A FRAMEWORK FOR THE INTEGRATION OF COMPUTERISED ACCOUNTING INTO HIGH SCHOOL ACCOUNTING CURRICULUM

by

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at the Cape Peninsula University of Technology

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DECLARATION

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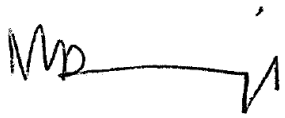

Signed **Date** **23 August 2024**

ABSTRACT

A framework for the integration of computerised accounting into high school accounting curriculum

Technological innovations have become a large part of people's daily lives. Computers have changed the way the workforce perform their duties. In this regard traditional manual systems have progressively been replaced with computer technology. As such education institutions are under consistent pressure to integrate technology in their learning and teaching. Depriving high school learners exposure to technological ways of performing tasks widens the gap between real life employment demands and what the education sector supplies. In this regard, higher education institutions have already taken advantage of the abundant benefits of technology integration into the curriculum, but school level education lags behind.

Computerised accounting can be classified as a subject-specific technology residing within technology content knowledge in the Technological, Pedagogical, and Content Knowledge (TPACK) model. This is a research study strived to understand the concerns of accounting teachers and how they foresaw such technological integration as an additional pedagogical tool for accounting in high schools. This study developed a framework for the integration of computerised accounting into the high school accounting curriculum delivery in a South African context.

A case study design using qualitative approach was used to investigate the issues related to introducing computerised accounting into high school curricular. The study is located within one educational district in the Western Cape province of South Africa. The sample consisted of nine accounting teachers who were purposefully selected. The selection was based on the fact that the accounting teachers are the ones responsible for the curriculum delivery in high schools and are therefore better knowledgeable of the current pedagogical tools they use and how technologically based pedagogical tools such as computerised accounting can be successfully integrated in the learning and teaching of accounting. The data for this study was collected using one-on-one semi-structured interviews and document analysis. Semi-structured interviews were appropriate for understanding deeply the concerns of accounting teachers in relation to the integration of computerised accounting into the accounting curriculum delivery in high schools. Document analysis was used to facilitate the development of the framework to integrate computerised accounting into the curriculum delivery of accounting in schools.

The study found mitigating factors that traversed policy, human, and material aspects. Concerns of the accounting teachers were about the availability of technology resources that will enable the integration of computerised accounting, their lack of background knowledge and experience of using computerised accounting, and assessment inequalities that might emanate from such an integration. The study uncovered several benefits that can be reaped by integrating computerised accounting in high schools. A spark emanating from this study focuses on initiating new debates of using subject-specific technology as an additional pedagogical in learning and teaching across subjects in school education.

This study has contributed to the body of knowledge by developing a proposed framework model that can be used to successfully integrate computerised accounting into the learning and teaching of accounting in Grades 8 to 11. The proposed framework provides guidelines of the key areas to consider when attempting to integrate computerised accounting for teaching at school level.

Keywords: Computerised accounting, manual accounting, technology integration, curriculum delivery, benefits, barriers

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DEDICATION

This research is dedicated to my late father Sindile “Bra Max” Mdingi, my mother Nothemba “Sis Nkithi” Mdingi, my daughter Alunamda Sinombulelo Khazimla Mdingi and my son Lizalise Iminathi Ndivikele Mdingi.

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ABBREVIATIONS AND ACRONYMS

BCM	Business, Commerce, and Management sciences
BEd	Bachelor of Education
C2005	Curriculum 2005
CAJ	Creditors' Allowances Journal
CAPS	Curriculum and Assessment Policy Statement
CAQDAS	Computer Assisted Qualitative Data Analysis
CAS	Computerised Accounting System
CAT	Computer Application Technology
CBAM	Concerns-Based Adoption Model
CJ	Creditors Journal
CPJ	Cash Payment Journal
CRJ	Cash Receipt Journal
CRM	Customer Relations Management
CWD	Cape Winelands District
DAJ	Debtors' Allowances Journal
DBE	Department of Basic Education
DJ	Debtors Journal
DoE	Department of Education
EFT	Electronic Fund Transfer
EGD	Engineering Graphics and Design
EMS	Economic and Management Sciences
EOQ	Economic Order Quantity
ERP	Enterprise Resource Planning
FE	Faculty of Education
FET	Further Education and Training
FICASE	Framework for the Integration of Computerised Accounting in School Education
FP	Foundation Phase
GAAP	General Accepted Accounting Principles
GL	General Ledger

HCM	Human Capital Management
IASB	International Accounting Standards Board
ICTs	Information and Communication Technologies
IFRSs	International Financial Reporting Standards
IP	Intermediate Phase
LMSs	Learner Management Systems
LoU	Level of Use
MRP	Material Requirements Planning
MRPII	Manufacturing Resource Planning
NCS	National Curriculum Statement
PAYE	Pay As You Earn
PGCE	Post-Graduate Certificate in Education
PK	Pedagogical Knowledge
PCK	Pedagogical Content Knowledge
RNCS	Revised National Curriculum Statement
SA	South Africa
SAQA	South African Qualifications Authority
SCM	Supply Chain Management
SME	Small to Medium Enterprise
SoC	Sages of Concern
SP	Senior Phase
SRM	Supplier Relations Management
STATS SA	Statistics South Africa
STC	Secondary Tax on Companies
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TAM	Technology Acceptance Model
TB	Trial Balance
TCK	Technological Content Knowledge
TK	Technological Knowledge
TPACK	Technological, Pedagogical, and Content Knowledge

TPD	Teacher Professional Development
TRA	Theory of Reasoned Action
VAT	Value Added Tax
WCED	Western Cape Education Department
UoT	University of Technology

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 Introduction

Computers have changed the way the workforce perform their duties. The manual systems have been long replaced with computer technology. According to Frey and Orsborne (2017:278) transactions that were formally recorded manually are now entered into computer programs which then automates most of the accounting cycle duties that were performed manually on paper. The above researchers caution that the replacement of the traditional manual system has an influence on the job requirements. The importance of computerised accounting is emphasized by Wessels (2006:26) who advocated for accounting learners[1] to be empowered with technological skills that will enable them to apply the acquired accounting knowledge.

Computerised accounting skills are required by retailers, wholesalers, the banking sector, and entrepreneurs, etc. Computerised accounting is a computer system or package that enables recording and processing of accounting transactions and storing of financial information (Ware, 2015:112 & Anaeli, 2017:24).

For decades universities have integrated computerised accounting into their curricular. Papageorgiou (2014:73) notes that computerised accounting has been integrated and as compulsory as part of Accounting 1 course in Bachelor of Commerce. According to the researcher's experience from two different universities, computerised accounting has been allocated weight as part of the Financial Accounting 2 course. The knowledge of accounting without the capacity to apply it in the real world exposes our school accounting education teaching methods to criticism by the South African business sector. However, the South African high school accounting curriculum it is overtaken by time because it is still fully delivered and assessed using traditional manual systems that no longer exists in the business environment (Fridman, Dasso & Basson, 2003). It is imperative to ensure that the skills and knowledge of graduates from the education sector match the requirements of the business sector (Mouton, Louw, & Strydom, 2012:1216).

It has been an endeavour of the DBE (2011a:09) that “accounting in high school enables learners to satisfy the minimum requirements expected from an accounting graduate, this includes technological skills. The curriculum should consistently seek to minimise the distance between what is taught in school and the real business practices and prepare learners to be ready for higher education curriculum. However, the curriculum is silent on how accounting can be aligned to the real-world when it comes to electronic processing. This highlights a mismatch between how accounting is practised in the real-world and how it is taught in high schools, in that learners are not being exposed on how to apply accounting knowledge using computerised accounting packages.

Two significant gaps emerged: firstly, the available research throughout the years focused on computerised accounting integration at university level. This highlights the gap in literature regarding the integration of computerised accounting at a school level. Secondly a gap exists between the intended and actual accounting curriculum through its implementation. The adoption of computerised accounting into high school curriculum might be beneficiary to improve learning and teaching and attract learners to join the accounting profession. A significant number of learners are dropping Accounting in school, this was indicated by DBE (2019:05) that shows that learners who sat for accounting examinations decreased by 43% from 140 474 in year 2015 to 80110 in year 2019. This drop highlights the need for interventions in how accounting curriculum is being delivered. Wessels (2006) and Schunk (2012) indicated that the use of computer simulation as an additional pedagogy can revive enthusiasm and attract learners to have an interest in a subject.

The purpose of this study was to determine how computerised accounting can be integrated into accounting curriculum delivery at high schools in South Africa. The integration of computerised accounting empowers learners with accounting skills necessary for the 21st century workplace and make them more employable. Computerised accounting skills might assist learners should they embark on entrepreneurial journey and to run small businesses.

1.2 The research problem

The importance of integrating technology into the curriculum delivery in schools is to align education to the 21st century real-world practices. There is an unexpected disparity between school accounting education and the real workplace environment where accounting practices are carried out using computerised systems. This dichotomy is highlighted in the Curriculum and Assessment Policy Statement (CAPS) document states that the major purpose of offering accounting is to ensure that learners meet the

technological skills and knowledge requirements of the accounting profession (DBE, 2011a:09). However, it is unclear what technology can be integrated to satisfy the minimum requirements of the accounting profession. Computerised accounting does not reflect explicitly under the list of topics to be covered during any of the academic terms in the high school curriculum. The omission in the curriculum of 'what technology to integrate, when to integrate it, and how to integrate it' creates an undesirable gap between policy and practice. The research problem for this study is distilled from a range of background factors and is stated as: there is no coherent direction and plan for computerised accounting to be integrated and realised at school level in South Africa. Hence, the need for a 'framework for the integration of computerised accounting into high school accounting curriculum'.

1.3 Aims and objectives of the study

This section provides the aims, research questions and objectives of this study.

1.3.1 Aims of the study

The aim of this study was to explore how computerised accounting can be integrated into the accounting curriculum delivery, and to develop a framework for successful integration into the curriculum at high school level.

1.3.2 Research questions and objectives

To understand the factors delaying the integration of computerised accounting into the curriculum delivery, it was important to understand the policy, material, and human factors and how they affect implementation. This required an understanding of the three related aspects: First, the concerns and the opinions of the accounting teachers by understanding their attitude and how they foresee the integration of computerised accounting as an additional teaching tool; second the integration of computerised accounting (technology) requires material resources as well as technological knowledge and skills to successfully implement; and finally a coherent policy implementation strategy for successful implementation. The research questions and instruments utilised in this study focused on these three aspects. This assisted in gaining an insight into teachers' attitudes and how they foresee the integration of computerised accounting as an essential teaching tool. The Table 1.1 below presents the main research question, sub-research questions and the conforming objectives that were applied to guide this study:

Table 1.1: Research questions and objectives

Main research question What framework can be developed to support the integration of computerised accounting into the high school accounting curriculum?		
Sub-questions		**Objectives**
RQ1.	How can the concerns of accounting teachers towards the integration of computerised accounting into their accounting curriculum delivery be addressed?	To understand the nature of concerns teachers, have regarding integration of computerised accounting into their accounting curriculum delivery and determine their solution.
RQ2.	What resources are needed to integrate computerised accounting into high school accounting curriculum delivery?	To determine what resources (material and human) are needed to enable the integration of computerised accounting into high school accounting curriculum delivery.
RQ3.	How can computerised accounting be integrated into high school accounting curriculum delivery?	To develop a framework (to bridge policy and practice) that can be used to integrate computerised accounting into accounting curriculum delivery at high school level.

1.4 Research design and methodology

This section illustrates the philosophical assumptions, research approach, and design that was followed to understand the research phenomenon. The research tools that were selected and applied to achieve the objectives of this study are discussed. Careful considerations were made based on literature to select a research design that will assist in achieving the research aims of this study.

1.4.1 Research Philosophy

The philosophical stance of this research was located within the interpretivist paradigm. The main objective of interpretivist researcher is to attain a deeper understanding of different experiences that people come across (Du Plooy- Cilliers et al., 2014:30). Thanh and Thanh (2015:25) affirm this by adding that the core belief with interpretivism paradigm is that reality is socially constructed. According to authors interpretivism accepts and seeks to discover multiple and different perspectives about individuals' experiences. Creswell and Poth (2016:25) note that the ultimate goal of interpretivism is that the researcher needs to discover the participants' views of the phenomenon and how it affects them and the society

at large. This study pursued to understand the accounting teachers' lived experiences, feelings and attitudes concerning computerised accounting as a reality of accounting teaching in the 21st century. Hence the researcher deemed interpretivism paradigm as a philosophical stance for this study as appropriate.

1.4.2 Research Approach

A qualitative research approach was used in this study. Creswell (2014:04) states that with qualitative approach a researcher would seek to explore and understand the meaning people assign to problems. According to Thanh and Thanh (2015:25) qualitative approach is compatible with the interpretivist paradigm. They further assert that while the quantitative approach is concerned with statistical numbers and measures, the qualitative approach's strength is in gathering information that provides the insight and in-depth understanding about the phenomenon from different lived experiences.

The selected data collection instruments were helpful to acquire rich details and in-depth understanding of what are the resources issues, and the teachers' concerns towards integrating computerised accounting into their accounting lessons, as well as how they envisage the integration. The researcher selected qualitative approach as he deemed it appropriate for this study to understand the lived experiences and standpoint of teachers with regards to computerised accounting as a part of pedagogical need of 21st century accounting teaching.

1.4.3 Research design

The research design selected for this research was a qualitative single-case study design. According to Rule and John (2011:07) case study design is a comprehensive investigation of a particular instance in its context in order to generate knowledge. Zongozzi and Wessels (2016:219) notes that a case study research design is divided into two categories (single-case and multiple-case). They posit that the single-case study is the one that enables a researcher to investigate a phenomenon in-depth and in narrow form. Olsen (2014:185) highlights that a case study is a flexible medium that accepts variety of data collection methods. Takahashi and Araujo (2020:110) confirm that in a case study research multi-data source can be used as evidence. They emphasize that case study design is not confined within one epistemological research. According to Hamilton and Ravenscroft (2018:88) the only flaw with the case study research is that it cannot be generalised. This study was

designed with no intention to generalise the findings but rather to get in-depth understanding of the factors relating to the integration of computerised accounting into curriculum delivery.

Gabby, Avargil, Herscovitz, and Dori (2017) used a case study design to investigate concerns of chemistry teacher with regards to the integration of technology in high school. With this design the authors were able to understand in-depth the concerns of teachers, profiled them, and provided alternative strategies to deal with teachers' attitudes. Therefore, a case study design was selected and deemed the most suitable research design because the intention of the researcher was to dig deep and in detail the possibility of integrating the computerised accounting into the curriculum. The single case which was the unit of analysis of this study is discussed in the following paragraph.

1.4.4 Site selection and sampling

The target population of this study was high school accounting teachers within the Western Cape Province of South Africa. This province was chosen because the researcher resides in it and participants and data collection were conveniently accessible. The Western Case Education Department (WCED) consists of eight education districts. Teachers from schools in the Cape Winelands district (CWD) was used as case study unit for this research. Figure 1.1 below provides an outline of the boundaries of this research:

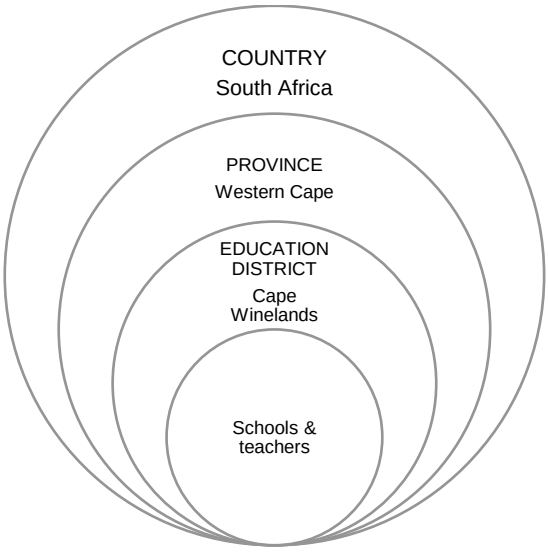

Figure 1.1: Boundaries of this research

Purposive sampling technique was applied to select schools and participating accounting teachers. According to Emmel (2013:33) purposive sampling technique is about exercising judgement in selecting participants and sites that will best respond with knowledge to the

research questions. The accounting teachers have better understanding of the curriculum delivery of the accounting subject and can provide a better insight of how technology intervention can assist to improve their curriculum delivery. The sample comprised of nine accounting teachers (one each from 9 high schools). The nine schools where the teachers worked was selected within the Cape Winelands district as the research site for this research. The schools with accounting subject were identified on list downloaded from the WCED website and the school addresses were used to select schools that are in close proximity with the researcher's residence.

1.4.5 Data collection

The data for this study was collected using one-on-one interviews and document analysis. The interviews assisted investigations driven by the first two research sub-questions about the concerns and resources. The document analysis was utilised to triangulate and assist in developing the proposed framework as per the third research sub-question.

1.4.5.1 One-on-one Interviews

One-on-one semi-structured interviews was conducted with the selected 9 accounting teachers. The purpose of using semi-structured interviews was to acquire rich information and detailed understanding of what are the resources available and needed, teachers concerns and how they envisage the use of computerised accounting as a teaching tool in school. A predetermined open-ended questions were asked while others emerged during the interviews. According to Norton (2019:96) open-ended questions assists in getting the views of the respondents rather than measurements.

The researcher first visited the schools where the teachers worked, met the principals to introduce the research and showed the ethics certificate from the education department. The school principals were asked for permission to meet with the school accounting teacher. The first meeting with the accounting teachers was meant to set up appointments and prepare them for the interviews. The objectives of the research were explained to the accounting teachers and the fact that it is not compulsory for them to participate. The researcher explained how the confidentiality of the teachers will be maintained and that their names and school names will not be mentioned in the research reports. Once the teachers agreed to participate then interview meeting dates, times and venues were scheduled based on their availability and convenience. The second meeting was the actual interview session. The interviews commenced with the signing of the consent form and in agreement

with the participants these meetings were recorded. Due to Covid-19 pandemic two out of the nine interviews were conducted virtually using the Microsoft Teams application.

1.4.5.2 Document analysis

Document analysis was utilised to collect data related to the accounting curriculum policies. These documents were selected to provide context and the historical insight of the accounting curriculum. Different computerised accounting manuals with details of how accounting topics are processed using the computer packages were additionally collected and used for the analysis. The analysis and comparison of the accounting curriculum documents, and computerised accounting manuals contributed, together with empirical data from interviews, in the development of the proposed framework that can be used to integrate computerised accounting.

1.5 Researcher's role

The researcher used multiple data collection sources to prevent obtaining biased information about the phenomenon. Berger (2015:02) encourages that researchers should continuously self-monitor and use various sources to crack the balance between self beliefs and universal ones while creating knowledge. The researcher played a role in conducting interviews with the the accounting teachers to ensure that all the key themes that emerged are probed fully to grasp their entire meaning.

1.6 Delineation of the research

The schools that form part of the population and sample of this study were only those that offer Accounting. The geographical location was limited to those high schools that fall under the Cape Winelands educational district within the Western Cape Province of South Africa.

1.7 Contribution of the research

The study addressed a gap in literature about computerised accounting in high schools. Studies like those of O'Connell et al. (2003), Wessels (2006), Rhodes (2012), Machera and Machera (2017) focus on computerised accounting implementation at Higher Education level. Though the CAPS document for Accounting subject mentions that its intention is to prepare learners for accounting occupation manually and technologically. However, on all

the planned weekly lessons and assessments it is silent on whether which technology to be used, when and how. This research adds to the body of knowledge and seek to close the gap between the policy and practice by providing a framework of how can computerised accounting be integrated into accounting curriculum delivery at high school level. The framework can be used by the accounting educators and education policy makers as guidelines to successfully integrate computerised accounting into high school curriculum delivery. The framework was constructed using the information obtained from the data findings.

This study proposes a framework for the integration of computerised accounting for high school accounting. The framework provides a simple three step approach to addressing the policy (curricular), the human (knowledge and skills), and material (computerised accounting packages/applications) necessary for successful implementation. It is envisaged that this framework will progress towards closing the vacuum between policy and practice and further improve the learning and teaching of Accounting for relevance in the 21st century.

1.8 Structure of the thesis

This study is organised under six chapters.

- ***Chapter One*** provides the context of this study. The research problem, aims and objectives are discussed. Detailed explanation of the research design and methodology are made. The reasoning behind the selection of each research method is backed with literature to justify its suitability for this study. The explanation of how the research process steps were undertaken is provided. Lastly the importance and the offering of this research to literature, accounting education, and accounting profession is set out.

- ***Chapter Two*** provides detailed explanation of the conceptual framework applied to frame this research. Relevant technology integration models that are commonly used by researchers are discussed. The models selected are Concerns-Based Adoption Model (CBAM), Technology Acceptance Model (TAM), Technological pedagogical and content knowledge (TPACK). The CBAM was closely linked with the first research question about the accounting teachers concerns in relation to the integration of computerised accounting into the curriculum delivery of accounting in high school.

The TAM was used to determine the attitude, personal stance and beliefs of accounting teachers about the possibility of adding computerised accounting as an essential pedagogical tool for accounting lessons. The TPACK model seek to classify and provides a detailed understanding of different technological knowledge constructs expected from teachers. Detailed explanation of how technology integration is linked to constructivist pedagogy is done. Lastly, a conceptual framework was formed the basis to guide this study was developed.

- ***Chapter Three*** provides a literature review of accounting discipline and provides the context of accounting education in South African schools. The literature dwells on the elements that are important to successfully integrate technology into education. Computerised accounting systems are discussed and how they have been integrated in the higher education level. The popular and commonly used computerised accounting packages in South are illustrated together with their common features. The literature review further expands on the adoption of online learning and teaching of accounting as another angle of technology integration enforced by the breakout of the Covid-19 pandemic. The literature review includes scholarly views about the importance of computerised accounting as an employment requirement.

- In ***Chapter Four*** the researcher discusses in detail the research design and methodology applied in the study. The study followed qualitative approach of research process to grasp comprehensive understanding of the stated phenomenon. The single-case study design followed is explained. The data collection methods appplied and the analysis tools used are explained. The selection of each research method applied is justified with literature.

- ***Chapter Five*** presents and discusses the research findings from the interviews. The findings are linked to the research questions and objectives. The findings showed that accounting teachers are concerned about the state of accounting in high school. When it comes to the integration of computerised accounting into their curriculum delivery, they are concerned about their lack of background knowledge and experience of teaching accounting using computers. The teachers highlighted

the implications of integrating computerised accounting. Benefits and barriers of integrating computerised accounting are discussed in terms of teachers' opinions.

In ***Chapter Six*** the researcher presents findings from data collected using document analysis is discussed. The CAPS prescribed topics in the accounting textbooks is compared to how they are processed using computerised accounting systems.

In ***Chapter Seven*** the researcher provides conclusions and. A proposed integration framework named Framework for the Integration of Computerised Accounting in School Education (FICASE) is developed as a significant contribution to the body of knowledge and a tool to guide successful integration of computerised accounting into curriculum delivery of accounting in school. The limitations of this study, and suggestions of future research are presented.

CHAPTER TWO

CONCEPTUAL FRAMEWORK

2.1 Introduction

The previous chapter provided the context and the overview of this research project. This chapter presents the conceptual framework applied in this research. It outlines the models used to develop the conceptual framework. These models are frequently used by researchers when considering integration of technology into education (Liu & Huang, 2005; Venkatesh & Bala, 2008; Hollingshead, 2009; Messina & Tabone, 2012; Chuang et al., 2015). The purpose of this study is to develop a framework that can be used to integrate computerised accounting into high school accounting curriculum delivery. The researcher investigated accounting teachers' concerns and how they perceived the usefulness and ease of use of computerised accounting for teaching. A theoretical perspective on the following two research sub-questions enabled the researcher to identify technology integration models suitable for this study:

1. How can the concerns of accounting teachers towards the integration of computerised accounting into the high school accounting curriculum delivery be addressed?
2. What are the resources needed to integrate computerised accounting into high school accounting curriculum delivery?

The model used for the first question is called the Concerns Based Adoption Model (CBAM) while the second question is explored through the Technology Acceptance Model (TAM). The integration of computerised accounting can assist in ensuring that curriculum delivery of accounting in high school covers the entire Technological, Pedagogical, and Content Knowledge (TPACK) model. Technology integration in the classroom is regarded as Constructive pedagogy (Sabzian, Gilakjani & Sodouri, 2013). The Constructive pedagogy has been explored as technology integration in the classroom speaks to pedagogical considerations. The Chapter is organised as follows:

2.2 Concerns-Based Adoption Model
2.3 Technology Acceptance Model

2.4 Technological Pedagogical and Content Knowledge
2.5 Constructive pedagogy
2.6 Conceptual framework
2.7 Summary

2.2 Concerns-Based Adoption Model (CBAM)

The Concerns-based adoption model is based on Frances Fuller's 1969 concerns theory (Hall, Wallace & Dossert, 1973). According to Fuller (1969:218) CBAM teachers' concerns are classified in three stages namely: non-concern, concern with self, concern with pupils. These concerns were re-classified by Hall and Hord (2011) into four clusters namely: unrelated concerns, self-concerns, task concerns, and impact concerns. Hall (1974:05) describes CBAM as a model intended to clarify the developmental process that people within an education institution go through when adopting an innovation or a new way of doing things. According to He and Yusop (2020:01) CBAM is a very useful model that assists the policymakers in planning and implementing technological integration into the school curriculum.

According to Sultani (2015:154) CBAM is a globally recognised change model used to plan and implement technology in education. Gundy and Berger (2016:235) regard the CBAM as one of the most powerful model that is instrumental in initiating and supporting educational change. According to Snider (2002:241) reaction to change differs from one individual to another and it involves a process that is developmental in nature. Isbell (2013:08) confirms this stating that CBAM is centred around the understanding that individuals respond distinctively to changes that technology integration brings. Cetinkaya (2012:155) acknowledges that teachers' concerns about technology integration are difficult to change however without addressing them then the implementation becomes impossible. Kang (2016:09) defines concern as "the composite representation of the feelings, preoccupation, thought and consideration given to a particular issue or task." He further explicates that concerns are either positive or negative and they are psychological actions based on one's individual characteristics, previous knowledge, or experience about the technology. Nasri (2018:2185) note that teachers' concerns play a crucial role when integrating technology and they emanate from experience and personal background.

A study by Gundy and Berger (2016:232) examine how teachers integrate and implement technology in their classrooms using CBAM. The authors classify CBAM as a change model for education. According to them change is not a once off incident but a process that an

individual follows when a new technology is introduced. They confirm that teachers play central key role in integration of technology into education. Furthermore, they state that no educational system change can occur without changing individual teachers first.

It is important to understand the stage where the teachers are in because they often become a barrier in integrating technology if their concerns are not addressed (Agormedah, Ansah, Betakan, & Parker, 2019:488). These scholars used the CBAM to determine teachers' concerns regarding integration of instructional technology in their Business Studies (Financial Accounting, Cost Accounting, Business Management, and Economics) curriculum delivery in high school. They conducted their study using a descriptive survey. They found that majority of teachers are in the consequence and informational stages. Furthermore, they suggest that teachers need to be thoroughly trained on how to use technology in their classrooms and that they should be included in the decision process regarding the implementation of new technologies in their curriculum delivery.

The researcher suggests that scholars should align the CBAM to the research method they are using in studying phenomena. Gundy and Berger (2016:234) question the use of quantitative methods with CBAM by most researchers. They substantiate their criticism by highlighting that the findings of such studies tend to be that majority of teachers are not integrating technology into their lessons. They suggest the use of qualitative interviews as the best method that can be used with CBAM. According to George, Hall and Stiegelbauer (2013:05) the CBAM consists of three diagnostic dimensions namely Stages of Concern (SoC) that represent the *who* and Levels of Use (LoU) that represent the *what*, and Innovation Configuration (IC) that represent the *how*, can be utilised to measure the status of individuals within an organisation regarding the adoption of an innovation. According to Isbell (2013:08) SoC and LoU are mainly about providing understanding of teachers' concerns while IC is about the actual execution of technology integration into the curriculum.

According to Cetinkaya (2012:156) SoC displays the teachers' perceptions and feelings about technology integration, LoU provides directions of how to implement it, and IC indicates alternative methods to implement technology. Gundy and Berger (2016:234) refer to SoC as a change model while LoU is an implementation model of technology into education. They pose that it is rare and often difficult to use all the three CBAM diagnostic tools within one research and that the one that is mostly used is SoC followed by LoU, and then IC.

There are few studies that apply CBAM to its entirety (Slough & Chamblee, 2007:222). This means that one can use one or more of these diagnostic tools depending on the objective of investigation. There researcher confirmed this while reviewing literature and even in this study only SoC that is relevant and that was used. This research selected CBAM theoretical framework to determine the stage of accounting teachers' concerns regarding the integration of computerised accounting into their accounting lessons. Khoboli and O'Toole (2012:146) state that it is important to clearly understand the stages of concerns of teachers regarding technology integration. They further reiterate that if the concerns of teachers are not known and addressed the integration of technology may not be successful. According to them CBAM provides proper guidelines for designing effective teacher development strategy. Lochner (2015:63) assists in identifying areas where teachers require support when integrating technology. The following paragraphs discusses interpretations of SoC and LoU according to researchers.

This research selected the CBAM theoretical framework to determine the stage of accounting teachers' concerns regarding the integration of computerised accounting into their accounting lessons. It acknowledges that the focus of the study is interpretive and as such best suited for qualitive analysis,

2.2.1 Stages of Concern (SoC)

The SoC is the first dimension of CBAM, and it has seven stages that have different features that are interdependent (Kang, 2016:09). Furthermore, Gundy and Berger (2016:233) note that these seven stages are sequential and metamorphically compares them with climbing stairs. This means when one encounters new technology, he or she moves gradually in the above stages consecutively. Snider (2002:241) purports that SoC develops progressively from lower stage of being unconcerned up to the highest stage of refocussing. Christou, Eliophotou-Menon, and Philippou (2004:168) note that the move from one stage to another is influenced highly by years of teaching experience. The Table 2.1 below illustrate the expressions of concerns in relation to stages of concerns:

Table 2.1: Typical Expressions of Concern about an Innovation - George et al. (2013:04)

Stages of concern			Expressions of Concerns
Unconcerned	0	Unconcerned	I am not concerned about it.
Self	1	Informational	I would like to know more about it.
	2	Personal	How will using it affect me?

Task	3	Management	I seem to be spending all my time getting materials ready.
	4	Consequence	How is my use affecting my students?
Impact	5	Collaboration	I would like to coordinate my effort with others, to maximize the innovation's effect.
	6	Refocussing	I have some ideas about something that would work even better.

According to Kang (2016:09) *unconcerned stage (Stage 0)* is originally related to the awareness individuals have about the technology. In this stage individuals are unconcerned about the new technology. In the *informational stage (Stage 1)* individual have some knowledge about the technology and begin to develop some interest about it. The *personal stage (Stage 2)* is when teachers do introspection of how the new technology will affects them. They individually examine their ability to implement the technology. Christou et al. (2004:172) findings deduce that personal stage receives more attention from teachers who are new in the teaching profession. They suggest that when designing training for the integration of technology one need to plan in cognisance of whether the teachers are new or experienced in teaching.

In the *management stage (Stage 3)* teachers considers how will the technology affect their time and lesson plans. In this stage they ask and search for resources that they will need to implement the technology. According to Cetinkaya (2012:157) if the change is not addressed properly then the SoC process do not continue sequentially and in many instances, it halts in stage 3. He notes that the pace of the move from one stage to another and the perspicacity of concerns are heterogeneous from one teacher to another. Kim and Paik (2016:359) agree with Cetinkaya that personal and management stages have high intensity in comparison to other stages hence it is important to ensure that they are addressed. Slough and Chamblee (2007:223) adds that sometimes concerns in management stage can be very tenacious to and requires long-term involvement of support staff.

In *consequence stage (Stage 4)* teachers seek to determine the value of the technology in their students' learning. They examine whether there is any change or improvement on students' academic performance because of the new technology. Christou et al. (2004:171) reveal that teachers mainly focus on the task stage which combines management and consequence stages. This means that teachers are more concerned on whether they will be able to accommodate the integration of technology into their teaching time, and on whether the integration will assist their students to perform better. In the *collaboration stage*

(Stage 5) teachers considers working with other teachers to get the best of what the technology can offer. Lochner, Conrad, and Graham (2015:68) suggest that learning communities should be established to address concerns in the collaboration stage. They explore the entire features of the technology. In the *refocusing stage (Stage 6)* teachers evaluate the technology in comparison with other alternatives to improve it. The refocusing is the highest SoC and Lochner et al. (2015:64) posit that teachers in this stage begin to make adjustments and reviews and consider additional options. Kang (2016:06) proves that if intensity of concerns is in collaboration and refocusing stages then that demonstrate a potential resistance from teachers in using technology.

2.2.2 Level of Use (LoU)

The second diagnostic tool of CBAM is LoU. According to Gundy and Berger (2016:234) LoU determines the behavioural side of teachers with technology. They state that LoU is used to examine the performance of teachers while using the technology. According to Matar (2017:143) it is not compulsory to apply the above listed behavioural categories in a sequentially or lockstep escalating manner. Christou et al. (2004:161) extrapolate that LoU scrutinises the actual use of technology by teachers. The Table 2.2 below illustrates the different categories of LoU:

Table 2.2: Typical expressions of LoU – (Kim and Paik, 2016:354)

Level of use		Typical expression
0	Non-use	I have little or no knowledge of information technology in education, no involvement with it, and I am doing nothing toward becoming involved.
1	Orientation	I am seeking or acquiring information about innovation.
2	Preparation	I am preparing for the first use of innovation.
3	Mechanical use	I focus most of my effort on the short-term, day-to-day use of innovation with little time for reflection. My effort is primarily directed toward mastering tasks required to use innovation.
4A	Routine	I feel comfortable using innovation. However, I am putting forth little effort or thought to improve innovation in education or its consequences.
4B	Refinement	I vary the use of innovation in education to increase the expected benefits within the classroom. I am working on using innovation to maximize the effects with my students.
5	Integration	I am combining my own efforts with related activities of other teachers and colleagues to achieve impact in the classroom.
6	Renewal	I re-evaluate the quality of use of innovation, seek major modifications of, or alternatives to, present innovation to achieve increased impact, examine new developments in the field, and explore new goals for myself and my school district.

According to Matar (2017:145) at *non-use (level 0)* the user takes a decision to investigate and learn the technology. Kim and Paik (2016:356) indicate that some researchers often remove the non-use level and apply only the seven levels. In *orientation (Level 1)* the user collects information related to the technology. In this stage there is no decision to use or not to use technology yet. In the *preparation (level 2)* the user begins to prepare and use the technology for the first time. In *mechanical use (level 3)* the user is not fully committed to the innovation. In this level users do not explore and use innovation to its entirety; the focus is only on what needs to be applied to proceed with tasks. In the *routine (level 4A)* the users begin to be little comfortable with the innovation and start thinking about how to improve the innovation. In *refinement (level 4B)* the users fully explore the innovation to improve the benefits for the students.

In the *integration (level 5)* the users merge their old methods with the innovation and combine with how other colleagues use the innovation to increase the benefit for the students. In the *renewal (level 6)* users look beyond the innovation for better versions and require major revisions. This means users in this level have explored the innovation to its entirety in such that they are able to suggest improvements or consider alternatives. Sadeck (2016:86) underlines that one of the limitations of CBAM is that it assumes that technology use already exists. The researcher did not use LoU as it is relevant for studies where technology is already in use whereas in this study computerised accounting is not already integrated into curriculum delivery of accounting in high schools. Isbell (2013:09) agrees that researchers do not usually use the three CBAM diagnostic tools as it depends on the nature of the technology to be integrated.

The diagnostic dimensions of CBAM are not far apart from the following model though they are sequentially different. Gundy and Berger (2016:235) conclude that most researchers modify CBAM or use one diagnostic dimension of CBAM and chains it with another model. The following section is centred around attitude and according to Lochner et al. (2015:63) SoC of CBAM describes the attitude of users who are to adopt a technology. They further highlight that CBAM is the most suitable framework to use when intending to successfully integrate technology into curriculum delivery. They state that CBAM does not only provide understanding of concerns of those who are to use the innovation but extends to non-users. The next section discusses the additional model used to support CBAM that was used in this research.

2.3 Technology Acceptance Model (TAM)

Another model relevant to this study is the Technology Acceptance Model that was developed by Fred Davis in 1985 based on Fishbein's 1967 model of Theory of Reasoned Action (TRA) (Davis, 1985:15). According to Julianto and Yasa (2019:276) the TRA is about one's intention to carry out a specific action. Furthermore, the authors state that intention is influenced by individual's attitude and social environment. Davis' motive for developing the TAM was to improve the understanding of what determines the acceptance of technology and to determine the motivational variables that are an arbiter between the features of a system and its actual use by users. Nugroho, Bakar, and Ali (2017:29) concur that the goal of TAM is to explain the reasoning behind users' acceptance of technology. According to Davis, Bagozzi and Warshaw (1989:985) the key purpose of TAM is to link external factors to internal beliefs, attitudes, and intentions. Furthermore, they outline that one need to comprehend why people accept or reject technology to increase and encourage use of technology. The Figure 2.1 below presents the TAM as designed by Davis in 1985:

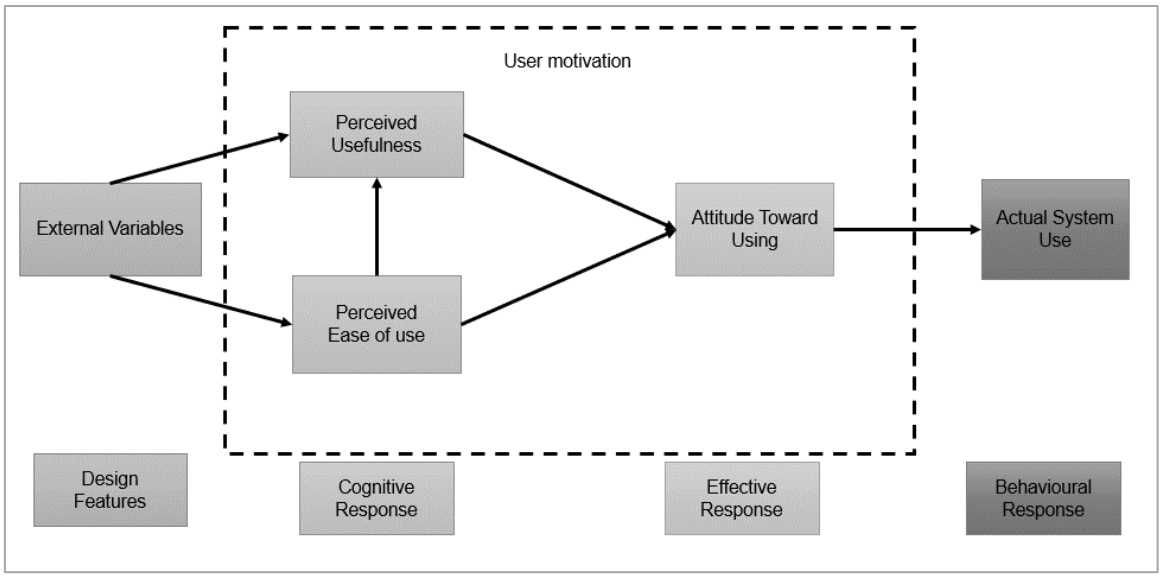

Figure 2.1: Technology Acceptance Model (Davis, 1985:24)

According to Davis et al. (1989:987) external variables are related to system interface like menus, icons, touch screens etc. These are about user-friendliness of the system. Though TAM identified external variables as the foundation of whether to accept or reject technology however, it limits them to only system features. Teo, Lee, and Chai (2008:131) confirm this noting that major weakness of TAM is the exclusion of the role played by external variables. The external variables stated by Davis under his TAM are limited to only those related to the system design features.

Legris, Ingham, and Correlette (2003:196) assessed 21 studies to determine what are the external variables listed in them including those of Davis. They conclude that there is no clear pattern identifiable suggesting the exact nature or types of external variables. The researcher adds that external variables that regulate the decision to accept and integrate technology are more than the system design features. In addition to the system design features there are other external variables that need to be included. Once one is convinced that the system is suitable based on its design features then at an organisational level there should be a policy mapping the introduction and implementation strategy.

The other external variable that needs to be considered that might influence the acceptance of technology is its cost and affordability. A system might be well designed and suitable to achieve certain stated organisational or individual outcomes but if it is expensive then it becomes difficult to accept it. Meaning though one can accept technology if is costly and unaffordable then that acceptance is irrelevant for the actual use of it. The cost of technology is divided into two, there is cost for buying the technology then the is cost associated with the actual implementation of it. To implement technology, one needs to consider training requirements necessary and the environmental costs surrounding it. Environmental costs include the hardware compatible and that will enable the use of the technology.

Strengths, weaknesses, opportunities, and threats (SWOT) analysis regarding the environment needs to be considered before a decision to accept and implement technology. Infrastructural availability should be considered as well because schools are in different locations like villages, farms, townships etc. There are certain threats that are uncontrollable for example if the technology requires network, internet and/or electricity and one of those are unavailable in the location where the organisation or an individual is then acceptance becomes irrelevant. The other factor that one needs to consider when thinking about accepting and implementing certain technology is the time factor. It is important to contemplate how long will it take to realise maximum use of technology.

Prior to the development of the TAM researchers linked system use to satisfaction (Legris et al., 2003:192). The authors explain satisfaction as “the sum of one’s feelings or attitudes toward a variety of factors affecting the situation.” According to Permatasari and Prajanti (2018:113) attitude is related to one’s happy or unhappy feeling or interest about using a specific technology. Davis (1985:24) postulates that attitude is derived from two major beliefs namely perceived usefulness and perceived ease of use. He defines perceived usefulness as “the degree to which an individual believes that using a particular system

would enhance his or her job performance" and perceived ease of use as "the degree to which an individual believes that using a particular system would be free of physical and mental effort." He states that the perceived ease of use has a direct influence on perceived usefulness therefore they have causal relationship. He pinpoints attitude a major determining factor of whether one uses technology or not.

According to Davis et al. (1989:985) perceived usefulness is about the benefits offered by a technology to improve performance in doing certain job tasks and perceived ease of use is about how easily understandable the technology is, and it simplifies one's tasks. Kripanont (2006:19) states that perceived usefulness is associated with advantages of using a technology and perceived ease of use is related to complexity and characteristics of new technology. He unearths that these two beliefs, attitude and actual use can be regulated by age and gender. Luan and Teo (2009:263) highlight that teachers tend to accept and use technology if it is going to assist them to achieve lesson outcomes and improves learning. They found that perceived usefulness has a greater influence on teachers' attitude towards using technology for teaching than perceived ease of use. Table 2.3 below demonstrates thirteen priorities of these two beliefs that were tested by Davis:

Table 2.3: Thirteen priorities to test beliefs under TAM (Davis,1985:90-91)

Priority	Perceived usefulness	Perceived ease of use
1	Effectiveness	Controllable
2	Job performance	Cumbersome
3	Quality of work	Frustrating
4	Increase productivity	Understandable
5	Critical to my job	Mental effort
6	Accomplish more work	Rigid and inflexible
7	Work more quickly	Confusing
8	Makes job easier	Ease of remembering
9	Control over work	Dependence on manual
10	Reduce unproductive time	Error recovery
11	Saves me time	Unexpected behaviour
12	Addresses my needs	Provides guidance
13	Job difficult without	Error proneness

Davis (1985:38) omitted behavioural intention to use. He notes that the main reason for this omission is based on that "intention reflects a decision that the person has made, and as such gets formed through a process of mental deliberation, conflict and commitment that may span a significant time period." Behavioural intention to use is related to intentions of

employees to behave in a certain way based on their belief that a technology will improve their job performance. The researcher supports the exclusion of the behavioural intention for accepting use of technology for this research. He poses that the intention to use technology might not be dependent on individual employees. The intention to use technology is vested on how the organisation directs its use under its technological use policy. Therefore, if the policy is explicit regarding the use of technology, then it becomes compulsory to use it. In addition, Kripanont (2006:22) notes that behavioural intention is relevant to users who have experience of using technology. The teachers selected in this study are not currently teaching accounting using computerised accounting.

The attitude of teachers whether it is favourable or unfavourable towards a technology when it is compulsory for them to integrate it, they begin to search information about it (Sadeck, 2016:78). However, the researcher warns that if it is compulsory to use technology then users might sabotage its use to portray it as ineffective. He suggests that there should be strategies in place to support and encourage effective and maximum use of technology. Kripanont (2006:14) questions the limit of TAM to only perceived usefulness and perceived ease of use as the determinants of attitude. He indicates that age, gender, experience, and voluntariness have an influence on attitude and thereby the actual use of technology. Luan and Teo (2009:262) add that teachers' negative attitude impedes use of technology for teaching. They emphasise that positive attitude towards technology is imperative for teachers to keep up with changes and additions of new technologies in education.

In the year 2000 TAM was further extended to TAM 2 and thereby excluded attitude concept (Venkatesh & Davis, 2000:188). Legris et al. (2003:202) pose that though TAM requires modifications, but the additional versions still fail to add important variables like change management and social factors. Marangunic and Granic (2015:82) review TAM developments and extensions for the years between 1986 to 2013 and confirm that TAM still have unexplored areas that could contribute in validating its application. TAM 2 simplified the perceived usefulness to include other concepts. Venkatesh and Bala (2008:280) further developed TAM2 to TAM3 by extending the perceived ease of use. Despite these extensions the researcher preferred the original TAM to fulfil the objectives of this study as the attitude of teachers towards computerised accounting integration is one of its focal points. Liu, Ritzhaupt, Dawson, and Barron (2017:795) highlight that teacher experience and attitude plays a significant role in technology integration. They suggest that once teachers have an unfavourable attitude towards technology then they become a stumbling block between the actual use and learners.

Literature notes that once teachers are uncomfortable and intimidated by technology integration then that automatically deprives learners from using and knowing it thereby not benefiting from it. Teo et al. (2008:128) concur that the success of integrating technology into lessons largely rely on teachers' attitude. Furthermore, they indicate that it is critical to examine teachers' attitude towards acceptance of technology as the main drivers of learning and teaching. The attitude of teachers determines the future of using computers in the classrooms. Therefore, without positive attitude from teachers towards technology then it becomes difficult to integrate it into lessons. TAM indicates that positive attitude towards technology is derived from perceived usefulness and ease of use. Hence the researcher felt that the original TAM is more appropriate for this study versus the extended two versions. TAM was used to examine the accounting teachers' attitudes towards using computerised accounting as an additional pedagogical tool in their lessons.

Kripanont (2006:16) notes that TAM can be applied to examine both individuals and organisational contexts. He explains that organisational context refers to an environment where individuals are expected to accept and use technology. Ajibade (2018:01) argues that TAM is relevant for individuals rather than institutions or organisations. According to him the widely acceptance and popularity of TAM is exacerbated by the fact that it is a simple and user-friendly model. However, the researcher contests the argument of Ajibade noting that even in an institution it is an individual who is influenced by external variables and introduce the technology in an institution.

The researcher argues that acceptance of technology in an institution depends on the influence and powers vested to certain individuals. Legris et al. (2003:203) substantiate this adding that top management involvement and satisfaction with new technology are significant to the attitude of staff in accepting and using a system. For example, a teacher might believe in a certain technology but if the school or the education department is not interested then that technology might not be used in the schools. In contrast if the principal or the education department policy director accepts such a technology then it might be implemented though teachers are against. Individuals constitute an institution or organisations therefore TAM cannot be discredited based on whether it is for individuals only and not for institutions.

The TAM was criticized that it fails to acknowledge that acceptance of technology is dependent on the policy and information technology guidelines of the institution (Ajibade, 2018:). The researcher concurs with this criticism because based on his observations, staff can ignore technology if they are not mandated by policy to use it. For example, the use of

e-learning platforms has been an optional and additional teaching and learning tool but not compulsory. Academics only used the platforms when it became mandatory to use them due to the Covid19 pandemic that forced closure of universities and online lessons in year 2020. Davis (1989:982) indicate that staff might be unwilling to use available technology and thereby deprive themselves and the organisation from performing efficiently. Therefore, the researcher suggests direct and explicit policy decisions and compliance to increase use of technology. In this research policy makers were interviewed to identify their attitude and stance on the integration of computerised accounting into high school accounting.

The other factor not touched by TAM is the cost implications of technology. Though one might accept technology, but affordability and financial implications might derail an individual or institution from implementing it. The discontinuation of an old method and availability of new technology as the only option moreover forces acceptance of technology. For example, the availability of soft music has forced discontinuation of production of CDs and CD players in such that new cars are now being produced with aux cable and Bluetooth functionality only. Therefore, advancement of technology forces acceptance of technology because though one might still prefer playing CDs he/she will only play only outdated or old music as new music is only available in soft copies.

Employees might not accept technology because of its control features. For example, a fingerprint barometer for capturing attendance might be difficult to manipulate versus a manual system where employees record their attendance and arrival time on a book. Therefore, new technology might expose inefficiencies of employees and that would make them to have a negative attitude towards accepting such technology. Recently in years 2020 to 2021 technology became the only option due to covid19 pandemic that forced employees to work at home. Universities relied on using e-learning platforms for teaching and learning of students. Therefore, in this instance acceptance of technology is not optional but based on environmental circumstances.

Pareja-Roblin, Tondear, Voogt, Bruggeman, Mathieu, and Van Braak (2018:166) note that TAM fails to provide what influences adoption of technology in an educational context, and they praise CBAM as the most relevant model for education organisation as it links the effect of technology in relation to students. However, the researcher in this study advocates for TAM not to be discarded entirely as it has variables in decision making of whether to use or not use technology. The researcher further notices that some scholars used TAM to measure and to predict use of technology. Literature review cited here is silent or does not make clear distinction on classifying TAM as whether it is relevant for either qualitative,

quantitative, or mixed-method studies. Some researchers used TAM for positivist aligned studies. This confusion might have emanated from the methodology used by Davis (1985) in his construction of TAM. He clearly states that TAM is to explain and understand determinants of actual use meaning TAM is qualitative in nature. However, his doctoral thesis is ambiguous in that he used interviews and surveys without clarifying and substantiating the paradigm foundation of his study. The researcher believes using TAM in this study is justifiable as the qualitative method was used. Joo, Park, and Lim (2018:48) indicate that there is a relationship between TAM and TPACK. The following section discusses TPACK and how it was linked to TAM in this study.

2.4 Technological Pedagogical and Content Knowledge (TPACK)

The models discussed in the Section 2.2 and Section 2.3 focus more on the personality traits and response of teachers to technology integration into their classroom environments. The TPACK has been incorporated in this study to cover the qualification's overall requirements of teachers to effectively integrate technology into their curriculum delivery. The importance of technology integration in teaching has been highlighted by Punya Mishra and Matthew Koehler through a framework called TPACK as an extension of 1986 Lee Shulman's idea of Pedagogical Content Knowledge (PCK). Mishra and Koehler (2006:1018) mention that TPACK was originally constructed to close a vacuum of an absence of a theoretical framework for technology integration in education. They caution that the lack of a theoretical grounding might cause a loss of vision of what can be achieved with computer technology in education. According to them TPACK provides an understanding of what teachers need to know to successfully integrate technology into their classrooms. They criticise the tendency of focusing on technology rather than how it can be used effectively for teaching and learning. In their study, they seek to create an understanding of the three interconnected and intricated elements of teaching and learning environment namely: content, technology, and pedagogy. The Figure 2.2 below demonstrates the TPACK framework composed of seven components (three major exogenous variables and four endogenous variables):

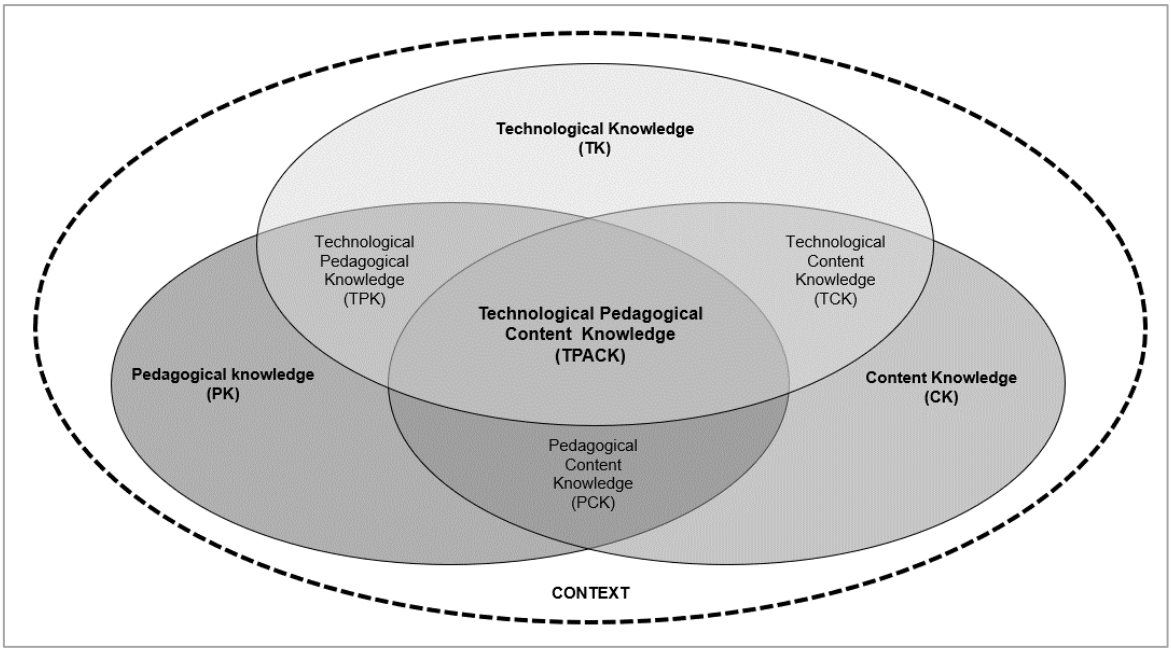

Figure 2.2: TPACK framework (Koehler & Mishra, 2009:63)

2.4.1 Content Knowledge (CK)

The teacher education has been accused of focusing mainly on CK however there is a swing recently to pedagogy that results in CK being given less priority (Mishra & Koehler, 2006:1020). This highlights the need for teacher education to strive to strike a balance between the two knowledge constructs. Koehler and Mishra (2009:63) describe CK as knowledge associated with learning and teaching of a subject matter. The subject matter in the context of this study is accounting subject in high school. This is the knowledge of concepts, principles, and application of accounting subject. CK in accounting includes knowledge and understanding of accounting concepts, accounting cycle and how to interpret and apply international financial reporting standards (IFRSs) and general accepted accounting principles (GAAP). Accounting is a global business language hence the need-to-know IFRSs. The accounting knowledge required from teachers in the South African school's curriculum is divided into two main disciplines namely:(a) Financial reporting and evaluation (focusing on external stakeholders) which is about recording, reporting and evaluation of financial Information; (b) Managerial accounting and internal control (focusing on internal processes) which is about manufacturing, forecasting & internal auditing, and control (DBE, 2019c:03). The accounting assessments are structured in accordance with these two knowledge disciplines. Therefore, accounting teachers are expected to be well-versed in these content knowledge disciplines.

2.4.2 Pedagogical knowledge (PK)

The Government Gazette of 2011 (South Africa, 2011:11) states that the PK is required as minimum for teacher education qualification includes “knowing how to present concepts, methods and rules of a discipline in order to create appropriate learning opportunities for diverse learners, as well as how to evaluate their progress. According to Celik, Sahin, and Akturk (2014:05) PK encompasses all elements of student learning from how to develop and implement a lesson plan to classroom organisation and management. These scholars add that PK is not only knowing what happens in the classroom but knowing why education is important for the society in general in terms of its values and aims.

PK is the knowledge of a teacher to develop lesson outcomes, use teaching media effectively, motivate learners to participate in a lesson, and assess if learning occurred during the learning period. PK involves ability to use relevant teaching styles to improve understanding of learners regardless of their previous background. Koehler and Mishra (2009:64) present that PK covers knowing what teaching techniques to use in the classroom, the characteristics of learners, and how to evaluate learners’ understanding.

2.4.3 Technological Knowledge (TK)

Scholars acknowledge the difficulty of defining TK as it is not as simple as defining pedagogy or content knowledge (Koehler & Mishra, 2009:64; Pereira, Nasu, Nganga, & Nogueira, 2018:04). The challenge with TK is that its definition is not static as it changes with time and that is what makes it difficult for scholars to be certain about its definition. However, Pereira et al. (2018:04) endeavour to define TK as “the ability to learn and adapt to technologies (standard and advanced technologies).” According to Koehler and Mishra (2009:64) TK is knowing ICTs broadly and using them effectively to improve job tasks. Therefore, this means that the TK of yesterday might be outdated and irrelevant to TK required today.

Teachers need to continuously update and adjust their technological knowledge as it is not static but evolves with time. Mishra and Koehler (2006:1028) note that TK is “knowledge of the existence, components, and capabilities of various technologies as they are used in teaching and learning settings, and conversely, knowing how teaching might change as the result of using particular technologies.”

2.4.4 Pedagogical content knowledge (PCK)

The tendency of ignoring content knowledge at the expense of the pedagogical knowledge or vice versa existed even in the 1800s (Shulman, 1986:06). However, he reckons that though this has been the case but the connection between the two knowledge constructs existed throughout the years as well hence the introduction of PCK. As mentioned earlier the entire TPACK framework is an extension of Shulman's PCK. According to Shulman (1986:09) PCK includes the knowledge of what makes certain topics in subject matter easily understandable or complex. This means PCK can be accumulated through years of teaching experience. A teacher would learn from previous learners what were their challenges in a certain topic and present to the current learners in a way that will ensure that they do not commit the similar mistakes as previous years' learners. Niess (2011:310) validates the above statement attesting that PCK on the perspective of in-services teachers is more developed and differs from that of pre-service teachers due to teaching experience.

According to Chai, Koh, and Tsai (2013:33) PCK is a construct of knowing how to use best pedagogical strategies to present the content of a subject in a simple and understandable way for learners. In accounting this would be knowing what types of business to use to present certain topics in accounting. For example, a service business will not be suitable to teach inventory systems or inventory valuation methods. Mupita, Widiaty, and Abdullah (2018:01) praise PCK as the best instrument for professional development of teachers. They acknowledge that the combination of content and pedagogical strategies are beneficiary in improving understand of subject matter by learners. According to Niess (2011:304) further subdivide PCK to include five additional knowledge domains (see Figure 2.3) below:

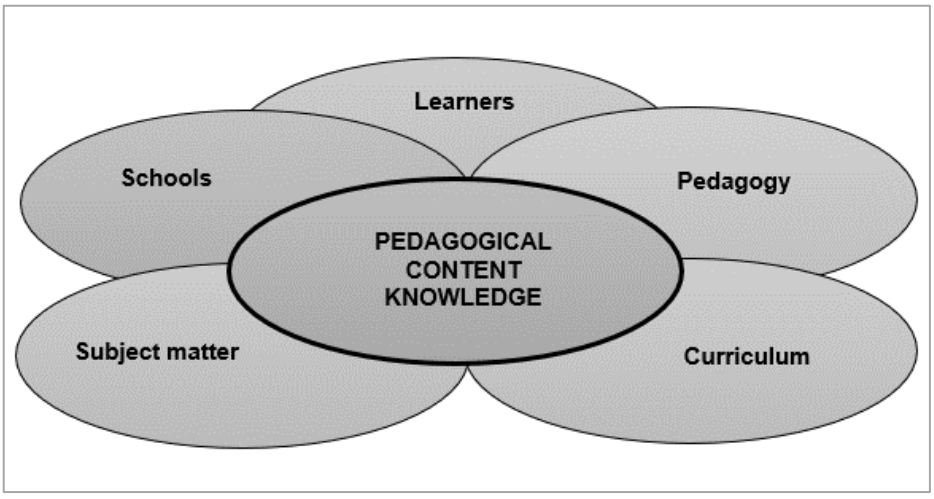

Figure 2.3: PCK multiple knowledge domains (Niess, 2011:306)

Koehler and Mishra (2009:64) indicate the above multiple knowledge domains of PCK when they mention that “PCK covers the core business of teaching, learning, curriculum, assessment and reporting, such as the conditions that promote learning and the links among curriculum, assessment, and pedagogy.” This means that the learning outcomes, the teaching methods and activities, and assessments are aligned and presented in a format suitable for the content subject. The above statement is based on Shulman’s (1986:10) assertion that within PCK there should be curriculum knowledge as the map of teaching a subject matter.

Pamuk, Ergun, Cakir, Yilmaz, and Ayas (2015:243) maintain that content knowledge alone is not enough, it should be supported by pedagogical strategies that are based on knowing learners’ background, misconceptions, and what motivates them to learn. They add that “PCK includes the most useful forms of representation, powerful analogies, illustrations, examples, explanations, and demonstrations.” They concur with Niese that wisdom of practice plays key role on PCK.

2.4.5 Technological content knowledge (TCK)

The Content Knowledge is subdivided to TCK and PCK (Koehler & Mishra, 2009:63). Computerised accounting falls under TCK and strictly related to accounting as a subject matter unlike e-learning or smartboards and other technologies that are not subject specific. Koehler, Mishra, and Yahya (2005:743) explain that TCK is a knowledge that require teachers to understand subject matter as well as how it is transformed or reciprocated through technology applications. Koehler and Mishra (2009:65) highlight that a teacher need to understand how a subject is addressed and applied with its related technology. The Government Gazette of 2011 (South Africa, 2011:12) emphasizes that in addition to the knowledge of ICTs a teacher should be competent and able to integrate technology of a specific subject matter into their classrooms. It projects the ability to use technology as an important aspect to provide innovative teaching and boost learning.

According to Mishra and Koehler (2006:1028) a subject matter related technology is flexible and provides learners an opportunity to view and understand content in different scenarios easy and quick. For example, in the old days geographical maps were taught with maps drawn in a paper but nowadays Google maps provides more interesting view of the world geographically. Google maps and GPRS are flexible and provides learners with an opportunity to zoom in from the continental view down to the street view with just a click. This zoom in feature of these technologies provides learners with an exciting and broad

knowledge of how communities in different countries are designed, better than a static paper map and pictures. In a research classroom a teacher would require knowledge and skill of using technologies like SPSS software, Atlas.ti etc. Computerised accounting transforms what the teachers normally teach with chalk, tables, and calculators into how accounting is done with computer software in the real business environment. TCK in the accounting field means the knowledge teachers have about different computerised accounting software that represent the accounting subject. In summary TCK is the understanding of technology that corresponds with the content.

2.4.6 Technological pedagogical knowledge (TPK)

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The TPK is defined as "knowledge about enhancing pedagogical practices, components with the application of technology into learning and teaching activities" (Pamuk et al., 2015:246). It involves ability to use instructional technologies for teaching and learning. TPK includes general technologies that are not subject specific like e-learning platforms. Internet, smartboards, social media etc. For example, during the covid pandemic, there has been a heavy reliance on delivering curriculum and conducting assessments using online platforms like Blackboard and Moodle. The availability and use of these online or e-learning platforms extended the learning time for learners as they can be accessed at any time and repeated as many times as possible. Video lessons are now the most common teaching methods that learners can download and listen to them as they please to firmly understand the subject matter.

According to Mishra and Koehler (2006:1028) TPK is the knowledge of how to use technological tools for "maintaining class records, attendance, and grading etc." Therefore, these are technologies that cut across different subject matters. Koehler and Mishra (2009:66) reflect that some of technologies under TPK are not necessarily meant for learning and teaching but they are utilised in the business sector. They make example with Microsoft Office Suites like (Access, Word, Power point, Excel, Outlook, Visio, Projects etc.). They suggest that teachers should be open-minded and flexible to know these technologies to improve and enhance learners' understanding of a subject matter. It is unwise for teachers to ignore and not embrace teaching with technology as technology is part of this 21st century and 4th industrial revolution. Redmond and Lock (2019:49) found that pre-service teachers view teaching with technology as the best approach for 21st century teaching and learning.

As noted in Section 2.4 teachers' TPACK is vital for the integration of technology in education. TPACK in this study has been used to evaluate the teachers' qualifications and preparedness for the integration of computerised accounting into their accounting curriculum delivery. TCK is the components of TPACK that is related to computerised accounting as it a subject specific technology. The information about status of accounting teachers regarding TPACK assisted the researcher to analyse and recommend necessary technological training needed by accounting teachers in order to successfully integrate computerised accounting into their teaching. Pereira et al. (2018:05) warn that the integration of technology into education can be very complex if TPACK knowledge constructs interactions are not considered. Redmond and Lock (2019:46) praise the availability of TPACK framework posing that it is compatible with both research and teaching objectives. The following Figure 2.4 provides an overview difference of TCK and TPK and their examples:

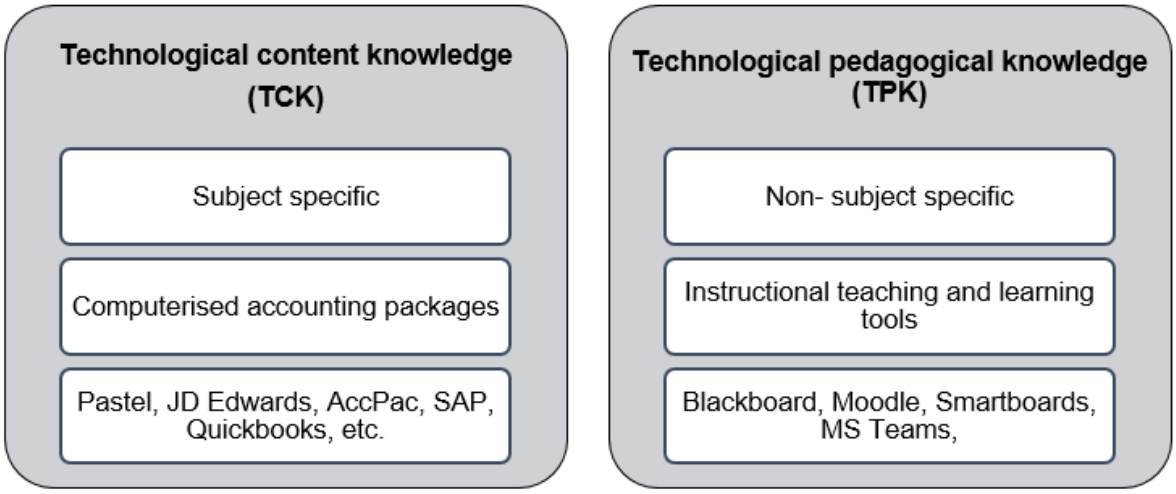

Figure 2.4: Differences and examples of TCK and TPK (adapted from Koehler & Mishra, 2009:63)

The above figure shows differences between TCK and TPK. The TPK is related to non-subject specific technologies that applies across different fields or disciplines in education while TCK is subject specific. Therefore, TCK of medical profession is different from that of engineering, accounting, research etc. The following section outlines what educational theory does teaching with technology belongs to.

2.5 Constructivist pedagogy

Teaching with technology falls under constructive pedagogy (Sabzian et al., 2013). Constructivist pedagogy was advocated by Catherine Fosnot in the late 1980s who defines

it as “a model that emphasizes that learners need to actively participate in their learning, to reflect on their learning and make inferences, and to experience cognitive conflict” (Fosnot, 1989:03). She argued that constructivist theory of learning is descriptive rather than prescriptive and therefore there is a need to develop the teaching perspective of constructivism where teachers are facilitators rather than transmitters of knowledge (Fosnot, 2005). She strongly emphasised that constructivism is a theory of learning and not theory about teaching. Therefore, this means that to achieve the constructivist learning there should be constructivist-based teaching prior.

According to Richardson (2003:1627) constructivist pedagogy is a creation of classroom environment, activities and methods that are based on constructivist theory of learning. He praises constructivist pedagogy as good teaching and state that it is student-centred with the intention to develop deep understanding of a subject matter. Light and Wallian (2008:389) note that with constructivist pedagogy the focus is on what is learned, how it is learned, and how the teacher can assist in the learning as a facilitator. According to them with constructivist pedagogy the duty of the teacher is to provide an enabling environment and let students wrestle the problems and propose solutions themselves.

Constructivist pedagogy originates from the constructivist theory of learning that was invented by Jean Piaget who believed that learning occurs in a process of continuous actions by a child (Sjoberg, 2007:02). The author cautions that researchers need to be clear in their literature review and in reference to the term constructivism as it might mean theoretical status or epistemological stance. Constructivism in this study is at an angle of theoretical foundation as a learning theory.

Another constructivist intellectual is a Russian named Lev Vygotsky who introduced social constructivism. Vygotsky’s theory is like that of Piaget in many aspects however it differs in that his is social constructivism meaning learning require assistance of adult. Alfajjam (2013:17) confirms this noting that with Vygotsky’s constructivism knowledge is developed through influence from other people like peers, teachers, or parents. Piaget’s one is personal (or cognitive) constructivism (Sjoberg, 2007:08). Von Glasersfeld (1982:613) in his interpretation of Piaget’s constructivism theory alludes to the viewpoint that under it knowledge cannot be transferred but it is originally developed by an individual through action. Halpenny and Petteson (2013:02) highlight that the advantages of computerised teaching are that it is learner-centred, learners actively participate in their learning, and their thinking capacity continuously progress. They note that Piaget’s theory is distinctive with that it believes that action comes before knowledge.

According to Alfajjam (2013:30) constructivism provides a new perspective of viewing students. He notes that unlike in traditional classroom where students are viewed as blank slates but with constructivism they are viewed as thinkers. He further highlights that while in a traditional setup there is a heavy reliance to textbooks and workbooks but with the latter primary source of data and computer simulation programs are used. Though he applauds computer simulations as an efficient education tool and that they improve academic performance, he points that they might not be suitable for all topics.

The Piaget's theory consists of four cognitive development stages namely: sensorimotor (birth-2 years), preoperational (2 - 7 years), concrete operational (7 - 11 years), and formal operational (adolescence - adulthood) (Wood, Smith, & Grossniklaus, 2010:37). These authors further elucidate that Piaget is criticised by other researchers for assuming that the thinking in all these cognitive development stages is similar. Wood et al. (2010:39) points that Piaget believes that younger children would struggle with advance concepts whereas researchers have proven that younger children might be competent in their practical knowledge.

Thorsteinsson and Page (2007:102) state that constructivist theory provides a better foundation for a reflection on teaching using computers. Sabzian et. al (2013) confirm that there's a close relationship between technology in education and constructivism. Hung (2001:282) highlights that though with the learning under behaviourist theory happens through memorising but with constructivist learning involves problem solving in a realistic and investigative scenario. Hung (2001:282) concludes that the process of learning should not only be confined on understanding but should be further be tailed with applying the knowledge to action. Integrating computerised accounting into high school curriculum delivery is constructive pedagogy as it turns teachers to be facilitators and make accounting lessons to be learner centred.

2.6 Conceptual framework

Based on the models discussed, one might conclude that when teachers' concerns regarding technology (CBAM) are addressed and they accept technology (TAM) they teach or are very likely to use technology. Computerised accounting forms part of a constructivist pedagogy as it exposes learners to real-life experience of how accounting knowledge is applied in the workplace through use of computers. The reality is that workplaces require accounting personnel who are competent in applying accounting knowledge into practice

using computer packages. The Figure 2.5 below display an overview of the conceptual framework applied in this study:

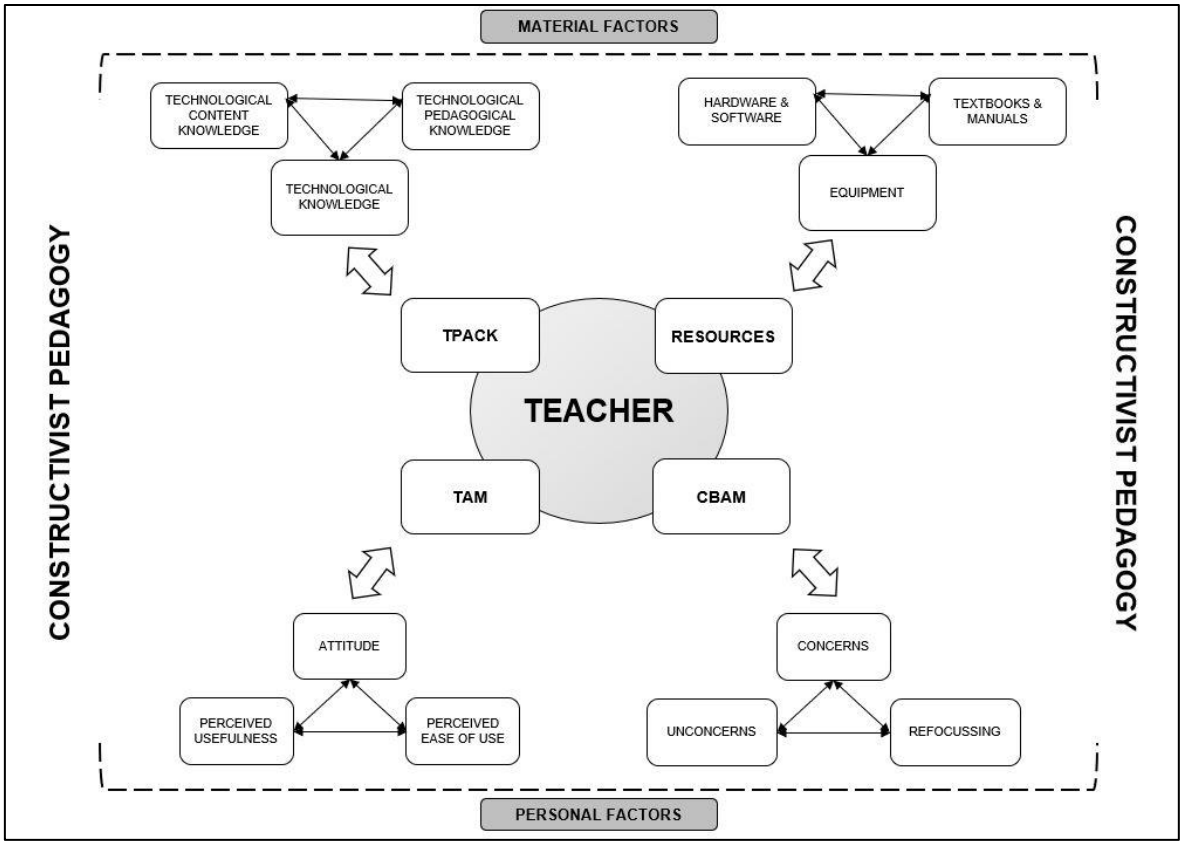

Figure 2.5: Overview of the conceptual framework applied.

The integration of computerised accounting into accounting curriculum delivery will require certain resources (material). Resources range from the computer equipment and human resources skills enhancement (material and personal). Teachers might need to be further professionally developed (personal). Glass and Charalambos (2005:9) note that for technological integration to be successful teachers need to be trained so that they change their pedagogical practice from being teacher-centred to be learner-centred. In addition to the resources, teachers would need to accept the technology (TAM) and their concerns (CBAM) to integrate technology be addressed.

Liu et al. (2016:795) highlight that teachers need to accept technology integration with positive attitude, when that is not the case, they become a stumbling block between it and learners. For teachers to integrate technology into curriculum delivery, they need the TPACK to be used as professional development assessment tool and approach to change their attitude and address their concerns. Teaching with technology forms part of constructive pedagogical approach. When teachers teach accounting using computerised

accounting, they are using constructive pedagogy where teaching is learner centred. When learners are taught with computerised accounting, they are being exposed to practical real business experience.

2.7 Summary

The CBAM was used to assess on which stage of concern do accounting teachers belongs to regarding the integration of computerised accounting into their lessons. Secondly TAM was applied to explore the attitude of teachers towards integrating computerised accounting into their teaching of accounting as an additional pedagogical tool. TAM determined the personality stance and beliefs of accounting teachers towards subject specific technology. This model assisted to understand perspectives of teachers regarding the resources they require to integrate computerised accounting. The TPACK was used to outline different knowledge constructs that teachers require to successfully integrate technology into education. The TPACK framework clearly defined the nature of teachers' knowledge required for integrating technology into their classrooms. The use of TPACK assisted in identifying the professional development needs of accounting teachers to integrate computerised accounting as an additional pedagogical tool in their classrooms. When TPACK is used in integrating technology in education as professional development tool then the attitude of teachers can be modified, and their stages can be addressed gradually. The constructive pedagogy was used to provide understanding of what teaching with technology fit in with educational theories. This provided the understanding of the benefits of using to technology to teach like learner centred teaching.

CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

This chapter provides a comprehensive review of accounting education in South Africa and internationally from high schools to tertiary level, the accounting practice and reviews literature related to computerised accounting in education. The chapter commences with a brief presentation of different disciplines within the accounting field followed by providing the meaning of the accounting cycle. The review is done to explore and understand the status of computerised accounting in accounting education nationally and internationally. Chenail, Cooper, and Desir (2010:91) advise that researchers should conduct literature review until they identify what is lacking or unknown about the phenomenon. Shortcomings, challenges, and benefits of integrating technology into accounting curriculum as well as the gap between accounting education and accounting practice are discussed extensively. In addition, general features of available computerised accounting packages in South Africa and employment requirements for accounting personnel are discussed. The Chapter is organised as follows:

3.2 Accounting disciplines
3.3 Accounting cycle
3.4 Accounting in high schools - South African context
3.5 Technology integration in education
3.6 Elements of successful technology integration
3.7. Challenges that impede technology integration
3.8 Education technology in South African schools
3.9 Technology integration in accounting education
3.10 Computerised accounting system
3.11 Computerised accounting in education
3.12 Computerised accounting packages in South Africa
3.13 Common features of computerised accounting packages
3.14 Accounting curriculum delivery online
3.15 Accounting curriculum delivery via games
3.16 Accounting practice and employment requirements
3.17 Summary

3.2 Accounting disciplines

Accounting is defined as “a process of measuring, recording, classifying, and summarising financial information that is used in making economic decisions” (Muriro, 2019:02). According to Akamigbo and Eneja (2020:83) accounting was invented around 1494 by an Italian mathematician named Luca Pacioli. They further state that it used a principle called double entry that requires a debit entry for every credit entry. Arena, Saggese, Sarto, and Viganò (2014:16) note that in the 1960s and before, the focus of accounting was on the preparation of financial statements for internal purposes only. However, they state that this was due to the size and the nature of ownership structure as businesses were often small sized and sole or one-family owned. They further note that a legal requirement that financial statements must be published for external parties commenced in the early 1990s.

Over the years, accounting has improved from focusing on record-keeping and organised records to be an important instrument for collecting financial information necessary to understand the business operations and performance (Ngwenya, 2012:25). Muriro (2019) concurs with Ngwenya (2012) that accounting has significantly grown from being limited to record keeping or bookkeeping and became an integral part for managing business and its successes. Muriro lists financial accounting, management accounting, auditing, tax service, and financial management as some of the disciplines within accounting. These disciplines are discussed individually in the following sections:

3.2.1 Financial accounting

Stittle and Wearing (2008) state that “financial accounting is primarily concerned with recording, processing and presenting historic information for the benefit of users external to the business”. External users of financial statements include shareholders, credit suppliers, investors, government authorities etc. They further allude that it is performed within a regulated framework and legal standards. Financial accounting should comply with globally set standards and practices as prescribed in the International Financial Reporting Standards (IFRSs). Dempsey, Watson, Joubert, and Britz (2011:15) emphasize that financial statements should comply with IFRSs that are issued by the International Accounting Standards Board (IASB). The accounting standards pronounced by IASB are meant to synchronize the preparation and presentation of financial statements for comparability of financial position and performance of businesses across different periods, entities, and multi-national divisions (Kolitz, Quinn, and McAllister, 2009:16).

Financial accounting is meant to supply information to stakeholders that are not part of the daily running of the business (Sittle & Wearing, 2008). The information is reported to the external stakeholders in the form of financial statements that are prepared annually or bi-annually. Kolitz et al. (2009:27) describe financial statements as “structured representation of the financial position and the financial performance of an entity”. Financial statements comprise of the following 7 components (Muriro, 2019:448):

1. Statement of profit or loss and other comprehensive incomes
2. Statement of financial position
3. Statement of changes in equity
4. Statement of cash flows
5. Accounting policies and explanatory notes
6. Auditors’ report
7. The directors’ report.

3.2.2 Management/managerial accounting

Drury (2015:17) states that “management/managerial accounting relates to provision of appropriate information for people within the organisation to help them make better decisions”. Van Rensburg, Ambe, Evangelou, Govender, Koortzen, and Ziemerink (2008) refer to the management accounting as an accounting discipline designed to develop informative internal reports used by managers when making decisions.

Nuhu, Baird, and Appuhami (2017:73) posit that management accounting have changed from traditional approach of focussing on short-term practices that are internally and that are only financially oriented but in the modern day focuses on both past and future events and covers factors that are both financial and non-financial. She notes that with contemporary management accounting practices one is required to identify the sources of costs, control the costs, minimise costs, and avoid wasteful occurrences. Muriro (2019:19) agrees with Nuhu et al. (2017) highlighting that management accounting is about collecting, allocation, and controlling of costs. He further poses that management accounting is vital for the preparation of future financial plans or budgets. The Table 3.1 below presents differences between financial accounting and management accounting:

Table 3.1: Comparison of management accounting and financial accounting - Horngren, Bhimani, Datar, and Foster (2002:04)

	Management accounting	**Financial accounting**
Users	Internal use e.g., managers, executives	External use e.g., Shareholders, creditors
Regulations	No regulations	Regulated e.g., IFRS and GAAP
Range and detail of information	Financial, non-financial and qualitative information	Financial information only
Reporting interval	hourly, daily, or weekly, monthly, annual basis	Annual, semi-annual, and quarterly
Time period	Historical, current, and future information	Past periods

3.2.3 Auditing

The term audit originates from the Latin word “Audire” that means hear (Sazena, Srinivas, and Rai (2009:03). They refer to auditing as a system that checks whether the recording of receipts and expenditure was done correctly without mistakes and misappropriations. This means that the accounting records are verified to ensure that they are authentic, accurate, and reliable. Auditing follows the preparation of financial statements. An internal auditor is normally an employee within the business while an external auditor is a qualified individual from outside the business who carries auditing of financial statements. Auditing is imperative to detect corruption in a business and therefore provides assurance to external stakeholders like government institutions, shareholders etc. Sazena et al. (2009:4) further states that some of the functions of auditing is to test internal controls of the business and collect evidence to support that accounting transactions really occurred. Weirich, Churyk, and Pearson (2020:14) emphasise that the importance of auditing is that it provides credibility of financial information and that it should be carried out with professional ethical standards. The Table 3.2 below illustrate classes of auditors:

Table 3.2: Classification of auditors and their functions – Jackson and Stent (2007:02)

Class	**Functions**
External auditors	Express an independent audit opinion on whether the annual financial statement of a company fairly presents the financial position and results of the company’s operations. They are not employees of the company being audited.
Internal auditors	Perform independent assignments on behalf of senior management of the company. They are employees of the company they are auditing.

Government auditors	Perform similar role to that of the internal auditors but within government departments. They are employees in the government departments they are auditing.
Forensic auditors	Investigate and gather evidence where there has been alleged financial mismanagement, theft or fraud.
Specific purpose auditors	Specialise in a particular field such as VAT auditors from the South African Receiver of Revenue who audit vendors' VAT returns for correctness.

3.2.4 Tax service

Another discipline within accounting is taxation. Knowledge of accounting assist businesses in tax avoidance (Muriro,2019). According to Kolitz et al. (2009:17) the main goal of accountants that specializes in tax service is to minimize the taxation due. The tax service includes calculation of taxes and submission of tax returns to tax authority. In South Africa tax revenue is derived from business via value added tax (VAT), pay as you earn (PAYE), income tax and secondary tax on companies (STC). These accountants are assumed or should have thorough understanding of tax legislation and application thereof.

3.2.5 Financial management

According to Correia, Flynn, Uliana, and Wormaid (2007) the core function of financial management is the growth of invested capital, and it depends on both economics and accounting disciplines. This means financial management focuses on risk and return of investment. Muriro (2019:19) simplifies financial management by noting that it is about exploring what are the available investment opportunities like opening new stores or production plants as well as how to best obtain financial resource between whether owners adding more capital and/or borrowing from external financial institutions.

3.3 Accounting cycle

The accounting cycle begins when business transactions occur and ends with financial statements (Ebrahim & Abd El-Raouf, 2020:06). He poses that the accounting cycle assists bookkeepers to arrange their tasks to be more concise and understandable. Kolitz et al. (2009:86) describes accounting cycle processes as selection and processing of transactions to produce financial information necessary for decision-making of the business. They group the accounting cycle steps as illustrated in Figure 3.1 below:

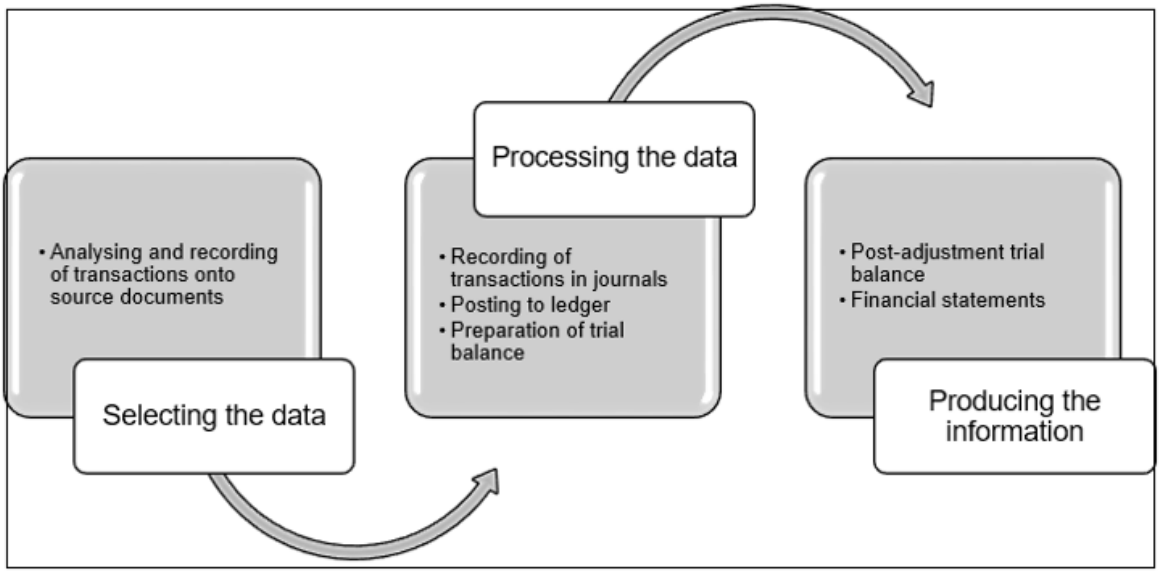

Figure 3.1: Accounting process cycle (adapted from Kolitz et al. (2009:136)

3.3.1 Selecting the data

According to Dempsey et al. (2011:63) accounting cycle commences with the recording of business transactions onto source documents. The examples of source documents include receipts, invoices, Electronic Fund Transfer (EFT) proof of payments, bank statements etc. A source document is evidence that a business transaction occurred and should include nature of the transaction (cash or credit), date, amounts, description of item being bought or sold, terms and conditions. Source documents are very important during auditing processes, they need to be filed and organised in a sequential manner and be accessible when required by auditors.

3.3.2 Processing the data

Journals

The second step is to record transactions from the source documents into journals. Walther and Skousen (2009:36) simplify journals as logbooks for historical business transactions. The recording to journals is done on daily basis. According to Dewangan and Ikhar (2018) transactions in the journals should be logged in a sequential manner as they happen. The Figure 3.2 below provides an overview of accounting journals:

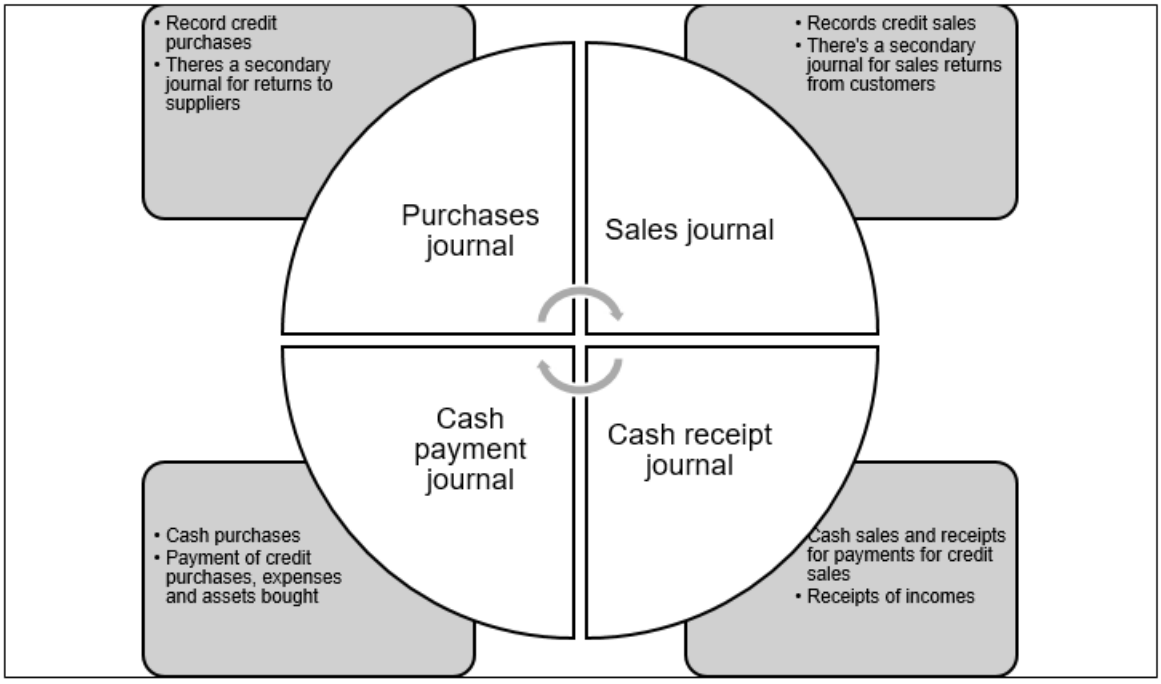

Figure 3.2: Accounting journals (Kolitz et al. 2009:224)

General ledger

On monthly basis journal totals are posted to the ledger accounts. Dewangan and Ikhar (2009:33) define general ledger as “a collection of accounts that shows the changes made to each account as a result of past transactions, and their current balances”.

Trial balance

Dewangan and Ikhar (2009:33) and Kolitz et al. (2009:109) pose that trial balance is meant to test the double-entry principle that requires that there should be a corresponding credit for every debit. To prepare trial balance one need to balance all the ledger accounts. Dempsey et al. (2009:82) define trial balance as “a list of balances drawn up to ensure that a double entry has been completed for every transaction”. Trial balance assists in detecting errors in the recording of transaction and that debit entries are equal to credit entries.

3.3.3 Producing the information

The last step of the accounting cycle is the preparation of financial statements. Financial statements have been discussed in depth above under Section 3.2.1. Financial statements are the goal of the accounting process that assists the users in making decisions regarding the business financial performance and financial position.

3.4 Accounting in high schools - South African context

In this section the high school accounting curriculum design in South African context is discussed, as well as how students are introduced to it and choose it as a career path to pursue. Perspectives of scholars from South Africa and abroad regarding students' choice of accounting in high school is discussed. The last portion analyses and interprets Grade 12 accounting results between the years 2016 to 2020.

3.4.1 Accounting curriculum

According to DBE (2011a:08) accounting serves as a yardstick for performance, records and process financial information to enable economic decisions to be made. Below is the purpose of accounting in high school as stipulated in the CAPS document (DBE, 2011a:02):

- Record, analyse and interpret financial and other relevant data in order to make informed decisions.
- Present and/or communicate financial information effectively by using generally accepted accounting practice in line with current developments and legislation.
- Develop and demonstrate an understanding of fundamental accounting concepts.
- Relate skills, knowledge, and values to real-world situations in order to ensure the balance between theory and practice, to enter the world of work and/or to move to higher education, and to encourage self-development.
- Organise and manage own finances and activities responsibly and effectively.
- Apply principles to solve problems in a judicious and systematic manner in familiar and unfamiliar situations, thus developing the ability to identify and solve problems in the context of the various fields of accounting.
- Develop critical, logical, and analytical abilities and thought processes to enable learners to apply skills to current and new situations.
- Develop the following characteristics: ethical behaviour, sound judgement, thoroughness, orderliness accuracy neatness.
- **Deal confidently with the demands of an accounting occupation manually and/or electronically.**

The accounting subject has been heavily affected by changes made to the curricular since 1994. The South African school curriculum has had four major revisions since 1994. The

Table 3.3 below provides milestones of changes in the South African school curriculum through the years:

Table 3.3 Overview of major curriculum changes (Adu and Ngibe, 2014:983)

Curriculum	Year implemented
Curriculum 2005 (C2005)	1997
Revised National Curriculum Statement (RNCS)	2002
National Curriculum Statement (NCS)	2007
Curriculum and Assessment Policy Statement (CAPS)	2012

The structure of the weights of accounting disciplines within the accounting curriculum depicted in the CAPS document in 2012 has been changed in 2019. This change additionally affected the number of assessments from one examination paper that was 3 hours to two examinations of 2 hours each. The Figure 3.3 below demonstrates the accounting curriculum structural change of accounting subject across the different accounting disciplines:

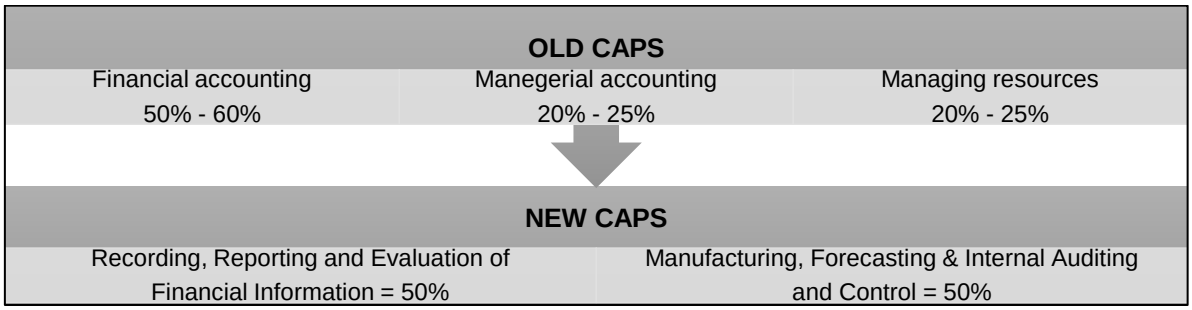

Figure 3.3: Accounting discipline syllabus structure changes (DBE, 2019c:03)

Before the introduction of Curriculum 2005 (C2005 - 1997) accounting was offered as a standalone subject throughout the five years in high school (grades 8 to 12), but it was changed and offered as choice subject in the last three years of high school (from grades 10 to 12). However, it was introduced at 25% weight in grades 7 to 9 as a module called financial literacy under a combined subject called Economic and Management Sciences (EMS). Coetzee (2016:25) notes that this 25% weight was increased to 40% in 2012 under a new curriculum revision called Curriculum and Assessment Policy Statement (CAPS). According to changes made by DBE (2020:) financial literacy currently weighs 50% of the EMS subject. The Figure 3.4 below provides an overview of changes in the weights of EMS modules:

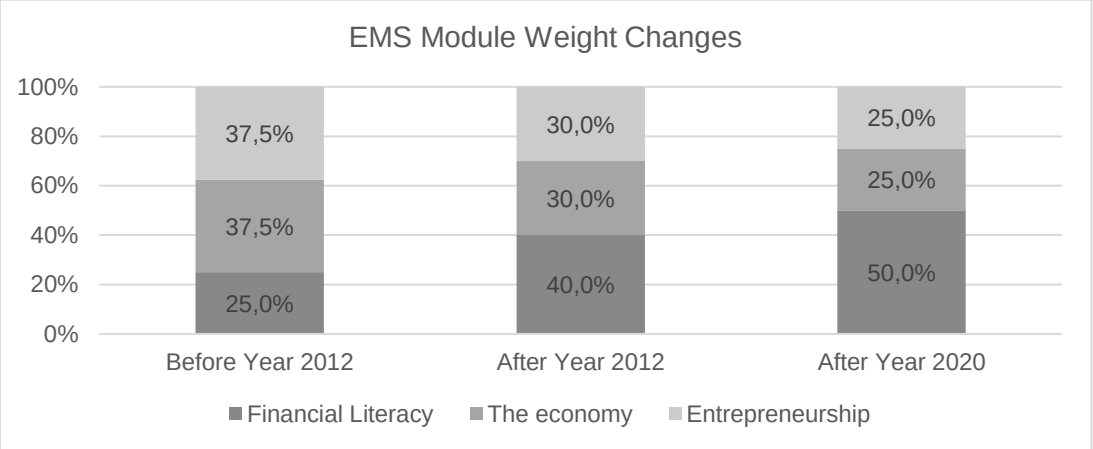

Figure 3.4: EMS module weight changes

EMS is defined by DBE (2002:27) as "a learning area that involves the study of private, public or collective use of different types of resources in satisfying people's needs and wants, while reflecting critically on the impact of resource exploitation on the environment and people". It combines three modules namely: 1) The economy; 2) the financial literacy; 3) entrepreneurship. The Figure 3.5 below provides an overview of how the EMS modules content is distributed across different grades 7 to 9.

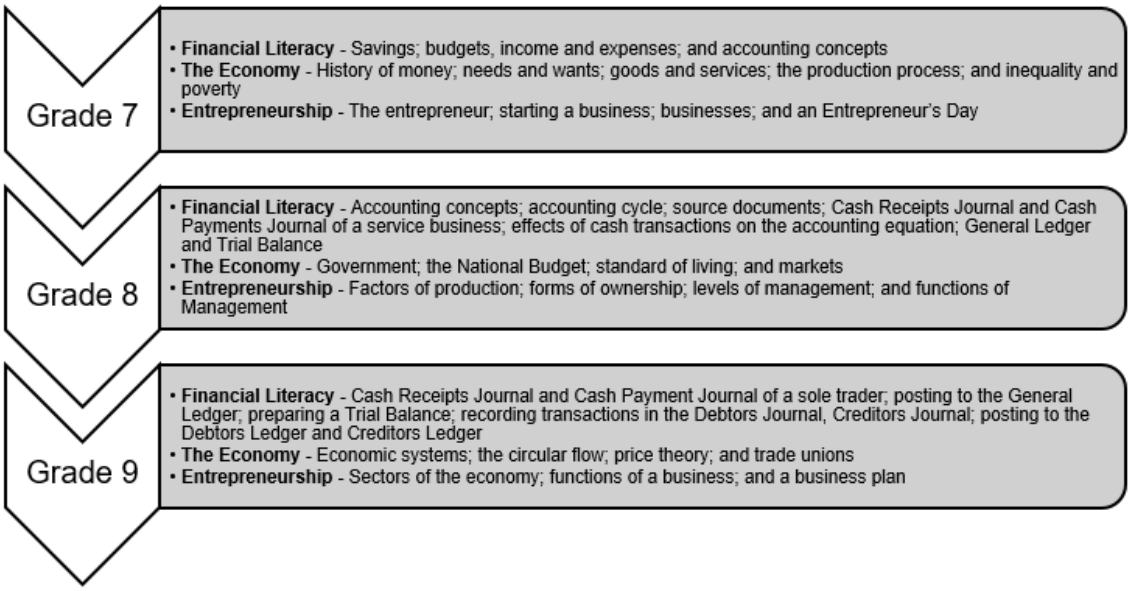

Figure 3.5: EMS modules content overview (DBE, 2011c:08)

Figure 3.6 above shows how accounting topics are covered as introduction under the EMS module called financial literacy in grades 7 to 9 (senior phase level). The accounting cycle is covered up to the trial balance and both cash and credit transactions are covered. However, it does not extend to the preparation and presentation of financial statements.

The combination of these modules as one subject has been heavily criticised as it brought more problems than it offers solutions. EMS subject is considered one of the reasons for decrease in students choosing accounting and it has been accused of creating unforeseen negative effect on students' performance in accounting due to poor teachers' pedagogical knowledge of the subject. Schreuder (2014) notes that the major challenge with EMS is that is taught by inappropriately qualified teachers. The challenge is that it is rare to find a teacher who is competent in all the three modules. A 2015 DBE report highlighted flaws with this EMS noting poor content and assessment knowledge of teachers to teach financial literacy. This EMS has significantly contributed to the drop of learners' numbers taking accounting between grades 10 to 12, such that 274 schools in Northern Cape Province between 2010 and 2014 dropped accounting as a subject (DBE, 2015:24). A Ministerial Committee was appointed year in 2009 by the minister of Department of Basic Education. The committee's task was to review the curriculum of the subjects in the field of Business, Commerce, and Management sciences (BCM). The committee found that the mix of the three modules under the EMS subject is not getting suitable qualified teachers. Recommendation was made to separate the three module and make accounting a standalone subject.

3.4.2 Accounting as a subject choice

The way accounting is introduced to learners by educators has an influence in choosing or not choosing accounting as a subject (Simons, Lowe, & Stout, 2003:13). In respect of South African curriculum structure EMS subject where accounting is introduced plays a significant role in learners' choice to do accounting in Grade 10. According to Albrecht and Sack (2001:05) the accounting educators had been cautioned frequently that accounting education has to reformed to maintain relevancy or the profession will face demise. They note that business environment has consistently changed due to technological advances and yet accounting is still being taught the same way as it was in more than 40 years ago in the 1980s. Simons et al. (2003) in their study of factors influencing the choice of accounting as a subject discovered that those in accounting profession made the decision to join the field while they were in high school. They establish that some of the reasons that convince students to choose the are employment availability and the interest in the subject.

In the years 2016 to 2019 the number of students that wrote accounting in grade 12 has seen a downward trend except for the year 2020 where there was a sudden raise. Below is a Figure 3.6 that illustrates these trends. A comparison of accounting with physical science

and life science has been made to depict the fields that students opt for instead of accounting. Physical science and life science lead to the engineering and medical professions, while accounting is a commerce subject. High schools structure their students' class groups according to either commerce or physical science and life science. These are scarce skills subjects in South Africa. This comparison in Figure 3.6 displays popularity of accounting among Grade 12 students versus other subjects that lead to other fields at university level.

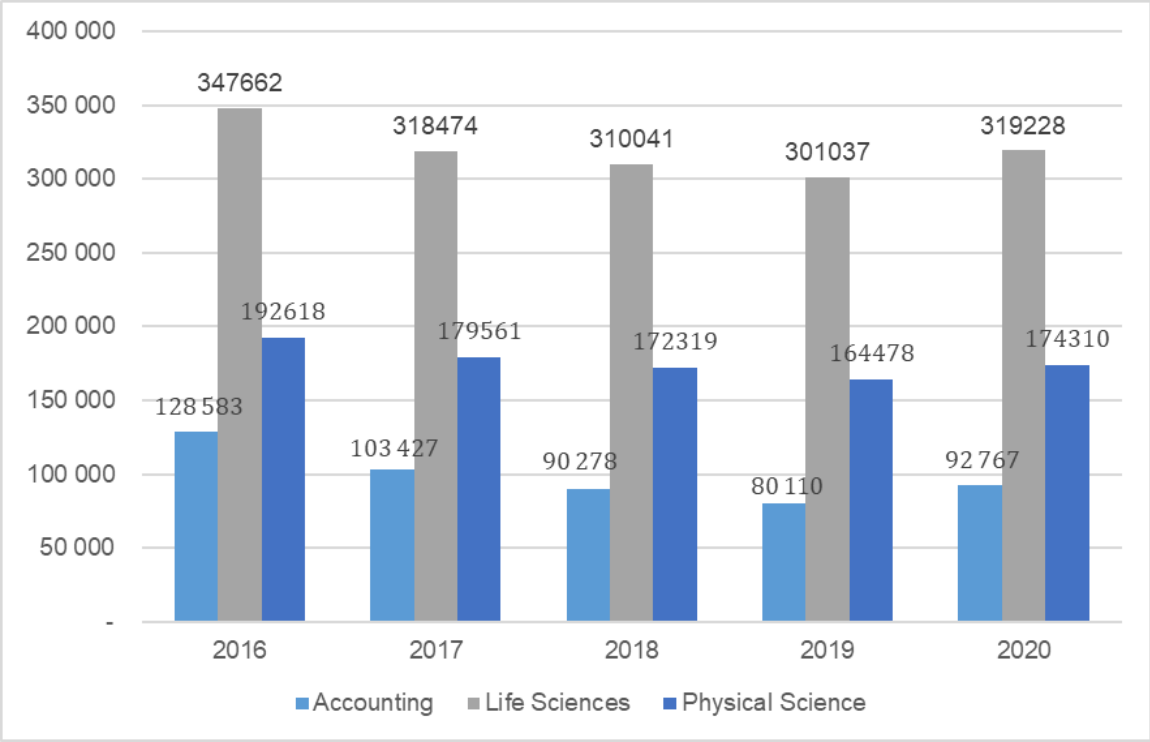

Figure 3.6: Grade 12 Accounting enrolments versus other fields subjects (DBE, 2020b:05)

From the above figure it is visible that accounting is having lowest numbers of students writing it in grade 12. There are fewer students writing accounting versus those who are writing life sciences and physical sciences. In the year 2016 accounting was about 37% of the 347662 students that wrote life sciences but in the year 2020 that has decreased to 29%. This means that the students writing accounting in Grade 12 in high school are not even half of those who aspire to be in the health sector or medical profession by doing life sciences. This further attest to the fact that accounting has consistently lost popularity among high school learners, and it is lagging way behind those subjects meant for medicine and/or engineering professions. Out of the 11 most popular subjects in South Africa accounting is in the 10th position surpasses only Agricultural Sciences in terms of the number of learners writing it in Grade 12.

The phenomenon of declining number of students entering the accounting profession is not a South African only situation as Chen, Jones, and McIntyre (2005:14) note that United States of America is faced with similar predicament. They suggest that the profession should consistently strive to understand and discover how to best attract high-aptitude students. According to Wells (2015:461) high-aptitude students are vital to meet the needs of the highly demanding accounting profession. Consistent with Simons et al. (2003), Chen et al. (2005:16) mention that introductory accounting class in high school is important in attracting students to join the profession. They pose that introductory accounting class should be used as a recruitment device to attract learners into accounting profession. Failure to introduce accounting in an attractive and understandable manner can encourage or discourage students in pursuing careers in accounting.

Chen et al. (2005:16), Byrne, Willis, and Burke (2012:101), and Wells (2015:463) agree that students make their career choices while in high school. Byrne et al. (2012) point out that in recent days there are many attractive career alternatives such as engineering and medicine that require high-aptitude students and therefore accounting profession needs to be competitive to attract the brightest students. Wells (2015:464) confirms this stating that accounting profession is ranked below other professions like doctors, architects, scientists etc. Figure 3.7 above confirms popularity of these other fields compared to the accounting field. According to Byrne et al. (2012) and Wells (2015) this profession competition has forced the big four accounting firms (KPMG, Deloitte, PwC, Earnest & Young) to recruit students while they are in high school. They extrapolate that parents and accounting teachers have an influence in swaying students to choose the accounting profession. According to Albrecht and Sack (2001:07) accounting profession is sometimes misrepresented by high school teachers due to lack of understanding and experience of accounting practice.

The financial reward scales associated with different professions has an additional influence on students in choosing a career. Wells (2015) explored the image of accounting profession and the perceptions students have about it. He asserts that an inappropriate image and inaccurate perceptions of the accounting profession might chase away best suitable students. Albrecht and Sack (2001:07) pose that lack of correct information regarding the work of accounting professionals might be one of the reasons the profession is not attracting high quality and quantity of students. Therefore, it is important that the accounting profession is accurately presented to students and that they clearly understand the job description of accounting professionals.

O'Connell, Carnegie, Carter, Lange, Hancock, Helliar, and Watty (2015) noted the university enrollments of students into accounting qualification in Australia is decreasing due to that accounting in high school is not an attractive subject choice. They cite that the technology used in the workplace is absent in the accounting classrooms and that there is no connection between the accounting research and accounting practice.

They blamed the quality and relevance of accounting education as the major causes of it being unable to attract best students. Other reasons causing the decline in students choosing accounting were that accounting education is outdated and that salaries of accountants are very low compared to other business disciplines. They criticize the pen and paper accounting assessments that they sometimes do not measure what the students really know about accounting but what they need to know to pass, while technology on the other hand assist in ensuring that knowledge, skills, and competencies are assessed.

3.4.3 Grade 12 Accounting learner performance

In addition to the dwindling numbers of Grade 12 learners writing accounting, their performance has been not the best either. The Figure 3.7 below displays the results of Grade 12 accounting learners' performance for the years 2016 to 2020:

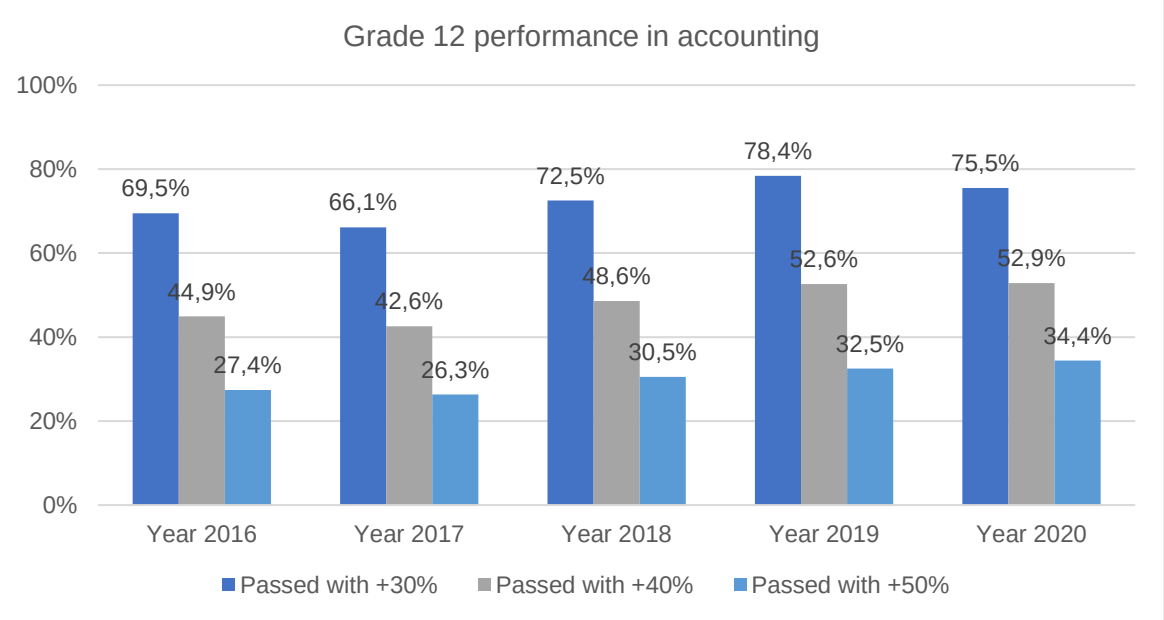

Figure 3.7: Grade 12 performance in accounting (DBE,2020:12)

The above results display a gloomy picture of how Grade 12 accounting learners perform in the South African context. From the indicated years the number of students who achieve 50% and above have never surpass 35% throughout the five years. Although at high school

level the DBE recognises 30% as a passing percentage but at universities only 50% and above is recognised as a passing percentage. This means that more than 65% of students who sit for Grade 12 accounting examination would be regarded as failures at universities and will not be accepted to enrol for accounting qualifications. Therefore, many accounting learners from high school level might not pursue accounting qualifications. These results further substantiate that there is a need to revisit and revise the accounting curriculum delivery in high school as well as competency of teachers in teaching it. These might be the reasons that accounting is ranked 10th out of the 11 most popular subjects in South Africa.

One of the most important noticeable differences between the South African school curriculum and that of other countries is that it is silent regarding the period it will be applicable, for example in Zimbabwe the Ministry of Primary and Secondary Education (MPSE:2015) Zimbabwean's current curriculum clearly states that the current curriculum is applicable for the years 2015 to 2022. This means that their curriculum has a seven-year cycle period after which it becomes due for a review and an update to ensure that it is relevant and valid. These updates might be more necessary in accounting as the terminology and accounting standards are frequently updated to keep up with time. The absence of this systematic and timely planned curriculum reviews in the South African context might be the reason why the teachers are using textbooks that are having outdated accounting terminology. Ngwenya (2014:175) adds that teachers are very vital in the implementation of the curriculum. However, the author notes that teachers are faced with a challenge regarding adapting to changes in curricular due to them lacking conceptual elasticity.

The high school accounting in South Africa is meant for university entry. However, universities require students graduating from Grade 12 to have passed only pure Mathematics and English to register for accounting qualifications. Duktur (2018:160) clarifies that in Nigeria the main goal high school accounting is to enable students to qualify as bookkeepers, accounting clerks, and cashiers. Additional accounting education at university enables them to qualify as professional accountants, auditors, managers, tax practitioners etc.

3.5 Technology integration in education

One of the key reasons for using technology is to simplify and solve difficult tasks quicker than they were done in a manual traditional way. Technology simplifies long processes and

provides quick results. As the world moves rapidly to technological space, education as the preparer of society cannot be left behind. Pine-Thomas (2017:41) notes that schools need to keep up with the fast-paced technological developments in the society. Technology integration in education is very broad term as the integration might mean the technology used for school administration. Koch (2009:29) explains that technology integration is a pedagogical process that can be used to deliver lessons within the curriculum. Inan and Lowther (2010:138) categorize technology integration according to the purpose of use. They list these categories as "technology for instructional preparation, technology for instructional delivery, and technology as a learning tool." The key common factor with these categories is that technology integration is meant to enhance and support learning and teaching in the classroom.

Karaca, Can, and Yildirim (2013:356) describe technology integration as "Teachers' use of technologies such as computers, projectors, printers, scanners, television, overhead projector, DVDs, and instructional". In this description they do not mention the intention of teachers' use of technology. The motive for integrating technology should be specific as its use is vast. Teachers might use technology not for teaching and learning but for administration only. The technology integration being described here is related to the teachers' use of it to facilitate learning and teaching. Robinson (2003:02) adds that technology integration is learner-centred, and it is embedded in curriculum delivery where learners have space to analyse and synthesize knowledge.

Technology in schools can be integrated for different purposes and use. It can be used for school and/or classroom administration and can be used for curriculum delivery. The essence and the angle being explored in this study is that of integration of technology for curriculum delivery. This means that technology is integrated into lessons during learning and teaching.

3.6 Elements of successful technology integration

This section discusses the key elements for a successful integration of technology into curriculum delivery. Lack of addressing these elements could turn these into barriers of technology integration. Figure 3.8 below provides an overview of these key elements as revealed by scholars (Ertmer, 1999; Robinson, 2003; Hew & Brush, 2006; Barri, 2013). Some of them are defined as first-order and second-order barriers or external and internal barriers. The external barriers are related to the institution while internal barriers are

centered around a teacher. Generally, these elements consist of three major variables namely curriculum, funding, and teacher. Teacher is highlighted as the key element that encompasses attitude, training, and support. The Figure 3.8 below provides an overview of elements that make technology integration successful:

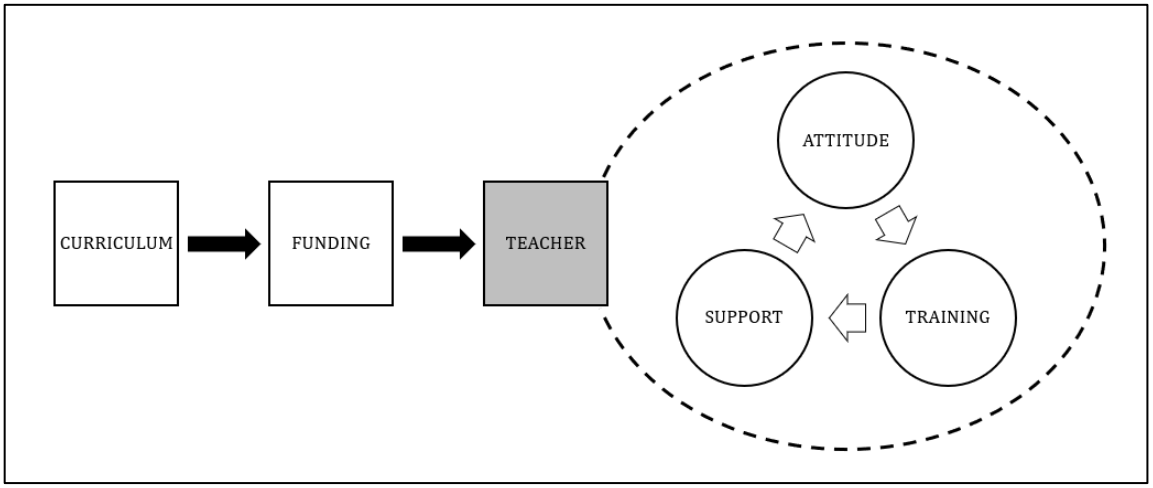

Figure 3.8: Elements of successful technology integration

Robinson (2003:03) points that to successfully integrate technology in the classroom one needs to identify the key elements to be addressed that might be possible stumbling blocks of the integration. According to him external barriers are not controllable by a teacher like funding and infrastructure while internal barriers are based on teacher's beliefs and personal stance regarding technology integration. He views the internal barriers as the most problematic to solve and more powerful in blocking technology integration. What makes internal barriers difficult to solve is that they are not measurable and are intangible. In a South African (SA) context even external barriers might be difficult remove, for example while first-world countries refer to internet connection or availability of devices as external barriers, but SA go as far as to lack of electricity in not only schools but in some communities where schools are located. Khan, Hasan, and Clement (2012:68) note that the rural areas in developing countries like Bangladesh tend to struggle with electricity which is what turns a computer on

A clear plan with directions of how technology will be integrated in education is very important. Additionally, the type of technology and its objective should be thoroughly detailed. Due diligence must be taken to examine the compatibility of the current environment to the envisaged technology. The following paragraphs discusses the three key elements of a successful technology integration into curriculum delivery.

3.6.1 Curriculum

The curriculum policy should outline the objectives of integrating technology into education. These objectives should be realistic and achievable. Ertmer (1999:55) pose that it is important to clearly identify the specific topics of the curriculum that can be delivered with the use of technology. She further states that for technology integration to be effective the curriculum should be reviewed and modified accordingly. The curriculum prescribes the expected outcomes, the time allocation for topics, nature of activities that will be used to teach, and how the outcomes will be assessed. It is important to clarify what type of assessments and tools will be needed and used to measure if learning occurred.

Padayachee (2017:39) criticizes the South African educational policy that it is not specific in terms of which technologies to be integrated in the curriculum. This lack of clarity applies in accounting curriculum document as well. Technology as explained is a very broad concept and therefore, curriculum should be specific as to what technology to be integrated, how will it be integrated and what are the expected outcomes of integrating it. Padayachee (2017:57) emphasizes that making technology available without specifying how will it be integrated into the curriculum is unhelpful. This means for technology integration to be effective; it must be aligned to the curriculum. According to Barri (2013:50) infusion of technology into curriculum in Saudi Arabia is compulsory in all public schools. When government stance is unequivocal regarding technology integration then schools are forced to work towards it.

In the case of South Africa, the curriculum document DBE (2011a:09) merely states that accounting learners should be developed such that they can deal with manual and/or electronic requirements of accounting occupation. This is a vague purpose of accounting subject regarding prescription of technology integration. However, on the other hand the Government Gazette states unequivocal that teacher qualifications must be prepared such that they have technological pedagogical knowledge. Lack of clear guidelines of how the accounting learners can be prepared for accounting occupation creates a vacuum and a confusion to schools and teachers as to how are they going to integrate technology into accounting lessons.

3.6.2 Funding

Funding enables acquisition of resources necessary to integrate technology. Lack of funding results in lack of resources that become a barrier for technology integration. There are four resources that require funding namely, equipment; time; training, support (Ertmer, 1999:56). Equipment includes hardware like computers/laptops/tablets, software, internet access, and other computer peripherals. Extra time needed to learn technology has to be incentivised. To learn and prepare for technology integration, teachers need to use additional time outside their normal working hours and in some cases even weekends.

Funding ensures that there is availability and accessibility of resources necessary for technology integration. Pine-Thomas (2017:52) notes that access to technology is quantified by the number of available computers and the access to internet in a school. Armstrong Davis, and Young (1996:83) state that funding for technology integration should be divided between hardware/software and the professional development of teachers. However, funding should not be limited to only these two items but includes study material or textbooks. Technology changes in a rapid pace, meaning that what is relevant this year might be completely outdated next year. Therefore, considerations should be made of how it will be updated and what will it require.

Some educational technology work with only a teachers' desktop computer while others require each student to sit with his or her computer. Padayachee (2017:51) found that in the South African context lack of infrastructure and cost are the leading barriers of technology integration in the classroom. Both these two barriers can be mitigated by ensuring that funding is available. Without proper financial muscle technology integration becomes impossible. Pine-Thomas (2017:52) points that availability of technology does not mean technology integration, unless it is used by teachers as parts of lessons. This is true because some schools use technology but only for administration.

Funding is additionally important for time factor. Technology integration in education require sacrifices to be made to open the already fully packed school day schedule. Firstly, time is needed for the training of teachers and then the phasing in of technology into lessons. Technology integration requires an extension of already full teachers' workloads. Khan et al. (2012:72) add that teachers' heavy workloads goes beyond teaching and learning and includes administrative duties. Sacrificing time for training require willingness and commitment from teachers as in many instances it must be conducted after school,

weekends, and on holiday. However, it is important to ensure that funding is available to incentivize them for the overtime and use of their personal time.

3.6.3 Teacher

Teachers are the ones entrusted with a responsibility of changing lives of people for advancement. They have sole responsibility of accelerating change in the educational space. It is for that reason that technology integration in education cannot thrive without their buy-in. Pine-Thomas (2017:53) posits that without including teachers, technology integration in education will be a futile exercise. Three variables that need to be addressed with them to successfully integrate technology in education namely their attitude, their training, and their support. To ignite a positive attitude from teachers it is important that proper training and support availability is in place. The competency of teachers in using technology determines their attitude towards integrating it to their classrooms. Furthermore, Karaca et al. identify teachers' attitude towards technology as a key factor affecting integration of technology in the classroom for teaching. Additionally, they point that support and experience are some of interrelated factors influencing technology integration. The paragraphs below illustrate how these three variables affect the integration of technology in education.

a) Teacher attitude

The key factor that accelerates technology integration is the positive attitude of teachers towards it. Hew and Brush (2006:229) explains that teacher attitude is associated with specific feelings that determines if teachers like or dislike the use of technology. However, one need to be specific in terms of teachers' attitude to technology as they might like technology in general and for personal use but not for using it for curriculum delivery. Barri (2013:22) notes personal attitudes of teachers towards technology as one of impediments for the integration of it into education. It is crucial to ensure that both in-service and pre-service teachers are trained sufficiently to be comfortable with new technology. To expect teachers to have positive attitude towards integrating technology in their lessons while they do not understand it is unrealistic and unfair.

Liu, Ritzhaupt, and Dawson (2017:798) pose that comfort and confidence of teachers with technology plays a key role in accelerating technology integration. Barri (2013:20) notes that sometimes teachers might not integrate technology into their lessons because of

irrational fear of technology. Armstrong et al. (1996:81) acknowledge the irrational fear of technology by teachers noting that they are intimidated by technology because it was not part of their qualifications when the qualified. The other factor that makes technology integration by teachers uncomfortable is the temporary switch of posture because they are required to relinquish temporarily the status of being a teacher and assume that of being a learners of technology. Their reluctance might be caused by fear of being seen as bad students. According to Barri (2013:23) technology integration require teachers to move from their comfort zone of delivering of lessons in a teacher-centred form to an unfamiliar zone of learner-centred teaching. Learner-centred teaching is more beneficiary to students as it empowers them to take initiative and be responsible for acquisition of knowledge.

Attitude of teachers is critical for technology integration hence it is an important variable in the TAM. Teachers need to be convinced that the technology is useful and that it won't give them problems in using it for them. According to TAM attitude is one of the key constructs that determine if teachers will or not use technology. Teachers negative attitude towards technology integration can be a huge deterrent for technology integration in curriculum delivery. Therefore, it is important that when one embarks on technology integration, then he/she should develop a clear plan and strategy of how positive attitude will be ignited from teachers. However, according to Mwapele et al. (2019:04) teacher attitude is a secondary challenge as in schools located in rural areas of SA there is a primary challenge of a shortage of teachers.

b) Teacher training

Teacher training is one of the strategies that can be used to ignite positive attitude of teachers to integrate technology into their lessons. Barri (2013:106) reveals that poor pre-service and in-service training of teachers has a major role in underutilization of technology in teaching. Therefore, it is important to ensure that an effective teacher training strategy is place. The training of teachers addresses lack of knowledge with regards to technology and teachers' concerns that might arise. Pine-Thomas (2017:56) concurs that teacher training is important and supreme for technology integration in education. Nokwali, Mammen, and Maphosa (2015:564) identify teacher training as a pillar of successful technology integration. Teacher training should include skills to manage a technology-based classroom. There is a difference between managing a traditional classroom and technology-based classroom (Hew & Brush, 2006:228).

The confidence and competency of teachers' use of technology can be achieved through continuous availability of professional development initiatives. According to Ertmer (1999:48) teachers are key when it comes to change process required when integrating technology into the classroom lessons. Barri (2013:119) suggests that the training of in-service teachers should be not once off workshop and that it should be an on-going long-term phase. Nowadays, training can be recorded and be made available whenever one needs it. YouTube channels and e-learning platforms make training accessible anywhere and anytime for everyone.

Koch (2009:159) notes that teachers found it difficult to change their traditional teaching methods and integrate technology. However, she suggests that technology integration should be embedded on teacher education qualifications' curricular for pre-service teachers. Barri (2013:30) adds that pre-service teachers should be trained on how to integrate technology into pedagogy to promote learner-centered learning environment. However, he points out that lack of technology integration exists more on in-service teachers than the pre-service teachers due to fear of the unknown and insufficient knowledge. When teachers have adequate knowledge about certain technology, then it becomes easy for them to incorporate it in their lessons, while if they have insufficient knowledge, they become vulnerable and reluctant to use it. The teacher training should involve large groups of teachers so that they know that they are not alone in the learning phase of technology.

c) Teacher Support

The teacher support manifests in different forms. The school principals must create space and conducive environment for technology integration. They need to understand the importance of technology integration and allow teachers to go for personal development. Support is not limited to that of principals. Technical support measures should be available and on time. Technical glitches that are solved instantly makes it difficult for teachers to be comfortable in integrating technology in their lessons. Pine-Thomas (2017:57) poses that if technical glitches are too frequent and without immediate responsive technical assistance then teachers' confidence in integrating technology in their lessons depletes. She suggests on-site technical support for quick response be made available to assist teachers to avoid unnecessary frustrations. Liu et al. (2017:807) add that the importance of availability of technical support for technology is key. They caution that an unresolved failure of

technology during a lesson may negatively influence teachers not to use technology. Lack of technical support is a barrier for technology integration (Hew & Brush, 2006:227).

Technology integration can be originated and initiated by a teacher, school, or government education department. Literature is silent in terms of the differences of these levels as if the approach is similar. Scholars discuss barriers of technology integration as if the approach is homogeneous and does not differ in terms of where it is being originated. When technology integration is being initiated by a teacher then attitude falls away as a barrier because by virtue of a teacher's interest in technology means he/she believes and convinced that it useful for the classroom. However, the teacher must convince the school administrators like the principal to find and release funding for the integration. When the technology integration is initiated at a school level by the principal then he/she must convince teachers to buy-in. The DBE can be the best level to initiate technology integration, in that the curriculum and funding depends on it. When the government is the initiator of technology integration then funding is made available for the project. In the above discussion funding seem to solve potential technology integration barriers. With funding lack of resources will be minimize, professional development of teachers will be made available, and when teachers are properly trained then their attitude and beliefs towards technology changes. However, the DBE must provide a clear vision and path to follow for technology integration so that the schools' administrators and teachers understands how to implement it.

3.7 Challenges that impede technology integration

The challenges that impede technology integration can be internal or external (Barri, 2013:20). According to the external challenges are related to the access to technology resources while the internal challenges are related to teachers' perceptions and beliefs. The TAM is a model that is capable to link external and internal variables that impede technology integration. Bingimlas (2009:237) points that scholars tend to classify these challenges using different terms, for example the resources related one's other scholars will refer to them as school-level, macro-level, or institutional-level barriers. The barriers related to teachers are sometimes referred to as micro-level or teacher-level barriers. The school-level challenges are about the availability and access to resources and the teacher-level are about how teachers view the integration of technology into curriculum. However, the barriers of technology integration are centered around these two factors (resources and teachers' attitude).

The teachers' attitude as a barrier that impedes technology integration are born from the knowledge and experience background of teachers. Chang (2019:24) confirms this stating that teacher's knowledge of technology may simplify or make the integration a very complex challenge. According to him the attitude towards technology integration corresponds with how teachers' belief in it. Therefore, this means that if teachers positively believe in technology integration, then it will be not difficult to implement it. Harvey-Buschel (2009:40) points that not only the teachers that can impede technology integration but additionally the institutional leaders such as school principals if they are not fully convinced with the benefits of it. Keane (2015:38) concur that successful integration of technology is not limited to individual teachers, but other institutional members also have a role. Ledford (2016:22) adds that the school principals have a responsibility to lead the technology integration, create an enabling environment, and provide support to teachers. Teachers need to be given time and space to attend trainings and workshops to enhance their knowledge related to new technology.

The DBE in SA through a White Paper released in year 2004 (South Africa, 2004:35) pointed out that teachers' attitudinal elements are a major threat that have a potential to block technology integration for learning and teaching in schools. The department undertook that it would ensure that there is a separate funding allocated to address these barriers. The government recognized that teachers grew up in environments where there was no technology such that the generation of young learners tend thrive better in technology than their teachers. Harvey-Buschel (2009:42) suggests that incentives are important to encourage teachers to integrate technology. This consistent to what the department raised that an extra funding dedicated to improving teachers' attitude is important to make technology integration successful.

The knowledge level of teachers influences their attitude towards technology integration. Bingimlas (2009:238) documents that lack of technology competency of teachers creates resistance and negative attitude towards integration. There are two instances that teachers might acquire technology knowledge, firstly during their pre-service training and secondly with teacher development initiatives as in-service teachers.

In the South African context, the availability of resources is inherent to the past racial segregation laws where schools were not funded equally for resources. Harvey-Buschel (2009:41) states that technology integration tends to benefit more those that are on a better economic scale rather than poor communities. According to her technology widens the digital divide. Davies and West (2014:07) explain that digital divide is related to unequal

access to technology resources. According to them technology resources includes hardware and software equipment or devices that enable learning and teaching in an effort to achieve intended learning outcomes.

With reference to the literature in this section challenges that impedes technology integration are inter-related from each other. The lack of funding seems to be an overall variable that results in lack of resources. However, in some instances it is the willpower from institutional leaders.

3.8 Education technology in South African schools

This section discusses the education technology landscape in South African schools. This explores readiness of SA schools to integrate technology in their classrooms. Literature related to the technology infrastructure available in schools, the mobile technology, online learning, and social media effect on education.

3.8.1 Technology infrastructure in South African schools

Generally, the challenge with the infrastructure availability in SA schools is inherent from the past apartheid system where funding was based on racial characteristics. Cantrell and Visser (2011:276) state that schools of white people were better funded while most other races were marginalised. The authors studied what influences technology integration in schools in one province of South Africa. Their study identified lack of facilities such as electricity, internet connectivity, and the space. In addition, they raised that the attitude and perceptions of teachers regarding the integration of technology need to be improved through changes in the curriculum of their qualifications and more teacher development. Padayachee (2017:51) confirms that lack of infrastructure and funding are the principal barriers of technology integration especially in SA schools that were previously disadvantaged by the apartheid system.

Agegbo and Aina (2020) investigated the perceptions of early childhood development teachers with regards to technology integration in the South African context. The authors recognise that curiosity strengthens learning capabilities of young learners. According to them the feasibility of integrating technology in lessons is firmly vested on teachers' assumptions about it. They concur with Cantrell and Visser (2011) that what hinders technology integration is teachers' lack of technological pedagogical knowledge. This

emphasises the need to ensure that teacher qualification curriculum is designed such that it satisfies TPACK framework in its entirety. Additionally, they discovered that policymakers, principals, and parents support is crucial in effectuating successful integration of technology in the classroom. They conclude that integration of technology into the curriculum of South African learners from early childhood development, will empower and prepare them for better use of technology as they progress to secondary and tertiary education.

3.8.2 Mobile technology in education

Mobile technology referred to in this study is the availability of smartphones and tablets (iPads) that can be used for learning and teaching. Stats SA (2020:26) revealed that 84.5% of households in SA connects to the internet via the cell phones. According to StatsSA (2020:34) about 57.5% of South Africans aged between 5 to 24 used smartphones for online learning. The Figure 3.9 below illustrates which devices are popularly used for remote learning by South Africans aged between 5 – 24:

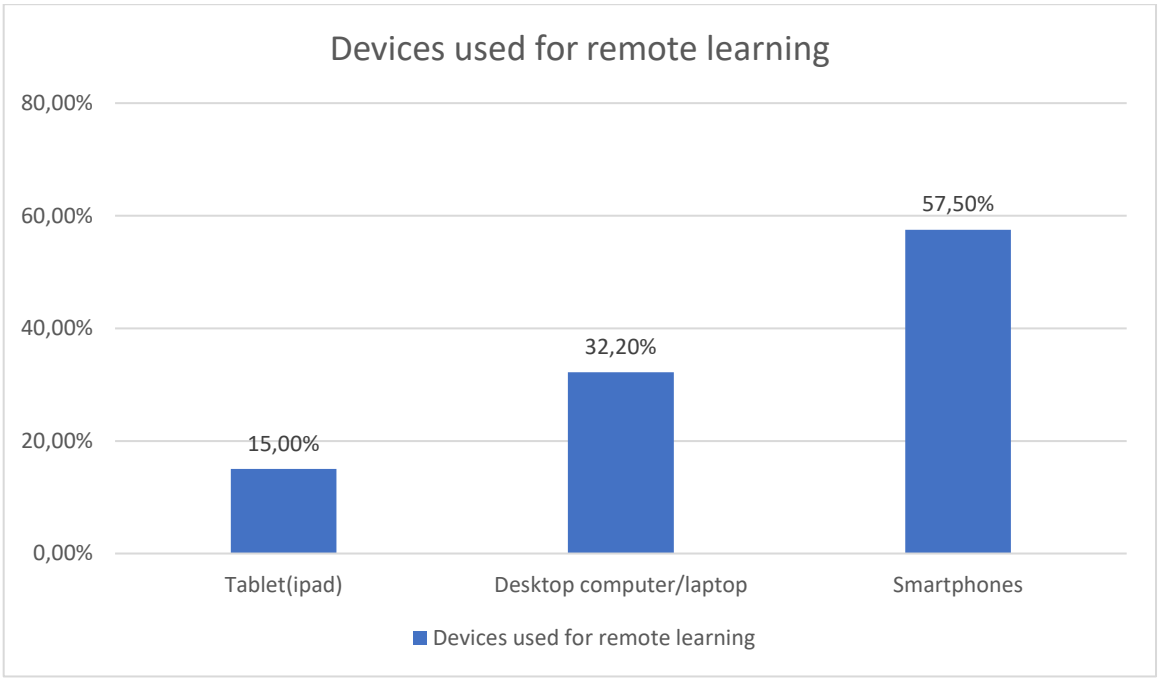

Figure 3.9: Devices used in SA for remote learning (Stats SA, 2020:33)

The above Figure 3.9 highlights the importance of finding best ways to integrate smartphones as one of the educational tools that can be used in the learning and teaching. Padayachee (2017:52) reveals that teachers frequently use their personal smartphones to download information in preparation of their lessons. However, she points out that it is costly

for teachers as they are using their personal network data to download. Agegbo and Aina (2020:10) affirm that teachers use smartphone to google information in preparation of their lesson presentations. According to them teachers found perceive smartphones as an important and resourceful tool for sourcing lesson related information. The smartphones enable viewing of pictures and videos related to lessons thereby have a potential of making lessons more interesting to learners. However, they pose that it is difficult for learners to use mobile phones in classrooms as the school policies prohibits their use during school hours. This prohibition of using mobile phones within school premises was previously raised as an obstacle by Mwapwele, Marais, Dlamini, and Biljon (2019). While that is the case Mwapwele et al. (2019:11) discovered that in rural areas teachers use mobile technology more than computers to prepare for their classes.

This highlights the missed learning opportunities that can be ripped through use of mobile technology. Although mobile phones are deemed as distraction, however there are advantages that can be realised if they are used in a properly controlled and monitored manner. Unlike laptops and computers, mobile phones can be procured at lesser price than the latter. Therefore, the education sector should not only punitively prohibit the use of mobile technology but should additionally consider the benefits that can be realised through its use.

3.8.3 Education via social networking tools

The social networking tools referred to in this section are Facebook, Twiter, WhatsApp, TikTok, Telegram etc. Molotsi (2022:06) found that although teachers know how to use social networking tools for personal reasons, but they have little knowledge of how these can used proactively for learning and teaching. These tools have gained popularity among young people born after year 2000. Molotsi concludes that technological tools such as these can be used to make learning and teaching more attractive and appealing to young learners. According to Padayachee (2017:56) WhataApp is superlative for communication as it is quick, and she sees Facebook as important for sharing of worksheets. However, with WhatsApp one can both communicate and share information with it. The challenge with it is tracing whether the participants in a WhatsApp group are indeed registered learners. Padayachee study found that the majority of teachers do use social networking tools for their communication and that teachers' resistance to use other digital learning tools is because of lack of knowledge.

3.8.4 Education policy on technology integration

The direction of the education policy towards the integration of technology in schools is very vital. Mwapwele et al. (2019:03) point that in SA there is a policy position stating that schools have internet connectivity by year 2030. The Government Gazzette of 2013 (South Africa, 2013:18) states that all schools must have internet connectivity whether wired or wireless.

According to Mwapwele et al. (2019:11) most schools in rural areas prohibits the use of mobile phones in school premises while there is a small portion that allows it. According to their findings teachers believe that mobile technology is suitable and can assist learners in learning and teaching. This means that the department of education should clarify through policy the guidelines on how learners can use mobile technology in classrooms and school premises. The policy should be drafted in consideration of accelerating the integration of technology. Padayachee (2017:56) raised concern with the discipline of learners in using mobile technology and warned that technology easily distracts learners. She suggested that guidelines for both teachers and learners should be drafted with regards to how to productively use digital devices for learning and teaching.

3.8.5 Covid-19 pandemic push to online learning

Unexpectedly Covid-19 pandemic abruptly broke out in year 2020. Alshurafat, Al Shbail, Masadeh, Dahmash, and Al-Msiedeen (2021:7006) concede that online learning became an ultimate solution for educational sector during the Covid-19 pandemic. During the pandemic, the time to deliver and fully cover the curriculum was threatened as physical attendance to schools was prohibited through lockdown rules and regulations. The only available option to continue with curriculum delivery was technology use through online learning platforms. The use of these online learning and teaching platforms extends the continuation of curriculum delivery beyond physical classrooms and time limitations. These platforms make learning and teaching possible wherever and whenever there is internet connectivity. Alshurafat et al (2021:6998) add that online learning enables delivery of curriculum at lower cost and without any space limitations.

According to Lomos, Luiten, and Tieck (2023:27) Covid-19 highlighted the need for schools to integrate technology in their classrooms. This pandemic queried the readiness of schools to use technology for learning and teaching. Higher education institutions had online learning platforms available whereas the primary and secondary schools did not have such

technology. According to Stats SA (2020:15) only 11.7% of SA schools that could continue with curriculum deliver via the remote learning during the period of covid-19 pandemic. Ali, Narayan, and Sharma (2021) reflected on the engagements with accounting students about crossover to online learning during the Covid-19 pandemic. Their finding was that online learning opens education to a wider scope of the society. This finding is important to consider in the context of South Africa where the capacity of educational institution to accommodate high numbers of learners is a consistent challenge.

3.9 Technology integration in accounting education

According to Qasim and Kharbat (2020:107) accounting education is heavily criticized on focusing on only the knowledge-based accounting curriculum and the slow pace of technological and competency skills development required by the business industry. They cite that the accounting profession on the other hand is doing its best to adapt and keep up with the new technologies. According to them this weakness of accounting education hinders the employability of accounting graduates. They advocate for change of how accounting curriculum is designed, its delivery, and assessments to conform with the industry technological skills requirement.

Chan, Ip, Wan, and Yiu (2018:02) points that there are new emerging technologies that are effecting changes in how auditing procedures are carried. According to them this has an influence on how auditing is taught, and students should be shaped accordingly. They pose that auditing performed using computers reduces workforce, saves time, and becomes more effective. These views substantiate the need to integrate technology in education of accounting students. Technology integration into education affords learners the opportunity to apply their knowledge into real business practices. Chan et al. (2018:08) note that the advantage of technology in teaching auditing is that it upgrades students from repetitive work and promotes analytical skills and critical thinking.

Krahel and Vasarhelyi (2014:01) note that the American accounting accrediting bodies are pressing schools to increase their integration of technology in their accounting and auditing qualifications curricular. They critique the accrediting bodies that they themselves have a very minimum coverage of technology in their qualifying exams. They cite that students focus on content and topics that will be assessed in the qualifying exams even such content is relevant to their careers. Therefore, this might be the reason why schools are reluctant to

increase coverage of technological integration in their curriculum if it is not going to be sufficiently covered in accreditation examinations.

To show importance of technology and encourage students to give it necessary attention, it is advisable to increase the assessment weight in the examinations. However, technology integration into accounting curricular should not be only for assessment purposes but to expose students to real business practices as well. Lack of sufficient coverage of technology in accounting and auditing education reduce relevance of accounting qualifications and threatens their future. Krahel and Vasarhelyi (2014) alert that the increase of technology into the accounting curriculum might put an additional burden to students as there is already limited time to cover the curriculum content. They conclude that the accountants and auditors are forced to adapt to new technologies and the education sector has no choice but to follow the paradigm shift posed by technology. Qasim and Kharbat (2020:10) predict that human auditors might be phased out soon due to automation of auditing processes and procedures.

Krahel and Vasarhelyi (2014:02) pose that it is preferable to integrate tax software into taxation classes instead of teaching them unconnectedly. According to them this provides better practice and meaning of tax concepts.

3.10 Computerised accounting system (CAS)

Computerised accounting system (CAS) represents a class of computer package that enables recording and processing of accounting transactions and storing of financial information (Ware, 2015:112 & Anaeli, 2017:24). Anaeli states that some of CAS advantages are that it fast tracks accounting tasks and makes it easy to analyse financial reports. Such packages automate some of the accounting cycle steps for example the generation of financial statements occurs simultaneously in the background as one is entering financial transactions. The way in which these packages function leads to its classified as a computer simulation of real-life accounting processes. Some of examples of computerised accounting packages are: Pastel, AccPac, Quickbooks, SAP, JD Edwards.

According to Bromson, Kaidonis and Poh (1991:445) computerised accounting encouraged and enable the fulfilment of following teaching approach objectives:

1. Develop and reinforce understanding accounting concepts,

2. Develop an understanding of the need for controls in an accounting computer environment,
3. Respond to the needs of the professional environment,
4. Expose learners to a commercially available package.

Machera and Machera (2017:378) explain that computerised accounting provides students with the practical skills of accounting and thereby increases their degree of employability. individuals to use computerised accounting intelligently.

Schunk (2012:326) promoted computer assimilation for learning noting that it is more effective than the traditional instruction methods as it promotes deep learning and problem-solving. Schunk added advantage of using computer simulations for learning are that they keep learners' attention and assist them to focus on relevant aspects of their lessons and grows their interest to learn more.

3.11 Computerised accounting in education

This section will discuss how computerised accounting has been integrated into education curriculum and the benefits thereof. Discussions are based on national and international available literature. Albrecht and Sack (2001) criticize that accounting education spend too much time on recording of transactions and the preparation of financial statements although such tasks are automated in the business environment.

3.11.1 Computerised accounting in high schools

In the South African context computerised accounting is not integrated into the accounting curriculum in high school level. Schools that might be doing it, are doing it voluntary, as it is not examinable or listed under any grades' weekly programme in the curriculum. Kilcullen (1996:29) investigated the status of computerised accounting in the high schools around State of Illinois and found that more than 117 high schools using computerised accounting in their accounting teaching in the mid-1990s. According to him there is a consensus among scholars regarding the need for the integration of computerised accounting in accounting education. However, they differ in terms of when it should be introduced. He notes that while some researchers at that time agreed that manual system and computerised accounting should be taught simultaneously, some felt that computerised accounting should be taught when the manual system is fully understood.

Research by Andiola, Masters, Norman (2020) upholds that a combination of manual and computerised accounting is more valuable and beneficiary to student learning when the computerised accounting follows the manual system. An overall 69.1% (123 out of 178) of secondary schools in Illinois were teaching computerised accounting. Schools with high enrollment numbers were the ones that taught computerised accounting more than those with small numbers. He concluded that schools with high numbers of student enrolments are more likely to integrate computerised accounting in the curriculum as compared to smaller schools. He maintained that manual and computerised accounting should be taught simultaneously. According to him integration of computerised accounting into accounting curriculum will ensure that graduates are compatible to the requirements of the real-world business environment.

The accounting curriculum taught in high schools should seek to be on par with new technological business developments and include technology in its delivery (Nwokike & Uwaneze, 2016:32). They argue that for accounting students to be relevant in the technologically dominated era they must be taught technological skills while in school. They found that lack of technological resources and educator knowledge are the reasons for poor integration of technology into accounting curriculum delivery in high schools. They recommended that government should provide resources and training for educators.

3.11.2 Benefits of integrating computerised accounting in education

The literature presented in this section relates to the benefits identified by scholars in integrating computerised accounting in education. According to Al-Khadash and Al-Beshtawi (2009:03) Americans were under pressure to integrate computer technology into accounting education as early as the 1980s. Rhodes (2012) references literature that accounting education is falling behind and does not keep up when it comes to technological changes and requirements of the business environment, remaining essentially the same as it was 20-30 years ago. He highlights that manual accounting is gradually becoming obsolete.

The use of a combination of manual and computerised accounting in the classroom is regarded as the best method to teach accounting (Boulianne, 2012:23). Furthermore, he posits that those who use only a manual method attain less knowledge when compared with the other two groups. He criticises the manual system for focusing too much on

accounting rules and principles rather than their application. According to him using a combination of manual accounting and computerised accounting software in the classroom provides students with exposure and experience of how accounting is practiced in the real business environment. Papageorgiou (2014) emphasizes that pre-knowledge of accounting is important before one embarks on using computerised accounting for teaching. Boulianne (2012:23) and O'Connell, Beaman, de Lange, and Smyrnios (2003) alerts that the disadvantage of computerised accounting packages is that it does almost everything for the students, leaving them with little to learn. They note that computerised accounting packages deprives students an understanding of process steps of information flow as it automates most of the accounting cycle steps. However, this is possible only if computerised accounting is taught in isolation without the manual accounting as an introduction.

Technology-oriented accounting curriculum is supported as efficient for learning and teaching (Harrast, Strong & Bromley, 2010). In their study that investigated whether students prefer theory versus practical application of accounting, they found that students have strong preference of learning accounting concepts using practical methods provided by technology. They pose that although we are in an era of technologically savvy students where students have pre-knowledge of some technology, they emphasize that students need to be taught technology in a proper coordinated manner to limit errors. They argue that a curriculum that is dominated by theory with under representation of technology is not serving the students and the accounting profession in a just manner. Phillips and Trainor (2014) substantiate this noting that students who were born between the 1982 to 2005 prefer the use of technology in their classrooms.

Blankley, Kerr, and Wiggins (2018) examined technology used by accounting educators and recommended that students should be exposed more to spreadsheets, word processing, and computerised accounting software. They suggest that textbook publishers and software companies should work together to integrate computerised accounting in accounting textbooks. According to them the working relationship between publishers and software companies will lessen the barriers of integrating computerised accounting curriculum and reduce costs. Blankley et al. (2018) and Wells (2018) further propose that textbook authors should include computerised accounting activities and assignments related to some topics in their chapters. Boulianne (2012:23) highlights that, students acquire sufficient knowledge of the accounting cycle when they are given assignments to be prepared using accounting software packages.

The duties of accounting personnel are no longer limited to bookkeeping as that has been automated by accounting software, instead their focus is more on analysing, interpreting and substantiate decisions taken or to be taken in business (O'Connell et al., 2016). Albrecht and Sack (2001) warn that anyone with the correct accounting software can be an accountant and provide financial information that will assist in decision making. O'Connell et al. (2016) mention that some of accounting academics have never been exposed to the practice of accounting and its technology except research and therefore lack knowledge of how accounting knowledge is applied in the real-world. This subsequently renders them unable to expose their students to the accounting practices. They emphasize that it is important that accounting educators use pedagogical methods that are compatible with the workplace requirements of the 21st century.

The new generation of students are technology literate and sometimes even more than the academics (O'Connell et al., 2016). This confirms what Senik and Broad (2011) insinuated that academics lack interest of the available technology and that prevents them from learning and understanding it. Watty, McKay, and Ngo (2016) noted resistance of accounting education instructors in accepting change and move towards technology integration. This instructors' stance is one of the impediments that causes the accounting curriculum to be far apart from the current real-world accounting practice. Furthermore, Senik and Broad (2011) state that the new generation students merely require a brief introduction when it comes to technology and thereafter, they can teach themselves. However, O'Connell et al. (2016) warn that academics should not take a risk and assume that students understand technology without testing if that is the case. Duktur (2018) motivates that the use of computerised accounting in teaching promotes life-long learning, critical thinking, and problem-solving skills of students and that they merely require guidance from teachers thereafter the work their way into their learning. O'Connell et al. (2016:87) note that "technology is seen to be changing the way students learn, academics teach and the accounting profession itself operates". Laing and Perrin (2012) state that the lack of integration of computerised accounting into the curriculum has been caused by the absence of the conceptual framework for the integration. Therefore, this means that the is a gap in literature in terms of a developed framework that can utilised to integrate computerised.

The use of a computerised accounting package when teaching accounting improves the students' understanding of accounting concepts, ignite positive attitude towards studying it, and provides skills needed in the business environment (Murvin & Price, 1992; Wessels, 2006; Laing & Perrin, 2012; Eloff, 2016; Yaftian, Mirshekary, & Mihret, 2016; Andiola,

Masters, & Norman, 2020). O'Connell et al. However, the benefits of integrating computerised accounting into the curriculum goes beyond the education sector into the business sector. According to Wessels (2006) computerised accounting simplifies accounting and makes lessons effective. Morris, Burnett, Skousen, and Akaaboune (2015) add that integration of computerised accounting as an additional pedagogy improves students' academic performance and caters for different learning styles of students. Furthermore, Eloff (2016) notes that the integration of computerised accounting into curriculum delivery encourages students to complete work with understanding rather memorising. This means that deep learning rather than surface learning is achieved better when accounting taught with computerised accounting.

3.12 Computerised accounting packages in South Africa

This section will discuss computerised accounting packages that are commonly used in the South African business environment. The last paragraph touches on computerised accounting packages used by government and municipalities. Computerised accounting packages are designed to cater for different businesses in terms of their sizes. However, some are industry specific for example restaurants tend to have certain computerised accounting packages that are dominant in the hospitality sector. Those that are integrated in education qualifications of accounting professionals will be identified. Around 2001 Pastel Accounting software and Quickbooks dominated the small to medium size enterprises (SME) with a market share of more than 80% according to Accountancy SA (2001).

3.12.1 Pastel Accounting

Pillay, Singh, and Prinsloo (2020:03) note that Pastel Accounting exposes students to how accounting is applied in accounting software and spreadsheets. They pose that it assists students understand the accounting cycle. According to Pillay et al. (2020) Pastel Accounting in their research site is done in one semester of the second-year level and has a pass rate exceeding 95%. They associate this high pass rate with the fact that Pastel Accounting is done after students have been introduced to accounting concepts and cycle manually.

According to Wessels (2006:140) Pastel Accounting possesses a market share of more than 70% in the small to medium enterprise (SME) segment in South African business community. He further states that when compared to the entire computerised accounting

software market in South Africa Pastel Accounting dominates with around 66% market share followed by Quickbooks with 12% and Accpac with 10%.

According to De Wet and Van Niekerk (2001:100) Pastel Accounting is the best computerised accounting package that sufficiently covers the topics in first year financial accounting course at university. These topics are the same as those covered extensively at high school level accounting subject. Teaching these topics with Pastel Accounting as an additional pedagogical tool will enhance students' knowledge acquisition and expose them in applying theory of accounting into practice. Wessels (2006:87) recommends that Pastel Accounting should be the computerised accounting package integrated into the curriculum of accounting qualifications at universities due to its popularity and domination of the South African business sector. Albrecht and Sack (2001) point out that accounting technology is not as expensive as it was although accounting is still being taught as if it was still very expensive. The domination in the business environment might be due to Pastel Accounting's affordability as a package and training courses thereof. High school education is a broader educational space compared to university as there are many high schools than universities in South Africa. This means that students who exit at high school level and explore job market due to poor capacity of universities have sufficient knowledge and skills necessary to perform low level accounting jobs.

3.12.2 QuickBooks

According to Masumbika, Swami, and Pallaprolu (2017:40) Quikbooks simplifies most of accounting cycle tasks and assist in generation of financial reports with just a one click. They note that Quickbooks is the most inexpensive computerised accounting package compared to Pastel Accounting and other packages.

3.12.3 Enterprise Resource Planning (ERP)

According to Jacobs and Weston (2007:358) Enterprise Resource Planning (ERP) is an addition or extension of Material Requirements Planning (MRP) and Manufacturing Resource Planning (MRPII). Scholts (2011:01) adds that MRP started around the 1960s mainly to monitor the movement of material and was expanded in the 1970s to MRPII that was specifically designed for manufacturing firms. Soliman and Karia (2015:265) describe an ERP system as a combination of different computer software programs related to

business functions. They further provide examples of those functions as “manufacturing, order entry, general ledger, accounts receivable and payable, purchasing, warehousing, transportation and human resources”. Klaus and Changchit (2020:34) note that ERP systems are mostly used by medium to large size businesses. However, Scholtz (2011:164) points out that in the South African context even the small sized enterprises are increasingly adopting ERP systems. The Figure 3.10 below shows an overview of how ERP systems have evolved through the years:

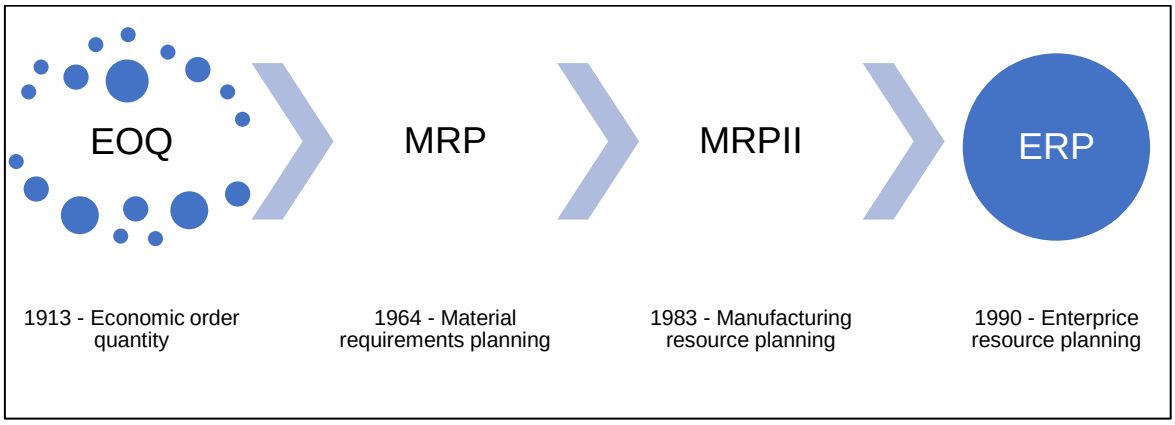

Figure 3.10: ERP evolution over years (Oracle, 2021: online)

The advantage of an ERP system according to Adelsberger, Khatami, Khatami, and Richter (2015:02) is that it provides relevant knowledge for different disciplines. According to Brehm and Markus (2000:45) and Joseph and George (2002:53) ERP systems integrate all business functions with different software modules like finance, human resource management, sales, distribution, inventory management, manufacturing, and operations into one software. In a business not using an ERP system it is common for them to have multiple independent software for every business function for example a separate payroll system and ordering system etc. They praise ERP systems noting that they are efficient in streamlining business operations. Brehm and Markus (2000:45) and Soliman and Karia (2015:266) pose that ERP systems are very intricate to understand.

Joseph and George (2002) studied integration of ERP systems in business education. They conclude that the integration assists in closing the gap between education and real-life business practice. They acknowledge that ERP systems have characteristics that are good for students’ learning process. ERP systems fits well with many business education qualifications like Human Resources Management, Logistics Management, Operations Management etc. Therefore, once an academic institution decides to adopt ERP systems in its qualifications’ curriculum then many students from different qualifications can be

exposed into the real-world business practices and thereby enhance their skills and competitiveness in the job market. Scholtz (2011:63) advocates for the integration of ERP systems into education curricular noting that it encourages active learning where students learn by doing. She points that South African higher education institutions are lagging in respect of integration of ERP systems into their qualifications' curricula when compared to the internationally institutions. She further highlights that there is a dire need both in South Africa and internationally to ensure that education institutions deliver competency-based curriculum that is relevant to the corporate environment.

3.13 Common features of computerised accounting packages

The following section will discuss the basic features that are common to most computerised accounting packages. The advantage in understanding features of an accounting package is that it becomes easy to adjust from one package to another. Computerised accounting package includes cashbook transactions, creditors' transactions, debtors' transactions, and payroll functions. The following Figure 3.11 displays the basic and common features of a computerised accounting package:

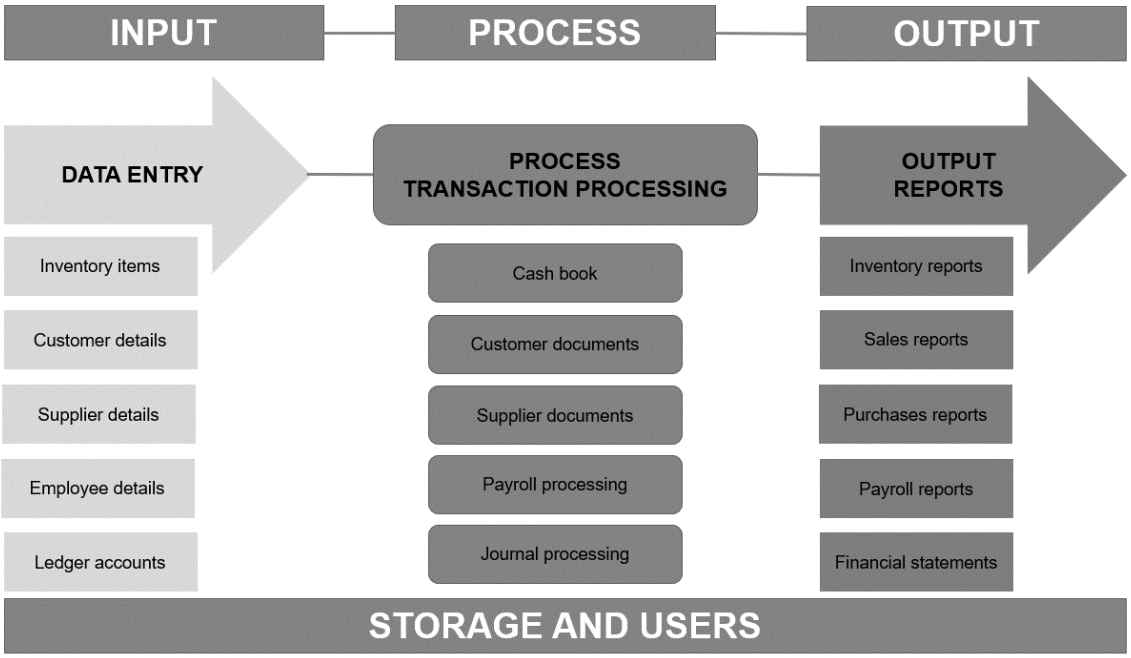

Figure 3.11: Common features of a computerised accounting package

3.13.1 Data Entry

In a business using a manual system there will be filling cabinets for inventory items, customers, suppliers, employees, and ledger accounts. Computerised accounting packages follow similar procedure by entering the information of about these items are entered in the computer system. However, some businesses still maintain paperwork stored in physical filling cabinets as a backup should an unforeseen circumstance occur to the computerised accounting package. Some businesses that are using cloud storage scan the hardcopy paperwork into the computer system to serve as source documents for future verification. When these data items are entered a system code will be allocated that can be numerical or alphanumeric. The Table 3.4 below provides minimum information entered in a computerised accounting package:

Table 3.4: Minimum information registered in a computerised accounting package (Source: Author)

Data entry items	Minimum information records
Inventory items	Name, description, quantity units e.g., liters or kilograms or meters, cost prices, selling prices etc.
Suppliers and Customers	Name, postal and physical address, contact person, VAT registration numbers, credit limits etc. Customer details are mostly kept where there are credit facilities.
Employee details	Personal details, address, position, wages/salary information, leaves etc.
Ledger accounts	Name of accounts, type of account, sub-accounts, account limits etc.

3.13.2 Transaction processing

The transactions that are processed are mostly related to the buying and selling of products and/or services. The ERP systems will have software modules for customer relations management (CRM) and supplier relations management (SRM) and human capital management (HCM). The transactions will range from buying from sellers, selling to customers goods and/or services, cash receipts and payments, inventory and production, and payroll for employees, and financing and investment. All transactions originate from source documents. Sales transactions normally starts with a quotation followed by a sales order, then delivery followed by billing or invoicing and receipt of cash, while purchases resume with a purchase order and when inventory is received then payments are made to the suppliers.

3.13.3 Reports

Computerised accounting systems automate the development of reports with one or two mouse clicks. In many instances these reports can be exported to other applications like spreadsheets, word documents, presentations etc. The reports include financial statements which are the core purpose of accounting. These reports assist stakeholders like managers, shareholders, investors, and credit suppliers in making decisions about the direction of the business. The advantage of reports from a computerised accounting system is that they can be acquired timeously and anywhere. However, their accuracy depends on data inputted giving the meaning of the principle of garbage-in-garbage-out. Reports in computerised accounting system are flexible and can be customized to meet different stakeholders needs. Reports like financial statements are tailored to meet the International Financial Reporting Standards and General Accepted Accounting Practices.

3.14 Accounting curriculum delivery online

As technology progressed in education curriculum delivery, online education has increased across the education sector globally. Picciano, Seaman, Shea, and Swan (2012:128) explain that online learning is delivery of lessons via the internet-based applications. Learning Management Systems (LMSs) or e-learning platforms like Blackboard, Moodle, Sakai, Claroline, Edmondo etc. are used by various educational institutions (universities and schools) across the globe. These e-learning platforms are not discipline specific and have been developed and used since the early 2000s. Basioudis, De Lange, Suwardy, and Wells (2007:74) attribute the growth of e-learning to the availability of complimenting technology. According to them distance learning institutions were among the first to adopt e-learning.

However, to a large degree, e-learning was optional for teaching and learning up until the emergence of the Covid19 pandemic in 2020. This forced educational institutions from primary level up to tertiary level to use e-learning for curriculum delivery due to lockdown measures that were instituted by different governments. E-learning platforms enable delivery of study guides, notes, presentations, videos, images, and online assessments. They enabled assessment feedbacks and results to be released instantly after they have been completed. However, some are limited in terms of the questioning types that are available. Some were further developed to include video conferencing where lessons can be presented virtually while students are on different locations. Delgado, Wardlow,

McKnight, and O'Malley (2015:405) investigated the growth and effectiveness of online learning in high schools in United States of America (USA). They acknowledge that online has gained huge interest of learners in education. According to them learners favor the online learning and are satisfied with it versus the traditional face-to-face learning and teaching.

Ali, Narayan, and Sharma (2021:262) highlight that teaching accounting online is not simple because it is a practical subject. They reflect that personal connection and enthusiasm that can be attained from students during the face-to-face classes is missing and that students' attendance of online classes is poor. Other challenges they identified with teaching online were network connectivity, proper computer devices, home environment etc. They conclude that students in accounting still prefer face-to-face classes versus online classes. Marking accounting subject require consideration of process steps and different methods of calculations rather than one amount as an answer, the e-learning platforms does not open that space as most of them rely on multiple choice questions, matching and calculations of one total amount. This then means that e-learning platforms expose students to unfair marking practices. However, if the marking procedures are thought thoroughly when setting online assessments, the unfairness of online marking can be mitigated. Guangul, Suhail, Khalit, and Khidhir (2020:519) identify academic dishonest by learners as a major challenge with online assessment. However, there are applications that can be used as control measures to limit or prevent academic cheating of learners during the online assessments.

3.15 Accounting curriculum delivery via games

Games in education provides several teaching opportunities and triggers interest and enthusiasm among learners (Silva, Rodrigues, & Leal, 2019:05). Games can take different spheres; some are technological based while some might be board games. Shanklin and Ehlen (2007) used a boardgame to teach the concepts of accounting. They note that the game changed the attitude of learners towards accounting and that positively affected their academic achievement. Damron (2019:95) agree with Gamlath (2007:132) that the use of games to teach accounting makes learners to be interested and actively participate in accounting lessons. He suggests that the game makes accounting less intimidating to learners.

Malaquias, Malaquias, and Hwang (2018:399) encourage educators to consider using online games to teach accounting. According to them technological games are effective and

improve the learning and teaching process in accounting. They note that other academic fields such as health, and engineering successfully integrated game-based learning (GBL) as their additional pedagogical tool. They add that there are several technological games that simulate accounting cycle processes that can be used by teachers. Gamlath (2007:137) concludes that simulated games provide learners with an unforgettable enjoyment experience of their lessons. Burdon and Munro (2017:431) substantiate that games simulating accounting processes enhance understanding of accounting concepts. Silva et al. (2019:05) identify that technology GBL initiatives increases learners' concentration and makes them motivated to be involved in the learning process.

The literature above highlights that teachers need to consistently try to find innovative curriculum delivery methods and not only rely on textbook, chalk and greenboard to teach. These different curriculum delivery methods in turn contribute to improving the academic performance of learners in accounting.

3.16 Accounting practice and employment requirements

According to Gauldi (2020) the integration of ICT in any accounting education curriculum is key in preparing students for skills required for employment. Gauldi (2020) confirmed what Damasiotisa, Trivellasb, Santouridisa, Nikolopoulosa and Tsiforaa (2015) highlighted that it is no longer possible to performing accounting duties without the use of technology. He maintained that it is imperative that accounting education move beyond the "talk and chalk" and fully prepare students for employment.

Damasiotisa et al. (2014) defines competency as a combination of knowledge and skills possessed by an individual to discharge his/her job responsibilities. They further allude that knowledge is what one knows while skill is what one can do. According to them the knowledge and competency use same word as above of using spreadsheets and accounting software in performing financial operations are the two most important skills. The employment opportunities for accounting personnel require those with qualifications embedded with skills.

Marriot (2004) noted that students are not purely driven only by love of accounting when joining the profession but to secure employment opportunities in future. According to him the curriculum design should not be limited to classroom activities but with a view of what the society and business environment require from graduates. Marriot (2004) acknowledges that integrating spreadsheets and computerised accounting when teaching accounting

enhances students' learning and provides them with concrete experience required in the real-world business environment.

Dunbar, Laing, and Wynder (2016) analysed skills required from accounting graduates in the accounting job advertisements of newspapers in Queensland Australia. According to their findings the top three skills required in the accounting job advertisements between the years 2008 to 2009 were communication, MYOB (computerised accounting package), and Microsoft Excel (spreadsheets) respectively.

Zhang, Dai, Miklos, and Vasarhelyi (2018) studied the impact of disruptive technologies on Accounting and Auditing. They identified that accounting graduates lack knowledge and skills required by employers from the business environment. According to them this compel students to use online courses to upskill themselves or that employers incur additional training costs. They posed that one of the difficulities in universities with regards to integrating technology into accounting education curriculum is the shortage of academics who are qualified in both technology and accounting. Adelsberger et al. (2015:02) pose that it is essential for education institutions to ensure graduates are given knowledge and understanding that makes them valuable for employment in the business sector.

3.17 Summary

The first part of this chapter discussed extensively all the accounting disciplines. What became eminent and common amongst all of them is that in the real-world business environment none of them are performed manually nowadays. Therefore, the way they are being thought in the education sector has to be aligned to the requirements of the business sector. The literature cited highlights that all the accounting disciplines' concepts are understandable and meaningful more when related technology is used in their lessons. The accounting cycle is the gist of the accounting curriculum both in high school and university. Scholars concurred that the entire cycle has been automated with computerised accounting. Literature reveals that with computerised accounting the accounting cycle tasks can be performed by someone with little or no knowledge of accounting. Scholars agree that the role of accountants have drastically changed through the years.

The structure accounting curriculum and how it is introduced to students in South African high schools has been outlined. The accounting curriculum structure has been criticized and accused as one of the factors resulting in less popularity of accounting as a subject

choice in high school. The numbers of students writing accounting in Grade 12 and their academic performance has been on a downward trend consistently since the year 2016. This highlights that there should be intervention measures taken by government education department. Anaeli (2017:68) recommended that government should ensure through policy development that computerised accounting education is accessible and available to many people. Changes and improvements are required, and this study focus on addition of accounting technology in curriculum delivery as one of the remedies to help in saving accounting from dying in high schools. When high numbers of students decide not to do accounting in high schools it is difficult to retrieve their interest at university level. Therefore, this means the lesser the numbers of students doing accounting in high school the lesser the number of students enrolling for accounting qualifications at university. In the South African context this is not a good option as accounting is among the scarce skills in the country.

The literature notes the gap between what the education institutions when it comes to accounting skills provides and what the real-world business sector requires from graduates. Scholars found that one of the major causes of the gap between the accounting education curriculum and real-world accounting practice is the lack of integration of technology into accounting curriculum. They outline the benefits of integrating computerised accounting in accounting curriculum delivery.

Among other researchers Eloff (2016) listed the following summarised benefits of integrating computerised accounting into accounting curriculum delivery (a) increases understanding of accounting topics; (b) improves students' academic performance; (c) creates enthusiasm and improves learning experience; (d) encourages students to complete work with understanding rather memorising; (e) creates interest and positive attitude of students towards accounting. These benefits highlight how important the integration of computerised accounting in accounting curriculum delivery is. Additionally, it has been proven that younger generation of students understands technology better and quicker than the older ones. Therefore, this substantiate the view that it is adequate to integrate computerised accounting at a school level.

There are no real reasons that cannot be solved that prevents the integration of computerised accounting at a school level in the South African context while other countries have integrated it as early as in the year 1990s. The positive attitude that is said to be created by the accounting technology towards accounting education is needed to encourage more students to take accounting in school. Accounting educators are accused

of being among the stumbling blocks of integrating computerised into the accounting curriculum delivery. Additionally, Andiola et al. (2020:04) identified the following challenges that makes accounting education faculties to be behind in integrating technology in their curriculum and delivery:

- Lack of funding for critical resources (computer labs, software)
- Time to learn and time to incorporate changes in the curriculum,
- Resistance from senior staff nearing retirement to learn new technology,
- Unwillingness to hire new staff with expertise of technology.

In the South African context computer infrastructure can pose serious challenge especially in rural areas where even electricity is a challenge. However, with willpower from government department officials these challenges can be curbed. Proper planning and implementation can pave way for the integration of computerised accounting in high school accounting subject.

Accounting curriculum delivery online is another additional pedagogical tool that can be explored at high school. Computerised accounting packages trainings are available online as well. Accounting training courses are available for free on Massive Open Online Courses (MOOCs). This another additional avenue that can be explored by education at high school level including the use of e-learning platforms for curriculum delivery of accounting. Several computerised accounting packages are available in South Africa and Pastel Accounting is the most popular software in business and that most education institutions in use. ERP systems are very expensive and complex for high school level. Literature cited here validates that computerised accounting is instrumental in bridging the gap between the accounting education and accounting practice. In addition, it becomes an important requirement for employment opportunities. It is rare to find an accounting job vacancy that does not stipulate the need of computerised accounting skills as a minimum requirement.

CHAPTER FOUR

RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

Chapter 3 discussed computerised accounting in the context of education. This chapter presents the research design and methodology applied in this study. The qualitative approach has been used to understand the phenomenon of integrating computerised accounting into high schools accounting curriculum delivery. The researcher sought to explore and understand the views and beliefs of accounting teachers and to understand the various material and curricular factors regarding the integration of computerised accounting as an additional pedagogical tool in classrooms. The rest of the chapter is organised as follows:

4.2 Research design
4.3 Research site background
4.4 Data analysis
4.5 Trustworthiness
4.6 Ethical consideration
4.7 Summary

4.2 Research design

The following sections substantiate the research directions selected and followed by the researcher by providing how the decisions made link up with literature.

4.2.1 Research philosophy

The philosophical stance of this study is located within the interpretivist paradigm. According to Du Plooy- Cilliers et al. (2014:30) the main objective of interpretivist researcher is to attain an in-depth understanding of multiple lived experiences. Thanh and Thanh (2015:25) confirms this adding that the core belief with interpretivism paradigm is that reality is socially constructed. According to them interpretivism accepts and seeks to discover multiple and different perspectives about individuals' experiences. Creswell and Poth

(2016:25) revealed that the ultimate goal of interpretivism is that its research objective depends on the participants' views of the phenomenon. The researcher sought to understand the teachers' lived experiences and standpoint with regards to computerised accounting as a reality of accounting teaching in the 21st century. Hence the researcher deemed interpretivism paradigm as a philosophical stance suitable for this study.

4.2.2 Research approach

This study used a qualitative research approach. According to Rahman (2017:103) the term 'qualitative research' is a classification of all research that produce results without the use of statistical procedures but by rather analysing the people's lived experiences, behaviours, emotions, feelings, perspectives and so on. Therefore, qualitative research seeks to construct meaning of human's understanding and interpretation of their practices. He further states that the key benefit of qualitative research is that it provides understanding of complex issues and simplifies them. Thanh and Thanh (2015:25) assert that while quantitative research is linked with statistical numbers and measures, the qualitative research's strength is in gathering information that provides the insight and in-depth understanding about the phenomenon from different lived experiences.

Johnson and Onwuegbuzie (2004:20) state that the strong point of qualitative research is that it is responsive to the required changes, challenges and needs of the society. According to them it is appropriate to determine why and how can a phenomenon be dealt with. This study seeks to determine how can computerised accounting be integrated into high school as an additional pedagogical tool according to teachers' perspective. Integration of technology into education is a need nowadays to conform with the 21st century technologically driven business environment. The qualitative research approach is appropriate approach to this study as the purpose is to understand the lived experiences and standpoint of teachers with regards to computerised accounting as a part of pedagogical need of 21st century accounting teaching. According to Creswell (2014:4) with qualitative approach the goal of the researcher is to explore and understand the meaning that people provide to certain problems.

Rahman (2017:106) highlights that quantitative research focuses mainly on measurable aspects of people's behaviours. This means that there are certain social aspects that cannot be investigated using quantitative research because they are not measurable. According to him one of the weaknesses of quantitative research that is time based. This means that the study is conducted and applies on a specific time and should it be done on another period

results might differ. According to Brantlinger, Jimenez, Klingner, Pugach, and Richardson (2005:198) the other benefit of qualitative research is its ability to describe and provide an understanding of its research subjects' shortcomings and disabilities. This point is relevant to this study as it will provide understanding of what are the impediments preventing the integration of computerised accounting into high school accounting curriculum delivery. Campbell (2015:201) notes that there are five approaches that fall under qualitative research namely: narrative inquiry, phenomenological, grounded theory, ethnographic and case study research. The following section will discuss the case study research as a selected qualitative research method used to investigate this research phenomenon.

4.2.3 Case study

This research is a single case study with boundaries set within one educational district in the Western Cape province of South Africa. The case is limited to public high school accounting teachers. Lapan, Quartaroli, and Riemer (2011:248) and Campbell (2015:201) pose that one of the basic steps of a case study is to clearly identify the boundaries for the case study based on either time and/or location. Creswell (2012:465) unlike Campbell (2015:201) classify a case study as a variant of ethnography design though he points out that it differs with it in several ways. Rule and John (2011:07) define case study as "a systematic and in-depth investigation of a particular instance in its context to generate knowledge".

Olsen (2014:185) highlights that a case study is a flexible medium that accepts use variety of data colllection methods. According to Yin (2009:99) case study evidence can be collected using a variety of sources and he identified six of them namely: documentation, archival records, interviews, direct observation, participants-observation, and physical artefacts. Yin (2012:10) notes that these sources of evidence can be used in any combination.

A case study design was selected because the intention of the researcher is to dig deep and in detail on the possibility of integrating the computerised accounting into accounting curriculum delivery. Therefore, to get deeper understanding for this phenomenon case study design was selected as the most suitable research design. According to Hancock and Algozzine (2017:10) findings from case studies have great potential to ignite changes in policy and procedures. Campbell (2015:202) is more explicit about the potential effect of case study research noting that "Insights gleaned from case studies can directly influence

policy, practice, and future research". This case study falls under descriptive design. (Newcomer, Hatry, & Wholey, 2015:164) and (Hancock & Algozzine, 2017:39) note that there are three major designs of case studies namely: explanatory, exploratory, and descriptive. According to them descriptive case study design seeks to bring understanding about important traits of a phenomenon. They further state that with descriptive case study the researcher can determine what is currently happening and why, in describing the situation. The researcher in this study seek to understand how accounting is taught in respect of technology and how the accounting teachers envisage the integration of computerised accounting into their teaching.

Furthermore, Lapan et al. (2011:243) state that case study research is appropriate to investigate a complex phenomenon and to provide in-depth understanding about it in detail. Integration of computerised accounting into high school accounting curriculum delivery might have been slow or ignored due to its possible complexity to implement it. Computerised accounting as a pedagogical tool in high school context is innovative. Lapan et al. (2011:246) note that case study research is relevant to unearth and transmit modern ideas.

4.2.4 Sampling technique

A purposive sampling technique was used in this research. A total of nine accounting teachers voluntary participated. The purpose of selecting accounting teachers was that they are responsible of learning and teaching of accounting in high school level. According to Alvi (2016:40) a sampling technique is one of the key decisions in the shape of a research. The author categorises sampling techniques as either probability or non-probability. Probability sampling methods are linked with quantitative research where representativeness of the sample for generalisability to the population is key, while non-probability sampling methods are synonymous with qualitative research where the objective is to develop understanding of the population and generate new alternative ideas.

Gentles, Charles, Ploeg, and McKibbon (2015:1772) define sampling under qualitative research as "the selection of specific data sources from which data are collected to address the research objectives". Lapan et al. (2011:253) note that sampling in a case study cannot be randomly selected as it is informed by a specific nature of information required from participants. This means that in a case study, participants are selected based on their understanding of the phenomenon to get in-depth understanding of their perspectives.

When using a purposive sampling, participants are selected deliberately based on their knowledge and experience about the phenomenon (Etikan, Musa, and Alkassim, 2016:02). These authors further mention that such participants should be accessible and willing to participate in the research. Etikan and Bala (2017:215) explain that with purposive sampling the researcher decides who to select as participants based on whether they will provide fruitful information necessary to achieve the research objectives. Hox and Boeije (2005:595) differentiates purposive sampling from probability sampling with that its focus is on construction of samples that are theoretical meaningful rather than statistically representative. Accounting teachers were selected to form a sample for this study. These teachers were teaching accounting in Grades 10 to 12. These participants were selected because they are the ones who can provide rich information about how best to implement computerised accounting as an additional pedagogical tool for accounting curriculum delivery.

Some of the challenges with samples in qualitative research includes getting right to enter the research site or participants or withdrawal since participation is voluntary (Oppong, 2013:206). He suggests good negotiation skills to mitigate withdrawal of participants. The researcher acquired the approval to access the participants in the selected schools from the WCED. Taherdoost (2016:23) notes that the strength of purposive sampling is that it is not time consuming and its best for case study research. However, he poses that it is subjective and not suitable for generalisation.

The education district used in this study was selected conveniently as the researcher reside within it. The sample size consists of nine accounting teachers (one each from 9 school). The nine schools were within the Cape Winelands district which was selected as the research site for this research.

4.2.5 Research site background

The target population of this study were the high school accounting teachers within the Western Cape Province of South Africa. The researcher selected this province because he resides in it and therefore conveniently accessible. The Western Case Education Department (WCED) consists of eight education districts. The Cape Winelands District (CWD) was used as case study unit for this research. This district was conveniently selected because it is in close proximity to the researcher and easily accessible. Schools offering accounting were identified using the DBE matric subject performance report The Figure 4.1 below provides an overview of education districts in the Western Cape Province:

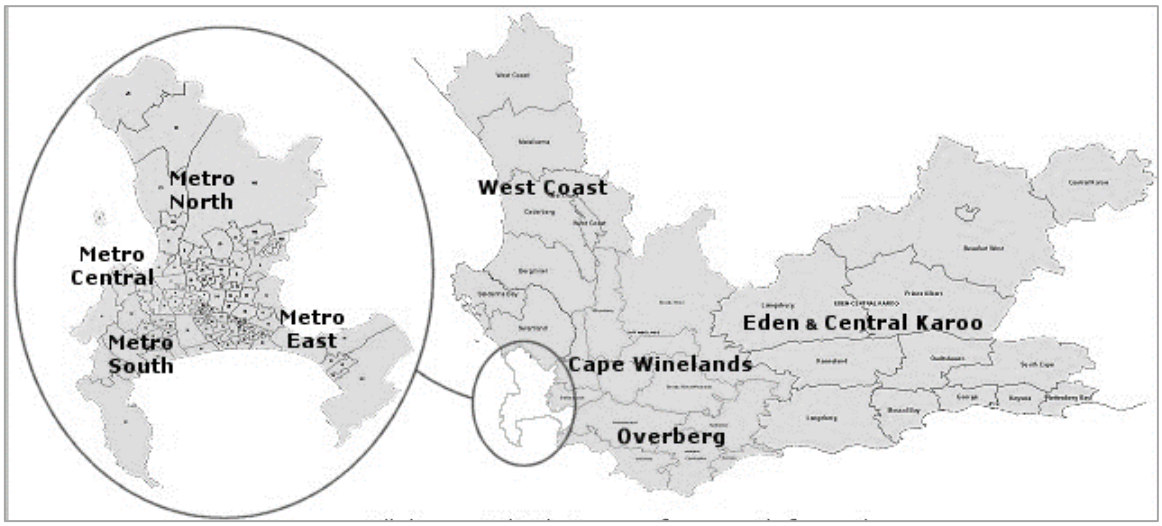

Figure 4.1: Western Cape Education Districts (wcedonline.westerncape.gov.za, 2012)

The CWD is situated in about 30 to 120 minutes' drive from the provincial capital city Cape Town. According to the Goliath (2019: online) the CWD has a total of 324 schools that includes 106 farm schools. He further states that in 2018 the district received first place in the country for grade 12 performance in Mathematics and Physical sciences. According to him the learner to teacher ratio stands at about 34.8 in each classroom.

The CWD accounts for 15.5% grade 12 enrolled accounting learners in the Western Cape province with a registered average pass rate of 79.6% in year 2022 for learners who achieved 30% and above. The grade 12 number of learners in the district decreased by 23.2% (319) from 1 373 in year 2018 to 1 054 in year 2020. However, the decrease in the district is reflective of the provincial decrease in enrolment numbers. The province has enrolled 11.6% (894) less grade 12 learners in accounting in 2022 when compared to the year 2018. The Table 4.1 depicts the number of learners enrolled for grade 12 Accounting and their performance in five years (from year 2018 to year 2022) from the national results to the selected district:

Table 4.1: Accounting performance national, provincial and district (DBE, 2018-2022)

	2018	**2019**	**2020**	**2021**	**2022**
National	90 278	80 110	92 767	105 894	104 798
% Achieved at 30% and above	*72.5%*	*78.4%*	*75.5%*	*74.7%*	*75.4%*
Provincial	7 690	5 766	6 762	7 281	6 796
% Achieved at 30% and above	*75.0%*	*84.3%*	*81.8%*	*80.1%*	*76.6%*
CWD	1 373	933	1 158	1 256	1 054
% Achieved at 30% and above	*76.8%*	*89.2%*	*85.1%*	*79.9%*	*79.6%*

According to Table 4.1 the CWD Grade 12 performance in accounting surpasses that of the province and the national results. The CWD have achieved consistently above 75% pass rate in accounting in the past five years (2018 – 2022). CWD is considered a rural district but its performance in accounting at Grade 12 is of high standard. However, the schools selected were those that are performing well and those that are struggling. The researcher included the analysis of the Grade 12 performance to provide an overview of the number of learners taking accounting in the district.

The schools selected covers those in quintile level 1 up to quintile level 5. The quintile level 1 is those schools in the poorest communities with little resources and are largely financed by government, while those in quintile level 5 are the most resourced schools and largely financed by parents of learners. The variety in terms of quintile levels provided an opportunity to triangulate different perspectives from accounting teachers who are in well-resourced schools from those in schools with little to no resources. The Table 4.2 below provides an overview of quintile levels of the selected schools:

Table 4.2: Quintile levels of the selected schools (DBE, 2020b:627-632)

Quintile levels	**L1**	**L2**	**L3**	**L4**	**L5**
Number of schools	4	0	1	2	2

The quintile level 2 schools that were approached declined to participate in the study. The data collection for this study was during the Covid19 pandemic in year 2021. According to Schafer, (2020: online) this district had confirmed 4 schools to be affected by the pandemic. The affected schools were sanitised and there are strict protocols that are in place from the national and provincial education departments. The researcher was screened on entry at the schools and supplied his contact details during his visits as part of daily protocol followed by schools. The contact details were taken for in case there can be a Covid19 case for the researcher to be traced and be isolated.

4.2.6 Participants profile

The participants of this study were purposively selected. Schools offering accounting were identified using the DBE matric subject performance report. Accounting educators were selected across different quantiles within the CWD in the Western Cape province of South Africa. Two visits were done for each school in the sample. The first visit was to introduce and explain the research project objectives with the school principal and to seek permission to meet the accounting educator and make appointment for the interview. In the first visit

the education department ethical clearance was presented to the school principals. The second visit was the actual interview with the accounting educator.

The Table 4.3 below displays pseudonyms of the participants. The qualifications and experience of the participants is displayed as well. The school quintiles were included as they have implication on the availability of resources or lack thereof:

Table 4.3: Pseudonyms of participants

No.	Participant	Qualification	Teaching Experience	School quintile
1.	Lingomso	B. Education (Honours)	25 years	1
2.	Sunell	Bachelor of Education	09 years	5
3.	Jacqueline	B.Tech CMA* & PGCE**	12 years	4
4.	Yogi	Bachelor of Education	06 years	1
5.	Lwazi	Bachelor of Education	04 years	4
6.	Alupheli	B. Acc*** & PGCE	09 years	1
7.	Thsume	B. Education (Honours)	16 years	1
8.	Jay-mee	Bachelor of Education	03 years	5
9.	Emihle	Bachelor of Education	09 years	3

* *Bachelor of Technology in Cost and Management Accounting*
***Post Graduate Certificate in Education*
*** *Bachelor of Accounting*

4.2.7 Data collection instruments

This section discusses the two data collection tools that were utilised in this study namely: one-on-one interviews and document analysis. The use of the document analysis was to supplement the data collected with the interviews. Additionally, the document analysis assisted immensely in the development of the proposed framework for the integration computerised accounting in high school.

4.2.7.1 Interviews

One-on-one semi-structured interviews have been conducted with nine participants. According to Minhat (2015:213) one-on-one interviews are more advantageous to extract genuine views from the participants as they can freely open up individually than in a group. The purpose of using semi-structured interviews was to obtain rich information and in-depth

understanding of what are the resources available, teachers concerns and how they envisage the integration of computerised accounting into accounting curriculum delivery.

Interviews are defined as “discussions, usually one-on-one between an interviewer and an individual, meant to gather information on a specific set of topics” (Harrell & Bradley, 2009:06). According to Gill, Stewart, Treasure, and Chadwick (2008:292) the main purpose of research interviews is “to explore the views, experiences, beliefs and/or motivations of individuals on specific matters.” They highlight that interviews are instrumental and helpful to acquire deep understanding and insight of a phenomenon. Interviews assist to discover in-depth views, beliefs, perspectives of participants about a specific idea (Boyce & Neale, 2006:03).

Hancock and Algozzine (2017:46) caution that though interviews are useful for acquisition of crucial and relevant information, but they tend consume lots of time to administer, transcribe, and analyse. Alshenqeeti (2014:40) and Minhat (2015:210) mention that the most popular methods of collecting data for qualitative research in social science is through one-on-one interviews and focus group interviews. With one-on-one the researcher interviews one person at a time while focus group interviews the researcher interviews two or more people at the same time and place.

According to Gill et al. (2008:298) there are three types of interviews namely: structured, semi-structured, or unstructured. They explain that structured interviews are conducted with predetermined questions and the researcher cannot pose follow-up questions seeking for more clarity. They praise structured interviews for being straight forward and quick to process. However, they caution that they might not be best to acquire in-depth information. Semi-structured interviews on the other hand use predetermined question but the researcher can ask follow-up questions for more information where responses are unclear. Aksu (2009:203) describes semi-structured interviews as interviews where an interviewer uses pre-set questions but is flexible to provide or seek for more information about unclear questions and responses and can swap questions around.

A set of open-ended questions were asked while other questions emerged during the interviews. Alshenqeeti (2014:40) points out that semi-structured interview is more flexible, and it allows the research to probe the participants for more information where necessary. He suggests that to ensure that interviews provide rich and detailed information, the researcher should assume the role of a listener more that be a speaker. After the acquisition of the ethics clearance the researcher visited the selected schools to meet and make

appointments with their accounting teachers. The dates, times and venues of the interviews were discussed and agreed with the participants based on their availability.

Hawkins (2018:493) notes that though face-to-face interviews were previously more popular, but new technologies have emerged for conducting interviews like emailing, telephonic, videoconferencing etc. He commends these new advances in technology for mitigating geographical barriers and financial constraints versus face-to-face interviews. The interviews were audio recorded. Aksu (2009:205) pose that relying on notes taking only during the interviews impedes the communication flow between the interviewer and the participants. He indicates that note taking delays the interview as the participants from time to time must wait for the researcher to finish writing and some important details might be forgotten. He further cautions that the disadvantage of using an audio recorder in interview sometimes makes participants to be reluctant to express their views freely.

The researcher explained to the participants that there is an additional option of using Microsoft Teams to conduct the interviews. The other advantage of using this virtual technology is that the researcher and the participants do not have to drive to a specific venue thereby saving costs and travelling time. There were two participants who took the option of being interviewed with Microsoft Team. This virtual platform has options to turn off the video and record only the audio. This was necessary to ensure that participants are comfortable during the interviews. The use of one-on-one interviews and virtual meeting platforms assisted in ensuring that participants are as comfortable as possible because the nation is going through a pandemic called Covid-19. Focus group interviews would have threatened they health as there were strict Covid-19 rules to be followed like 1.5 meters social distancing, wearing of masks, and continuous sanitization of hands and venues.

The questions used for the interviews had two sections (see Appendix D). The first section was about general demographical information, and the second section was based on the three research questions. The questions were open-ended to allow participants to expand more and provide detailed information of their experience and views about integration of computerised accounting as an additional pedagogical tool. The Table 4.4 presents the research questions and objectives that were used in this study:

Table 4.4: Research questions and objectives

Main research question What framework can be developed to support the integration of computerised accounting into the high school accounting curriculum?		
Sub-questions		**Objectives**
RQ1.	How can the concerns of accounting teachers towards the integration of computerised accounting into their accounting curriculum delivery be addressed?	To understand the nature of concerns teachers, have regarding integration of computerised accounting into their accounting curriculum delivery and determine their solution.
RQ2.	What resources are needed to integrate computerised accounting into high school accounting curriculum delivery?	To determine what resources (material and human) are needed to enable the integration of computerised accounting into high school accounting curriculum delivery.
RQ3.	How can computerised accounting be integrated into high school accounting curriculum delivery?	To develop a framework (to bridge policy and practice) that can be used to integrate computerised accounting into accounting curriculum delivery at high school level.

4.2.7.2 Document analysis

The intention of collecting data with document analysis was to triangulate and corroborate data from the interviews. Bowen (2009:27) defines document analysis as "a systematic procedure for reviewing and evaluating printed and electronic material". According to Hox (2005:594) document analysis is a secondary qualitative research data set that is useful for investigating policy issues. Curriculum policy documents with curriculum prescripts were collected and analysed. The provincial and national department of education websites were used to download CAPS documents of Grades 7 to 9 EMS and Grades 10 to 12 Accounting (www.education.gov.za). The following five curriculum policy documents were analysed in this study:

1. Department of Basic Education. 2011. National Curriculum and Assessment Policy Statement (CAPS): Senior Phase Grades 7-9. Economic and Management Sciences.
2. Department of Basic Education. 2011. National Curriculum and Assessment Policy Statement (CAPS): Further Education and Training Phase Grades 10-12. Accounting.
3. Department of Basic Education. 2019. FET Grade 10-11 CAPS Amendments.

4. Department of Basic Education. 2019. GET Grade 7-9 CAPS Amendments.
5. Department of Basic Education. 2020. Abridged Section 4 Grade 12 CAPS Amendments.

These curriculum documents are developed by the DBE for all the public schools in SA. The CAPS documents were fruitful in providing high school accounting context and historical insight of how accounting topics are covered in high schools. They helped in providing understanding of what the high school computerised accounting manual should include in terms of the prescribed topics. Additionally, the manner that these topics are assessed was scrutinised. According to Yin (2012:04) it is critical for the case study research to scrutinise the contextual conditions of case to develop proper meaning of a phenomenon. EMS and accounting textbooks for Grades 7 to 12 were collected to understand how the topics prescribed by the curriculum are presented manually.

Three different computerised accounting manuals were analysed. These manuals were for SAP, JD Edwards, and Pastel that the author used when he was trained these different computerised accounting systems. The manuals provide step-by-step procedures of how accounting is applied in computerised accounting systems. Comparison between how accounting topics is taught manually using textbooks versus how they are processed with a computerised accounting systems was made to develop a framework. The analysis and comparison of curriculum documents, accounting textbooks, and computerised accounting manuals assisted in understanding how computerised accounting can be integrated into regular curriculum. These documents were selected because they contain related to accounting in high school facilitated the development of the framework to integrate computerised accounting. The findings from the analysis of these documents facilitated decisions for the development of the framework.

The research design followed in this study is summarised in a Figure 4.2 below. The figure illustrates graphically the research design that guided the researcher to investigate the stated phenomenon. It provides an overview of the research direction of this study from the research paradigm selected to the data collection instruments used:

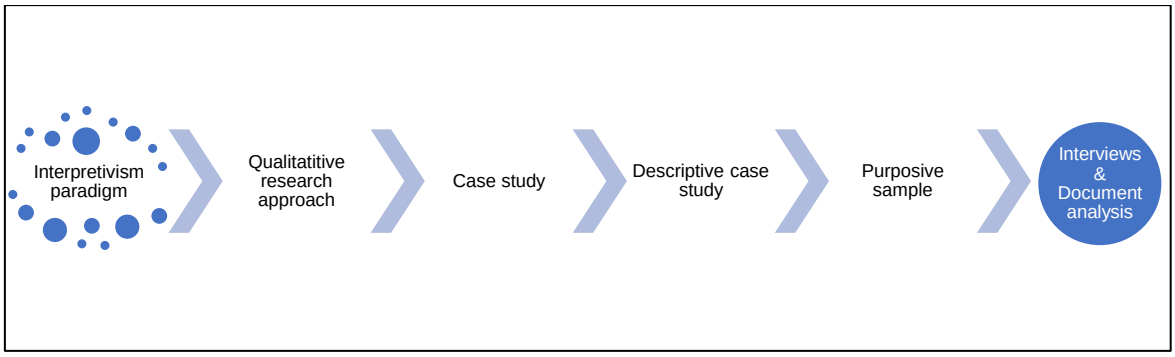

Figure 4.2: Research design direction guide overview

4.3 Data analysis

Data analysis in qualitative research is not simple due to the absence of numerical values (Feza, 2015:458). She asserts that data analysis is about withdrawing meaning from the collected data. According to Lapan et al. (2011:263) data analysis goal is to make sense of the data collected by pulling it apart to smaller pieces. De Casterle, Gastmans, Bryon, and Danier (2012:362) contend that data analysis process is often very complex for researchers as it results in voluminous data which can be difficult to comprehend. Castleberry and Nolen (2018:808) note that data analysis process in qualitative research embodies five steps namely: compiling, disassembling, reassembling, interpreting and concluding. The Table 4.5 below provides the meaning of these steps:

Table 4.5: Qualitative research data analysis process steps (Castleberry & Nolen, 2018:808-812)

Analysis step	Explanation
Compiling	*Transcribing* – Transforming audio or video recordings to be in written form.
Disassembling	*Coding* – Involves taking the data apart and creating meaningful groupings
Reassembling	*Thematic analysis* – Mapping codes and categories and put them in context to create themes
Interpreting	*Analytical meaning* – Involves the researcher making analytical conclusions from the data presented as codes and then themes.
Concluding	Conclusions are the response to the research questions or purpose of the study

Onwuegbuzie, Leech, and Collins (2012:24) conclude that there are five qualitative data analysis techniques that are suitable for research synthesis: constant comparison analysis, domain analysis, taxonomic analysis, componential analysis, and thematic analysis etc. Thematic analysis was the technique selected and used in this research. Castleberry and Nolen (2018:808) claim that thematic analysis is the most relevant and commonly used data analysis technique for qualitative research. According to Onwuegbuzie et al. (2012:12)

thematic analysis "involves a search for relationships among domains, as well as a search for how these relationships are linked to the overall cultural context." Feza (2015:462) notes that the purpose of using thematic analysis is to determine popular themes in the data for interpretation. The Figure 4.3 below demonstrates the manual process steps for manual data analysis according to Feza:

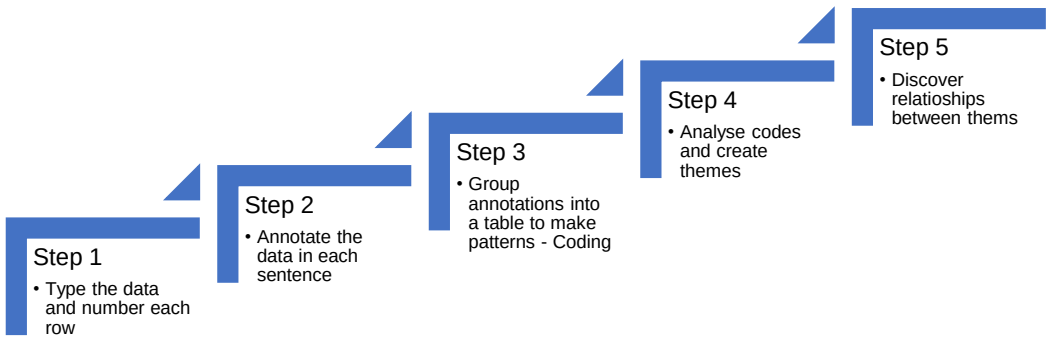

Figure 4.3: Manual data analysis process (Feza, 2015:462-463)

Feza (2015:468) cautions that using the manual process for data analysis is inefficient and time consuming versus the use of software such as ATLAS.ti, MAXQDA, NVIVO etc. These data analysis software programs simplify the entire data analysis process with clear audit trail of how the analysis was done. Creswell (2012:243) suggests ATLAS.ti highlighting its ability to create networks for connecting data for better analysis, and praises it as the quickest for searching, retrieving, and browsing through the data. Newcomer et al. (2010:452) concur with Creswell that Computer Assisted Qualitative Data Analysis Software (CAQDAS) improves the quality of analysis posing that they help to "link data, code data, annotate the data, produce maps or network diagrams". Casterle et al. (2012:362) warns against over-reliance on software packagers as they cannot understand text.

The CAQDAS that was used for data analysis was Atlas.ti, The audio-tape recordings and video-recorded interviews were transcribed verbatim. The interview transcripts were entered into it for thematic coding and for thematic analysis. Creswell (2012:243) suggests Atlas.ti highlighting its ability to create networks for connecting data for better analysis, and it is quicker for searching, retrieving and browsing through the data. Both deductive and inductive coding approaches were applied in this study. Du Plooy-Cilliers et al. (2014) describe deductive coding as where a researcher uses a list of known or anticipated themes while with inductive coding approach the researcher allows the themes to emerge throughout when scrutinizing the text. The Atlas.ti software was used to create networks

and links of the identified themes to form a basis for the interpretation of the findings. The researcher additionally made comparisons of literature and the findings.

The researcher is fully trained on how to import transcripts into ATLAS.ti and how to create codes, themes and data networks using the software. Professional service provider with dedicated transcribing computer software and experience was sourced. Castleberry and Nolen (2018:808) encourage use of transcription service noting that it saves time as an audio of few minutes can take several hours to transform to text. Upon receipt of the transcripts, they were imported into ATLAS.ti software for coding and thematic analysis.

Houghton, Murphy, Shaw, and Casey (2015:10) define coding as an assignment of descriptive or conceptual labels to data. Coding involves marking of sentences and phrases according to how the researcher describes them. Both deductive and inductive coding approaches will be applied in this study. Du Plooy-Cilliers et al. (2014) explain that deductive coding is where a researcher uses a list of known or anticipated themes while with inductive coding approach the researcher allows the themes to emerge throughout when scrutinizing the text. Casterle et al. (2012:362) discourage the use of only deductive coding posing that it often results to loss of potential richness of data.

The Microsoft Word files with transcripts were uploaded into qualitative data analysis computer software package called ATLAS.ti which was used for creating networks and links of the identified themes to form a basis for the interpretation of the results. The researcher made comparisons between literature and the findings. The construction of codes and themes were first based on the research questions and then according to the data findings transcripts that were uploaded into ATLAS.ti software. The researcher followed the advice by Houghton et al. (2015:10) to simplify the coding process by creating pre-list of codes based on research questions. The networks were done by connecting codes that were similar to certain themes in terms of their relationships.

Textual analysis was used to analyse these documents to understand their meaning. De Vos, Strydom, Fouche, and Delport (2011:381) note that textual analysis associated with qualitative research as its focus is on interpreting the meaning of data from the documents rather than quantifying the frequency as in content analysis. Research questions that were used to analyse these documents were as follows:

1. What are the accounting topics covered in high school?
2. How are the accounting topics presented for learning and teaching in textbooks?

3. How are these topics presented for training in the computerised accounting systems manuals?
4. How are these topics assessed?

The above questions link up with the third research sub-question that sought to understand how can computerised accounting be integrated into high school accounting curriculum delivery? De Vos et al. (2011:381) state that the first practical step to analyse documents is to formulate research questions that serve as investigative angles and basis for analysis. After reading these documents notes were created and themes were developed for a comprehensive comparison. Lastly, a reflection report was written as findings.

4.4 Trustworthiness

This section discusses how qualitative research is evaluated in terms of its quality and how quality has been maintained in this study under the term trustworthiness. According to Shufutinsky (2020:56) qualitative research is often unfairly criticised that it lacks rigor, credibility and therefore biased. The author poses that judging qualitative research using criterion of quantitative research such as repeatability and replicability is misplaced. Terminology and criteria to evaluate quality of qualitative research slightly differ though the main goal is similar in terms of ensuring that a study maintains high quality levels. Rahman (2017:105) cautions that policymakers tend to undermine qualitative research results since they are not representative of the entire population and therefore, cannot be generalised. However, According to Brantlinger et al. (2005:203) defend qualitative research that its primary objective is not to generalise but to construct scientific evidence based on the examination of participants' specific context. Similarly, Noble and Smith (2015:34) highlight that qualitative research cannot be evaluated in a similar manner to quantitative research while philosophical stance and aims are different. Therefore, terms like validity, reliability and generalisability are viewed differently. The Table 4.6 below illustrates the alternative terminology used to evaluate credibility of qualitative research versus that of quantitative research:

Table 4.6: Terminology and criteria used to evaluate the credibility of research findings (Noble & Smith, 2015:34)

Quantitative research terms	Alternative qualitative research
Validity - The precision in which the findings accurately reflect the data	*Truth value* - Recognises that multiple realities exist; the researchers' outline personal experiences and viewpoints that

	may have resulted in methodological bias; clearly and accurately presents participants' perspectives.
Reliability - The consistency of the analytical procedures, including accounting for personal and research method biases that may have influenced the findings.	*Consistency* - Relates to the 'trustworthiness' by which the methods have been undertaken and is dependent on the researcher maintaining a 'decision-trail'; that is, the researcher's decisions are clear and transparent. Ultimately an independent researcher should be able to arrive at similar or comparable findings. *Neutrality (or confirmability)* - Achieved when truth value, consistency and applicability have been addressed. Centres on acknowledging the complexity of prolonged engagement with participants and that the methods undertaken, and findings are intrinsically linked to the researchers' philosophical position, experiences and perspectives. These should be accounted for and differentiated from participants' accounts.
Generalisability - The transferability of the findings to other settings and applicability in other contexts.	Applicability - Consideration is given to whether findings can be applied to other contexts, settings or groups.

Terms such as validity and reliability apply in qualitative research however, they are applied differently with other terms. In qualitative research these terms are assessed under a broad term called trustworthiness. Elo, Kääriäinen, Kanste, Pölkki, Utriainen, and Kyngäs (2014:02) concur by saying that validity and reliability apply in both qualitative and quantitative research though in qualitative research they fall under the term credibility. They pose that trustworthiness is about assessing whether the study is valuable enough to deserve attention. This is why Lemon and Hayes (2020:605) breaks down trustworthiness into five strategies that are interdependent and intertwined namely: credibility, dependability, confirmability, transferability, and authenticity. The following paragraphs discuss these measures.

Another aspect of trustworthy is credibility, which Newcomer et al. (2010:558) refer to as an evaluation of whether the results of the study are believable and legitimate. This is emphasised further by Amankwaa (2016:121) who views credibility as the level of confidence and trust that can be put on the results of the study. The author further points out that one of the techniques that can be used to ascertain if the study is credible, is to use member checking technique. It is suggested that this should take place after the researcher analysed data and interpreted the findings, then send the report to the participants. This was done to give an opportunity to the participants to confirm whether the conclusions made in the report truly reflected their views.

The researcher went on to consider dependability which literature touts as very important. Lemon and Hayes (2020:605) opine that credibility cannot exist without dependability.

According to dependability is the substitute of reliability and it is about uniqueness of results in respect of specific time and place. Cope (2014:89) states that the study is dependable if the findings can be replicated when applied in similar conditions and participants. According to Amankwaa (2016:122) dependability is about evaluating accuracy of results and the supporting data. Connelly (2016:435) concurs with Lemon and Hayes that dependability is like reliability in quantitative research. She states that it is about the stability of findings over time and conditions. The key question regarding dependability is whether the results would be replicated if similar participants in a similar context are probed. Therefore, it is important to ensure that findings of the study are neutral and have high level of potential consistency.

Confirmability is about showing how the interpretations and conclusions were made (Cope, 2014:89). The researcher should clearly demonstrate that he was not biased in reporting responses from participants. Therefore, the results should be moulded and directly linked to the views of the participants rather the researchers' interests. To achieve this the researcher used direct quotes from the interviews as a basis for his interpretations and conclusions. Amankwaa (2016:122) suggests that availability of audit trail assists in ensuring confirmability and transparency of qualitative research.

To determine whether the findings of the study can be transferable there should be a detailed description of a phenomenon (Amankwaa, 2016:122). Transferability is about determining whether the findings of the study can be applied to other settings. According to Connely (2016:436) transferability is equivalent to generalisability in quantitative research though it is not statistically based. Hallberg (2013:01) posit that it is imperative that the findings of the study should apply in other settings with similar selection criteria and circumstances.

Authenticity is one of the important strategies of evaluating trustworthiness of a study (Lemon & Hayes, 2020:605). According to Cope (2014:89) authenticity refers to the faithful manner in which a researcher presents the emotions and feelings of participants. Connelly (2016:436) states that authenticity does not apply in quantitative research, and it is the strength of qualitative research. The author further explains that authenticity can be addressed through selection of relevant participants who have thorough understanding about the spectacle under investigation. The use of direct quotes and detailed description of emotions and feelings of participants addresses the authenticity evaluation criteria (Cope, 2014:89). The researcher thoroughly defined the emotions and feelings of accounting teachers regarding integration of computerised accounting into the high school accounting curriculum delivery.

Trustworthiness of qualitative research should apply during data collection, data analysis, and data presentation (Elo et al.,2014:02). The authors highlight that the key questions that should be posed to test if the research is trustworthy in respect of data collection stage are whether the data has been collected with instruments that will assist to sufficiently respond to the research question and whether the sampling strategy used is appropriate. The researcher used semi-structured interviews to collect data for this research, that gave him an opportunity to ask open-ended questions that were linked to the main research question. Semi-structured interviews allowed him to probe participants for more information where responses were not clear enough. The researcher did not manipulate or lead the participants to respond in a certain way and he gave them an opportunity to tell what else they think are important to integrate computerised accounting into accounting curriculum delivery.

Multi data sources that includes accounting teachers, subject adviser, and provincial accounting head were used in this research. Lapan et al. (2011:251) emphasize that it is critical for a case study researcher to use multiple sources to gather information to enhance trustworthiness through triangulation. The data was collected using two collection methods namely: one-to-one interviews, and document analysis to perform triangulation. Descriptions and themes from the different data collection methods were compared ensuring that they support each other. The researcher triangulated the results from accounting teachers with that of subject advisers and provincial subject head. The purpose of triangulation according to Lemon and Hayes (2020:606) is “to identify inconsistencies or breaks in emergent patterns in the findings that can lead to deeper understanding of the phenomenon.” Triangulation is not limited to only different methods of data collection but extends to multiple sources of data.

In a different context, Brantlinger et al. (2005:198) defend the purported subjectivity of qualitative researchers that to circumvent biasness of their research they become explicit about their personal stance and views. They pose that to ensure credibility of their research qualitative researchers use triangulation and afford research participants an opportunity to read and confirm accuracy or imprecisions of transcriptions before and after data analysis and interpretation is done. The CAQDAS called ATLAS.ti that was used to analyse data in this study enhanced trustworthiness of this research. Sinkovics and Alfoldi (2012:827) highlight that though qualitative research often criticised due to lack of rigor but the use of CAQDAS curb such criticism due to its provision of transparency and auditable footprint. These authors further praise the use of CAQDAS that its comprehensive and systematic

audit trail provides strong basis of defence and improves the quality of qualitative research. Most of the above stated strategies of evaluating trustworthiness of qualitative research require audit trail of the processes followed by the researcher to arrive at the conclusions. ATLAS.ti assisted in providing audit trail of the systematic process used to analyse and arrive at the conclusions.

The data was collected using two collection methods namely: one-to-one interviews, and document analysis in order to perform triangulation. Descriptions and themes from the different data collection methods was compared to test if they supported each other. During the interview meeting with participants, they were encouraged to respond freely and as honest as they possibly can. The participants were afforded an opportunity to review and confirm that the transcriptions true reflected their views. In order to ensure credibility of this study, the participants were given the findings to read and check accuracy. Creswell (2012:259) considers this as member checking noting that it's a process whereby the researcher gives one or two study participants the findings and ask them to make a report.

4.5 Ethical considerations

Research based on human beings require careful ethical considerations versus that of objects (Van Deventer, 2009:45). He emphasizes that research participants' integrity should be protected at all costs. Therefore, research participation must not be compulsory and that the researchers should not encroach the rights of participants but rather protect their integrity. He further states that it is unethical for the researcher to distort, falsify or misinterpret the responses of the participants. Lindorff (2010:53) poses that the principle of justice should be maintain in the research process and that researchers should respect participants. Furthermore, she states that research results should not promote social inequality. This section discusses the researcher's efforts and undertakings followed to ensure that the rights of this research's participants are protected and that they do not feel coerced to participate. The researcher outlines measures taken to prove that the interpretation of results was not falsified in any manner. Granted permissions, consents, confidentiality, honesty are some of the terms discussed below.

The first step taken was to apply within the university where the researcher is registered in for ethical clearance to conduct a study. A dedicated ethics committee composed of experienced research scholars scrutinized the researcher's application to ensure that due process is in place to protect participants' rights, dignity, and reputation. O'Reilly, Dixon-

Woods, Angell, Ashcroft, and Bryman (2009:246) note that the main responsibility of the research ethics committee is to adjudicate if ethical standards are followed in a research project and make researchers accountable. They state that research ethics committees' reviews confirm quality of research projects as thoughtful deliberations take place to scrutinize if participants are not exposed in any harm. The ethics application and process took for about four months with communication between the researcher and the ethics committee. After the institutional ethics committee was satisfied that the researcher has considered all elements of the research that might interfere or be encroaching with the participants' rights, an approval was granted. The researcher was issued with an ethics clearance certificate (see Appendix A).

After the acquisition of the ethics clearance certificate from his university, the researcher approached the provincial department of education for a permission to conduct research in the selected district. An application form was filled and submitted including the research proposal and proposed interview questions. The department gave permission to the researcher and a letter to be presented at the selected schools to access them. The ethics clearance is attached at the end of this thesis, the department permission letter (see Appendix B) has been attached. The names of the schools visited has been removed to ensure that anonymity of participants is not jeopardized.

The researcher first visited the selected schools to go and set up interview appointments with the participants. The purpose of the visit was to make the participants aware about the objectives of the study and what is expected from them as participants. During this first visit the rights of participants and that their participation in the study is voluntary including the right to withdraw at any stage of the study was thoroughly explained. The period between the first visit and the date of appointment was meant to give participants sufficient time to decide if they really want to partake in the study, thereby ensuring that the risk of coercion is limited or even eliminated.

There are no power relations between the researcher and the participants therefore that diffused the feeling of being coerced to participate in the study. There were no financial incentives or gifts offered and given to participants for their involvement in this study. The researcher explained to the participants how confidentiality was processed. The researcher used pseudonyms to protect the identity of the participants and schools are referred as School 1, School 2 etc. Referencing schools in this manner makes it impossible to trace and link participants to their schools. Therefore, verbatim quotes cannot be linked any of the participants or their schools. Fleming and Zegwaard (2018:211) highlight that there is a

tendency among researchers to use the term confidentiality and anonymity synonymously while they are significantly different. They explain that anonymity means that the researcher does not know the participants while with confidentiality the researcher knows the participants' identity however, he/she hides it in the data collected. The researcher de-identified the participants in the data analysis and reporting.

The researcher explained to the participants that he is going to use the audio tape to record the interviews. He elucidated that the purpose of using the audio tape is to ensure that the views and opinions of the participants are not misinterpreted. In addition to that the participants were given an opportunity to read and confirm if their views we presented and report in a manner that truly reflected what they meant.

For the interviews with teachers the researcher presented the ethical clearance letter from the education department to the school principals and ask for their oral permission to conduct research at their schools. The accounting teacher as participants of this study were asked to sign a consent form prior the commencement of the interviews. The information on the consent form included the objective of the study, the right to withdraw from the study at any time, understanding that participation is voluntary etc. The signing of the consent form was to confirm that the participants understood what was expected from them and that they understand that their right to withdraw at any stage of the process. It was explained to participants that it is not binding them to anything but rather serve as a proof that they participated in the study freely and voluntary with understanding of what it entails. The consent form signed by participants has been attached as Appendix C.

The confidentiality of the participants was guaranteed to them. It was explained to them that instead of their original names, pseudonyms were going to be used. It was explained to the participants that their identity will be concealed and will not appear in the thesis and journal publication. The researcher explained to the participants that their participation to the research was voluntary, and it was acceptable for them withdraw from the study should they wish to. The ethical clearance certificates are attached in the end of this thesis (see appendix A and B). The responses of the participants have been entered and stored in a password encrypted computer to ensure confidentiality of the interaction with the participants.

Ethical considerations made in this research were not limited to those concerning participant only but extended to other researchers. All the literature collected were accredited and cited to the contributors. Khan (2016:02) poses that ethical considerations in education field are

concerned with plagiarism. According to Khan plagiarism is the lack of proper citation and references of other researchers' intellectual work used in a study. He stresses that academic integrity and honesty in research provides value as the findings and recommendations of a study might inform changes in curriculum. The researcher used Harvard referencing method to cite and reference other scholars' work in this study. This method of referencing is in accordance with the strict Cape Peninsula University of Technology (CPUT) research standards and code of conduct. This was maintained throughout the research process. In summary regarding ethics, the researcher can fully confirm that he conducted this research in a professional and moral manner.

4.6 Summary

This chapter provided information in respect of the research design selected. The selections made were justified using literature. The basis of aligning it under interpretivism paradigm and as qualitative research was explained. Furthermore, it discussed how the data was collected and analysed. A brief background of the selected district as the case study unit was provided. Trustworthiness of the study and ethical considerations followed were outlined as well. The next chapter will provide an analysis and interpretation of the findings from the data collected.

CHAPTER FIVE

TEACHERS' VIEWS ON INTEGRATION OF COMPUTERISED ACCOUNTING

5.1 Introduction

The previous chapter discussed the research design and the methodology applied in this research. Details of how the sample was selected and the methods used to collect and analyse data were provided. This chapter presents the data together with an analysis and findings of the study based on the research questions and objectives of the study. The aim was to develop a framework for the integration of computerised accounting for high school implementation. This was achieved by collecting data regarding teachers' perceptions and ideas about the integration of computerised accounting and an analysis of the related documents.

There were three sub-research questions used to answer the main research question that seek to determine and develop a framework that can be used to support the integration of computerised accounting into high school accounting curriculum delivery. The three sub questions were as follows:

1. How can the concerns of accounting teachers towards integration of computerised accounting into their accounting curriculum delivery be addressed?
2. What are the resources needed to integrate computerised accounting into high school accounting curriculum delivery?
3. How can computerised accounting be integrated into high school accounting curriculum delivery?

These questions were refined by the conceptual framework and the literature review conducted regarding the integration of technology into curriculum. The empirical findings of this research were discovered through the collection of data using semi-structured interviews that were recorded. A total nine interviews were conducted in this study and two of the interviews were done virtually using Microsoft Teams (MS Teams). This was due to the covid-19 pandemic that broke out between the years 2020 until 2022, and the consequential government lockdown rules that were enforced to limit the spread of the

pandemic. Audio recordings were then transcribed and uploaded on Atlas.ti software for coding and thematic analysis.

This chapter presents the following five broad themes as revealed through data collection:

1. Teachers' concerns about status of accounting subject at school level
2. Teachers' concerns about integration of computerised accounting
3. Implications of integrating computerised accounting
4. Benefits of the integrating computerised accounting
5. Barriers of integrating computerised accounting

5.2 Teachers' concerns about status of accounting subject at school level

The following sections identified from the data collected the concerns of accounting teachers regarding the status of accounting subject in high school.

5.2.1 Poor foundation in grades 7 to 9

In the South African context accounting in schools is introduced as the financial literacy module, one of the three modules under a subject called Economic and Management Sciences (EMS) in grades 7 to 9. Learners have an option to choose pure accounting as a standalone subject in grades 10 to 12. Data revealed that under EMS the financial literacy module that represents accounting is not being properly introduced which appears to result in learners not to choose accounting as an elective in grade 10 towards their final school leaving qualification. Teachers reported the EMS teachers tend to focus more on other EMS modules namely Entrepreneurship and Economy. Lwazi stated that:

> There is less focus on accounting in grades 7 to 10 and that denies learners a proper foundation of accounting such that they do not choose to continue with it in grade 10 or choose it and drop it before grade 12… some of the teachers that teach EMS have no accounting background and they avoid the financial literacy module. It becomes better in schools where the financial literacy is being taught separately by an accounting teacher.

The data highlighted that in grades 7 to 9 the EMS teachers are not properly capacitated to teach the financial literacy module hence they put minimum effort in ensuring that learners understand the module. The data pointed some EMS teachers had no background knowledge of accounting. Learners do not perform well in the financial literacy module and this could be a contributing factor to them not choosing accounting in grade 10. Teachers

noted that some of the learners who choose accounting in grade 10 fail to cope with the level of accounting knowledge and skills expected from them in grade 10 such that they end up dropping it within one year.

The finding of this study is consistent with that of Schreuder (2014) who noted that EMS is being taught by teachers who are insufficiently qualified to teach it. It would appear from this finding that a less than good grounding in the fundamentals of accounting contributes negatively to learners' decisions about choosing accounting for further study. The weak foundation, according to the data, could be attributed to the varying knowledge and skills levels of teachers teaching EMS at schools.

5.2.2 Use of outdated accounting textbooks

The teachers raised the fact that some of the textbooks that they use in schools are outdated with accounting terminology that is no longer used in accounting and with no exam type questions. This means that learners are not being properly prepared for examinations and that is one of the reasons learners' academic performance in accounting is low. Lingomso noted that:

> In university I was told long time ago that the term 'trading stock' was substituted with the term 'inventory' under International Financial Reporting Standards (IFRSs) as it was identified that it creates confusion as stock is also known as shares. But when I got a job here to teach accounting the textbooks were still using trading stock and my mentor teacher said I must use the terms in the textbook and forget about university. The financial statement terms like income statements and balance sheet are the terms no longer used in accounting and there are new names of financial statements.

According to the data the teachers stated that they are supposed to order and buy only the textbooks that are listed and approved by the department of education. Although some of these textbooks conforms with CAPS requirements however the accounting terminology in them is not as per accounting standards as prescribed by IFRSs. As accounting is a global business language it is being updated on an annual basis to ensure that the terms being used are understandable and the financial information is comparable across different nations. In support of outdated terminology Yogi commented that:

> We still talk of cheques and cheque counterfoil in high school whereas the use of cheques in South Africa was stopped in year 2020 due to their labour intensiveness and frauds being committed using them. Businesses these days use Electronic Fund Transfers (EFT) for their business transactions.

The accounting teachers need to continuously find ways of updating their knowledge to ensure that they keep up with the latest developments in the accounting subject. The above comment from teachers point squarely to a serious flaw in the textbook vetting and approval system controlled by the DBE. Textbooks with terminology not correctly aligned with the DBE examination requirements and indeed IFRS accounting standards have the potential of severely diminishing the quality of accounting education in South African schools. The knock-on effect is a cadre of learners ill prepared for the world of accounting work.

5.2.3 Old teaching methods

The accounting teachers indicated that the teaching methods they use in schools are outdated with little or no adaptions with the current times. It was identified that teachers still rely on only the textbook, chalk, and greenboard/whiteboard as their teaching media to deliver the curriculum. The data revealed that teachers recognise that the teaching methods they use are not creative and flexible to accommodate the current generation of learners hence learners view accounting as uninteresting, difficult and drop it before they reach grade 10 in high school. It was further noted that the accounting teaching is not learner-centred and that experienced accounting teachers are not willing to adjust their methods of delivering the curriculum. Thsume, one of the experienced teachers noted that:

> The current teaching is teacher-orientated and less focussed on learners. Our teaching is not advanced and integrating new methods of curriculum delivery. It is the same old textbook-based teaching.

Data exposed that the old method of teaching by using the textbook and writing on the board does not ignite enthusiasm and interest of learners. According to the participants the use of technology in classroom is highly favoured by learners, and a raw lesson without technology use is regarded as boring and uninteresting. The possibility exist that learners may believe that accounting is boring rather than understanding that the teaching methods applied by the teacher are killing the subject. Use of technology in classroom afford learners to opportunities to actively participate in the lesson rather than depend on the teacher. Lwazi noted that when lessons are driven by technology, learners become inquisitive and curious to learn. He stated that:

> You see, what I've noticed is that when you teach by just taking a textbook and stand there and do calculations. Some learners get interested and some not, but then the moment you start your introduction of a lesson using a different method like using a computer, all learners get more interested because they want to know what is going to happen next.

According to this Lwazi's statement it seems that teachers do recognise that learners respond better when modern pedagogies involving technology versus when using the old teaching methods. However, despite this recognition they continue with the old teaching methods, this might be due to the pressure to complete the curriculum, or they are not properly equipped to evolve with the technologically based pedagogies. This links up with the need to assess the available teacher development strategies as well as curriculum policy directives that might be static.

5.2.4 Irrelevance of accounting to real-world

The teachers specified that the accounting subject is not linked to the real-world business practices. Learners are struggling to relate it to their daily life experience. It was stated that in some instances in school the focus is too heavy on things that are not being practiced in real business. The data highlighted that too much time is being spent on things that do not matter rather than the important ones. Jacqueline stated that:

> In comparison with what is done in the workplace, I feel like accounting is overrated in school. Learners are given too much unnecessary information. You find out when you go to workplace you don't need such information. Hence, I feel like the amount of information being given to learners at a school level is too much. And sometimes they put so much emphasis on the information that does not really matter whereas they could have used that time on to focus on important things.

The accounting teachers highlighted that some the process steps they are teaching in accounting are automated in the real-world using technology. They add that the way they teach certain topics is completely irrelevant in the workplace as they are automated. This means the curriculum might not be properly designed to cover the workplace requirements and that the learners are being ill prepared for the real-world.

5.2.5 Poor academic performance

The teachers registered their concern about the poor academic performance of learners in accounting. According to them poor academic performance of learners in accounting is caused by the above four findings (poor foundation in grades 7 to 9; use of outdated textbooks; old teaching methods; irrelevance of accounting to the real-world). Their concern is evidenced in the DBE (2022) national senior certificate examination results report. The report displays a high pass rate of 75.4% on the learner's achievement of 30% and above category. However, when one drills the results down only 51.8% of learners that pass

accounting with 40% and above and 5 out of the 9 South African provinces are below the 50% at the 40% and above category. Lingomso reported that:

> Sometimes, we as accounting teachers are accused of the poor academic performance in accounting. We teach accounting the same way we were taught it thousand years ago, not considering that times have changed, and the calibre of learners has changed. As a teacher you feel when your learners are losing interest on your subject, but most of the time we do not change how we teach to entice our learners to love accounting.

The poor academic performance of learners in accounting appears to be a combination of factors as reported by teachers during the interviews.

5.2.6 Diminishing numbers of accounting learners

According to the views of the participants, their concerns regarding the curricular, teaching methods, baseline grounding, their own knowledge and skills stand as major reasons for the diminishing number of accounting learners. The data confirmed what was pointed out in the literature review of this research that accounting in becoming unpopular with learners in high school. The accounting teachers are concerned that this continuous decline of learners taking accounting in grades 10 to 12 will influence their employment as they will not have work if accounting is phased out in their schools. They pointed out that they know schools that phased out accounting and that the accounting teachers had to be placed in other schools or relearn to teach other subjects that they are not properly qualified to teach. Thsume noted that:

> Last year in my grade 12 accounting class I had 17 learners and this year I'm having just 11 learners, and I don't know what will happen next year. But the reality is that I use to have more than 70 learners doing accounting in my grade 12 and having two class groups.

The fading picture highlighted in the data above is noticeable even at a provincial level. According to DBE (2022) Northern Cape province had only 1152 learners writing accounting in grade 12 in year 2022. This is only 1.1% of the total 104 798 of accounting students that wrote accounting in year 2022 nationally. This means accounting is dying in the entire Northern Cape province. The Western Cape province accounts to only 6.5% of grade 12 learners enrolled for accounting this decreased from 6.9% (7 281/105 894) in year 2021. Teachers might need to understand that they have power to attract learners to take accounting. They need to review the subject content and the methods of teaching and ensure that they are align to the industry needs. The overview of findings discovered about

the concerns of accounting teachers regarding the status of accounting subject at high school level were demonstrated in this section. The Figure 5.1 above provides a graphical summary of the concerns pointed out by accounting teachers regarding the status of accounting at a school level.

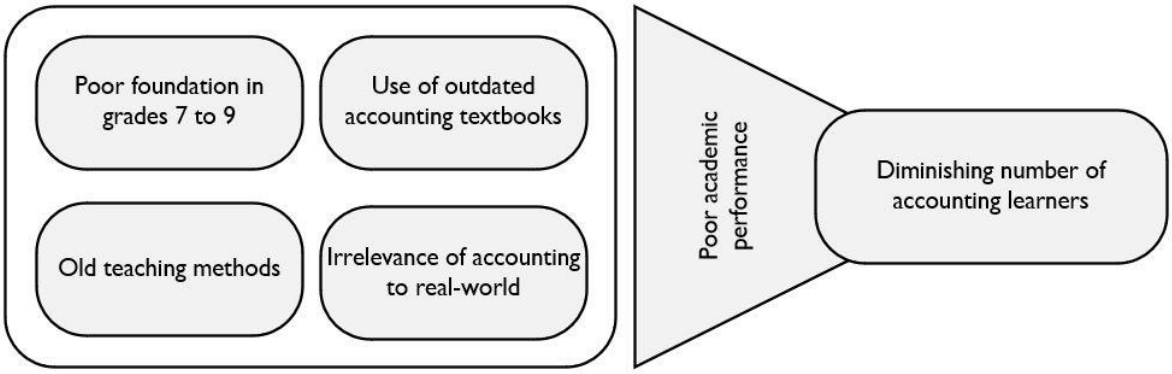

Figure 5.1: Concerns about the status of accounting subject at school level

The Figure 5.1 shows how poor foundation of accounting introduction in Grades 7 to 9, use of outdated accounting textbooks, old teaching methods and irrelevance of accounting education to the real-world possibly results in poor academic performance and thereby diminishes the number of learners taking accounting as a subject.

5.3 Teachers' concerns about integration of computerised accounting

This section provides the following themes emerged as concerns regarding the integration of computerised accounting:

1. Lack of background knowledge
2. Assessment inequalities
3. Unavailability of resources and lack of funding
4. Safety of resources

These concerns continue to link and emerge as barriers of integrating computerised accounting under Section 5.6.

5.3.1 Lack of background knowledge

The data uncovered that computerised accounting will be doing everything for the learners such that they do not see a need to understand the background knowledge that backs each processing step in accounting. One teacher Alupheli stated that:

> Computerised accounting does everything for you. You see in school we struggle teaching learners things that they will never ever do… because all these things like amortisation table and trying to workout interest, depreciation etc. These are all done for you, all you need to do is to enter few obvious information and the accounting system will process everything for you in a second.

Another teacher Jacqueline stated that with computerised accounting system there is no need for accounting knowledge as it performs all the accounting cycle steps. Teachers became concerned that computerised accounting might yield lazy learners as it will be doing accounting for them. Yet Sunell stated that:

> They are not going to understand the logic behind certain accounting process steps … because with computerised accounting they do not have to understand them… they do not have to analyse transactions because with accounting systems they simply need to record the transaction and the computer does everything else… they won't need to understand reasoning behind the treatment of transactions.

Based on these concerns, the data highlighted that teachers prefer that the integration of computerised accounting be used as an additional pedagogical tool rather than the only accounting teaching tool. They believe that the theoretical background knowledge provided by manual accounting is still important for learners. The teachers still maintain the need for the continuation of teaching manual accounting stating that it shows learners a step-by-step process of how the output in the form of financial reports was created. Teachers seem to understand that there is a need to align accounting education to real-world accounting practices. However, they still value the need for background knowledge of how calculations occur in the background of computerised accounting. This means that teachers are more in tandem with a combination of manual accounting and computerised accounting.

5.3.2 Assessments inequalities

The teachers raised that the integration might expose inequalities when it comes to assessing attainment of outcomes. They highlighted the issue of ensuring that learners who

are based in poor resourced schools are protected from unfair assessment. Teachers posed that not all schools are well resourced therefore the assessment results might not reflect the true performance of learners. They posit that there might be difficulties in assessing learners at the same time as computers in some schools are not enough for all learners. Additionally, the issue of technical glitches was raised as another concern that might imped the smooth running of assessments. They suggested that the best way to assess understanding would therefore be giving learners projects or assignments with sufficient due date for submission. They raised that several measures would need to be taken to ensure the integrity of assessments. Alupheli stated that:

> I think the challenge would be in common examination in grade 12 because of the uncertainties that the network connection, electricity loadshedding, and technical issues in general. In my view it would be better to assess learners with things like assignments and projects where there won't one day time restrictions.

However, though the teachers posed inequalities due to resources when assessing learners on computerised accounting, they believed that learners would be able to approach assessments with better understanding. According to them this will be because learners will be doing their homework with enthusiasm and thereby practicing more. Jacqueline stated that:

> Giving out homework to accounting learners is no longer interesting to them… but once you give them a homework that require use of technology, they become excited… because these students are constantly using technology after school.

Sunell was not so optimistic regarding giving out computerised accounting homework to learners. She pointed that some learners only have access to computers during school hours. Therefore, she believed giving learners computerised accounting-based homework will not be possible. However, she stated that this would depend on how government provide the resources needed by learners. She suggested that:

> Government should provide all learners with tablets so that when they are at home, they can be able to do their homework, otherwise how will learners be expected to do a homework that require technology whereas they have none.

Based on the theme of assessment inequalities, it would appear that teachers are divided to some extent on different aspects. These aspects are access to technology at home for learners; sufficient (numbers) of access for learners at school; technical glitches with technology at school; reliability of internet/Wi-fi network, and the issue of tasks/assignments that require computer technology. The data has revealed that with each positive vote

towards computerised accounting, the teachers cite a negative counter for its implementation. However, it is noted that they are focusing their comments on examinations and school-based assessments that would assess accounting based on some or the other computer applications.

A point to draw on is the provisioning for computer application technology (CAT) and information technology (IT) and to a lesser degree the subject engineering graphics and design (EGD). These three subjects have a computerised application section/module in their content. The DBE and indeed the Western Cape in particular has seen to it that the schools (in whichever quintile or whether considered well-or poorly resourced) offering these subjects at minimum have a networked and internet available in a computer room for the subjects. The Western Cape has and continues to conduct national exams simultaneously across the province. With regards to EGD, the computer assisted drawing (CAD) is not examined nationally, because many other provinces do not have the resources in all schools. The point to note is that with CAT, IT and EGD one cannot really cry inequity in assessment. A further point to note is that students of EGD receive all the 'manual' drawing knowledge and skills as well as the 'CAD' knowledge and skills. Therefore, the belief by teachers that computerised accounting might raise assessment inequalities might not hold water.

5.3.3 Unavailability of resources and lack of funding

The major concern pointed by the participants of this research was the lack of resources that will be needed to integrate computerised accounting. According to them the integration will expose inequalities in schools regarding the availability of resources. The resources required to integrate computerised accounting includes, hardware, software, study material, and teacher development. The hardware might be desktop computers, laptops, or tablets. The software needed is the actual computerised accounting system to be used. Some of the computerised systems need licensing fees to be paid on annual basis. The teachers raised that not all schools have enough technological resources.

The study material would need to be adjusted to accommodate the traditional method of doing accounting and how it is processed with computerised accounting. This will ensure that learners understand that the computerised accounting reciprocate and applies the same accounting principles as the traditional method of pen and paper. The teachers related that schools in rural villages would additionally require internet and network

connections as well as electricity infrastructure depending on the devices to be used. Jaymee noted that:

> Many schools are not fortunate enough to have these technologies and stuff. I know for a fact that you must pay to use a computerised accounting system. So, the other schools that are privileged will have more advantage versus to those that cannot afford resources more especially those in the rural areas.

Lingomso commented that:

> You also need to look at the demographics of where the school is situated… because not all schools can afford to buy computers and software. This is South Africa there's rural schools that cannot afford other basic needs. All schools would need to have laboratories with high quality technology, there would be software licences to be paid and programs to be updated annually which will be an extra cost to schools. In addition, there's electricity with loadshedding challenges. You'll have a situation where while working then boof computers switch off and back again… sometimes that will also damage computers as well.

Additionally, teachers highlighted that the training of teachers will not be difficult for teachers to understand computerised accounting because they know basic principles of accounting. However, Jacqueline raised concerns about the availability of funding to buy resources. She commented as follows:

> I think teachers being trained is not a major problem because if you know accounting, and if you understand accounting from its fundamentals the computerised accounting systems are not that difficult depending on what system you are using…but I think from the resources point of view like computers, laptops etc. there is no money. Government is still struggling with buying textbooks. How are they going to be able to buy laptops and computers.

According to her the integration of computerised accounting would need proper planning and would need a long-time planning to phase it in. The concerns of teachers appear to be realistic in their worldview. However, to some extent there are roles and responsibilities of teachers, schools, districts, provinces, and DBE. Teachers have accurately in the data noted that material and human resource aspects are necessary for the integration of computerised accounting in schools. The data appears to show a defeatist view of implementation as the comments portray a situation that is not fixable. However, drawing from lessons from other subjects in the South African curriculum and in other countries, one must acknowledge the need for these material resources and human resource development, all of which has been managed in this province (Western Cape), nationally, and internationally. The political will of the DBE and provinces might be what is needed to enable computerised accounting through the two factors of resourcing and professional

development. The researcher does not negate the concerns of the teachers regarding the material needs but maintains that these are not unattainable. Resolutions to these issues reside in the domain of provincial and national budgets, and political will of the concerned parties to realise this.

5.3.4 Safety of resources

The teachers raised that the other concern with the integration of technology in education is the security of the technological equipment to be used. They pointed out that schools are consistently experiencing burglaries due to criminals wanting to steal technological equipment in schools. They added that it does not help to even give out tablets, laptops, and computers to learners to go and use them at home as they get mugged on their way home. Emihle noted that:

> Theft and frequency of burglaries are very high in my township… and the other challenge is that even the learners are involved in crime. They are the ones who would sometimes give out information about the technology equipment in our school.

While Jacqueline added that:

> Security of the resources will be a challenge. Taking it from my community, like the school next to my house. I know for a fact that if people around know that there are computers that are saleable at that school… they are going to try to break-in and steal the computers… because there is no proper security at schools… so that would create a threat for schools.

Teachers are concerned that the availability of resources at the school premises will increase safety challenges. They believe that schools are not properly secured and ready to prevent theft of resources. They suggest that government would need to beef up security in schools before considering bringing technological resources in schools. Jacqueline further pointed that:

> The department of education would need to provide additional security personnel in our schools and ensure that there is high police visibility and patrols around the schools.

There appear to be an additional realistic condition for integrating computerised accounting using technology. In the teachers' understanding that aspect of general and subject specific requirements at schools resides with different organs of the state and distilled to provinces,

the researchers offers that the issue of 'safety' of resources is lower down in the reasons for not implementing computerised accounting.

5.3.5 Concerns of Accounting teachers as per CBAM

This section sets out the concerns of accounting teachers in terms of CBAM. The first diagnostic tool of CBAM is stages of concerns (SoC). This tool has seven stages starting from stage 0 where teachers are unconcerned and not interested on the technological integration to the last stage 6 where teachers are developing alternative methods of using technology. In terms of the data collected the concerns of participants seem to be located between stages 0 to 4. The Table 5.1 below classifies the concerns of accounting teachers in terms of CBAM:

Table 5.1: Accounting teachers concerns per CBAM

Stages of concern	Accounting teachers' concerns
0 – Unconcerned	The most experienced accounting teachers are in stage 0 (awareness/unconcerned stage) as they showed little interest and lack of knowledge of computerised accounting.
1 – Informational	The accounting teachers with minimal experience showed high interest in knowing computerised accounting and how can it be integrated into their curriculum delivery. The accounting teachers with PGCE qualification have thorough training and experience of using computerised accounting while those with B. Ed qualification seem to have little or no knowledge of computerised accounting
2 – Personal	All the participants of this research seem to be concerned how the integration of computerised accounting will affect their role in the classroom. The participants felt that computerised accounting will reduce their role and importance in the classroom.
3 – Management	The accounting teachers were concerned about how computerised accounting will affect their lesson planning in terms of time availability and resource availability. They expressed concerns that at the initial stages of the integration they will require additional preparation time.
4 – Consequence	The participants concurred that the integration of computerised accounting will enhance understanding of accounting. They believed that learners will be more interested in accounting, and it can grow the number of learners choosing to follow accounting profession.
5 – Collaboration	They haven't reached this stage.
6 – Refocussing	They haven't reached this stage.

The second diagnostic tool of CBAM is the Level of Use (LoU). In this study it was not possible to ascertain fully apply the LoU diagnostic tool as all the participants are in Level

0 (non-use level). According to the findings all the accounting teachers interviewed in this research are not using computerised accounting in their curriculum delivery.

5.4 Implications of integrating computerised accounting

This section outlines the implications of integrating computerised accounting into high school accounting curriculum delivery. The following four themes emerged as findings from the data collection:

1. Curriculum policy revision
2. Lesson planning
3. Minimise the teacher's role
4. Assessments of accounting

5.4.1 Curriculum policy revision

The teachers stated that the accounting curriculum policy is silent regarding the use of computerised accounting as an additional pedagogical tool. They commented that that the first point would be to clearly outline how computerised accounting would be integrated into accounting curriculum delivery. They said that it would need to be stated in which grade will it be started, in which academic term, which topics will be taught using it and how will it be assessed. According to them this means that the accounting curriculum policy need to be revised to include the integration of computerised accounting.

Teachers pointed that the integration of computerised accounting might help to reduce the workload of accounting subject as it is difficult to cover it. Sunell stated that adding computerised accounting in the curriculum will help to create a link of accounting from one grade to another. She stated that:

> The advantage of computerised accounting inclusion in the curriculum is that it will help provide understanding of how accounting topics fit in with each other. Currently each grade brings a set of new topics that are difficult to link, for example in grade 11 we do partnership then in grade 12 we talk of ordinary share capital that is difficult to link. Sometimes due to high volume of work in grade 11 we end-up not doing certain things that the learners need in grade 12. Therefore, technology will help to cover certain topics at a speed.

The above finding shows that teachers believe that the inclusion of computerised accounting will help them manage and deliver the accounting curriculum efficiently. This finding is in line with what the researcher found in the analysis of the curriculum policy document. The CAPS document is silent with regards to computerised accounting. Teachers suggest that a curriculum review might be needed to implement computerised accounting.

5.4.2 Lesson planning

Regarding the lesson planning, teachers felt that the integration of computerised accounting will simplify their lessons. They believe that there won't be too much need to explain lots of information as it will be visual to learners. Yogi pointed that with the current pedagogy that they are using for accounting it takes time to make learners understand as they cannot relate to the topic. They believe that the other advantage with computerised accounting is that everything is setup and ready for use. According to them this will reduce the time unnecessary information of the background processing that one would need to provide to learners. Thsume noted that:

> It will make my planning easier because there are things, I won't have to spend too much time explaining them. You see sometimes because accounting happens in the background scenes some of the processing steps become very strange to learners… because even at the shop learners just get in buy and get out without seeing the further processing of the transaction after their purchase. Now in class you have to explain what happens after they left the shop.

The teachers believe that the enthusiasm that the use of technology ignites to learners makes their understanding to be very quick as their attention level is very high. Teachers recognized that the incorporation of new pedagogical tool in accounting will require additional planning time. Teachers firmly believe that more time for planning will only be required at the beginning of the integration. The teacher's pointed out that a preparation done on the computer is easy to repeat as it normally requires minor adjustments for the repeat lesson, and its advantage is that it will be stored in the computer for future use. They added that the advantage of having to prepare once is that it will give them time to create more examples and activities and focus on other administrative duties.

Lingomso cautioned that the other additional factor that will prolong their planning is the current electricity grid loadshedding. He felt that backup lesson plans would need to be in place to cater for inconveniences brought by loadshedding. This means that there will be a

need for double planning. The teachers additionally noted that the selection of the best computerised accounting system will play a role in planning as some are precise and basic and on the other hand others are complicated to understand. Additionally, they pointed that the other thing that will help simplify their lesson planning will be that they should be fully equipped and continuously trained how to use a selected computerised accounting system. They state that this will be important as they will be required to find ways of transforming and linking the current manual system examples and activities to the computerised accounting for learners to easily understand.

5.4.3 Minimize the teacher's role

The teachers felt that the use of computerised accounting to teach accounting will diminish the need for their role in the classroom. They stated that learners would not need them because they normally figure out technology without anyone's help. This exposed that accounting lessons will change from being teacher-centered to be learner-centered. Although this was raised by teachers as a negative implication, it has a positive element as well. Learners need to drive the lessons and actively participate in their learning process. Thsume explained that:

> I feel like it's going to minimize the role of a teacher… because like we will only be needed to explain the process at the beginning and thereafter learners would be able to do it on their own because computerised accounting will show them how to do it. The need for the involvement of the teacher is going diminish.

According to what the teachers related computerised accounting will make learners actively involved in their lessons and that would further enhance their knowledge. The teachers felt that computerised accounting will simplify and make accounting very easy for learners to understand. They related that the time that they waste explaining step by step background accounting processes will be saved because computerised accounting does everything very quick, and the detection of mistakes is easily visible and can be fixed in a second. As much as teachers think their role in teaching accounting will be minimized by an introduction of accounting, what they might not be foreseeing is that a new role will be emerging and that will need to adjust for the benefit of their teaching. The idea that with computerised accounting

5.4.4 Assessments of accounting

The formulation of assessments would need to be revised to ensure that all learners are accommodated in a just manner. The teachers highlighted that it will not be possible to write examinations using computerised accounting. They cautioned this sighting differences in availability of resources. Emihle noted that:

> The number of computers available in school computer laboratories are less versus the number of learners and therefore to have examinations within a specific time frame will not be possible as not all learners can fit in a venue in one go.

They suggested assignments or projects with a weight not more than 20% for the year for each grade. They posed that it would be best to introduce computerised accounting in grade 8 and focus only on navigation that will not be assessed, then start assessing it in grades 9 to 11. The teachers felt that it will not be necessary to assess learners in grade 12 as they believe that the matric syllabus is already intense and too much for learners. In his suggestion Emihle said that:

> I would prefer that computerised accounting be introduced in grade 8 with a simple navigation and then data entry in grade 10 and business transactions processing in grade 11… because in lower grades we will use it to attract learners and make accounting a real-life subject unlike currently.

Yogi highlighted the following challenges related to assessing learners' knowledge of computerised accounting:

> To have a mid-year or end of the year examinations would be a challenge because the number of computers available in schools does not match the number of learners. Therefore, you cannot have an examination that should run for 2 or 3 hours for all learners doing EMS. Hence, I suggest that computerised accounting to be assessed with an assignment or a project with a certain weight… but at the same time the integrity of the assessment might be at stake.

Teachers seemed concerned about how will computerised accounting be assessed and raised relevant barriers. This means that proper assessment strategies would need to be developed to assess computerised accounting. They additionally posed the possibility of not maintaining assessment integrity. They said with assignments or projects learners tend to seek help from other people and therefore test scores might not thoroughly reflect learners' real level of knowledge. However, the teachers concurred with each other that to have examinations whereby all learners write at the same time would be difficult to do as

there are many factors that might disturb the examinations such as electricity loadshedding or technical glitches. Although teachers pose assessment integrity challenges, in actual fact the issues they raised are centred around validity and reliability of testing learners using computerised accounting. Sighting the example of CAT and EGD it means integration of computerised accounting is possible as well.

5.5 Benefits of the integrating computerised accounting

The accounting teachers identified several benefits of integrating computerised accounting into high school accounting curriculum. The following benefits were revealed from the data collected:

1. Develop interest and positive attitude
2. Enhance understanding of accounting principles
3. Improves academic performance
4. Grow the accounting profession
5. Exposure to real-world job practices and enhance employability

5.5.1 Develop interest and positive attitude

The accounting teachers in this study posed that the integration of computerised accounting as an additional teaching tool in high school will develop interest and positive attitude of learners towards accounting. The accounting teachers confirmed what was pointed out in the literature review that the number of accounting learners in grades 10 to 12 in high schools is decreasing. This appears to indicate that the popularity of accounting in high schools is dropping, and learners are losing interest in the subject. Jacqueline commented as follows:

> I think it (computerised accounting integration) will change their attitude to be positive about accounting, because most learners that we have they are doing accounting because it is part of the commerce stream whereby, they must do it with economics and business studies. So, to my experience most learners are not choosing to be in commerce field to do accounting, but they are doing it because it is part of the subjects that they need to do.

This study found that this situation could possibly be mitigated by the introduction of computerised accounting. Alupheli noted that the current generation of learners become enthusiastic when lessons use technology, and he stated that:

> Anything with technology most learners take it positively. It will better their attitude because they will relate more to accounting than they do now. It will be a different route of teaching accounting. They will know more than the teacher is telling them. They will experience a lot more than hearing that this is what is happening.

Additionally, Alupheli highlighted the importance of teaching learners by allowing them to be actively involved in a lesson through practice rather than merely listening to the teacher. Emihle added that the current generation of learners prefer to use technology. He seemed optimistic that computerised accounting integration into high school curriculum delivery would make learners excited to learn accounting. He related as follows:

> The learners today I've noticed they are more inclined to technology. It was not like this back when I was in high school it wasn't as much. But now they want to know about technology. Because the world is more technological you know. So, learners strive better in subjects where technology is used more. So, I think if you introduce computerised accounting, they will be more excited. It will revive the subject in a way.

Emihle's comment recognised that 21st century is fast moving towards technologizing everything. The findings above provide evidence that the teachers themselves recognised that the methods they have been using to teach accounting are outdated and possibly irrelevant to the current generation of learners. While this is the case, on the other side learners are keen for technologically driven lessons. New technological pedagogical strategies and tools have a potential to increase the class attendance as well. Class attendance is key in a subject like accounting as each lesson builds from previous one. Thsume said that:

> Computerised accounting will be a great benefit, as it will make the curriculum easier because there is that stigma that 'oh! accounting is difficult. There are too many numbers.' Everyday there is that negative attitude towards accounting among learners. So, it will ignite enthusiasm and interest in accounting.

The finding from the data above suggests that computerised accounting might be a much-needed remedy to change the attitude of learners. Positive attitude is key in learning and teaching. Yazdani and Godbole (2014) confirmed that the attitude of learners has an intertwined effect on class attendance and academic performance.

5.5.2 Enhance understanding of accounting principles

Accounting requires in-depth understanding of its principles to appropriately apply it. The findings indicate that computerised accounting provides practical reality of how accounting rules and principles are processed. According to the accounting teachers computerised

accounting will take learners a step further from knowing accounting information to knowing how accounting information is applied in real business. Therefore, computerised accounting provides an opportunity for learners to apply the accounting principles they have learnt. Complimenting theoretical knowledge of accounting with computerised accounting enhances understanding of accounting principles and concepts and provides life-long learning experience to learners. Jacqueline noted that:

> When I was introduced to a computerised accounting system, I understood accounting principles better, and I felt like I was driving real business processes. Even the terminology used was the one you find in real business. For example, the accounting cycle steps, and the different source documents were clearly understandable and how they affected the financial statements. Transactions were not general as you will find them in an accounting textbook like 'bought goods' but were more realistic like 'bought 10kg of rice' meaning they were specific and described the actual items bought.

This finding shows that computerised accounting has the potential to bring understanding of accounting that is linked to everyday life of learners. Real-life scenarios enhance understanding as learners can relate to the lessons and automatically become more interested. This means learners should understand accounting better as it will be related to what is being taught in the classroom to what is visible and practical in their daily lives. This finding is consistent with that of Yaftian, Mirshekary and Mihret (2016) that discovered that computerised accounting enhances the learning of accounting and understanding the accounting concepts.

5.5.3 Improves academic performance.

The interest and positive attitude towards accounting and proper understanding of accounting principles have direct influence on academic performance. Once learners have interest and positive attitude towards accounting their understanding is likely to be better as they become inquisitive. Understanding filters through and improves academic performance of learners. Sighting the trends of accounting academic performance, the accounting teachers believed that the integration of computerised accounting can improve the academic performance of learners in accounting subject. The accounting teachers commented as follows:

> **Yogi said:** Learners discuss the classroom atmosphere of every subject and the performance of their peers in the upper grades and that contributes to diminishing numbers of learners doing accounting. I think it (computerised accounting) will affect the accounting results positively, because if learners know better about the

> background of accounting, I think it will help in topics like analysis and interpretation of financial statements. Because they fail more those topics because they lack proper understanding. Because if they would be able to visualise the real business and be able to comment on numbers.
>
> **Jay-mee noted that:** Learners will approach questions in assessments with concrete knowledge of what was taught theoretically and what they experienced when they applied the knowledge using computerised accounting syste*m.*
>
> **Lwazi maintains that:** Computerised accounting is real-time because you like assessing them as you go. You can see their understanding and if they don't understand you can explain it, you can see where problems are. Unlike with a piece of paper reading it and learners having to do a t-account. Whereas if you on the computer, you can immediately see if you are doing something wrong because it won't be balancing.

The findings above highlight that learners are vigilant and knowledgeable of what transpires in different grades in terms of academic performance. This infers that learners monitor the academic performance in upper grades and the conduciveness of classroom environment. Additionally, the findings demonstrate that learners will be afforded an opportunity to write assessments with all-rounded knowledge, their confidence levels will increase and that can positively affect their academic performance.

According to the findings teachers noted that teaching using computerised accounting will transform lessons from being teacher-centred to be learner-centred and afford learners an opportunity to actively participate in the lessons. They posited that computerised accounting would enable learners to get used to work independently and that assists them when writing assessments as that is where their knowledge is tested on an individual basis. According to Richardson (2003) learner-centred lessons develops deep understanding of subject matter. Computerised accounting simplifies accounting tasks and accurately provides audit trail that assist to quickly identify mistakes committed. Therefore, as the accounting teachers identified mistakes during lessons will be detectable instantly and become learning points. This means that learning will be quicker and instant when using computerised accounting and therefore learning objectives might be achieved easier. When the learning outcomes are achieved there is a high possibility that academic performance might improve for the better.

5.5.4 Grow the accounting profession.

In the South African context learners choose the careers they want to follow in Grade 10. They do this by choosing subjects related to specific professions they are interested to join

when they reach tertiary level education. The findings reveal that the accounting profession is losing prospective followers in lower grades in high school. The accounting teachers stated that:

> **Yogi contends that:** If that computerised accounting can be introduced to learners in grades 8 and 9, then it will entice learners to follow the accounting profession because if they lose interest in it in those grades then forget that they will ever choose it in grade 10 or in any other times of their career. To be honest with you poor teaching of accounting under the EMS (Economic and Management Sciences) is the main reason that that drops the number of accounting learners year in year out.

> **Lingomso believes that:** The accounting subject will pick up again because at the moment accounting isn't that popular subject, kids don't like doing accounting. You get accounting classes of just 10 learners. I think if you do introduce it more especial in the EMS grades, it will motivate learners to come to accounting in grade 10, and to do more accounting because computerised accounting is easier compared to normal accounting. It will help the learners and they will feel more confident in doing it.

The findings above appear to suggest that if no interventions are made in the curriculum delivery of accounting in grades 7 to 9 then the accounting profession's growth will continue to diminish. This diminishing number of accounting learners might result in accounting teachers ending up with no employment as subject specialists. Therefore, measures need to be taken to prevent the unpopularity of accounting at a school level as that has a direct impact on the accounting profession. The accounting teachers believe that the computerised accounting can be a useful pedagogical tool in attracting more learners into joining the profession.

5.5.5 Exposure to real-world job practices and enhance employability

In the real-world business environment accounting information is processed with computerised accounting systems rather than manual paper-based systems. Accounting learners need to be exposed in the real-world business practices. The exposure would provide them a view of how accounting information is processed in the business environment. The exposure would enlighten them and place them in a better position to make informed career decision regarding their future. Emihle commented that:

> Simulated business practices are crucial in making education relevant to learners more specially to subjects like accounting because they are not that easily visible in learners' daily lives like for example with economics, they would get some knowledge from reading news and can relate, but with accounting if you talk about something it becomes totally strange because they do not see it in their daily lives. Because

> accounting is done behind the scenes, even in the shop you just buy and get out, you don't know what is happening behind that transaction.

Alupheli reflected that:

> Computerised accounting will make accounting easier, because I can take it from myself, when I was in school, I understood accounting, and I went to the university I understood accounting but when I went to the actual workplace… it's a completely different way of doing things. It's nothing like what we did in school, it's nothing like what we did in university because all those amortisation tables and trying to workout interest rates, that is all done for you. You just literally have to take the information you have and process it in a computerised accounting system.

Exposing learners to computerised accounting will extend the thinking of learners to be not limited to what they see in the books but visualise the real business. The finding above extrapolates that learners ought to understand the whole picture of accounting and be able to see how the accounting cycle steps relates to one another. Additionally, exposing learners to real business practices enables them to easily adapt in the job environment with limited pressure as new recruits. This is very good for business as well in terms of ensuring staff turnover rate is low. As stated in the introduction learners in the 21st century easily adapt and understand how to work with technology faster, meaning teaching them how to work with technology in school will benefits them more.

The employability of high school graduates is enhanced by relevance of education to the requirements of employers. According to Machera and Machera (2017) employers are concerned with recruiting accounting graduates with no computerised accounting skills as that forces them to further pay more money to train them after recruiting. Adding computerised accounting skill to accounting learners will increase their degree of employability. Lwazi noted that:

> Sometimes our learners when they finish matric do not find space to enrol at universities due to high numbers of applications and end-up being forced to look for employment. Computerised accounting is a skill that they can add to their CVs (curriculum vitae) to become more employable.

The above finding highlights that the integration of computerised accounting into high school curriculum delivery has the potential to reduce unemployment. In South Africa there is a high disparity between the number of learners that graduate in high school and the availability of space for learning in higher education level. Empowering high school learners with computerised accounting skill will make them more attractive to prospective employers. This will further build the reputation of the education sector that it supplies the workplace

with learners that are ready for employment. It is important that the education sector consistently strive to provide the business sector with personnel with relevant skills that are on demand. In this manner the gap between what the education sector provides in terms of skills and what the workplace require is minimised.

5.6 Barriers of integrating computerised accounting

This section deals with the barriers of integrating computerised accounting that were found from the data collection. These barriers were deemed as having potential of delaying or diminish any possibility of integrating computerised accounting in high schools. The barriers noted were:

1. Accounting curriculum review
2. Teacher attitude and development
3. Unavailability of resources and lack of funding

5.6.1 Accounting curriculum review

Accounting is a global business language that is updated on annual basis via International Financial Reporting Standards (IFRSs). Therefore, changes in it are dynamic and on the other hand the accounting education curriculum prescribed in schools is static with no strategy of dealing with the consistent developments. This is visible and evident by merely noting the outdated terminology still being used in school and in accounting textbooks (for example use of outdated terms like ‘trading stock’ instead of ‘inventory’). Jay-mee pointed that:

> The CAPS document will need to state when the computerised accounting can be used for teaching and how will it be assessed. We as teachers strive to adhere to CAPS and if something is not stated there then we do not take it seriously.

Although teachers are supposed to consistently update their knowledge and keep up with the updates around the accounting profession. The finding above shows that teachers restrict themselves and strive to follow only what is stipulated in the CAPS document to the latter. The document only states that accounting curriculum should strive to meet the demands of the accounting jobs both manually and electronically, but it does not state how these demands can be met (DBE, 2011). The curriculum needs to clearly outline which computerised accounting to be used in schools, in what grade and academic term should it be integrated to, and how will the learning outcomes be assessed. Assessment methods

will need to be designed and scheduled such that they are fair, valid, and reliable by all learners regardless of context.

5.6.2 Teacher attitude and development

The teacher' attitude to successfully integrate technology in education plays a significant role (Liu et al., 2017). A sound teacher professional development strategy will potentially turn the attitude of teachers to be positive towards the integration of computerised accounting in high school. Teachers need to be further developed thoroughly to have confidence of delivering curriculum using computerised accounting. The new entrants in the teaching profession are welcoming the use of computerised accounting for teaching while those with more than 10 years' experience teaching accounting are uncomfortable with integration of technology. Lingomso the most experienced teacher in this research commented that:

> These things of technology are best carried out by the younger teachers, some of us are too old now to be learning these new things. I can only teach with that computerised accounting if it is compulsory otherwise to me my current teaching methods are sufficient.

Jay-mee the least experienced in this research stated that:

> I would love to be thoroughly trained first because technology is taking over everything and resisting only makes one irrelevant and embarrassed. I think the training of teachers isn't one of the big issues because if you know accounting, and you understand the fundamentals then computerised accounting will not be that difficult but may depend on which system is being used.

The findings show that the attitude of old accounting teachers differs to that of those who are new in the profession. Teacher development strategies created will need to take cognisance of this difference to become successful. Some accounting teachers revealed that computerised accounting was never in their university curriculum. The findings reveal that pre-service and in-service teachers would need to be trained the computerised accounting as some of them have never used it before. The Bachelor of Education qualification curriculum will need to be updated to include computerised accounting. A gap was identified regarding the training of accounting teachers, that the real business accounting practice exposure is missing entirely in the training of accounting teachers. They come from the schools, study at university and go back to teach without ever setting foot in a business sector. This means that their knowledge of accounting is purely based on what is provided in the books. Thsume expressed the following:

> To be honest with you, I have never been in an accounting firm or work in a business and see how accounting information is processed in real life. I went from matric and studied my B. Ed degree and qualified as a teacher. The only work-integrated learning I did when I was studying was teaching practice in schools.

The above finding highlights that the integration of computerised accounting will not only be helpful to learners but also to the teachers as well. The accounting teachers that have some experiences of computerised accounting are those that have pure accounting qualifications and thereby became accounting teachers by doing Post-Graduate Certificate in Education (PGCE). Pure accounting qualifications such as Bachelor of Commerce in Accounting, National Diploma in Accounting etc. includes computerised accounting in their curricular. Additionally, some PGCE qualified teachers gained experience of using computerised accounting while they were working in business or accounting firms. The training of computerised accounting can be done virtually and be made available and accessible 24/7 via video recordings. This means that the training can be facilitated physically in a face-to-face classroom or online and teachers can use the video recording to practice and train themselves on how to use it.

5.6.3 Unavailability of resources and lack of funding

Integrating computerised accounting into curriculum delivery require resources to be made available. Resources needed to integrate computerised accounting in schools are equipment and study materials. Equipment means computer hardware and software. Moreover, in rural schools, the electricity infrastructure and internet network connection are additional needs to delivery curriculum using computers. Some schools do have computer laboratories, however they are not used efficiently and kept in good working condition. Emihle reported that:

> Our school does have a computer lab but most of the computers are not working and there is an issue of internet connection. Though there is a Wi-Fi available, but it is not strong enough to connect. So, it will require an effective working lab with proper internet connection.

This finding reveals that there is a need to conduct a quantitative study to investigate how many high schools with computer laboratories, their condition and what they are used for. In cases like in rural areas and marginalised communities, mobile technologies might be the best solution. However, some computerised accounting packages do not require internet connection especially those that have a version for training purposes. Study

material that includes computerised accounting will need to be developed. This can be an opportunity for teachers to develop learning and teaching material in accordance to their knowledge and experience of accounting content. The DBE or provincial education department can facilitate and provide guidelines of what to cover in those study material. Currently the school accounting textbooks are silent regarding computerised accounting as if it is something that does not exist. The textbooks will need to include information about how learning activities are processed using CAS.

Technical support personnel are another resource needed for the successful integration of computerised accounting in schools. They need to be available and on standby to assist with technological glitches that might occur during classes. Poor technical support discourages teachers in fully committing to the integration of technology in their classroom as they may not have technical expertise to solve challenges that arise during class time. Therefore, if there is no available standby technical support then the class times gets affected. If technical challenges take longer to be solved that will demotivate teachers and delay them from successfully implementing their lesson plans.

The unavailability of resources is interlocked with the lack of funding. The lack of funding is one of the threats that can deter successful integration of computerised accounting. The resources required to integrate computerised accounting can be acquired through funding. Alupheli stated that:

> Though some schools have computers, but they might not have money to upgrade them and money to buy software, licensing, and annual renewals. So, introducing computerised accounting will need more time for the government to make funds available. For example, a period of about 5 years and ensure that the resources are bought in time. It's not an overnight thing, it is long-term.

In the South African context, the education departments receive the highest share in the fiscal budget. This means that if the government authorities can be convinced with the benefits of integrating of computerised accounting into the high school curriculum and they be made aware of the barriers then funding can be made available. The funding issues are a responsibility of the provincial and national education department rather than individual schools. Therefore, schools need not focus on the issue of lack of funding but rather look at the benefits that might be achieved should the computerised accounting be integrated.

5.7 Summary

This chapter presented and discussed five themes that emanated from the findings. The teachers' concerns regarding the status of accounting subject and the possibility of integrating computerised accounting in high school accounting curriculum delivery were presented based on responses of teachers. The data collected subsequently revealed the implications, benefits, and barriers of integrating computerised accounting. The barriers identified were the resources required to successfully integrate computerised accounting in high school. Chapter 6 will present the findings from the document analysis.

CHAPTER SIX

DOCUMENT ANALYSIS OF HIGH SCHOOL ACCOUNTING CONTENT

6.1 Introduction

The previous chapter discussed findings from data collected using semi-structured interviews. This chapter presents data findings from document analysis. The curriculum prescribed content is examined in terms of how it is taught manually using accounting textbooks versus how it is presented in the computerised accounting systems. The last research sub-question sought to understand *how can computerised accounting be integrated into high school curriculum delivery*. This required an understanding and an analysis of the accounting content prescribed in the curriculum and how it is currently presented for learning and teaching in the textbooks. Curriculum and Assessment Policy Statement (CAPS) documents of the EMS and Accounting subject (EMS textbooks of grades 7 to 9, and accounting textbooks grades 10 to 12) and computerised accounting manual. Textual analysis was used to analyse these documents to uncover and understand hidden meaning in text. The Table 6.1 below shows which documents were used to respond to each of the following research questions.

Table 6.1: Research questions and documents analysed

Research question	Document analysed
1. What is the accounting content covered in high school?	CAPS documents
2. How is the accounting content presented for learning and teaching in textbooks?	Accounting textbooks
3. How is this content presented for training in the computerised accounting systems manuals?	Computerised accounting system manuals
4. How is this content assessed?	CAPS documents

The purpose of analysing CAPS documents was to understand and discover the content that is supposed to be covered in high school, as well as the guidelines for assessments. The textbooks were analysed to understand how the curriculum prescribed accounting content is presented manually for learning and teaching in the classrooms. The computerised accounting manuals were analysed to determine the difference between how accounting content is presented manually and how they are presented in computerised accounting

systems. Furthermore, conducting the document analysis assisted to elicit data not apparent in the interviews and to triangulate all data sources.

The South African Schools' Act 84 of 1996 as amended by Act 15 of 2011 provides the minister of the DBE with a responsibility to develop the curriculum and determine the process and procedures for the assessment of learners. The curriculum in SA prescribes the content to be covered by learners from Grades R to 12 and the assessments guidelines. The following sections will present findings relating to accounting content covered in Grades 7 to 12.

6.2 Accounting content in Grades 7 to 9

This section presents the accounting content that is meant to be covered in high school according to the CAPS documents. Accounting is introduced to learners in grades 7 to 9 as an EMS module called financial literacy and then in Grades 10 to 12 accounting is a standalone elective subject.

6.2.1 Accounting content in Grades 7

The accounting (financial literacy) module is equal to 50% of the EMS subject, 25% is for entrepreneurship module, and the other 25% is for the Economy module. EMS is a compulsory subject from Grades 7 to 9 and all learners register for it. The learners are introduced to the accounting concepts, incomes, and expenditure as well as budgets in a period of two academic terms (term 2 and term 4). In Grade 7 the focus is purely on laying theoretical foundation and background of accounting. When zooming in to Grade 7 accounting content the researcher found that although this content is deemed for accounting however, it is terminology related to businesses in general and personal finances.

The EMS subject is allocated 2 hours per week (DBE, 2011b:07). The financial literacy module is allocated a total of 18 hours in Grade 7 for the entire year, while in Grade 8 it is 36 hours, and in Grade 9 a total of 32 hours. This means that for a period of 3 years learners are taught accounting 86 hours only. This confirms what the teachers pointed that the time allocated for the introduction of accounting in Grades 7 to 9 is not sufficient to cover the accounting content hence there is no proper foundation of accounting in these grades. Lingomso stated that:

> The class time allocated to teach accounting in Grades 7 to 9 is not sufficient to cover the accounting content… such that learners need to be given lots of homework that they do not do.

In Grades 8 to 9 accounting for several weeks accounting is allocated an hour a week. This means the EMS teachers must juggle between the three EMS modules within one week. This might be the reason that some of the EMS teachers that are not adequately trained to teach accounting tend to focus more on the other two modules of the subject and reduce the already limited accounting allocated time. Lwazi noted that:

> There is less focus on accounting in Grades 7 to 10 and that denies learners a proper foundation of accounting such that they do not choose to continue with it in grade 10 or choose it and drop it before Grade 12.

Therefore, the teachers' concern that there is poor foundation of accounting in Grades 7 to 9, their sentiment that accounting should be separated from the EMS, and that it should be taught by an accounting qualified teacher might be justified. However, the content covered in Grade 7 does not necessary require teachers' accounting knowledge and qualification as it is general business terminology as well as related to personal finances.

The CAS are purely designed for business. Therefore, textbooks are the relevant learning and teaching material to use in Grade 7. Additionally, this content is scheduled to be covered in two academic terms in 9 weeks per year. This is equivalent to 18 hours as EMS is given a period of two hours per week. Time allocated for accounting in this Grade 7 might be insufficient to integrate computerised accounting and seeing that the content being covered is also not compatible with CAS, therefore an integration of computerised accounting in this grade might not be worthwhile. Although Grade 7 is the beginning of senior phase according to the curriculum phases, but the reality is that in SA this grade is not regarded as high school but rather higher primary. When learners graduate in Grade 7, they normally change schools as Grade 8 is in different schools. To invest technology resources that are required to successfully integrate computerised accounting for only 18 hours per year might not be sound and reasonable. The overall finding with Grade 7 content is that it is irrelevant for learning and teaching using computerised accounting.

6.2.2 Accounting content in Grades 8

Grade 8 content is the one that really introduces learners to accounting concepts that are business related. The accounting concepts provides an insight and the foundation of

accounting. The accounting textbooks and the CAS manuals provides similar definitions and explanations of the accounting concepts as basic accounting terminology. The second topic is the source documents. Source documents are what originates the business transactions. The records of accounting are initiated by source documents. These documents are receipts, invoices, bank statements on the case of Electronic Fund Transfers, deposit slips etc. They are evidence that a transaction really occurred and are very important for auditing purposes and the South African Receiver of Revenue (SARS) require that they need to be stored and be available for at least a period of five years. as well.

In the classroom the source documents are listed, and their important features are explained. The accounting textbooks still reflect cheques and cheque counterfoils as some of the source documents. This was identified in the findings by accounting teachers as a concern about outdatedness of textbooks. Yogi noted that:

> We still talk of cheques and cheque counterfoil in high school whereas the use of cheques in South Africa was stopped in year 2020 due to their labour intensiveness and frauds being committed using them. Businesses these days use Electronic Fund Transfers (EFT) for their business transactions.

In a computerised accounting the learners will get to develop the source documents themselves and will understand the importance of their features as the system does not allow the processing to continue if one of the important features are missing. For example, who is the customer or the supplier, what is being sold or purchased, what is the price of the product or service. Therefore, learners will not only know that this information is important in the transaction but will realise that a transaction without this information is not possible. The learners will get to see the actual source documents and be able to relate them to what they normally see in their daily lives when they buy something in the shops. Such a connection of accounting education to the real life of learners further validates the findings from accounting teachers that computerised accounting will expose learners to the real-world of business.

After the introduction of source documents, the curriculum prescribes that learners should be taught the accounting cycle steps. These steps are an overview of how transactions are processed from the source documents up to the financial statements. This is a theoretical background of the accounting cycle steps rather than the practical processing. In a CAS manual the accounting cycle steps are explained as in accounting textbooks, however in the actual processing in the CAS, only the recording of transactions from the source documents that is done, and all other steps are automated. This collaborates with the finding from the

interviews where teachers believe that computerised accounting will minimize their role in classroom. Thsume explained that:

> I feel like it's going to minimize the role of a teacher… because like we will only be needed to explain the process at the beginning and thereafter learners would be able to do it on their own because computerised accounting will show them how to do it. The need for the involvement of the teacher is going diminish.

This sentiment might not be necessary true as the background knowledge of how accounting cycle steps are processed by the computer in the background is still important for learners to understand and therefore teachers would need to explain the steps to the students. Therefore, the role of teachers in the classroom might not be necessary be reduced but be simplified and made more practical with the use of CAS.

After the learners are taught the accounting cycle, they are then introduced to cash journals of a service business. The journals are the second step of the accounting cycle. In the school context as per the curriculum, journals are covered in grades 8 and 9. In grade 8 the learners are taught how to record transactions of a service business in a journal whereas in grade 9 they record transactions of a trading business. The cash journals are cash receipt journal and cash payment journal with a broad term for both called subsidiary journals. In the school context learners are taught how to do journals by drawing columns on the paper and record the information based on the transaction given to them. In some instances, learners would be given templates with columns and rows already drawn to save time. In the textbooks transactions are given sentences that are said to be coming from source documents to record in the columns. These transactions are broad and not product item specific. This was raised by Jacqueline as a disadvantage of accounting textbooks and the benefit of computerised accounting. She said that:

> Transactions were not general (in a computerised accounting) as you will find them in an accounting textbook like 'bought goods' but were more realistic like 'bought 10kg of rice' meaning they were specific and described the actual items bought.

In real-world accounting and in computerised accounting the terms cash receipt journal and cash payment journal are not generally used at all, but these journals are referred to as cash book. The cash book normally has two sides: the one for receipts and the one for payments. The cash transactions are based on the bank statements and therefore with a click on the computer the bank statement is downloaded into the systems and all the transactions that occurred in a specific month will reflect. Only the missing transactions that will be entered manually. This reduces the time to teach journals significantly.

The third accounting step general ledger is introduced in academic term 4 in Grade 8. General ledger is driven by accounting fundamental principle of double entry principle that says, 'for every debit there must be a credit'. It is a t-account that seek to ensure that the debit side is always equal to the credit side. The learners in textbooks are taught how to post transactions from journals to the general ledger using t-formatted columns with debit side and credit side. Learners are required to draw the t-accounts or given the t-accounts templates already prepared and they post transactions in them. The need to clearly understand how the different financial categories (assets, owners' equity, liabilities, incomes, and expenses) are treated. They consistently need to determine by calculating the balances or totals brought forward from one period to another. The posting to the general ledger requires firm understanding of accounting equation and this is what learners found difficult as it plunders their entire work. In computerised accounting, the whole process is made automated. Learners only need to create the general ledger accounts and link them to their financial category (asset, liability, owner's equity, expense, or income) and the system will automate the transactions as they are being entered. With one click to update the system, all the balances and totals are computed to provide a trial balance and financial statements.

The fourth accounting step taught in Grade 8 fourth term is the trial balance. The trial balance is a list of balances and totals of general ledger accounts. It is part of the topics covered in grades 8 and 9. Learners need to be able to classify these totals and balances of general ledger accounts in terms of their financial categories such that the total on the debit side is equal to the total on the credit side in order the trial balance to be in-balance. If they make a mistake in posting the accounts and values in the general ledger accounts, then the trial balance will not be in-balance. The CAS automates the trial balance.

6.2.3 Accounting content in Grades 9

The accounting content covered in Grade 9 is not that different from that covered in Grade 8. The difference is that in Grade 8 the focus is on the service business while in Grade 9 the focus is on trading business. Learners are additionally taught how to do journals for cash and credit transactions. However, the same accounting cycle (journals, general ledger, and trial balance) steps are taught. In the textbooks credit journals are taught in a similar method as cash journals with a use of drawing columns where learners are expected to record the details given to them. With computerised accounting learners are taught how to create invoices for credit purchases and credit sales transactions. This is how the credit transactions are dealt

with even in the real-world business. The invoice in the CAS exposes learners to additional information about how credit transactions are managed including an understanding of real payment terms and credit limits.

In CAS for items such as discounts learners merely type the percentage, and the system will count how much is the value. Whereas in the accounting textbooks they are required to calculate the value using the percentage given to them. In the findings this was another concern from accounting teachers that computerised accounting does the calculations for learners leaving them without the knowledge of what is happening in the background of the computer. The reality is that technology is changing the role of accountants from focusing on computations and calculations to be analysts of financial information. This means the knowledge of background calculations is becoming irrelevant and unnecessary. What is important in real-world business is the outcomes of calculations to be analyzed and interpreted for decision making. The following Table 6.2 provides an overview of the accounting content in Grades 9 as well as how they are presented in the accounting textbooks and in the CAS manuals:

Table 6.2: Grade 7 to 8 accounting content in textbooks and in CAS manuals (adapted DBE, 2019b)

Grade	Content	Manually with a textbook in class	Computerised accounting
7	Accounting concepts and personal finances	Textbooks provides a definitions, explanations, and examples of the accounting concepts. Learners are taught incomes and expenses related to business and those that are personal.	The CAS provides a definitions, explanations, and examples of the accounting concepts, however personal finance is not covered as CAS are designed for businesses.
8	Accounting concepts, source documents, accounting cycle steps, cash journals of a service business, GL, and TB	This is theory-based content with definitions and explanations. The source documents are explained, and their pictures displayed as examples. Learners are taught the concepts, journal formats and how to record and analyse transactions in journal exercise book. They are taught how to post journal totals to the GL exercise book or worksheet and prepare TB of a service business.	In the manuals cover this content the same way as in textbooks. The source documents are explained but additionally learners get to create them in the system. They create the names of GL accounts. However, the value effect in the GL and the TB is automated as they enter transactions in the source document.
9	Accounting equation, Cash and credit journals of a trading business, GL, and TB	The learners are taught the effect of the cash and credit transactions in the accounting equation in a table format. Make journal entries in the journal exercise books and post to the GL exercise book. Prepare in a table a TB.	The accounting equation is not covered as the system is designed to do it in the background. Cash and credit journals automatically emanate in the system as transactions are being entered in the respective source documents.

6.3 Accounting content in Grades 10 to 12

Accounting is an elective and a standalone subject in Grades 10 to 12. The topics selected below are those that can be taught with computerised accounting. Below they are discussed in terms of how they are currently being taught manually in accounting classrooms in comparison to how they are processed in computerised accounting systems. The difference in the content covered in Grades 10 to 12 is not that huge. The example of this is that of the financial statements, they are taught in all these grades however the focus is based on the form of business. In Grade 10 the focus is on sole trader (one owner businesses), in grade 11 learners are taught partnership businesses and clubs, and in grade 12 they do companies. The main difference in these financial statements of these forms of business is the equity section of the statement of financial position and the unique general ledger accounts related to each form of business. Some topics are covered in terms of basic introduction in Grade 10, intermediate in Grade 11 and then advanced in Grade 12. The following sections will discuss the content covered in the curriculum in each grade.

6.3.1 Accounting content in Grades 10

The Grade 10 contents starts with the introduction to the bookkeeping of informal business, GAAP principles, ethics and internal control measures. Ethics are related to human behaviour and conduct and therefore do not easily feature in computerised accounting. Learners are taught professional behaviour expected in the corporate world. GAAP principles and some internal control measures are embedded in CAS packages. Therefore, the systems are designed such that they comply with the GAAP principles. The example of this is the entering of credit limit in the CAS, automatically the system will prevent the processing of credit sales if the value is going to exceed the credit limit, and an approval of a person in the higher post will be required. Whereas in the classroom a teacher read and explain the GAAP principles, ethics and internal controls to learners. The curriculum states that ethics and internal control should be merged in all the accounting topics from Grade 10 to 12.

The second part of Grade 10 is the revision of Grade 9 work, the recording of cash transactions in the cash and credit journals, general ledger, trail balance and the accounting equation. Learners are given a list of transactions to draw up journals, post to the general ledger accounts, then draw up the trial balance and explain the effect of the transactions in the accounting equation. In the CAS they would only enter the transactions in the source documents and the general ledger, and the trial balance will be automated. Errors in CAS are easily detectable as they would normally use a different colour (red, green or blue) font to

show an error and with a click the system goes straight to where the mistake is. This corresponds with Lwazi's sentiment that:

> Computerised accounting is real-time because you like assessing them as you go. You can see their understanding and if they don't understand you can explain it, you can see where problems are. Unlike with a piece of paper reading it and learners having to do a t-account. Whereas if you on the computer, you can immediately see if you are doing something wrong because it won't be balancing.

The credit transactions in the CAS are more realistic and provide learners with an exposure of what they see from day-to-day at their homes. The system can create letters of accounts to customers with one click and the letters will show each customer's opening balance, payments received, closing balance, what is 30 days overdue, 90 days etc. The system creates lists of debtors and creditors, charge interest on overdue accounts based on number of days automatically. These assist learners to know that accounting is what in their daily lives. The focus of the textbooks is on how to calculate figures whereas in real life they will not do any calculations as the system do them. It consumes lots of class time to teach these calculations to learners.

Learners are introduced to VAT, salaries and wages, year-end adjustments, and the financial statements in the second to third academic term, then in the fourth term they do cost accounting and budgeting. The VAT reports with calculations of what needs to be paid or collected from SARS can be retrieved in the system with one or two clicks. However, the textbooks provide a good background information around VAT procedures, this information is available as well in the CAS manuals. Salaries and wages are the other content that can be taught better with computerised accounting. The only thing learners enter in the system is the records of the employees and the time worked and the system will calculate everything from gross wages/salary, deductions, up to net wage/salary. The system additionally develops payslips which is omitted in the textbooks while it would connect accounting education to the real-life experience of learners. Year-end adjustments are done in the system using journal entries but the value effect on the financial statements is automated, same as the financial statements. The year-end adjustments, preparation of financial statements, and analysis and interpretation of financial statements are scheduled to be covered in a period of 52 hours (13 weeks x 4 hours per week). In a CAS accounting this topic can be taught in a period of 3 to 4 weeks as they are automated.

In Grade 10 learners are introduced to basic manufacturing concepts and calculations of cost accounting and budgeting. They need to know the different types of budgets and their

components, but extensive calculation of figures is reserved for Grade 11. The CAS covers such information in the manuals as well. The overall focus on the textbooks seems to be more on only the understanding whereas the CAS goes beyond understanding to the application of knowledge, that empowers learners to be competent.

6.3.2 Accounting content in Grades 11

Grade 11 commences with reconciliations, fixed assets and bookkeeping relating to partnership business in academic term 1. The bank reconciliations are irrelevant as they were based purely on cheques. They were based on post-dated cheques, stale cheques, cheque errors, cheques that were stopped. This was raised as a concern by accounting teachers that the accounting textbooks are outdated. Yogi commented that:

> We still talk of cheques and cheque counterfoil in high school whereas the use of cheques in South Africa was stopped in year 2020 due to their labour intensiveness and frauds being committed using them. Businesses these days use Electronic Fund Transfers (EFT) for their business transactions.

The CAS allows learners to download the bank statements into the cash book and that eliminates errors that might require reconciliation. A vast number of errors that occur with the manual system do not occur when computerised accounting is used for business processes. The error detection in CAS is in real-time and immediate.

The fixed assets topic is about purchase of assets, their valuation, and disposals. Additionally, learners are taught how to disclose them in the financial statements and notes. The valuation of fixed assets is based on the depreciation methods. The fixed assets topic covers mainly the tangible assets (assets that can be physical touched with a lifespan longer than one year). Learners are taught how to calculate and record the cost, the depreciation expense, accumulated depreciation, and the carrying value of assets from one year to another. In a computerised accounting the assets are entered in the system and the system is designed according to the business policies to automatically calculate the depreciation, accumulated depreciation and the carrying value. When entering the assets in the register more description and specific information about the assets is punched into the system. This information is related to what learners see daily in their lives. For example, if the asset purchased is a vehicle, then its description will include the registration numbers, the model, the colour etc. This is what will make accounting interesting to learners and more relevant to them. This confirms what the teachers raised that computerised accounting would expose

learners to real-life unlike in textbooks where the transactions are general like “bought motor vehicle”. Jacqueline mentioned that:

> When I was introduced to a computerised accounting system, I understood accounting principles better, and I felt like I was driving real business processes. Even the terminology used was the one you find in real business. For example, the accounting cycle steps, and the different source documents were clearly understandable and how they affected the financial statements. Transactions were not general as you will find them in an accounting textbook like ‘bought goods’ but were more realistic like ‘bought 10kg of rice’ meaning they were specific and described the actual items bought.

The tendency of accounting textbooks to use transactions that are general and broad might be the reason that the learners struggle to connect accounting education to real-life. This is what needs to be explored and possibly be improved in accounting education. The connection of accounting education to real-life might ignite interest and enthusiasm of learners in the subject. With regards to the bookkeeping related to partnership the only part that is covered in the computerised accounting is the recording of transactions and all the calculations up to the analysis of financial statements is automated. The cost accounting module in Grade 11 covers the costing concepts, costs calculations and preparation of general ledger accounts related to a manufacturing business. While the textbooks these three with computerised accounting only the explanations of concept are in the CAS manuals and cost calculations and ledger accounts are automated.

The academic term 3 in Grade 11 covers budgeting, inventory systems and clubs. With budgeting learners are taught how to do projections of receipts, payments and drawing the cash budget and projected statement of comprehensive incomes. The learners are given percentages to make calculations for future months. In computerised accounting the percentages are punched into the system and the calculations occur automatically. The CAS goes a step further to show differences between what was projected and the actual results, giving an opportunity to do variance analysis better. The variance analysis is what helps businesses in real-life to understand the performance of the business.

There are two inventory systems covered in the curriculum. They the periodic and perpetual inventory system. In Grade 11 learners are taught the differences between these two inventory systems, the bookkeeping recording related to inventory, their effect in the accounting equation. The computerised accounting systems uses perpetual inventory system as it updates the inventory levels whenever there is a purchase or a sale of inventory. This assists businesses to be aware with their inventory levels and know when to order. The other content covered in term 3 is clubs which are non-profit organisations and while the textbooks

cover their bookkeeping from general ledger accounts to the financial statements and their analysis. Learners are taught the difference between the terminology used in profit-driven business and the non-profit organisations, the general ledger accounts specific to clubs, and the reporting in financial statements. Computerised accounting systems have pre-loaded list of non-profit organisations such as different clubs in terms of sport codes, churches, and charity organisations. Each have a list of specific general ledger accounts related to them. The processing of cash receipts and payments is done in the cash book and thereafter everything else to the analysis of financial statements is automated.

In the lasts term in Grade 11 only the VAT topic is covered. This was introduced in Grade 10. Learners are taught how to calculate it and how it is recorded on the t-accounts. Learners are taught the VAT input and output to determine whether there's a VAT asset or liability that should be claimed or paid at South African Receiver of Revenue (SARS)With computerised accounting each transaction that is being entered into the systems automatically calculates the VAT where applicable using the current rate. The system develops a VAT report similar to VAT return that is submitted at SARS. The system provides a real-life view of how VAT is dealt with in businesses on monthly basis.

The content that is covered in Grades 10 and 11 can be easily covered with computerised accounting. The advantage with CAS is that lots of time spent on unnecessary calculations might be saved for more important aspects of accounting. Additionally, as highlighted above computerised accounting would possibly connect accounting education to real-life business processes and simplify complex accounting content for learners.

6.3.3 Accounting content in Grades 12

The academic term 1 in Grade 12 focuses on companies. Unique general ledger accounts, financial statements including the statement of cash flow, and the analysis and interpretation of financial statements is covered. The learners are taught how to prepare these financial statements using tables (columns and rows templates) that they draw or supplied with as templates. The analysis and interpretation of financial statements is done with the use of a list of financial ratios. These ratios are computed using formulas that are provided to learners. Learners are taught how to determine whether a business is doing good or bad by comparing the results brought by these ratios. Learners tend to struggle with both calculations using the given ratios and how to comment whether a business performance or position is improving

or deteriorating. According to DBE (2020:18) learners make mistakes and errors in the calculations of these ratios due to their poor mathematical background.

Again, computerised accounting systems provide beautiful graphs/charts that are used in business as instruments for the analysis and interpretation of business performance or position. In a system these ratios are available with a click and can be monitored in real-time. This is a major part of accounting in grades 10 to 12. Therefore, for a period of three years (grades 10 to 12) learners are taught these financial statements and in real-life accounting practices the financial statements are computed by a computerised accounting system with one second click and few minutes waiting for a system to run reports. One can does not diminish the need to understand how to prepare financial statements for the sake of informal small business who cannot afford computerised accounting systems. However, technology these days is available and affordable even in the form of mobile phone apps.

The academic terms 2 to 4 covers the content that was already covered in Grades 10 to 11 but in a more intensive approach. In Grade 11 learners are introduced into differences between the inventory systems while in Grade 12 they are taught how to value closing inventory using three inventory valuation methods (first-in-first-out, weighted average, and specific identification methods) under each inventory system. In real-life business one inventory valuation method will be selected as part of the business policy. The learners are taught using the term ‘goods’ to accommodate any type of inventory that different businesses might have. Computerised accounting systems tracks the movement of inventory as transactions occur and the calculation of the value of closing inventory is automated. The system tells exactly how many items available in the warehouse and their value. The real description of inventory items is being used which assist in relating accounting to the real-world business. This again corresponds with the findings from data collected from accounting teachers that computerised accounting relates accounting lessons to the daily lives of learners making accounting enjoyable and understandable.

The emphasis on the cost accounting content covered in Grade 12 is the production cost statement and the analysis and interpretation of the costs. For the VAT the move from calculations to VAT control account which is meant to calculate VAT liability or asset. For the budgeting the analyse the cash budget. This content is automated in computerised accounting. The Table 6.3 below shows a summative comparison of what content is covered in Grades 10 to 12 and how it is presented for learning in accounting textbooks as well as in computerised accounting:

Table 6.3: Grade 10 to 12 accounting content in textbooks and in CAS manuals (adapted DBE, 2020a)

Content	Grade	Manually with a textbook in class	Computerised accounting
Ethics, GAAP principles, internal control introduction	10-12	In class these are taught as theory and are integrated in the accounting content of all the grades.	The CASs are designed according to the GAAP principles and control measures are embedded in the systems. Ethics are human factor rather than system based.
Accounting equation	10-12	In class this is done in a table format template (columns and rows) or worksheet	Not covered in the computerised accounting as systems are designed to automate the accounting equation in the background.
Journals	10	Journal exercise book is used to record the transactions	This occur simultaneously in the background of the system as source document transactions are being entered in the system.
Salaries and wages	10	Journal exercise book is used to record the transactions	Learners enter the personal details of the employees and their time sheets in the system will make all necessary calculations and develop payslips.
General ledger and trial balance*	10-12	For the GL the learners use general ledger exercise book and for trail balance use templates.	Automated in computerised accounting.
Value added tax	10-12	Learners need to calculate VAT for every transaction they do. The need to determine and subtract the input VAT from output VAT.	The system calculates VAT with every transaction entered in it where applicable. VAT reports showing how much to be paid to or claimed from SARS.
Financial Statements and year-end adjustments*	10-12	In class this is done in a table format template (columns and rows) or worksheet. Learners are taught step by step of calculating every item of the financial statements.	Automated in computerised accounting.
Analysis and interpretation of financial statements*	10-12	Learners are given formular sheet to use for the calculation of ratios and then interpret them.	The ratios calculation is automated with additional graphs and charts for simplicity; however, one need to be able to interpret them.
Cost accounting	10-12	Learners are given theoretical background and use a calculator to calculate every cost item and then in a table format prepare production cost statement.	Learners enter the cost related transactions, and the system creates production cost statements
Budgeting	10-12	Learners are given theoretical background and use a calculator to calculate every item for every month using percentages given to them.	Learners enter the percentages in the system and the system would automatically calculate every amount from one month to another.
Reconciliations	11-12	Reconciliations are based on the errors due to manual processing. Learners must check and calculate balance given make reconciliations.	Not covered as the system uses the exact information.
Fixed assets	11-12	The learners are taught the depreciation methods and how to calculate depreciation expense, accumulated depreciation, and carrying value from one year to another. They also need to be able to make fixed asset notes in a table template or exercise book.	Learners enter the cost and other specific information when the asset is being purchased and the calculations of depreciation expense, accumulated depreciation, and carrying value will be done by the system. The depreciation methods and percentages are business policies that are entered in the system so that it makes calculations accordingly.
Inventory systems	11-12	Learners are taught to calculate the value of closing inventory using different inventory systems and inventory valuation methods. These calculations are done using calculators.	Computerised accounting systems use one inventory system, and the valuation method is system designed. Learners select the one used by a specific business according to the policy.

6.4 Assessments

The section sought to understand how accounting content is assessed in high school. This might assist in identify the best assessment method that can be used to assess computerised accounting in high school. The CAPS document for Grades 10 to 12 states that it is compulsory that each of these grades to have a project as a mode of assessment. It further states that the project might be based on a computerised accounting system. This is the second time in the curriculum that an accounting software is mentioned. Firstly, at the beginning in the purpose of accounting subject where it states that "accounting learners will be able to deal confidently with the demands of an accounting occupation manually and/or electronically". This shows that the DBE understands the demands of accounting occupations includes computerised accounting. However, it does not provide clear direction of how this important demand should be met. The Table 6.4 below shows an overview of the assessments of Grades 7 to 12 as prescribed in the curriculum:

Table 6.4: Assessments of EMS and Accounting in Grades 7 to 12 (adapted DBE, 2019; DBE 2019b; DBE2020a)

Term	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12
1	Assignment	Data response	Assignment	Presentations	Report	Report
	Test	Test	Test	Test	Test	Test
2	Case study	Project	Case study	Project	Project	Project
	Examination	Examination	Examination	Examination*	Examination*	
3	Project	Case study	Project	Case study	Presentation	Case study
	Tests	Tests	Tests	Tests	Tests	Test
4	Examination	Examination	Examination	Examination*	Examination*	Examination*

** Examinations have Paper 1 and Paper 2*

According to Table 6.4 above the is an opportunity for computerised accounting to be assessed as a project. This is further enhanced by the statement in the curriculum that says, "*accounting skills may be developed through a project by incorporating use of an accounting program*". With controlled test it might be difficult to assess computerised accounting as the number of available computers in schools might not match the number of students. This was mentioned by Emihle when she noted that:

> The number of computers available in school computer laboratories are less versus the number of learners and therefore to have examinations within a specific time frame will not be possible as not all learners can fit in a venue in one go.

The limited number of computers is something that can be solved should the decision to integrate computerised accounting in high school.

6.5 Summary

The first section of this Chapter examined the accounting content within the EMS subject in Grades 7 to 9. The document analysis reveals that accounting in high school focusses on theory and calculations. The accounting content covered in Grade 7 was deemed insufficient and irrelevant for the using computerised accounting to teach it. The content prescribed for Grades 8 and 9 is automated in computerised accounting. Teaching this content with computerised accounting enhance understanding with practice, and that might provide a well-rounded learning experience for learners.

Several findings from data collected with semi-structured interviews was confirmed and collaborated by the findings from document analysis. The content covered in Grades 10 to 12 could be covered in a minimum time with a computerised accounting. The textbooks focus on background theory and too much time on calculations. These calculations are automated in computerised accounting, this possibly mean that the knowledge of how to calculate might be unnecessary and never be used in a business environment. This possible ignite a broader thinking of what knowledge really matters in accounting education. The emphasis on calculations that might never be necessary in the real-world business might be a waste of important time that can be used for other important aspects of accounting education.

This chapter further highlighted the need to really consider integrating computerised accounting in high school accounting education and the two benefits of that could be to save time and connect accounting education to real-life business practices. Chapter 7 will present provide conclusions and recommendations of this research.

CHAPTER SEVEN

CONCLUSIONS AND RECOMENDATIONS

7.1 Introduction

The previous chapter presented and discussed the findings from document analysis. This chapter provides conclusions based on the findings and the proposed framework as a recommendation. The aim of this study was to develop a framework that can be used to integrate computerised accounting into the curriculum delivery of accounting in high school through seeking to understand the accounting teachers' opinions. To do this the researcher gathered data aligned to the study research questions which are:

1. How can the concerns of accounting teachers towards the integration of computerised accounting into their accounting curriculum delivery be addressed?
2. What resources are needed to integrate computerised accounting into high school accounting curriculum delivery?
3. How can computerised accounting be integrated into high school accounting curriculum delivery?

The findings from this study were used to develop a proposed framework (FICASE). This framework will assist in providing guidelines for education policy makers regarding the key areas to consider when integrating computerised accounting in high school curriculum from policy reorganization to implementation and evaluation.

The study magnified the importance of computerised accounting as an additional pedagogical tool that can be used to respond to challenges facing accounting education at high school level. Benefits that can be used as a motivation to integrate computerise accounting in high school curriculum were discovered. Barriers to integrate computerised accounting into accounting lessons in high school were identified however they should not be the end point but rather the starting point. Continuous efforts to get rid of such barriers related to technology integration in classroom should be made. This chapter is organised as follows:

7.2 Summary of findings from the interviews
7.3 Summary of findings from the document analysis
7.4 Proposed integration framework
7.5 Curriculum policy implications
7.6 Limitations of the study
7.7 Contribution of the study
7.8 Suggestions for future research

7.2 Summary of findings from interviews

The first research question was about the concerns of accounting teachers regarding the integration of computerised accounting in high school accounting curriculum. This section presents an overview summary and concluding thoughts of the findings related to teachers concerns as per the interviews conducted. Additionally, findings related to the benefits and barriers of computerised accounting integration were summarised in a table format. The Table 7.1 below provides a summary of accounting teachers' concerns about the possibility of integrating computerised accounting in high school curriculum. These concerns are linked to the barriers of integrating computerised accounting as well:

Table 7.1: Teachers' concerns about integration of computerised accounting

Findings	Summary
○ Lack of background knowledge	○ The findings showed that accounting teachers are concerned that computerise accounting might deprive learners knowledge of what occurs in the background of a computer. They are uncomfortable with the fact that computerised accounting simplifies accounting and automate most of the accounting cycle step.
○ Assessment inequalities	○ Teachers were concerned that computerised accounting integration in the curriculum will expose inequalities when it comes to assessments as learners are not having equal access to technology resources from one school to another.
○ Unavailability of resources and lack of funding	○ The study revealed that technology resources are not available in high schools to accommodate all learners and the reason for the unavailability of these resources relates to the lack of funding to procure them.
○ Safety of resources	○ The accounting teachers posed that the schools are not secured enough to have technology resources on their premises and the availability of such resources will expose schools to burglaries and other crimes.

The concerns in Table 7.1 above depicts that teachers are still into traditional paper-based accounting rather than moving with times into the 21st century technologically based ways of teaching. These concerns are DBE responsibility rather than individual schools' challenges, should government embark on integrating computerised accounting assessment strategies that will accommodate all learners irrespective of background in terms of resources. This includes the security measures that would need to be taken in order to secure the acquired resources. The curriculum would need to be designed with thorough considerations of the available technological resources.

7.2.1 Status of accounting in school

The teachers raised concerns with the current status of accounting in school. They fingered poor accounting foundation being laid in grades 7 to 9, the use of outdated accounting textbooks, old teaching methods, irrelevance of accounting subject to the real world. They stated that these challenges have a negative effect on academic performance and the diminishing number of learners opting to pursue careers in accountancy. The Table 7.2 below shows the accounting teachers' concerns related to the status of accounting in high school:

Table 7.2: Teachers' concerns about status of accounting subject at school level

Findings	Summary
○ Poor foundation in grades 7 to 9	○ The accounting teachers raised concerns about the poor foundation accounting in the EMS subject in grades 7 – 9. They reflected that some of their colleagues tasked to teach EMS in those grades are not capacitated with accounting knowledge. They posed that the financial literacy module is not being thoroughly taught and that has implications in grades 10 to 12.
○ Use of outdated accounting textbooks	○ It was discovered that some of the accounting textbooks being used in schools are outdated with old terminology that has been changed.
○ Old teaching methods	○ It was discovered that the accounting teachers still rely on only chalk, chalkboard and textbooks to teach accounting and they rarely use any technology in their curriculum delivery. This was identified as one of the reasons learners loose interests in accounting.
○ Irrelevance of accounting to real world	○ Accounting education was viewed as not relevant to the real-world business practices. The way topics are presented are not processed the same way in the business environment.

○ Poor academic performance	○ Teachers were concerned that the academic performance of learners in accounting is poor, and they pointed the above findings as some of the reasons.
○ Diminishing number of accounting learners	○ The numbers of learners choosing accounting is consistently decreasing. Learners are not interest in the profession anymore.

The concerns in Table 7.2 above vividly show that interventions are needed to turn things around in respect of how accounting is taught in high school. The old methods of teaching need to be updated and since the learners in this 21st century are seen to be technologically savvy, therefore computerised accounting might provide a much-needed solution in terms of aligning accounting into the real-world of business, igniting interest, improving academic performance and attracting more learners into joining the accounting profession.

7.2.2 Benefits of computerised accounting integration

Teachers themselves identified several benefits of integrating computerised accounting. These benefits were confirmed what was revealed by literature review. The Table 7.3 below presents what accounting teachers deem will be the benefits of integrating computerised accounting into the high school accounting curriculum:

Table 7.3: Benefits of the integrating computerised accounting

Findings	Summary
○ Develop interest and positive attitude	○ The accounting teachers firmly believed that the integration of computerised accounting into the accounting curriculum will ignite interest and enthusiasm of learners towards accounting. They add that learners will have positive attitude towards accounting as they like anything that has to do with technology.
○ Enhance understanding of accounting principles	○ According to the accounting teachers the use of computerised accounting for teaching will enhance understanding of accounting principles as the learners will be exposed to real-business practices.
○ Improves academic performance	○ The study revealed that the increased interest towards accounting and enhanced understanding of accounting principles because of integration of computerised accounting will assist in improving the academic performance of learners in the subject.

○ Grow the accounting profession	○ The findings revealed that accounting is losing popularity in high school and that has an influence on the growth of accounting profession.
○ Exposure to real-world job practices and enhance employability	○ It was found that computerised accounting will expose learners into real-world job practices and enhance their employability in the business environment.

Teachers seem to understand that learners have a negative attitude towards the accounting subject and that computerised accounting might assist in igniting interest of learners to choose accounting. The link between the accounting education and the real-world of accounting that the integration of computerised accounting would create seem to be another important benefit. This would possible add more to learners' attributes when seeking employment. Accounting is regarded as a scarce subject in South Africa and therefore interventions to turn around this would be very helpful.

7.2.3 Barriers of computerised accounting integration

Teachers posed that the current curriculum is unclear when it comes to how can computerised accounting be integrated in the classroom. The teachers seem to be looking forward into adding computerised accounting as one of their teaching tools but specified that they would firstly need to be trained. The issue of lack of technological resource was fingered as one of the barriers for integrating computerised accounting. The Table 7.4 below depicts the barriers of integrating computerised accounting as identified by the participants:

Table 7.4: Barriers of integrating computerised accounting

Findings	Summary
○ Accounting curriculum review	○ The findings revealed that the accounting subjects is being updated on annual basis under IFRSs while the accounting school curriculum takes long time before it gets update. The findings showed that if the technology integration is unclear or does not reflect in the curriculum policy then teachers will not attempt to integrate technology in their lessons.
○ Teacher attitude and development	○ The findings of this study confirmed what the literature stated that the attitude of teachers plays a major role technology

	integration in education. The attitude of accounting teachers is positive towards the integration of computerised accounting. However, they raised that they will need to be trained first before the integration is implemented.
○ Unavailability of resources and lack of funding	○ Schools where the participants of this study teach do have computer laboratories. However, they teachers raised that the computers software in them need updates as they are very old. Teachers also raised that the number of available computers is less than the number of students and there would need to be proper timetabling to use the laboratories.

The barriers of integrating computerised accounting presented in Table 7.3 above are linked to the concerns raised by teachers. The curriculum would need to be reviewed and updated to clarify how will computerised accounting be taught. Teachers seem to open for training and upliftment of their skills in relation to computerised accounting as their lack of experience would possibly be a barrier should it be unattended. The number of available resources would need to be improved to match the number of learners as it seems not to be the case. The barriers sighted above are the responsibility of the DBE and should the government decide to integrate computerised accounting in high school then these should be the starting point.

7.3 Summary of findings from document analysis

This section provides a synopsis of findings based on document analysis. The documents that were analysed were the CAPS documents, EMS and Accounting textbooks, and computerised accounting manuals. The findings from the document analysis collaborated what was discovered during the interviews. Additionally, it was identified that time allocated to certain topic can be saved with computerised accounting. Content such as source documents, salaries and wages, general ledger, trial balance, financial statements, analysis and interpretation of financial statements, can be taught effectively and efficiently with computerised accounting. The manual method used in the accounting textbooks to present these topics for learning it is traditional and possibly no longer exist in the real-world business. From this document analysis it was confirmed that the integration of computerised accounting would possibly connect accounting education to the real-world accounting practices and that would benefit the learners in their future accounting careers.

7.4 Proposed integration framework.

While the first research question was about the concerns of accounting teachers in relation to the integration of computerised accounting as an additional pedagogical tool, and the second question about the resources required to integrate computerised accounting, the third research question asks, *"How can computerised accounting be integrated into high school accounting curriculum delivery?"* This section proposes a framework for the integration of computerised accounting based on the empirical findings and literature review as a response to this research question. The framework is named a Framework for the integration of computerised accounting in school education (FICASE). The framework has three phases namely:

- Phase 1 – Curriculum revision
- Phase 2 – Funding for resources
- Phase 3 – Implementation

This proposed framework can assist the education policy makers to understand better what the key requirements to successfully integrate computerised accounting into high school curriculum delivery. Additionally, this framework is not limited to only the integration computerised accounting, but it can be applied to integrate other technological content knowledge systems into the school subjects.

Each phase is discussed in detail in the following paragraphs. The first two phases correctly address the teachers concerns regarding the integration of computerised accounting while the last phases focus on the implementation, monitoring and evaluation. The framework is displayed in Figure 7.1 below:

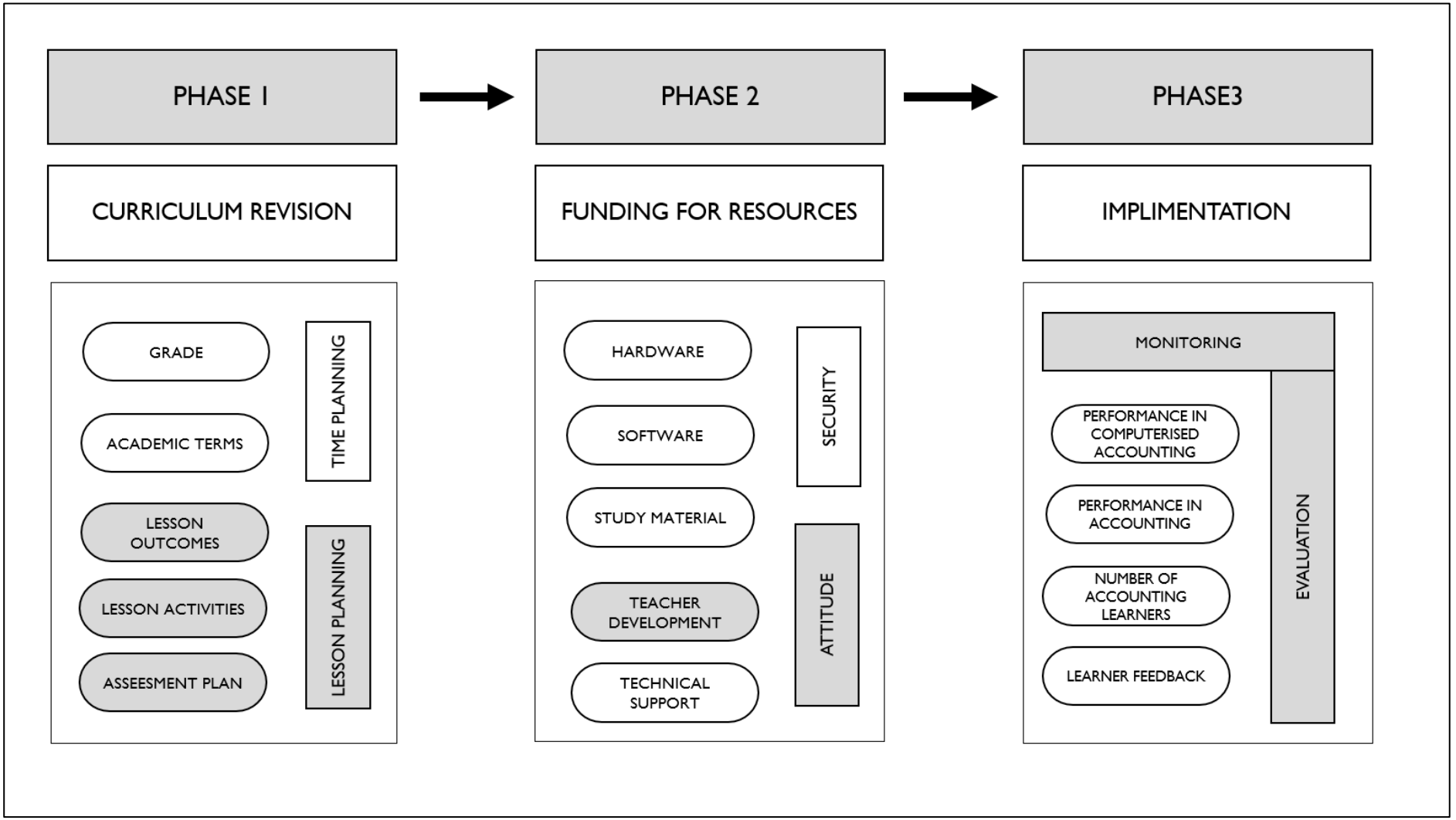

Figure 7.1 Framework for the integration of computerised accounting in school education (FICASE)

7.4.1 Phase 1 – Curriculum revision

The first critical step to integrate technology into the curriculum is to set a clear direction via the curriculum policy. The policy makers need to have a willpower based on understanding of the benefits of integrating technology to subjects such as accounting. A clear vision and mission of integrating computerised accounting would need to be developed. Currently in the South African context, the curriculum policy is silent on how the accounting related technology should be integrated into it. The curriculum of the accounting subjects would need to be reviewed and updated to include computerised accounting. The following variables would need to be clearly determined:

- Time Planning
- Lesson Planning

7.4.1.1 Time Planning

The curriculum police should indicate in what grade/s should the computerised accounting be integrated. The teacher in this study suggested grade 8 as the best grade to introduce computerised accounting. They recommended system navigation as the first step of introducing computerised accounting. The purpose of include computerised accounting in grades 8 and 9 would be mostly to attract learners to choose accounting/ in grade 10. Therefore, in these two grades basic training of computerised accounting can be introduced. The study recommends the following structure of integrating computerised accounting in terms of grades. The Table 7.5 below provides suggestions of what units should be covered in terms of grades:

Table 7.5: Suggested topic coverage per grade

Grades	Topics
8	System navigation and data entry (Creating customer, supplier, inventory, and general ledger accounts)
9	System navigation, data entry, cash book transactions (Payments and receipts)
10	Cash book and credit transactions (credit purchases and credit sales cycles)
11	Generating financial reports and Analysis
12	None

The topics should be spread across the academic school terms in a calendar year.

7.4.1.2 Lesson Planning

The curriculum should identify topics to be covered and determine the outcomes of such topics. Secondly, the class activities to be done to achieve the stated outcomes. Lastly, the curriculum should be clear on how the achievement of outcomes will be assessed. Lesson planning should consider the availability of resources to implement it. Well organised lesson plan will start with the lesson outcomes and objectives, the lesson activities and media resources to be used, and how the teacher will evaluate if the learning has occurred. The Figure 7.2 below provides an overview of the basic items that should be in the lesson planning:

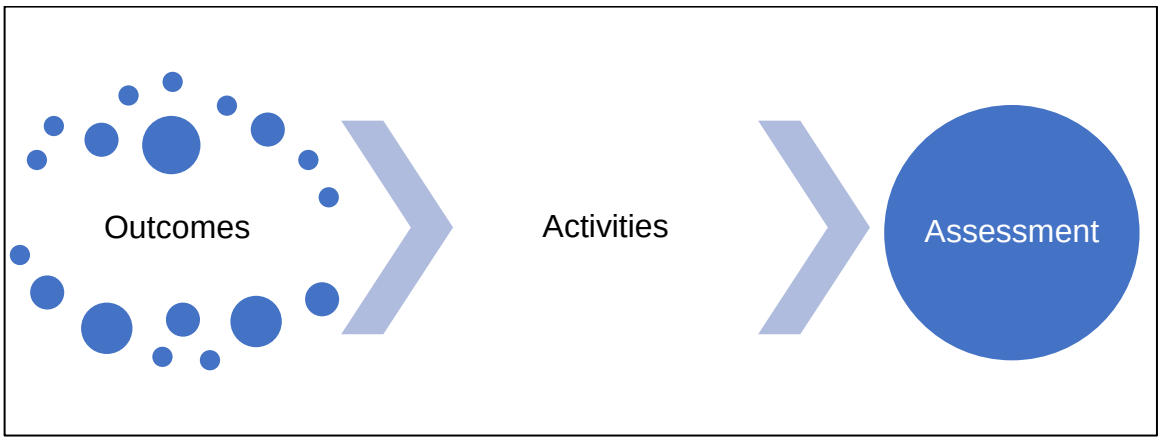

Figure 7.2: Overview of lesson planning

The following paragraphs illustrates the lesson outcomes, lesson activities and assessment plan that can be followed to integrate computerised accounting in high school.

- **Lesson outcomes**

The curriculum should clearly outline what should the learners learn and understand under each topic or chapters. The outcomes should clearly indicate what knowledge and skills is expected from learners at the end of each lesson. Therefore, the lesson outcomes should indicate what learners are supposed to have learnt after the lesson activities has been completed and why it is important for them to learn the specified lesson topics. The integration of computerised accounting into accounting lesson is about developing the skills of learners in how to apply accounting principles using real-world business scenarios. The sequence of lesson outcomes should systematically fit in with the topics or chapters to be covered in each grade and/or academic term.

- **Lesson activities**

The lesson activities should be drafted such that they are aligned to the lesson outcomes. The preference would be to use the activities that appear on the textbooks, in that way learners would realise that what computerised accounting processes the same transactions that they normally do manually but simply transforms them technologically. This means the development of computerised accounting study material to be used should be not far different from what is in the accounting textbooks. However, the activities should resemble the real-life business transactions. As identified in the findings that business transactions in accounting textbooks tend to be general such that they make learners not to connect accounting to real-life. For example, the accounting textbook transaction would say *'bought goods for R299.95'* whereas the computerised accounting transaction would be like *'Bought 10kg rice R299.95'*. Learners would be left wondering what goods is but with computerised accounting transactions they will know exactly what rice is as it is something that they buy in real-life.

The activities should be purposive, short, and precise. Alternative methods of doing activities should be developed especially to be pro-active in cases of electricity loadshedding incidences. The format of activities should accommodate different contexts of schools and their backgrounds.

- **Assessment plan**

The Government Gazzette of 2004 (South Africa, 2004:20) boldly states that "assessment is an important driver in education, and if not well-managed, can become a barrier to innovation". Assessments should be developed in a manner that systematically assess cognitive levels using lower order to higher order questions in accordance with Bloom's taxonomy. The assessments should be continuous and formative in nature with feedbacks that enhance learning. Assessments should enable clear detection of the level of competency of learners. The purpose of the assessments should be to measure the attainment of the pre-planned lesson outcomes and improve learning and teaching process. The lesson outcomes, lesson activities and the assessment criteria should be aligned. Therefore, the computerised accounting assessments should be formative.

Learners can be given individual projects or tasks to complete, and the teachers provide feedback on questions where learners did not perform well. The preference of projects is

informed by the fact that they can be allocated longer time to complete and submit which will assist in terms of limited resources that has to be shared in schools. The feedback of how learners performed in the assessments should assist teachers to detect weaknesses and strengths of lessons. This will highlight areas that require more focus and how teachers can improve their teaching and thereafter create remedial teaching methods. In this manner the learners' understanding of the application of accounting principles will be enhanced and their competence levels thoroughly developed. This research suggests a minimum weight of about 10% - 15% per annum to be allocated for computerised accounting assessment. Allocating an assessment weight will highlight to learners the importance of computerised accounting skill and derive commitment of learners to ensure competency.

7.4.2 Phase 2- Funding for resources

The integration of technology into the curriculum requires resources and to acquire them funding should be made available. This section responds to the research question that asks, *"What are the resources needed to integrate computerised accounting into high school accounting curriculum delivery?"* The focus of this research was on public schools and their funding of resources is the responsibility of the government under the Department of Basic Education. However, schools can on their own source funding from private businesses more especially for hardware resources. In one school that participated in this research their computer laboratory was sponsored by a private business. Findings revealed that the availability resources differ from one school to another. According to the findings the following resources will need to be funded to successfully integrate computerised accounting in high schools:

- Hardware
- Software
- Study material
- Teacher development
- Technical support

Additionally, the security of the resources was identified as paramount. The paragraphs below provide explanations of what do each resource entail.

7.4.2.1 Hardware

The findings indicated that there are schools that have the hardware resources such as computer laboratories. All the 9 schools where the participants of this research teach have function computer laboratories. However, a further quantitative study would need to be conducted in future to determine the number of schools with computer laboratories and those without. The hardware requirements needed are the desktop computers, laptops, or tablets. Laptops are more advantageous as they can be safely stored in a safe after their use and can be used in any classroom not necessarily need a separate one. The desktop computers require a separate classroom to be built or converted into a computer laboratory which might make it expensive and uneconomical. The tablets are another alternative that can be used however their size user interface might not be conducive for the navigation and typing of business transactions.

As confirmed by the findings some schools might need more resources than others. In the South African context there are rural schools that do not even have electricity infrastructure and therefore the funding requirement for them might be huge. However, what matters is that it is possible to integrate computerised accounting in all schools as there are options like mobile computer laboratories and alternatively the tablets can be used. The internet connection might not be that necessary as some of the computerised accounting systems might be used offline. This means that the selection of the computerised accounting system should consider this fact.

7.4.2.2 Software

Computerised accounting software will need to be procured and the licensing might require annual renewals. From researcher's experience the computerised accounting software have basic commonalities that makes it easy to adjust from one to another. Computerised accounting systems have dummy software for educational and training purposes. However, as stated in the previous paragraph the selection of the software should consider several aspects. The findings revealed that some software are simpler than others and this confirmed what was stated in the literature review that computerised accounting systems differs in terms of business sizes. Those aspects are the affordability, user friendliness and the fact that they can be used without the need for the internet. Internet require network connectivity and continuous funding for network data or Wi-Fi. The selection of computerised accounting

system that does not require internet connection will accommodate both urban and rural schools.

7.4.2.3 Study material

All computerised accounting software comes with manual. The manuals can be in the form of hardcopy or printed copy. However, development of study material that would bridge the gap between the computerised accounting software manuals and textbooks would be needed. As exposed in the findings that real-business accounting practices in the computer tend to look completely different from the accounting taught at school. This emphasizes the need to create synergy between the textbooks and computerised accounting system manuals. The new study material to be developed would need to show how business transactions are dealt with in the school traditional accounting format and how they are reciprocated in a computerised accounting. This will ensure that learners to not view computerised accounting as different learning tool but rather an alternative method that is used in real-world business.

7.4.2.4 Teacher development

Teacher development will require funding as well. The importance of investing in teacher development is that it transforms the attitude of teachers towards the integration from being negative to positive. The findings revealed that some accounting teachers have never saw or used a computerised accounting system in their entire life. However, they stated that the do know that there is something like it that exists in business. This meant that the training of accounting teachers in universities would need to be revised. Therefore, the computerised accounting training should be considered for both in-service teachers and pre-service teachers. For the pre-service teachers it is not that difficult to integrate computerised accounting in their curriculum as all the universities have computer laboratories and access to computerised accounting systems. Some universities do have computerised accounting in their curriculum; however, government would need to ensure that it is included in all universities offering teacher education.

The training for in-service teachers will have to be conducted outside the school hours, in the afternoon, weekends, and/or holidays. Funding will be needed to incentivize teachers to sacrifice their resting time for the training. Additionally, to the physical face-to-face training of

teachers recorded video lessons might assist for personal reference after the duration of the trainings.

7.4.2.5 Technical support

As reflected in literature and confirmed by findings, technical support is very important in the integration of technological pedagogies in classroom. The delay in solving technical challenges affects time for content delivery and makes teachers to be reluctant in using technology for their lessons. Technical support should be ready and on standby.

7.4.3 Phase 3 – Implementation

As cited in the findings the integration on computerised accounting into the curriculum will require time and proper planning to successfully implement. It is not advisable to start it in all grades at once. Preferable that it is started with one grade then phase it up on yearly basis. Therefore, if in one year it starts in grade 8 then the following year it goes to grade 9 as shown in the Figure below. This means that to roll it in grades 8 to 11 a period of 4 years will be needed to fully implement. The goal of integrating computerised accounting into curriculum delivery of the accounting subject is to provide additional pedagogy, enhance understanding of accounting, and attract more learners to follow the accounting profession. To evaluate the effect of the integration matric results and numbers of students enrolled can be measured to determine the trends post the integration. The Figure 7.3 below provides an implementation rollout coverage in terms of the grades:

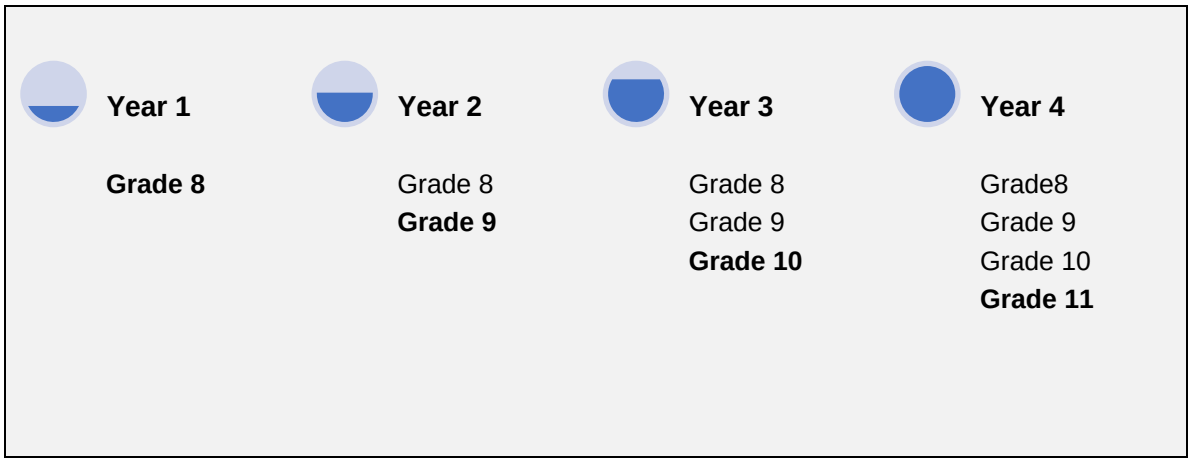

Figure 7.3: Computerised accounting implementation rollout.

7.4.3.1 Monitoring and evaluation

The effectiveness of the integration can be evaluated by analysing the changes in numbers of enrolment of accounting in grade 10 to 12. The numbers of learners would indicate whether accounting is regaining popularity among learners after they have used computerised accounting. Additionally, the academic performance changes in accounting subject and in computerised accounting itself would need to be monitored and used as yardstick to evaluate whether the integration is yielding positive results or not. Learners can be asked to give feedback on their experiences. The feedback from learners will assist in identifying key areas that require improvement. The teachers' experiences will assist as well because they will be the best to know the challenges when implementing lesson plans.

7.5 Curriculum policy implications

The study found that the curriculum policy for the accounting subject in relation to technology integration into the curriculum is ambiguous. It was discovered through literature and data collected that teachers only strive to follow what is prescribed in the curriculum policy and anything outside the policy they ignore. The omission of clear policy direction related to technology integration in high school curriculum delivery has an effect of teachers' attitude towards technology. Technology integration in education is a very broad term as there is technology for instruction and communication delivery as well as technology for content delivery. In the curriculum policy of geography, it is clearly stated which subject specific technology that needs to be promoted. The DBE (2011b:08) states that "promoting the use of new technologies, such as Information Communication Technology (ICT) and Geographical Information Systems (GIS)". However, the document is unclear as to how and when is the promotion going to done. The government education departments should provide clear vision and mission of how and when technology can be integrated into curriculum delivery of school subjects.

Another policy perspective is related to teacher education qualification minimum requirement specifications. The government as the regulator of teacher education should also be specific in terms of the required technological pedagogical knowledge as well as technological content knowledge that graduate teachers should have. A collaboration and close relationship between the Department of Basic Education, Department of Higher Education, and the universities is important in clear determining the curriculum to be delivered in schools and that to be delivered to pre-service teachers.

7.6 Limitations of the study

This study is a qualitative case study, and its intention was to understand in-depth the opinions and concerns of accounting teachers with regards to the integration of computerised accounting into the curriculum delivery of accounting in high school. Therefore, the study findings cannot be generalised to a larger population. Secondly some of the participants had little knowledge or no experience at all of computerised accounting. Some have never been in a business environment where accountants work.

The access to accounting teachers was difficult due to the Covid-19 pandemic that broke up in year 2020. The government instituted lockdown regulations that restricted physical movement and contact of people. Schools were closed and when they were opened the visits from external stakeholders and people was prohibited. The teachers themselves were uncomfortable with meeting strangers as that exposed them to health threats. This is what forced that two of the interviews of this study to be conducted virtually with MS Teams. This denied the researcher a view of the body language of these teachers during the interview sessions. The circumstances brought by the pandemic prolonged the data collection phases of this study.

7.7 Contribution of this study

The study contributed to the body of knowledge by developing a framework (see Figure 7.1) that has been explained in Section 7.4. This framework can be used as overview guidelines when considering integration of computerised accounting into the curriculum delivery of accounting in high school. The study discovered benefits that can be ripped through integration of computerised accounting as an additional pedagogical tool in learning and teaching. The benefits identified in this study can be used as a motivation for the integration of computerised accounting in schools as an effort to improve the current status of accounting academic performance as well as to spark interest towards accounting among learners. The benefits identified in this study are not only limited to learners and in school environment but goes beyond the high school life in terms of empowering learners with skills required in the business sector.

This study found that computerised accounting makes learners employable better when they have knowledge of computerised accounting. The barriers that can impede such integration were also identified, giving education government department an opportunity to approach computerised accounting integration in high schools better planned strategies. This study ignites a debate about the integration of technological content knowledge in curriculum delivery at school level as well as at the universities in teacher education qualifications.

7.8 Suggestions for future research

Future related research may focus on the following:

1. A statistical-based study about technology resource availability in schools can additionally look at the differences between what the rural schools need versus the urban schools and indeed across the quintile levels for computerised Accounting.

2. The perceptions of learners with regards to this technology integration will further be important to have a well-rounded understanding of how the attitude of learners is.

3. A study into the pedagogical aspects of pre-and in-service training for computerised accounting.

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APPENDICES

APPENDIX A: Ethics approval from CPUT

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Highbury Road, Mowbray
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FACULTY OF EDUCATION

On the 20th of April 2021 the Chairperson of the Faculty of Education Ethics Committee of the Cape Peninsula University of Technology granted ethics approval **(EFEC 9-4/2021)** to MV Mndingi for a D. Ed degree.

Title of thesis:	A framework for the integration of computerised accounting into high school Accounting curriculum

Comments:

The EFEC unconditionally grants ethical clearance for this study. This clearance is valid until 31st December 2024. Permission is granted to conduct research within the Faculty of Education only. Research activities are restricted to those details in the research project as outlined by the Ethics application. Any changes wrought to the described study must be reported to the Ethics committee immediately.

Livingston

Date: 20th of April 2021

Dr Candice Livingston

Research coordinator (Wellington) and Chair of the Education Faculty Ethics committee

Faculty of Education

APPENDIX B: Research approval from WCED

Western Cape Government
Education

Directorate: Research

Audrey.wyngaard@westerncape.gov.za
tel: +27 021 467 9272
Fax: 0865902282
Private Bag x9114, Cape Town, 8000
wced.wcape.gov.za

REFERENCE: 20210504-2671
ENQUIRIES: Dr A T Wyngaard

Mr Mvemve Mdingi
38 Rand Street
Newton
Wellington
7655

Dear Mr Mvemve Mdingi

RESEARCH PROPOSAL: A FRAMEWORK FOR THE INTEGRATION OF COMPUTERISED ACCOUNTING INTO HIGH SCHOOL ACCOUNTING CURRICULUM

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Educators' programmes are not to be interrupted.
5. The Study is to be conducted from **01 June 2021 till 30 September 2021.**
6. No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December).
7. Should you wish to extend the period of your survey, please contact Dr A.T Wyngaard at the contact numbers above quoting the reference number.
8. A photocopy of this letter is submitted to the principal where the intended research is to be conducted.
9. Your research will be limited to the list of schools as forwarded to the Western Cape Education Department.
10. A brief summary of the content, findings and recommendations is provided to the Director: Research Services.
11. The Department receives a copy of the completed report/dissertation/thesis addressed to:

    The Director: Research Services
    Western Cape Education Department
    Private Bag X9114
    CAPE TOWN
    8000

We wish you success in your research.

Kind regards.
Signed: Dr Audrey T Wyngaard
Directorate: Research
DATE: 06 May 2021

APPENDIX C: Letter requesting participation of accounting teachers

Universiteit vir Tegnologie:
Kaapse Skiereiland
Cape Peninsula
University of Technology

30 August 2021

Cape Peninsula University of Technology
Faculty of Education
Senior Phase & FET
Mowbray Campus
Highbury Road
Mowbray
Cape Town
8000

Dear Accounting Educator

PARTICIPATION IN A RESEARCH PROJECT

I am currently a lecturer and PhD student at the above-mentioned academic institution. I hereby request your participation in my research project titled: A framework for the integration of computerised accounting into high school accounting curriculum. The purpose of the study is to design a framework that will be used to integrate computerised accounting into high school accounting curriculum.

You were selected because you are an accounting educator within the Cape Winelands education district. Your insight into this topic is highly valued as someone responsible for the daily delivery of accounting curriculum at the high school level. Due to Covid pandemic I will email you a short questionnaire that you will fill in and send it back, then a follow up telephonic interview for clarity will be arranged.

Your confidentiality and anonymity will be highly protected and guaranteed. Only pseudonyms will be used on the research report e.g., School A and Educator A to refer to your participation. The participation into this project is voluntary and a withdrawal is permissible at any stage. A summary of the research findings will be made available to you on request.

Your consent to participate in this study is highly appreciate and will assist the future of accounting in high school as we approach 4th Industrial Revolution.

Kindly complete the table below before participating in the research.

Statement	Tick the appropriate column	
	Yes	No
1. I understand the purpose of the research.		
2. I understand what the research requires of me.		
3. I volunteer to take part in the research.		
4. I know that I can withdraw at any time.		
5. I understand that there will not be any form of discrimination against me because of my participation or non-participation.		
6. Comment:		

Please sign the consent form. You will be given a copy of this form on request.

Signature of participant

Date

APPENDIX D: Interview questions

INTERVIEW QUESTIONS - ACCOUNTING TEACHER

RESEARCHER DETAILS	
Name:	Mvemve
Surname:	Mdingi
Student number:	201 253 258
Email:	MdingiM@cput.ac.za
Contact number:	021 680 1500 / 083 365 6441

SUPERVISORS' DETAILS		
	Main Supervisor	**Co-supervisor**
Title	Professor	Doctor
Name:	Agnes	Osman
Surname:	Chigona	Sadeck
Email:	ChigonaA@cput.ac.za	osadeck@gmail.com

RESEARCH TITLE
A framework for the integration of computerised accounting into high school Accounting curriculum.

ETHICAL CONSIDERATIONS
Please note that ALL information provided by the participants will be kept strictly confidential. With the completion of the questionnaire, the participation is deemed as voluntarily and the participant can withdraw from the study at any time if they so wish. All information provided will strictly be used for research purposes.

PRIMARY OBJECTIVES OF THE STUDY
To develop a framework that can be used to integrate computerised accounting into accounting curriculum delivery at high school level.

PARTICIPANTS' GENERAL INFORMATION

School District	Cape Winelands			
Gender	Male		Female	
Qualifications	Under-Grad	Post-Grad	Computerised Accounting skill	
Graduation Year	Before 1990	1991 - 2000	2001 - 2010	After 2010
Accounting Teaching Experience	Over 20 years	Between 11 & 20 years	Between 6 & 10 years	Less than 5 years
Grade teaching this year 2021	10	11	12	

MAIN INTERVIEW QUESTION:
What framework can be developed to support integration of computerised accounting into high school accounting curriculum delivery?

SUB-QUESTIONS

1.	***How can the concerns of accounting teachers towards integration of computerised accounting into their accounting curriculum delivery be addressed?***
	1. How do you feel about the way accounting is currently being taught in schools?
	2. What is your opinion about introducing computerised accounting in schools?
	3. If computerised accounting is introduced into schools, what effects do you think it will have on your teaching…your planning…accounting results…attitudes of learners?

	4. What computerised accounting knowledge/skill do you have?
	5. What are your concerns regarding the integration of computerised accounting into accounting curriculum delivery?
	6. How do you think the integration of computerised accounting can affect your teaching of accounting?
	7. How do you think the integration of computerised accounting can affect your preparation of accounting lessons?
	8. What impact can integration of computerised accounting have on your teaching time?
	9. How do you foresee as benefits of computerised accounting to your accounting learners?

	10. What do you think will be the attitude of your learners to the introduction of computerised Accounting?
	11. How do you think your concerns regarding the integration of computerised accounting can be addressed?
	12. Are you comfortable with the idea of teaching accounting using computerised systems? Yes/No and Why?
	13. Do you believe that it will be easy/difficult to use computerised accounting for teaching accounting? Yes/No and Why?
	14. Do you think computerised accounting can improve your teaching? Yes/No and Why?
	15. Do you think the introduction of computerised accounting to your learners can assist to revive interest or develop enthusiasm of accounting? Yes/No and Why?

	16. Would you support the use of computerised accounting as an additional teaching tool for accounting?
	17. Would you be interested in being trained how to use computerised accounting to teach accounting?
	18. What accounting related technologies do you currently use to teach accounting?
2.	***What are the resources needed to integrate computerised accounting into high school accounting curriculum delivery?***
	19. What are the resources required by school in order to integrate computerised accounting? Probe according to: Computer Laboratory, Computerised accounting software, computerised accounting study material, Teacher professional development.
3.	***How can computerised accounting be integrated into high school accounting curriculum delivery?***
	20. What do you think need to be done in order to successfully integrate computerised accounting into accounting curriculum delivery in high schools?

	21. What grade/s do you think will best to introduce computerised accounting?
	22. Which accounting topics that you think will be best covered using computerised accounting?