT MAY CONCERN

Re: Letter of confirmation of language editing

The dissertation **The South African financial skills shortage: Exploring solutions to bridge the gap** by **Zanele Valencia Sobopha** (22594310) was language, technically and typographically edited.   The citations, sources and referencing technique applied were also checked to comply with university Harvard guidelines. Final corrections as suggested remain the responsibility of the student.

Antoinette Bisschoff

Officially approved language editor of the NWU since 1998

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