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Aspects influencing Accounting teachers' attitudes towards Computer Aided Learning

by

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DECLARATION

I, Maria Magrietha Breedt, declare that the dissertation, which I hereby submit for the degree Master of Education at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

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ABSTRACT

This dissertation reports on a study that was conducted on six Accounting teachers in South African private schools in Gauteng. The focus of this study was on the motivational aspects that influence Accounting teachers' attitudes towards Computer Aided Learning (CAL). These Accounting teachers' had access to computers and application software, and had received training to use CAL as a teaching strategy.

The Accounting profession now requires electronic Accounting skills, as electronic systems have replaced manual Accounting systems. As a result, secondary, tertiary, and professional Accounting has been greatly affected. In terms of this, Accounting teachers in South Africa appear to predominantly practice traditional teaching strategies. It seems that they tend to overlook the positive impact that CAL can have on learners' preparation for the real world of work. This tendency is seemingly perpetuated by the intrinsic and extrinsic aspects motivating Accounting teachers' use of computers. Consequently, learners do not have the opportunity to use Accounting software in the classroom because their teachers hesitate to use computers as a teaching strategy.

This study engaged a qualitative approach, which allowed me to use questionnaires and structured interviews as data collection strategies to answer the research questions. This multiple case study design was applied to explore the differences within and between the six particular cases that were focused on. The theoretical framework of this study was the Self-Determination Theory. The conceptual framework that was adopted was derived from Ryan and Deci's (2000) Self-Determination Continuum, which focuses on the degree to which behaviour is self-determined by means of a continuum.

This study found that even in well-resourced schools Accounting teachers are sceptical of updated ways of teaching, and are thus hesitant to move from clear zones of comfortable expertise and known methods to more digitally supported experimental teaching and learning methods. Congruence as an extrinsic aspect was found to influence Accounting teachers' motivation the most as motivation to implement CAL. This study therefore recommends that comprehensive training and support should be provided to teachers to enable them to integrate CAL in their classrooms.

Keywords: Accounting software; Accounting teachers; Computer Aided Learning, private schools; Self-Determination Continuum; Self-Determination Theory; teaching strategy.

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LIST OF ACRONYMS

BPNT	Basic Psychological Needs Theory
CAPS	Curriculum and Assessment Policy Statement
CAL	Computer Aided Learning
CET	Cognitive Evaluation Theory
DBE	Department of Basic Education
FET	Further Education and Training
GET	General Education and Training
HET	Higher Education and Training
MM	Motivational Model
NQF	National Qualifications Framework
ICT	Information and Communications Technology
IEB	Independent Examinations Board
OIT	Organismic Integration Theory
SDT	Self-Determination Theory
SGB	School Governing Body
TA	Thematic Analysis
TAM	Technology Acceptance Model
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action

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CHAPTER 1
ORIENTATION OF THE STUDY

1.1 Overview of the chapter

The purpose of this study was to investigate the aspects that influence Accounting teachers' attitudes towards the use of Accounting software in a Computer Aided Learning (CAL) environment. Teo (2011) supports this, as there seems to be a general lack of understanding regarding Accounting teachers' attitudes towards the use of Accounting software. Further research is therefore required on the motivational aspects that influence Accounting teachers' attitudes towards CAL as a supplementary teaching strategy. This study should be of value to Accounting teachers in gaining self-awareness of their teaching strategies and their attitudes towards CAL.

In this chapter, the status of CAL in Accounting education in South African private schools is introduced. This includes a discussion of the background to, and rationale for, CAL's implementation in Accounting education, both of which originate in the real world of work. The focus then moves to Accounting as a subject in South African schools, and teachers' attitudes towards the use of CAL. The specific area of concern in this study is the factors that influence Accounting teachers' attitudes towards CAL. The focus is on Accounting teachers who have access to computers, as well as computer software that can be employed as a teaching strategy, and who have received training to use these. In the following section, the problem statement and the aims and objectives for the study are presented, followed by the research questions and the context of the study. These are followed by an overview of the research design, which includes the philosophical assumptions. The chapter concludes with definitions of the key concepts of this study. Lastly, the outline and organisation of the remainder of the study are described. An introduction to Chapter 2 follows in conclusion of this chapter.

1.2 Background and rationale

Teachers are among the key players in effectively integrating technology into teaching and learning. Using computer technology has some advantages for learners (Handy, 2005). However, it is also recognised that these potential gains are not fully realised when teachers do not accept and apply these technologies in the classroom (Geisert & Futrell, 1995).

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Although computers have been introduced in many schools in South African, some teachers are doubtful about the significance of using computers for teaching and learning. Teachers see innovation through the lens of their attitudes and backgrounds, such as the integration of CAL. Hence, teachers' attitudes may need to change in order to successfully integrate CAL in the classroom (Albion & Ertmer, 2002). Studies indicate that the level of teacher motivation to integrate CAL ranges from excitement to uncertainty, resentment and fear (Sabzian & Gilakjani, 2013)

This tendency is problematic in an environment where rapid technological advances and growing market globalisation have significantly altered the way in which Accounting processes are conducted in the real world of work. Over the last decade, electronic Accounting systems have replaced manual Accounting systems in organisations (Jackling & McDowall, 2006). As a result, Accounting at secondary and tertiary levels of education, as well as at a professional level, have been greatly affected by the ongoing rapid changes in information technology. The developments in information technology necessitate accountants to use computer-related skills in their daily tasks (Fridman, Dasoo & Basson, 2003). Paisey and Paisey (2010) write that the Accounting profession now has a more forward-thinking, information technology consultancy role, and therefore secondary and tertiary Accounting education has to adjust and develop consequently. It is thus imperative for Accounting teachers to keep abreast of the demands of the real world of work. In this manner, they can assist learners who are studying Accounting at school to enter tertiary studies in Accounting with confidence in their Accounting knowledge and computer-related skills. The demand for computer-related skills includes the ability to use computers and Accounting software to record and analyse financial data and transactions (Jackling & McDowall, 2006).

South African tertiary institutions have identified a serious shortcoming in the skills of Accounting undergraduates with regard to computer-related Accounting skills (Wessels, 2004). This shortcoming could be ascribed to some Accounting teachers' discomfort with, or lack of understanding of information systems or information technology. As a result, students who enrol for Accounting undergraduate studies are unable or ill-equipped to use information technology or apply computer-related Accounting skills to their studies. This shortcoming may be attributed to the background and context of the South African educational system, as well as to possible curricular insufficiencies (Wessels, 2004). The South African educational system must be understood in the context of the country's unique history. The institutions and policies governing education underwent dramatic changes with the transition to democracy in

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1994. The previously racially seperated administrations were consolidated into a unified Department of Basic Education (DBE). Overall, the national DBE is responsible for all nine provinces' educational systems. Each province has its own education department, which have been given considerable authority with regard to administering education on a local scale. The National Qualifications Framework (NQF) comprises three educational bands: General Education and Training (GET), which comprises Grade 0-9, Further Education and Training (FET), and Higher Education and Training (HET). The FET band is offered from Grades 10 – 12 and includes career-orientated subjects, such as Accounting (Department of Basic Education, 2011).

The South African education system further consists of three types of schools: government schools, governing body-funded government schools and independent private schools. The provincial education departments manage the government schools under their jurisdiction. Depending on the wealth and efficiency of the province, the overall quality of education at these schools vary, and are mostly attended by the country's working classes. Former Model C schools are government schools that are managed and principally funded by a School Governing Body (SGB). Private education is more expensive than regular government school education. In comparison to government schools, private education is far more expensive than public education, but offers generally high standards of education. Du Toit (2004) finds that private schools enjoy a higher average pass rate in the matric examination than government schools (68.9 % versus 61.7 %).

This study focused on private schools because traditionally there has been a perception that private schools in South Africa are affluent and exclusive (Hofmeyr & Lee, 2004). As the researcher, I expected that the teaching environment of teachers teaching at private schools would be conducive and more favourable towards the successful implementation of CAL in the Accounting classroom. The reason why it was presumed that private schools in South Africa are well resourced is that they have an excellent academic reputation, are financially strong, and chart a path of excellence in implementing innovative international trends and offering learners access to state of the art technology. Similar to other countries, it can be assumed that private schools generally have better infrastructures and facilities (Du Toit, 2004).

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The three schools in this study's sample were private schools, as described above. They had an excellent history of matric pass rates, and were situated in the middle and high-income areas of the larger Tshwane District of Gauteng. The teachers also experienced seemingly less external barriers, which are often noted in government schools, e.g. infrastructure, financial strain, and access to professional development opportunities.

Unemployment is a reality in South Africa. Census data have revealed that young people who have received schooling do better in the labour market than those who have not received schooling (Lam, Leibbrandt, & Mlatsheni , 2007). The longitudinal data of the Cape Area Panel Study of youth and their families in the Western Cape provides a rich picture of the transition from school to the real world of work (Lam *et al.*, 2007). Considering the unemployment problem in South Africa as it emerges from the literature (Posel, Casale, & Vermaak, 2014), it is the stance of this study that Accounting learners should be provided with computer skills, and, idyllically, trained to do electronic Accounting, as found in the Curriculum and Assessment Policy Statement (CAPS) (Department of Basic Education, 2011). If this were the case, they could become an asset to their future employers, or alternatively have the skills to start their own business, which might reduce the high unemployment rate in the future. The literature strongly indicates that education impacts on the competetiveness of a country's economy within the global marketplace, decreasing unemployment rates (Borjas, 2010).

According to De Wet and Van Niekerk (2001), it is of extreme importance that South African Accounting learners should have access to the latest technologies available to prepare them for tertiary studies in Accounting or the real world of work. This is consistent with Wessels' (2006) explanation that computer software should be used as a teaching strategy when learners are taught in class by the teacher as this could empower learners. In this way, employability rates could be augmented, as explained by the theory of Human Capital.

The Theory of Human Capital is regarded as one of the most significant economic theories of Western Education, setting the framework for government policies (Borjas, 2010). The Theory of Human Capital encompasses the acquisition of knowledge and skills, which would increase the value of an invididual's human capital in terms of their employability, productivity and income potential (Mincer, 1974). At the level of society, greater productivity is pushing the production limits of the economy.

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At the level of the individual, enhanced productivity improves employability. If ignored, these risks may threaten the value that the Accounting profession adds to the prosperity and economic value of South Africa in general (De Wet & Van Niekerk, 2001). One way of addressing the situation is to examine the aspects that influence teachers' decisions to use CAL as a teaching strategy.

It appears that many Accounting teachers in South Africa primarily use teaching strategies that facilitate manual Accounting skills, despite being guided by national and provincial policies to integrate technology tools in their classrooms (Fridman *et al.*, 2003). One of the main reasons for the current predominant use of manual Accounting in South African schools seems to be that Accounting teachers are reluctant to implement CAL as a teaching strategy (Hennessy, Ruthven, & Brindley, 2005). Such reluctance could be related to the intrinsic and extrinsic aspects supported by relevant regulatory processes that motivate these teachers to integrate, or not to integrate, CAL as teaching strategy. It seems that both the DBE and some Accounting teachers have been overlooking the positive impact that CAL could potentially have on learners' preparation for the real world of work after completing Grade 12. Accounting teachers' use of CAL and its assumed effectiveness seem to depend heavily on the extent of their motivation to use application software in the classroom, and their competence to do so with conviction and confidence (Garceau & Bloom, 1994).

The preliminary investigations that have been conducted for this study included meetings with the Pastel Certified School Program coordinators, as well as casually discussing the matter with my students. My practical experiences as an end-user computing lecturer in Business Information Systems for undergraduate Accounting students seem to confirm my suspicions that some Accounting teachers do not adopt the available technology as a teaching strategy, in spite of having access to all the necessary resources. However, the reasons for this phenomenon are largely unclear. It is not known exactly what the motivational aspects are that influence South African Accounting teachers in their decision to capitalise, or not, on these resources and to use computer software that could possibly assist them in their teaching strategies.

Although the South African National School Curriculum (Department of Basic Education, 2011) recommends the use of electronic Accounting, it is not regarded as a compulsory element of the Accounting curriculum. The Accounting curriculum does not address the value and usefulness of computers as a teaching strategy that enhances the learning process in

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Accounting, as published in the CAPS document. The DBE only gives tentative prominence to electronic technology in the CAPS document for Accounting (Department of Basic Education, 2011). The importance of using computers and integrating digital Accounting programs in Accounting is relatively understated, as is evident from the following sentence quoted from the CAPS document (Department of Basic Education, 2011:9): "Accounting learners will be able to deal confidently with the demands of an Accounting occupation manually and/or electronically". A possible reason for the understatement of the use of CAL in Accounting in the CAPS document could be because of the lack of basic infrastructure and computer access in schools located in certain parts of South Africa. CAL cannot be compulsory in the Accounting curriculum due to the inequality in infrastructure and computer access in South African schools. Therefore, the CAPS document gives Accounting teachers the option to use either manual and/or electronic Accounting systems in their classrooms.

Fridman *et al.* (2003) express concern regarding the fact that teachers have such an option, and that it is not mandatory for them to teach electronic Accounting systems, or use CAL as a teaching strategy. Fridman *et al.* (2003) further stress the necessity of a shift from manual Accounting systems towards the use of electronic Accounting systems to equip learners with a range of computer-related skills. Jun Lin, Xiong and Liu (2005) support Fridman *et al.* (2003) in their call for reform in Accounting education in writing that Accounting curricula across the world have been criticised for not adding value, and being irrelevant to the current electronic Accounting practices required in the real world of work. Outdated Accounting education practices are a legitimate cause for concern and lead to unnecessary strain on the future of the Accounting profession (Albrecht & Sack, 2000). An important factor in reforming the Accounting curriculum is the strengthening of teachers' levels of motivation to optimally use accessible technology and available resources.

Marriott (2004) is of the opinion that one of the key advantages of implementing CAL as a teaching strategy in Accounting is that learners are provided with a concrete experience of Accounting methods and practices that are used in the world of work, which will benefit them when entering the profession. Radhakrishna and Bruening (1994) state that, when using computers in Accounting education, learners are given the opportunity to develop computer-related skills. Jackling and McDowall (2006) agree with Marriott that the value of computer-related skills development in Accounting education is important for learners' future studies in Accounting.

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The development of computer-related skills in the Accounting curriculum reflects how information systems are used in the real world of work (Jackling & McDowall, 2006). This advantage could be realised if teachers were sufficiently motivated to implement CAL teaching strategies in their classrooms.

Fridman *et al.* (2003) conducted research in South African high schools to evaluate computer-aided instruction and learners' academic performance in Accounting. Their findings suggest that the use of CAL enhanced learners' computer-related skills and their interest in Accounting. In addition, the learners' understanding of the relevance of computers in the present commercial, financial and industrial environment was improved, and learners had a more positive experience overall when they used CAL during Accounting activities. Fridman *et al.* (2003) therefore recommend that education and training institutions should build on the positive foundations of CAL by including a computer literacy course. These institutions should also provide education students studying to become Accounting teachers with the computer-related skills that they require to use CAL as a teaching strategy in supporting their traditional teacher-centred teaching strategies. However, Boyce (1999) echoes Garceau and Bloom's (1994) warning that, without professional awareness, educational planning, training and organisational support, the implementation of CAL in Accounting education is unlikely to be successful. Therefore, both education students studying to become Accounting teachers and current Accounting teachers should be provided with CAL training. This training should include the use of computer-related skills and the application of computer software as a teaching strategy in the Accounting classroom, combined with an increased professional awareness. These measures could have a positive effect on Accounting teachers' levels of motivation to use CAL in their classrooms on a regular basis.

In recognition of this need, the private sector has on its own developed software programmes such as the Pastel Certified School Program to reach FET Accounting learners. However, the literature indicates that teaching strategies are still inadequate in meeting the private sector's demands (Fridman *et al.*, 2003) in spite of this kind of support being initiated by the private sector. This can be observed in the predominance of manual Accounting methods favoured by teachers in both government and private schools.

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Accounting teachers are expected to use technology tools in the classroom (Assan & Thomas, 2012). The White Paper on e-Education stipulates that, "Every South African learner in the general and further education and training bands will be *ICT* capable (that is, use ICTs confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community) by 2013" (Department of Education, 2003:17). This set goal has not yet been achieved, although it should be noted that the extent to which this goal can be achieved depends partially on teachers' readiness to integrate technology into teaching and learning.

Teachers face many obstacles in the South African education context such as socio-economic background, relevant qualifications, and curriculum requirements. According to Geisert and Futrell (1995), some teachers may adopt CAL and others may never do so because of these obstacles. Therefore, well-designed research should be conducted to determine what experiences and regulatory processes, according to the Self-Determination Continuum, are deterring factors in Accounting teachers' use of the software that is available to teach Accounting. Based on the rationale, the purpose of the study is therefore to explore and reveal the motivational aspects that may influence the attitudes towards the use of CAL of Accounting teachers in private schools in the larger Tshwane District.

1.2.1 Accounting as a subject in South African schools

According to the CAPS document for Accounting (Department of Basic Education, 2011:8), "Accounting focuses on measuring performance, processing and communicating financial information about economic sectors". Accounting adheres to principles such as ethical transparency, behaviour, and accountability (Department of Basic Education, 2011). According to the CAPS document, Accounting comprises the recording of financial information, as well as the collection, examination, interpretation and communication of financial statements and managerial reports. Accounting thus incorporates the knowledge, skills and values required for the financial Accounting, managerial Accounting and auditing fields, which cover a broad spectrum of basic concepts and skills.

Table 1.1 shows the three main topics and corresponding themes in the South African Accounting curriculum, as documented in the CAPS document (Department of Basic Education, 2011), which the learner will study from Grades 10 – 12. In the last column, the themes where CAL may possibly be used as a teaching strategy to teach the theme, supported by traditional manual strategies, are identified.

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Table 1.1: The main topics in the Accounting curriculum as adapted from CAPS (Department of Basic Education, 2011:8).

Topics	Corresponding themes	Possible strategy to teach the topic
Financial Accounting **Includes the logical, systematic and accurate recording of financial transactions, as well as the analysis, interpretation and communication of financial statements by understanding the fundamental concepts regarding basic Accounting principles and practice.**	1. Accounting concepts	Manually
	2. GAAP principles	Manually
	3. Bookkeeping	Electronically
	4. Accounting equation	Electronically
	5. Final accounts and financial statements	Electronically
	6. Salaries and wages	Electronically
	7. Value-Added Tax	Electronically
	8. Reconciliations	Electronically
Managerial Accounting **Includes concepts such as costing and budgeting. It puts emphasis on the analysis, interpretation and communication of financial and managerial information for decision-making purposes.**	9. Cost Accounting	Electronically
	10. Budgeting	Electronically
Tools in Managing Resources **Includes basic internal controls and internal audit processes and code of ethics. These features put an emphasis on the knowledge, understanding and adherence to ethics in pursuit of human dignity, acknowledging human rights, values and equity in financial and managerial activities.**	11. Indigenous bookkeeping systems	Electronically
	12. Fixed assets	Electronically
	13. Inventory	Manually
	14. Ethics	Manually
	15. Internal control	Manually

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The CAPS document for the FET band identifies a set of specific aims that learners should achieve in order to pass Accounting in Grade 12. Teachers should guide learners to "record, analyse and interpret financial and other relevant data in order to make informed decisions" (Department of Basic Education, 2011:9). Specific software, such as the Pastel Certified School Program or spreadsheets, might assist teachers/learners to record, analyse and interpret financial and other relevant data in order to make informed decisions. Teachers should also guide learners to use generally accepted Accounting practices that are current in terms of the development of electronic Accounting skills, and that adhere to legislation, as stipulated in the CAPS (Department of Basic Education, 2011).

Moreover, it is expected of Accounting teachers to facilitate learners in managing their personal finances responsibly and effectively. Learners should be able to apply basic Accounting concepts and principles to solve problems in any situation. Teachers should therefore guide them to develop the ability to identify and solve problems in the context of the various fields of Accounting. The learner should be skilled in dealing with the demands of the Accounting profession being confident in manual and/or electronic systems. However, the learner would at no stage be formally assessed on his/her performance in any of the above-mentioned areas in a national examination using electronic Accounting systems. Teachers might therefore not see the value of implementing CAL in the FET band in order to benefit the learner and contribute to his/her future. This way of thought might have an influence on teachers' attitudes towards the use of CAL.

1.2.2 Teachers' attitudes towards the use of Computer Aided Learning

An attitude is "a relatively enduring organisation of beliefs, feelings, and behavioural tendencies towards socially significant objects, groups, events or symbols" (Hogg & Vaughan, 2005:150). According to Allport (1935), an attitude is a mental state of willingness that is perceived through the lens of experience. Attitude also influences an individual's response to related situations. In their definition, Fishbein and Ajzen (1975) emphasise that attitudes are a learned tendency to respond consistently with respect to a given task.

According to Zupanec, Miljanovic and Parezanovic-Ristic (2014), the successful implementation of CAL as a teaching strategy depends on teachers' attitudes towards CAL. Askar and Umay (2001) advocate that teachers will be less likely to use new technology if they do not believe that it will positively impact teaching and learning. An individual's attitude toward computers can be influenced by different intrinsic or extrinsic aspects,

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whether positive or negative. Zhao, Tan and Mishra (2001) demonstrate that teachers' attitudes are related to how often and how well they understand how to use a computer. These aspects usually interact with one another to impact on teachers' attitudes towards the use of computers in their classrooms.

1.3 Problem statement

This study focuses on the aspects that influence Accounting teachers' attitudes towards CAL. The participants in this study had access to computers, application software or subject-specific software, and had received training to use it as a teaching strategy. It was noted from a preliminary review of the literature that there is an insufficient understanding of the factors motivating Accounting teachers to use CAL (Igbaria, Iivari, & Maragahh, 1995).

Also, there seems to be a general lack of research in the field of teacher motivation in terms of the use of CAL in Accounting education. It was my intention to explore the possible aspects that could influence Accounting teachers' adoption of CAL as a teaching strategy in their Accounting classrooms in the Gauteng province of South Africa.

1.4 Aims and objectives

The long-term aim of the study was that it should inform other researchers, and the Accounting profession. The identification of possible strategies for implementing CAL in Accounting could provide the DBE with useful information when consideration is given to enforcing CAL in the South African Accounting classroom. This research attempted to provide support to the participating Accounting teachers in gaining self-awareness of their teaching strategies and attitudes towards CAL. Participation in this study had the potential to contribute to these teachers' personal growth in terms of self-knowledge. This in turn could result in an enhanced ability to help their Accounting learners acquire skills to develop and support themselves after they have matriculated, either in the real world of work, as entrepreneurs, or as undergraduate students.

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1.5 Research questions

This study was guided by the primary research question:

How does the nature of Accounting teachers' motivation inform us about their self-determination to use CAL as a teaching strategy in their classrooms?

In order to answer the primary research question, the study was guided by four secondary research questions.

Sub-question 1:

What aspects contribute to Accounting teachers' a-motivation[1] to implement CAL as a teaching strategy?

Sub-question 2:

What extrinsic aspects have an influence on Accounting teachers' attitudes towards CAL as a teaching strategy?

Sub-question 3:

What intrinsic aspects have an influence on Accounting teachers' attitudes towards CAL as a teaching strategy?

Sub-question 4:

How is the motivation to use CAL reflected in the teaching strategies of Accounting teachers?

1.6 Context of the study

In assessing Accounting teachers' levels of motivation to use CAL, the sample for this study consisted of six Accounting teachers who taught Accounting to learners in the FET band at three private schools in the larger Tshwane District of the Gauteng province in South Africa,. These teachers had access to computers, application software, and had received training to implement this approach in their classrooms as a teaching strategy.

[1] The mental state of lacking the intention or willingness to act, which is manifested through no action at all (Deci & Ryan, 2000).

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The reason for only selecting participants from private schools was that greater and more frequent use of technology in teaching and learning was expected there than in government schools, as discussed in Section 1.2. It was projected that the participants would have access to better technological resources, infrastructure and assumed training than government schools. These three private schools followed the same Accounting curriculum prescribed in the CAPS document as that of government schools. The participants were diverse in race, age, religion and cultural background.

1.7 Research approach

Qualitative research methods were used in this study. There was uncertainty at the begining of the study regarding the dimensions and characteristics of the motivational aspects, both intrinsic and extrinsic, that influence Accounting teachers' attitudes towards using CAL as a teaching strategy. Qualitative research was of value in that it helped me to develop an understanding of these aspects. I wanted to make sense of the aspects that influenced the participants' attitudes towards CAL. To do so, the evidence of relevant regulatory processes that characterise the quality of behaviour, according to the conceptual framework, were considered. To achieve this, a multiple case study design was employed, which was approached from an interpretivist perspective. This multiple case study allowed an examination of the motivational aspects influencing these Accounting teachers' attitudes towards the use of CAL and the possible reasons why they did or did not utilise it. It further provided a descriptive account of the participants' experiences and motivational influences. The case study design permitted the development of a shared understanding between the participants and myself. I wanted to acquire a sound understanding of the motivational aspects that influence Accounting teachers' attitudes towards the use of CAL by using the Self-Determination Theory (SDT).

The findings of this study were examined through an interpretivist lense. Interpretivism focuses on the different forms of reality that emerge from the findings (Hartley, 2010). In the context of this study, the focus was on the reality of motivational aspects, which included the unique context and motivational aspects that influence Accounting teachers' attitudes towards the use of CAL. The relativist ontological assumptions about the nature of reality had a significant influence on the importance of the aspects of reality. My assumption is that no ideas or beliefs are absolute truth, but that they all are "relative" instead. While reflecting on relativism, I considered the participants' motivation based on the Self-Determination

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Continuum, referring only to the participants' social and emotional contexts on the day of data collection. Therefore, both I and the participants constructed meaning out of whatever they encountered and experienced, thus bringing our own realities and personal interpretations to the research process.

In this study, purposeful sampling was used to select participants with homogeneous or similar characteristics (Creswell, 2008). The homogeneous sampling strategy is a type of purposeful sampling. All of the participants were Accounting teachers at private schools in the larger Tshwane District who were teaching learners specifically in the FET band. The six purposefully selected participants formed part of a homogenous sample in that they were Accounting teachers who had access to computers, computer software and subject specific software that would enable them to use CAL in their Accounting classrooms.

The two data collection strategies used in this study were structured interviews and questionnaires. The structured interviews consisted of open-ended questions (see Appendix A). This strategy was selected because it allowed me to develop a detailed understanding of the participants' attitudes towards the implementation of CAL in their Accounting classrooms. I conducted face-to-face interviews and recorded the interviews by means of field notes and digital audio recording, which took place only after I had received written consent from each participant.

A questionnaire was administered to the participants after the interview was completed (see Appendix B). The questionnaire took approximately ten minutes to complete. The questions posed were directly related to the primary and secondary research questions, which encouraged methodological triangulation by using two different data collection strategies on the same object of study (the case).

I transcribed the qualitative data that were collected from the structured interviews. The structured interview and questionnaire data were coded into *a priori* codes that were derived from the conceptual framework (Figure 2.2). This was done using five themes that are directly interrelated with the SDT and the Self-Determination Continuum. The relevant regulatory processes of the conceptual framework were used to guide the data structure of the sub-themes. The Thematic Analysis (TA) (Braun & Clarke, 2006) phases were used to analyse the data collected. The analysed data was then presented in a discussion.

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1.8 Concept clarification

Certain key concepts need to be clarified to enable the reader to develop an understanding of their meaning and implications, and the context in which they were used in this research.

1.8.1 Accounting

Accounting can be defined as: "The logical, systematic, accurate selection and recording of financial information and transactions, as well as the compilation, analysis, interpretation and communication of financial statements and managerial reports for use by interested parties" (Department of Basic Education, 2011:8).

1.8.2 Attitude

An attitude is an internal state that influences behaviour (Bohlin, 1999). An individual's attitude encompasses whether they perceive a psychological object, which might be events or people, in a favourable or unfavourable way (Ajzen & Fishbein, 2011).

1.8.3 CAL

The notion of CAL refers to the integration of computers as a teaching strategy. CAL encompasses instructional design, the use of in-class lecture aids, learning materials, e-books, classnotes available on networks such as the Internet, application software, subject-specific software, and any other learning aid that is used with computers or related devices in order to assist learners in the learning process. (Jensen & Sandlin, 1995).

1.8.4 Extrinsic motivation

Extrinsic motivation refers to the performance of an activity in order to attain an unrelated goal (Ryan & Deci, 2000). Extrinsic motivation can be defined as a type of motivation that is directed at attaining or avoiding something that is external to the self. The extrinsically motivated individual will perform an activity for the attainment of a desired goal or some other form of external reward.

1.8.5 FET

Further Education Training (FET) includes all education and training from the National Qualifications Framework (NQF) levels 2 to 4 (equivalent to Grades 10-12). The National Senior Certificate is awarded on completion of the requirements of NQF level 4, and serves as the entry level for tertiary education or the real world of work in South Africa.

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1.8.6 Intrinsic motivation

Intrinsic motivation is a type of motivation that compels an indiviual to seek and conquer optmial challenges through the use of their instincts and natural inclination to engage their interests. Intrinsic motivation emerges spontaneously from an internal locus of causality and can motivate behaviour even without the aid of external forces (Deci & Ryan, 1985).

1.8.7 Self-determination

Self-determination is the natural inclination to carry out an activity based on their own will. This behaviour can thus be described as the ability to make a decision for oneself without the influence of external forces (Nota, Soresi, Ferrari, & Wehmeyer, 2011).

1.9 Theoretical framework: the Self-Determination Theory

The theoretical framework for this study was the Self-Determination Theory (SDT). The SDT is based upon the assumption that humans are active and growth-orientated organisms (Deci, 1971). The SDT focuses on the benefits of self-determined behaviour. Humans pursue their personal goals, and integrate social norms and practices based on their values and interests. The development of these propensities is dependent upon the kind of interaction that humans have with their social environment, which may encourage or undermine the internalisation of behaviour (Soenens & Vansteenkiste, 2005).

According to the SDT, the underlying motives for behaviour differ in the quality of self-determined behaviour that they reflect, which demonstrates how much a certain behaviour has been internalised. The SDT postulates three basic psychological needs: the needs for autonomy, competence, and relatedness (Ryan & Deci, 2002). Autonomy refers to the individual being the perceived origin of his/her own behaviour. The need for autonomy can be satisfied, if an activity is accompanied by a sense of free choice and psychological freedom (Deci & Ryan, 1993). Teachers experience work-related autonomy if they can, for instance, choose which teaching strategies they want to use. Competence can be described as feeling effective in interacting with the activity or setting. According to the SDT, competence refers to an individual's confidence rather than a skill that can be acquired (Ryan & Deci, 2002). Teachers may feel competent when observing the progress and improvement of their learners, or getting positive feedback from people of importance to them. Relatedness is a feeling of being connected to others, or rather, experiencing a sense of belonging (Ryan & Deci, 2002). Accounting teachers can feel connected to their colleagues, to their learners or

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possibly also the broader community. From the SDT perspective, basic psychological needs are not hierarchically ordered, and all three needs are equally relevant for psychological health (Deci & Ryan, 2000). The need for autonomy, competence and relatedness are universal, and the degree of self-determination is important for optimal psychological well-being.

The SDT deals with the internalisation of behaviour using the concept of the Self-Determination Continuum (Figure 2.2). The Self-Determination Continuum, as derived from the SDT, serves as the conceptual framework of this study and is discussed in Section 1.10 and Section 2.6. In this model, different types of motivation exist on a continuum with a-motivation on the far left, extrinsic motivation in the middle, and intrinsic motivation to the right. An individual's motivation towards a particular activity will fit into one of these three types of motivation, although there may be some overlapping.

1.10 Conceptual framework: the Self-Determination Continuum

The conceptual framework adopted in this study was based on Ryan and Deci's (2000) Self-Determination Continuum. According to the Self-Determination Continuum proposed in the SDT, which is visualised in Figure 2.2 and discussed in Section 2.6, the continuum focuses on the degree to which an individual's behaviour is self-determined.

The SDT places the different types of motivation along the continuum, with a-motivation on the left side indicating the lowest self-determination, and self-determination on the right side, indicating total intrinsic motivation. A-motivation is the lack of motivation to take part in or carry out an activity (Ryan & Deci, 2002). In the middle of the continuum lies extrinsic motivation. An individual is extrinsically motivated when they take part in an activity to attain a goal that is outside of the activity itself (e.g. a reward or social recognition) but not out of interest, enjoyment or inherent satisfaction. The far end of the continuum represents intrinsic motivation. When an individual is intrinsically motivated, they take part in an activity because they find it interesting or because they derive enjoyment or satisfaction from this activity. The fine points of the Self-Determination Continuum and these three types of motivation are discussed further in Section 2.5.1.

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1.11 Potential contributions of the study

In the current South African socio-economic climate, the demand for jobs is greater than the number of jobs available. It may thus be helpful for teachers to be aware of the recommendations of this research for providing and assisting learners with the relevant skills to develop and support themselves. I hope to contribute to the existing literature on Accounting education in South Africa, and more particularly, to extend the existing Theory of Self-determination. There is a scholarly need to understand the aspects that motivate Accounting teachers to implement CAL, as discussed earlier.

1.12 Outline and organisation of the study

Table 1.2: The outline and organisation of this study

Chapter	Chapter heading	Chapter outcome
1	Orientation to the study	Called attention to the infrequent use of application software as a teaching strategy in Accounting education in South Africa. The need was raised for CAL in the Accounting classroom, which is derived from the real world of work. Chapter 1 also set the stage for the rest of the study.
2	Literature review	Sets out the literature review, and discusses core topics and key issues that have a bearing on the topic of this study. The theoretical framework of this study, which is based on the SDT, is introduced, along with the discussion of four models of motivation. The conceptual framework, based on the Self-Determination Continuum, is described and discussed.
3	Methodology	A description of the research approach, research design, research paradigm, methodology, sampling and data collection instruments that were used in this study. This is followed by the transcription procedure, data analysis, interpretation and data structuring. The chapter concludes with quality measures and ethical considerations.
4	Findings: Aspects influencing Accounting teachers' attitudes towards CAL	Results obtained from analysing the data are discussed, and the way in which these results answer the research questions is explained.
5	Reflecting on findings and recommendations	A discussion of the qualitative findings and answers to the research questions. This chapter also includes final reflections on, and conclusions of, the research. Recommendations for further research are also given.

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1.13 Conclusion

In Chapter 1, I presented an introduction and background to the study. Attention was called to the phenomenon that teachers are hesitant to use computer software and teach digital Accounting, even though they taught at the well-resourced private schools from which the sample was drawn and were trained to use CAL. I then proposed a rationale for the study focused on the motivational levels of Accounting teachers with regard to CAL. I subsequently presented the research questions, which positioned the study as a qualitative inquiry. The specific purpose thereof was to explore and interpret Accounting teachers' self-determination in their adoption or non-adoption of CAL as a teaching strategy in their Accounting classrooms. Individuals have different types and levels of motivation, that is, individuals vary not only in their level of motivation, but also in the orientation of this motivation (Ryan & Deci, 2000). By summarising the research approach, I presented an overview of the research methodology and strategies against the background of a multiple case study design, which was followed by a clarification of the key concepts related to this topic. I touched briefly on the theoretical and conceptual framework that guided the study so as to establish the motivational levels of Accounting teachers, according to the Self-Determination Continuum. In Chapter 2, I present an overview of the existing literature related to CAL and different models of motivation, followed by an in-depth discussion on the theoretical and conceptual frameworks underpinning this study.

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CHAPTER 2

LITERATURE REVIEW

2.1 Overview of the chapter

This chapter presents a review of the literature on CAL in general. It commences with an overview of CAL definitions, followed by the historical background of CAL and the occurrence of CAL in Accounting education. The chapter then proceeds with an introduction to the theoretical framework of this study through an exploration of four different models of motivation, and comes to a conclusion with a description of the Self-Determination Theory (SDT). The focus then shifts to the Self-Determination Continuum that serves as the conceptual framework for this study and is based on the SDT. The core elements of the Self-Determination Continuum are concisely described and a rationale for choosing the conceptual framework is offered.

2.2 Defining Computer Aided Learning

CAL is an educational teaching strategy that involves teachers using computers to create an environment in which active learning occurs (Boyce, 1999). It strengthens the learner's motivation, and can be useful in helping learners to increase their learning speed. CAL as an educational method is formed through the teacher combining computer technology and learning principles in the classroom (Hancer & Tuzeman, 2008).

Different terms for CAL are used in educational research. Some of the terms include: computer-assisted learning, computer-assisted instruction and computer-based learning. In this study, I take CAL to be synonymous with these three terms, but use the concept computer aided learning. The general understanding of CAL in an educational environment is that it is a computer program that is used to assist the learner in learning a subject, e.g. Accounting. The focal point is the word "assist", which means that the program is used not in isolation, but in combination with other teaching strategies in the instruction of the specific subject, in this case, Accounting. CAL can thus be explained as teachers using computers, and any software program, as an aid for a more comprehensive overall teaching strategy. Helmi (1986:105) puts some perspective on the broad issue of workload through the following insight:

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> *The basic advantage of CAL is that it relieves the teacher from having to spend time on relatively simple topics. CAL as teaching strategy thus allows him/her more time for difficult topics that cannot adequately be explained by using CAL.*

It is implied in Helmi's (1986) words that traditional teaching strategies should not be neglected when implementing CAL as a teaching strategy, but that CAL must play a supportive role in assisting teachers to relieve their workload. Boyce (1999) adds that the use of CAL might free up teaching time to focus on other aspects of education, and that such time could be used to develop higher-order skills in Accounting.

2.3 Historical background of Computer Aided Learning

The use of computers was introduced into education in the 1950s. The computer was mainly used as a bank of questions through which learners could undertake self-assessment of their knowledge (Wenzel & Gotfredsen, 1997). The use of computers in Accounting education started in the early 1960s. Mainframes were very expensive and not user-friendly and it was only after 1981, when IBM™ presented the IBM™ personal computer to the world, that the use of computers for educational purposes started to grow. Since then, the personal computer has become the first choice in Accounting education for equipping learners with practical computer skills for Accounting (Borthick & Clark, 1987).

As early as 1985, when a survey was conducted to identify computer competence requirements in the Accounting industry, it was found that most Accounting firms experienced a need for computer coverage in the curricula of Accounting courses (Waller & Gallum, 1985). This survey indicated that it was essential to provide Accounting learners with the necessary training in application and Accounting software to enable them to carry out their daily tasks in the real world of work.

The possible advantages of using CAL were brought to the fore by research that was conducted in the field of CAL in education towards the end of the 20th century. The evidence as to whether CAL in Accounting education has a positive or negative impact on learners is an active debate. These possible advantages and disadvantages will be further discussed in Section 2.4.

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2.4 Computer Aided Learning in Accounting education

Yang (1994) states that our society is becoming more information-based as software and communication technology improve. Accounting seems to be one of the disciplines that are the most affected by information technology, and the trend towards the use of CAL in the classroom seems particularly relevant in Accounting education. Olson (2000) regards a lack of professional autonomy and a lack of access to computer resources as obstacles in the way of the successful implementation of CAL in the Accounting classroom in South African schools.

There are conflicting research outcomes and opinions as to whether CAL improves Accounting learners' academic performance. Research studies conducted by Teh and Fraser (1994), and Jackling and McDowall (2006), find that CAL does indeed improve Accounting learners' academic performance and also prepares them for the use of computers in the Accounting profession and in the real world of work. Conversely, Lane and Porch (2002) studied the impact of CAL on Accounting undergraduates' academic performance in the United Kingdom, and found that CAL negatively affected the learners' perception of Accounting. On the one hand, Sugahara and Boland (2006) agree with Ijiri (1983) that incorporating CAL into Accounting courses does not offer academic benefits. Marriot (2004), on the other hand, finds that CAL is considered to be more interesting and stimulating than other teaching strategies, but it is also an easy way to learn, which results in better academic performance on the part of the learners. These findings indicate that there are different opinions and views of the use and value of CAL in Accounting education.

Some teachers seem to believe that CAL ought to be used as much as possible and as often as possible in the classroom (Boyce, 1999). This means that the use of CAL may result in the computer becoming the dominant teaching tool, which is not ideal. The leading definition of CAL emphasises that it should only be used to complement, support and assist traditional teaching strategies. Teachers need to convey more than just impartial knowledge when teaching Accounting as learners should be actively engaged in their own learning processes, and not only recipients of information.

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In contrast to the use of CAL as a passive addition, there is also an urge to use CAL as the only teaching strategy in the classroom, with the intention to do away with the teacher. Boyce (1999) is of the opinion that CAL may have negative consequences, such as shifting the focus of learners from quality to quantity, when teachers try to economise on time and content in the effort to complete the syllabus in time. It takes a relatively large amount of time and experience on the part of Accounting teachers to balance the relationship between CAL and traditional teaching strategies in their classrooms. When teachers misuse or overuse CAL, its advantages cannot be optimally exploited for effective teaching and learning, and for this reason the allocation of time to CAL and to Accounting theory should be a well thought out and carefully planned balancing act.

The implementation of CAL in classrooms introduces a certain amount of doubt and hesitation for the Accounting teacher (Helmi, 2001). Some teachers are unsure what CAL entails and might therefore not have the confidence to experiment with it. There is often frustration and scepticism about the value of new ideas among practising teachers, the South African Department of Basic Education, and policy makers when a new concept or teaching strategy is implemented, which contributes to anxiety (Yildirim, 2000). The successful implementation of new technology is determined by teachers' attitudes toward the adoption of new teaching strategies. The implementation of CAL in pedagogy means that teachers' practice, motivation, attitudes, roles, and teaching strategies to use CAL in the classroom evolve over time.

A search for literature on motivational studies that focus specifically on computer acceptance in Accounting in South Africa indicated that only three studies had previously been conducted (Fridman *et al*., 2003; Wessels, 2004; De Wet & Van Niekerk, 2001). These studies identified a gap in the literature, which emphasises the importance of conducting this study and the scholarly need for it due to the lack of literature in the South African context a decade later.

It is necessary to do research from a South African point of view because of the growing number of schools that have access to computers and therefore can implement CAL in the Accounting classroom. South Africa's complexity can be seen in its demography where one finds elements of a developed country and, at the same time, elements of a developing country within different cultures in any of the nine South African provinces. The purpose of the research conducted by Fridman *et al.* (2003) was to investigate the effect that CAL has on

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learner performance in Accounting in South African high schools. De Wet and Van Niekerk (2001) were interested in the implementation of technology in a single Accounting course at a tertiary institution in South Africa, suggesting adaptation to the use of CAL as a supportive teaching strategy. Wessels (2004) carried out an investigation in several South African universities regarding the incorporation and application of information technology. The study conducted by Wessels (2004) only addressed the use of CAL, or the lack thereof, from a tertiary point of view.

The available literature (Fridman *et al.*, 2003; Wessels, 2004; De Wet & Van Niekerk, 2001) is based on quantitative survey studies, which give a broad picture of the amount of computer technology used in the classroom, the impact it has on learner performance, and the integration of technology at tertiary level in Accounting education. However, it does not touch on a discussion or identification of the factors that influence Accounting teachers' motivation to use CAL as a teaching strategy.

The implementation and adoption of technology, and specifically CAL software, in the Accounting classroom in South African schools is proving to be a matter of debate between the Department of Basic Education and the private sector (Fridman *et al.*, 2003). As previously stated, CAL has the potential to be beneficial to learners' futures and to the Accounting profession.

2.5 Teaching strategies aimed at the inclusion of CAL in Accounting education

Stangster (1992) states that CAL applications can be applied as two different types of teaching strategies: supplantive and supportive. Supplantive teaching strategies refers to the substitution of teachers and traditional lessons by CAL, and supportive teaching strategies refers to the use of CAL as a reinforcement in addition to traditional teaching and learning strategies. In this sense, CAL serves as an aid to compliment teaching and learning, as defined in Section 2.2. CAL should be viewed as a combination of information technology resources available to engage learners in the learning process (Boyce, 1999). This study advocates the use of supportive CAL. The possible teaching strategies that Accounting teachers can use in tandem with CAL in their classrooms are discussed in this section.

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The impact of globalisation and advancing technologies has placed increasing demands on teachers to adopt innovative teaching strategies that are aligned with the changing educational environment and the diverse nature of learners (Devi, Kumar, & Raju, 2012). A teaching strategy comprises the principles and methods used by the teacher for instruction.

Teaching strategies encourage learners' curiosity, engage them in the learning process, help them to develop critical thinking skills, keep them interested, and in general, enhances the learning of subject content. Albrecht and Sack (2000) suggest major amendments to the teaching strategies of Accounting for the singular aim of preparing learners adequately for the contemporary demands in Accounting. The use of CAL to enhance the quality of Accounting education requires a change in teaching strategies (Boyce, 1999). The literature has discussed various teaching strategies, such as the use of CAL to counteract the evolving issues in the delivery of Accounting. Commonly used teaching strategies found in the Accounting classroom may include traditional teaching, class participation, demonstration, and project-based learning. It is clear that CAL cannot supplant the need for traditional teaching strategies, and does not obviate the benefits of alternative or traditional teaching strategies. In general, it is not advised in the literature (Boyce, 1999) that CAL should be used to teach technical/applied content, theoretical or conceptual content, these are best taught using traditional teaching strategies.

Different kinds of computer software are available to use in Accounting. These types of software include application software, drill-and-practice software, modelling software, and simulation software. The internet is also used to find a range of electronic sources in the field of Accounting. Each of these types of computer software can be used in ways that integrate CAL in teaching and learning in the Accounting classroom.

2.5.1 Application software

Application software can be defined as software dedicated to producing information such as spreadsheets, documents created in a word processor, presentations and databases. Application software is used on a daily basis worldwide to increase productivity. Teachers use application software not only for administrative tasks, such as setting question papers or preparation, but they also incorporate it as a teaching strategy in the classroom.

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Application software in the Accounting classroom is often used as a teaching strategy and a computational tool that supports Accounting processes, usually through the means of spreadsheet software. The word processor has the potential to develop and nurture important writing and reporting skills that Accounting learners need for the real world of work. Presentation software is often used as a teaching and learning tool. Teachers present lessons using presentations, and learners report on projects presenting their findings to the class.

2.5.2 Modelling and simulation software

Modelling software is spesially designed to assist learners in thinking about real life situations, which is usually an element of Accounting practice. Simulation software can be described as experientially-orientated and is designed in such a way to simulate a practical situation and involve learners in learning by simulating a scenario what would be done in the real world of work (Feurzeig & Roberts, 2012).

Modelling and simulation software emphasises the potential interactions between "Accounting data, Accounting processes, and Accounting information". Such software could bring a dimension of realism to the Accounting classroom that is not possible with traditional teaching strategies (Boyce, 1999).

2.5.3 Drill-and-practice software

The theories of well-known behaviourists, like Pavlov and Skinner, is reflected in drill-and-practice software. In drill-and-practice software, learners are required to give the appropriate responses to various stimuli such as journal entries and account classifications. These types of exercises are performed regularly with constant feedback and repetition (Kuiper & de Pater-Sneep, 2014), and are commonly used to compliment the teaching of Accounting foundations

2.5.4 The internet

The internet is not used as an active teaching strategy in the Accounting classroom, but it does provide access to the relevant resources to compliment subject content. The Accounting teacher might use it to explain a concept, and show the learners how it is applied in the real world of work. Teachers and learners may also use the internet for research purposes to study a new topic or for a project.

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Having considered the four types of computer software that can be used as possible teaching strategies in the Accounting classroom, it is evident that CAL can be successfully implemented to teach different topics of the Accounting curriculum, and to support traditional teaching strategies.

2.6 Theoretical framework: motivational theories

Motivation means to be moved to do something (Ryan & Deci, 2000). The lack of inspiration to act is thus characterised as a-motivated, whereas someone who is energised to act is considered motivated. Motivational theories are built on a set of assumptions about humans' nature and about the aspects that drive and influence their actions (Mitchell, 1982). Most theories of motivation view motivation as a unitary phenomenon, one that varies from almost no motivation at all to acting in a way that is self-determined (Ryan & Deci, 2000). These theories may differ on the particulars and may even be in conflict on certain points, but they still share a set of basic assumptions. There are three meta-theories associated with motivation, namely, mechanistic, organismic and contextualistic theory (Goldhaber, 2012).

Mechanistic theorists view humans as passive, and assume that humans have no influence on, or involvement in, their environment. It further proclaims that humans function like machines by an external force. Organismic theorists view humans as active and growth-orientated organisms that initiate behaviour. The organismic theory assumes that humans act within their internal and external locus of causality to be effective and to satisfy all their needs. According to the organismic theory, humans have intrinsic needs and physiological drives. Intrinsic needs provide energy for humans to act within their environment and to manage aspects of their behaviour (Deci & Ryan, 1985). They are thus considered as living organisms who make choices that are orientated towards the future. Contextual theorists view humans in contrast to both the mechanistic and organismic theories. The contextual theory assumes that humans function on particular events that form their everyday experiences (Goldhaber, 2012).

I believe that the Organismic Meta-Theory, supporting intrinsic and extrinsic motivation, offers a more balanced and true reflection of human behaviour and the choices that humans make. The SDT provides an account of the motivational theories that employ the organismic theory as meta-theory (Deci & Ryan, 1985). The SDT is thus considered a macro-theory that developed from organismic psychology (Ryan, 1995); a member of holistic psychological

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theories that assumes that humans are active and growth-orientated organisms with a tendency to grow and develop psychologically. According to the SDT, humans have a natural, instinctive tendency to develop and improve their sense of self.

Figure 2.1 visualises the Self-Determination Theory hierarchy adapted from Reeve (2012) as the theoretical framework of this study. Following the diagram, the SDT as macro-theory is discussed, followed by a brief overview of the three micro-theories that support the Self-Determination Continuum.

2.6.1 The Self-Determination Theory as a macro-theory

The insights of this study rely on Deci and Ryan's (1985) classic psychological theory of self-determination, which underpins the phenomenon of motivation. The SDT was chosen as the theoretical framework for this study. The SDT can be described as a "macro-theory of human motivation, emotion, and development that takes interest in factors that either facilitate or forestall the assimilative and growth-orientated processes in people" (Niemiec & Ryan, 2009:134).

Self-determination involves the experience of choice. This implies that individuals are active and growth-orientated organisms who interact with their social environment, supporting the Organismic meta-theory (Deci & Ryan, 2000). Self-determination is also a human need that is classified alongside basic human needs, as asserted by Freud and Hull in the early 20th century (Deci & Ryan, 1985). Humans have a basic, instinctive propensity to be self-determined, which leads them to engage in certain behaviours or activities that are of interest to them. Self-determination typically enables people to develop competencies that empower them to work towards a flexible interaction with their social environment and feel motivated. In this study's context, the Accounting teacher will implement CAL in the classroom if he/she is interested in using technology as a teaching tool.

According to Ryan and Deci's (2000) SDT, the satisfaction of the three basic psychological needs (autonomy, competence and relatedness) is needed for optimal growth, well-being and functioning. The three basic psychological needs are universal, inborn and psychological in that they represent innate requirements rather than acquired motives. As such, the three basic needs are expected to be evident in all cultures and in all the developmental stages of humans (Ryan & Deci, 2000).

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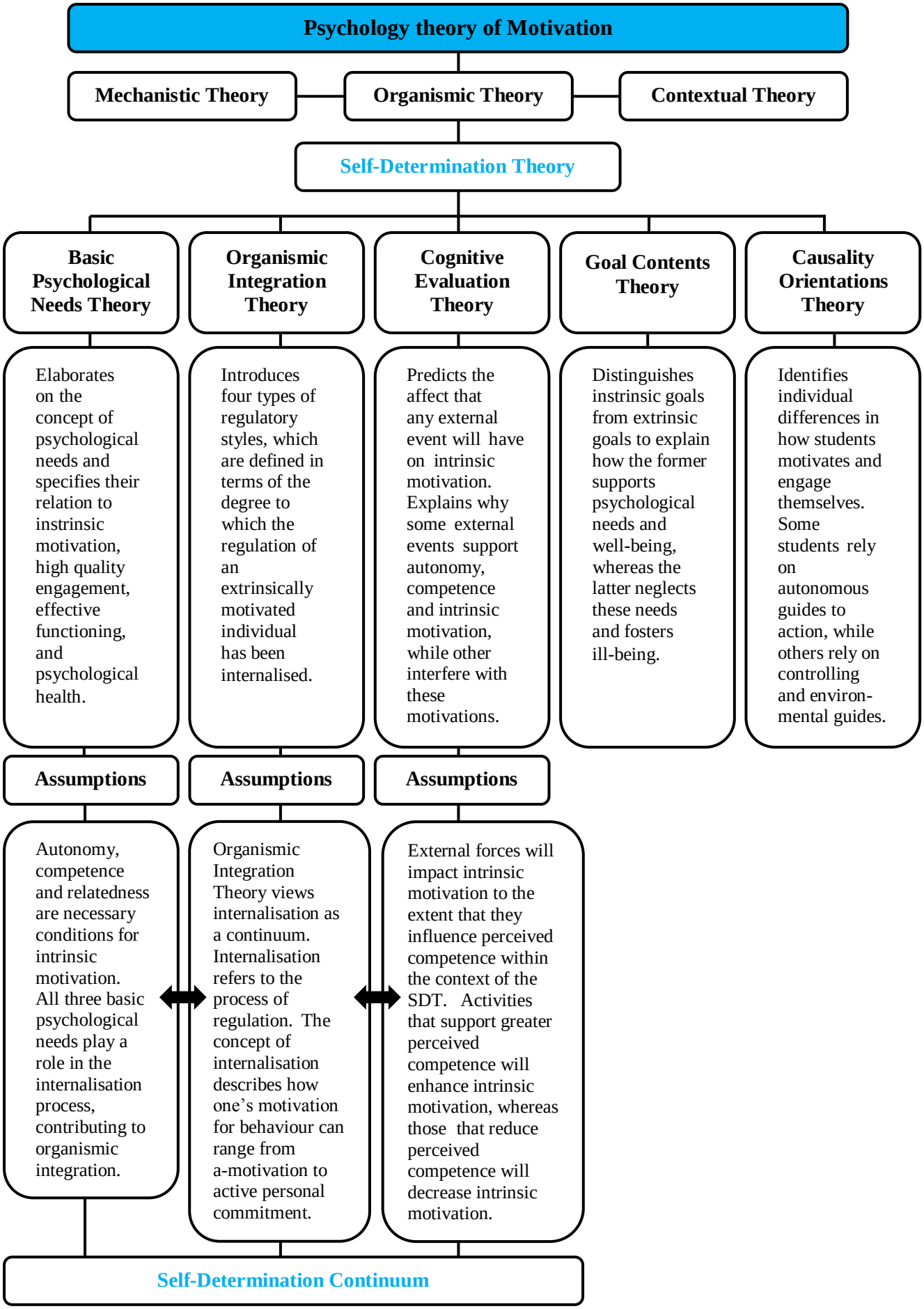

Figure 2.1: Self-Determination Theory hierarchy adapted from Reeve (2012)

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Healthy social environments where the fulfilment of these three psychological needs is promoted support optimal functioning, whereas aspects associated with the prevention of these needs are predicted to be antagonistic. Thus, the concept of basic needs provides a critical linking pin within the organismic interaction and is the basis for making predictions about the conditions that promote internalisation on the Self-Determination Continuum. This link will also be utilised in the data structuring process in Section 3.10.1.

2.6.2 The five mini-theories of the Self-Determination Theory

The SDT as a macro-theory impacts the socio-contextual environment of a human's beliefs, thoughts and behaviour. The theory has been developed and researched through a set of five mini-theories (Figure 2.1), which together comprise the formal framework of the SDT (Ryan, 2009). The five mini-theories look at the motivational basis of human decision making without interference from an external force (Janssen *et al*., 2013; Reeve, 2012). These mini-theories are linked, sharing organismic assumptions and concepts of basic psychological needs. Each mini-theory was developed to describe phenomena that emerged from research on the aspects affecting human motivation (Vansteenkiste, Niemiec, & Soenens, 2010). When these mini-theories are coordinated, they cover all the types of human behaviour in all domains (Ryan & Deci, 2000). The five mini-theories include: Basic Psychological Needs Theory, Organismic Integration Theory, Cognitive Evaluation Theory, Goal Contents Theory, and Causality Orientations Theory (Reeve, 2012).

Each mini-theory's basic purpose is briefly explained in Figure 2.1. For the purpose of this study, only the Basic Psychological Needs Theory (BPNT), Organismic Integration Theory (OIT) and Cognitive Evaluation Theory (CET) will be discussed. I focused specifically only on the BPNT, which hypothesises intrinsic motivation, OIT, which hypothesises extrinsic motivation, and CET, which hypothesises the effects of external forces on internal motivation. The reason for concentrating only on these three mini-theories was to establish the relationship between the three mini-theories, and the integration thereof. This underpins the conceptual framework of this study, the Self-Determination Continuum, and aligns it with the data structure in Section 3.10.1.

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a) The Basic Psychological Needs Theory

The BPNT, a mini-theory of the SDT, elaborates on the concept of basic needs by linking them to psychological well-being. Deci and Ryan expand on their earlier work on the SDT by differentiating between intrinsic and extrinsic motivation (Ryan and Deci, 2002). They propose three main psychological needs that are involved in self-determination, and which serve as the foundation of the BPNT. According to Deci and Ryan, the three basic psychological needs motivate humans to initiate behaviour that is essential for psychological health. This includes the need for autonomy, competence and relatedness (Reeve, 2012). Autonomy refers to the control one has to make one's own choices (Deci & Ryan, 1985). When humans are autonomous, their behaviour is an expression of the self, even when they are influenced by external forces. When behaviour is influenced by external forces, in order to remain autonomous, the individual must approve the influence, feeling both a sense of initiative and personal importance in the situation. This means that when an Accounting teacher feels autonomous, he/she acknowledge the possible influence an external force might have on him/her. This scenario might occur when teachers' are expected to implement CAL in their classroom, but do not have a negative association with it by subjective norm. Subjective norm refers to the important other (Ajzen & Fishbein, 2011).

Competence, according to the SDT, refers to the degree of effectivity that one has in a particular social environment, and experiencing opportunities to express and exercise one's capacities. Competence is a felt sense of confidence in action. Competence can be fulfilled by achieving desired goals. An Accounting teacher would feel competent teaching Accounting using CAL if he/she feels confident in his/her own abilities and skills.

Ryan, Kuhl and Deci's (1997) describe relatedness as feeling connected to others. This means that an Accounting teacher will feel related to his/her colleagues when they all have to receive training and implement CAL in their classrooms. They may also experience the feeling of relatedness when they feel that a colleague shares their feeling of incompetence and anxiety about implementing CAL. Relatedness may also occur in the context when an Accounting teacher experiences a mutual feeling of non-valuing and non-use of CAL with his/her colleagues, or in contrast, when they feel they can approach the task as a team.

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b) The Organismic Integration Theory

The OIT, another mini-theory of SDT, addresses the process of internalisation of various types of extrinsic motivation regulatory styles. OIT is founded on the assumption that humans are naturally motivated to integrate their ongoing experiences (Ryan, Kuhl, & Deci, 1997). OIT recognises that some types of regulations are experienced as relatively foreign to the self, or imposed and heteronomous, whereas others can be very much autonomous and self-endorsed.

OIT emulates a continuum of autonomy underpinning the four different types of extrinsic regulatory styles. The focus is on the Self-Determination Continuum of internalisation, extending from external regulation, to introjected regulation, to identified regulation, to integrated regulation. Regulatory styles can be simultaneously operative, and can differ in their autonomy. External regulation is the least autonomous form of extrinsic motivation and integrated regulation is the most autonomous form of extrinsic motivation. These regulatory styles are discussed in Section 2.9.2. OIT further suggests that internalisation is facilitated by contextual support for autonomy, competence and relatedness (Ryan, 2009). The chance that an individual will internalise an activity or value is significantly augmented if he/she experiences choice, and is able to freely engage with it. This mini-theory allowed me to predict behaviour from enduring orientations of the individual.

Deci and Ryan (1985) believe that there is a relationship between humans' psychological well-being and their activeness in the sense of being intrinsically motivated. This means that some Accounting teachers may voluntarily choose to use CAL as a teaching strategy, while others may not. Based on the SDT, I assumed that when self-determined, teachers act out of choice rather than obligation. Self-determined individuals are capable of controlling their environment, but may also choose to give up their autonomy. Teachers can thus be self-determined, and therefore choose to use CAL in their teaching, or not.

Conceptualising the SDT as a continuum helped to relate motivation to self-determination in presenting the Self-Determination Continuum (Figure 2.2). The movement along the continuum is founded on the idea that humans embed themselves in their environment, and therefore exhibit certain behaviour when an activity has personal meaning and reflects their unique identity.

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c) The Cognitive Evaluation Theory

Deci and Ryan (1985) present the concept of CET, which identifies social aspects that affect human movement along the continuum with regard to intrinsic motivation. Cognitive evaluation theorists argue that internal motivation (e.g. rewards and feedback) may contribute toward the feeling of competence during an activity. CET specifies that the feeling of competence alone will not enhance intrinsic motivation, unless it is accompanied by a sense of autonomy (De Charms, 1968).

Cognitive Evaluation theorists suggest that people are intrinsically motivated in the right social environments where their need for autonomy and competence is recognised and supported. For activities that are not of interest to the individual, the principles of CET do not apply (Ryan & Deci, 2000).

To understand the motivation of activities that are not experienced as interesting, enjoyable or inherently satisfactory, the nature of extrinsic motivation, mentioned in Section 2.6.2.(b) and discussed in Section 2.9.2 need to be considered along with the BPNT and OIT, to understand the conceptual framework and data structure.

2.7 Models of motivation

Research studies have provided various psychological models for identifying the possible aspects that play a part in the motivation to adopt CAL. Several psychological models of technology acceptance have been developed to support motivational theories (Davis *et al.*, 1989). Philosophical and ideological differences among theorists are the reason for the on-going practice of developing new motivational models. However, despite the variety of approaches evident in the motivational models, some commonalities within these motivational models do exist.

It is widely accepted that individuals in all spheres of life find computer technology useful, but it is also recognised that sometimes this is not recognised due to a lack of recognition and acceptance of the benefits thereof (Igbaria, Iivari, & Maragahh, 1995). Researchers interested in explaining users' intention to use technology have developed tools for measuring and analysing computer user satisfaction. Information systems, psychology and sociology are some examples of research that has branched out from studies on computer user satisfaction. Information systems researchers have suggested intention models from social psychology as

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a potential theoretical foundation for research into the determinants of user behaviour (Swanson, 1982). In this study, the "user" refers to Accounting teachers as "users" of computers during routine teaching. The following sections focus on models that are informative regarding the relationship between acceptance models and intrinsic-extrinsic motivation.

2.7.1 Theory of Reasoned Action (TRA)

The TRA model was developed by Fishbein and Ajzen (2010). The purpose of the TRA is to predict and understand an individual's behaviour by considering the effect of attitudes (feelings) and the perceived social pressure (subjective norm). The TRA is a general model anchored in psychology, which is concerned with the determinants of behaviour and relations among beliefs, attitudes, subjective norms, behaviour and intentions. According to this theory, an individual's behaviour is determined by his/her intention to perform the behaviour. The TRA is based on the assumption that humans are rational, and that they systematically use information that is made available to them. Fishbein and Ajzen's (2010) model is concerned with the determinants of behaviour, beliefs, attitudes, subjective norms, intentions and behaviour and is a well-researched model that has proved to be successful in predicting and explaining behaviour across a wide variety of domains (Davis *et al.*, 1989). The TRA is often used in studies with a mixed-methods approach.

Behavioural intention looks at the motivation behind certain behaviour. This behaviour is more likely to be exhibited when the intention to perform it is very strong (Ajzen & Fishbein, 2011). This action can be linked to the organismic meta-theory. Davis *et al.* (1989) observed that theoretical and psychometric problems are a central part of the subjective norm, where it is difficult to determine whether certain behaviour is motivated by behavioural intent or by attitude. I therefore did not regard the TRA model as a suitable conceptual framework for this study.

2.7.2 Technology Acceptance Model (TAM)

Following Fishbein and Azjen's *beliefs-attitude-behavioural intention-actual-behaviour approach*, TAM was developed by Davis *et al.* (1989). The technology acceptance model (TAM) proposed by Davis *et al.* (1989) is a model that was built with the purpose of predicting the likelihood of a new technology being adopted within an organisational workplace by a group or by an individual.

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In TAM, Davis *et al.* (1989) replaced the TRA's attitudinal determinants with two variables: perceived ease of use and perceived usefulness. Davis *et al.* (1989) added external variables to TAM, which are absent from the TRA. According to this theory, a user's acceptance of any technology, measured by a person's intention to utilise an activity, is determined by two beliefs, namely, perceived ease of use and perceived usefulness.

Davis *et al.* (1989), among others, have provided empirical evidence that shows that ease of use becomes insignificant with increased experience. TAM suggests that perceived ease of use and perceived usefulness are the two most important determinants in explaining the successful implementation and adoption of new technology, which in the context of this study is CAL as a teaching strategy in the Accounting classroom. TAM has been tested in many empirical research studies over the past three decades and some researchers regard it as a valid and robust model (Legris, Ingham, & Collerette, 2003). However, Malhotra and Galletta (1999) criticise TAM in one respect: it does not account for the subjective norm as a determinant in the adoption of computer usage. I agree with Malhotra and Galletta's (1999) critique of TAM as being limited, since it cannot specify whether the aspects influencing computer acceptance are intrinsically or extrinsically motivated. It is important in this study to know what type of aspects influence FET Accounting teachers' attitudes towards CAL. Malhotra and Galletta (1999) further note that TAM's results are sometimes regarded as volatile or vague. As the focus of this study is on the intrinsic and extrinsic aspects influencing FET Accounting teachers' attitudes towards CAL, and not on the intentions and drivers of teachers' choices and behaviour, I did not regard TAM as a suitable conceptual framework for this study.

2.7.3 Theory of Planned Behaviour (TPB)

The TPB was proposed by Ajzen (1991) as an improvement to the TRA model developed by Fishbein and Ajzen in 1975. Ajzen (1991) added a third determinant to the TRA model, namely perceived behavioural control. The TPB model explains that intentions drive attitude, which in turn influences behaviour. Thus, behavioural intention is hypothesised as a vital construct that is able to predict behaviour. This is done by determining how far people are willing to go to implement certain behaviour (Ajzen, 1991). Studies adopting the TPB model mostly use quantitative methods for data collection and analysis.

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A subjective norm in this study's context refers to the Accounting teacher's perception or opinion about what "important others" believe he/she should do. In terms of the TPB model, a third party, whoever that may be, may have an influence on the teacher's perception of whether or not CAL is useful in the Accounting classroom. If someone other than the teacher has an impact on the successful implementation of CAL in Accounting, this should be addressed.

The TPB model fits into the mechanistic meta-theory, since humans are regarded as passive organisms who are mainly influenced by environmental stimuli and physiological drives, which is represented in this model by the third party. This study is rooted in the organismic meta-theory (Section 2.6).

I agree with the TPB and the TRA, and accept the importance of a subjective norm, which influences humans' motivation. According to the SDT, which serves as the theoretical framework for this study, external influences from 'important others' and the influence they might have on the individual are acknowledged. Individuals often experience a lack of autonomy when pressured to do something. However, according to the SDT, an external influence is permitted when an individual agrees with or can identify with the object or person exuding that influence. Thus, if the teacher believes in the value of CAL in Accounting education, he/she can experience the command of the school principal, or following colleagues in implementing CAL in the classroom, as autonomous.

2.7.4 Motivational Model (MM)

More recent work by Davis *et al.* (1992) has resulted in the development of the MM. MM theorists focus on extrinsic and intrinsic motivation that has an influence on user acceptance of computer usage. As explained earlier in Section 2.6, theorists of motivational theories argue that behaviour (in this case usage) is determined by extrinsic as well as intrinsic motivation. MM theorists posit that individuals will make an effort to be successful in a task if the task is enjoyable and ultimately offers an external reward, which may be acknowledgement, remuneration, or promotion. According to Igbaria *et al.* (1995), individuals accept technology because it might be interesting, enjoyable, useful or beneficial to them. MM has basic similiarties to SDT when referring to extrinsic and intrinsic motivational factors, with which I agree. Table 2.1 shows a summary of the core ideas of each motivational model discussed.

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Table 2.1 Summary of the essence of the motivational models

Model	Essence	Proponents
Theory of Reasoned Action (TRA)	Attitude towards behaviour. Behavioural intention. Subjective norm.	Fishbein and Ajzen, 1975.
Technology Acceptance Model (TAM)	Perceived usefulness. Perceived ease of use. Attitude towards use.	Davis, Bagozzi and Warshaw, 1989.
Theory of Planned Behaviour (TPB)	Attitude towards behaviour. Behavioural intention. Subjective norm. Perceived behavioural control.	Ajzen, 1991.
Motivational Model (MM)	Extrinsic motivation. Intrinsic motivation.	Davis, Bagozzi and Warshaw, 1992.

2.7.5 Advantage of the Self-Determination Theory

The SDT is a more comprehensive model in that it also addresses the role that external rewards, enjoyment and inherent satisfaction plays in the internalisation process of self-determination. The SDT as a theoretical framework allowed me to determine the type of motivation that the participating Accounting teachers possessed, or which aspects influenced their attitudes to implement CAL as a teaching strategy in their Accounting classroom on a continuum. Although the motivational models discussed in Section 2.7 are popular motivational models, the primary difference between the SDT and those motivational models is that the SDT focuses on the relative strength of autonomy versus controlled motivation.

2.7.6 Autonomous motivation and controlled motivation

Autonomous motivation comprises both intrinsic regulation and two regulatory styles of extrinsic motivation; identified regulation and integrated regulation (Figure 3.1). When someone is autonomously motivated, they engage in an activity with eagerness, with a sense of choice and willingness.

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Controlled motivation, in contrast to autonomous motivation, consists of both non-regulation and two regulatory styles of extrinsic motivation: external regulation and introjected regulation (Deci & Ryan, 2008) (Figure 3.1). The SDT, with respect to extrinsic motivation, provides a more complete and more useful approach to understanding the motivational bases for self-determination than the other motivational models (Gagne & Deci, 2005).

Aspects that are relevant to motivation and the Self-Determination Continuum refer to basic psychological needs. The SDT assumes that the three basic human needs, as discussed earlier, are inherent motivational aspects that drive humans to initiate certain behaviour (Section 2.6.1). The SDT predicts that human motivation will be shifed along the continuum of self-determination when these three basic psychological needs are met. Internalisation, according to the SDT, is the process of converting extrinsic motivation into intrinsic motivation, thereby assimilating behavioural regulations that originally had an external perceived locus of causality to be internal (Deci, 1971).

Satisfying the need for relatedness is vital in internalising motivation that originates from an external locus of causality. The degree of autonomy distinguishes whether identification regulation or integration regulation will take place, rather than just introjected regulation (Gagne & Deci, 2005). If these three basic psychological needs are not satisfied, there will be no self-determination (Ryan, 2009). Figure 3.1 illustrates these different forms of motivation, and will contribute to the data structure of this study.

2.8 Conceptual framework: Self-Determination Continuum

The conceptual framework that I have selected for this study is the Self-Determination Continuum adapted from Ryan and Deci (2000). I adapted the Self-Determination Continuum by making structural changes to the Self-Determination Continuum (Ryan & Deci, 2000) (Figure 2.2) to improve and ease the visual interpretation of the model. A continuum is a continuous series of elements or items that vary by small differences, although the extremes are very different from each other ranging on a scale from non-self-determination to self-determination.

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The SDT theorises that motivation is based on the Self-Determination Continuum, with different types of motivation that range from a-motivation to extrinsic motivation and finally, intrinsic motivation (Ryan & Deci, 2000). Thus, the SDT focuses on the degree and quality to which an individual's behaviour is self-determined by means of the Self-Determination Continuum (Ryan & Deci, 2000).

The extreme left of the continuum represents a-motivation, which is defined as the absence of motivation. In the middle of the continuum lies extrinsic motivation. Individuals are extrinsically motivated when they engage in an activity to obtain an outcome separable from the activity itself. The SDT subdivides extrinsic motivation into four types of regulatory styles (Section 2.9.2 a-d). The extreme right of the continuum represents intrinsic motivation, individuals are intrinsically motivated when they engage in an activity out of interest for the activity itself, and because they derive spontaneous satisfaction from the activity (Visser, 2010).

Figure 2.2 illustrates the Self-Determination Continuum model, which links a-motivation, extrinsic motivation and intrinsic motivation and positions them in a framework that considers regulatory styles, perceived locus of causality and the relevant regulatory processes. The SDT elaborates on how humans tend to internalise regulation of behaviour that was initially external in order to develop autonomous, self-determined behaviour (Ten Cate, Kusurkar, & Williams, 2011).

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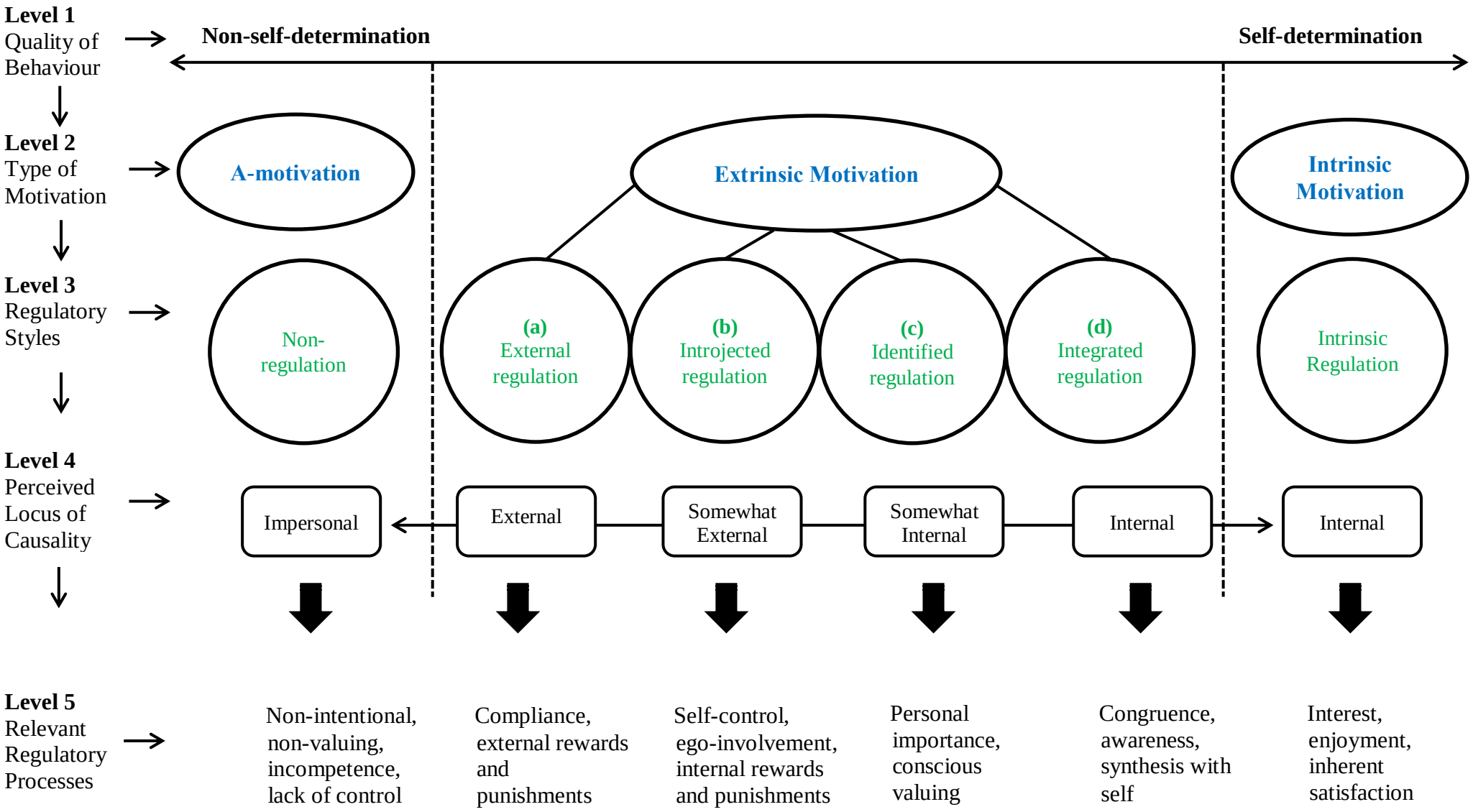

Figure 2.2: The Self-Determination Continuum adapted from Ryan & Deci (2000:61)

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2.9 Interpreting the Self-Determination Continuum

The Self-Determination Continuum can be analysed in five levels. The Self-Determination Continuum is indicated by a horizontal line, with both extremes quite distinct and clearly indicated by small arrows to visualise the continuity of the continuum. There are two types of behaviour designated at the top of the continuum, which differ in quality. Level 1 is labelled 'Quality of Behaviour'. The SDT considers optimal functioning and psychological well-being to be determined not only by the strength or quantity of motivation, but also by the type or quality of motivation.

The quality of behaviour is indicated with non-self-determination on the extreme left, indicating the least self-determination, and self-determination on the extreme right, indicating total self-determination. Non-self-determination is expressed when humans participate in an activity in order to gain rewards or avoid a certain consequence. In the case of self-determined motivation, an individual participates in an activity because of the inherent value of engaging in that activity due to the pleasure or satisfaction derived from it.

The three main types of motivation in Level 2 are labelled 'Type of Motivation'. They can be positioned from left to right according to their relation to self-determination: a-motivation, extrinsic motivation, and intrinsic motivation (Deci & Ryan, 1985).

These three main types of motivation are represented by different types of regulation. These different types of regulation are positioned on Level 3, and are labelled 'Regulatory Styles'. These regulatory styles range from non-regulation to intrinsic regulation on the continuum. The SDT highlights the different types of regulation utilised when moving from one end of the Self-Determination Continuum to the other. However, the SDT separates the four types of regulatory styles in terms of the degree to which they have been internalised, suggesting that the more internalised and integrated with one's self, the more it will be the basis for autonomous behaviour

Level 4 is labelled 'Perceived Locus of Causality'. Perceived locus of causality refers to the perceived source of initiation and regulation of behaviour (Deci & Ryan, 1985) and is concerned with the reasons why a person behaves the way they do (De Charms, 1968). The perceived locus of causality in SDT can thus be explained as the individual's perception of whether the source of their motives for engaging in behaviour is internal or external.

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If the perceived locus of causality is external, it can be due to either external forces or because of self-imposed internal pressures. Activities that are not self-determined to any degree have a locus of causality that is impersonal, this results in a state of a-motivation (Deci & Gagne, 2005).

As an individual becomes less self-determined, their motivational orientation is assumed to move towards extrinsic motivation, finally becoming a-motivated. Conversely, the dynamic process (indicated by the multi-directional arrows and vertical stipple lines to illustrate the permeability and movement along the continuum) by which individuals move along the continuum of motivation to become more self-determined is termed internalisation (Ryan & Deci, 2000). However, the focus of this study is to only identify the static position of the participants at a certain point in time, and not their movement/s along the continuum. If I had focused on the participants' movements, the study would have had to be a longitudinal case study, with data being collected on different occasions. As I only concentrated on positioning the participants on the continuum, the data collection was a once-off process, accommodating the relatively restricted timeframe of this study.

When Accounting teachers are autonomous, it means that their behaviour is volitional through the making of conscious choices or decisions, and it is reflectively self-endorsed (Deci & Ryan, 1985). Using the traditional and familiar manual Accounting as a teaching strategy may allow some teachers to feel competent, as they are acquainted and comfortable with this way of teaching, while using CAL might make teachers feel incompetent with regard to their skill, knowledge and experience. If the teacher feels related or connected to a peer or colleague, he/she might facilitate the process of internalisation, satisfaction and being motivated to use CAL in the classroom. Along the continuum, individuals' motivational behaviour is characterised differently in terms of quality of motivation, types of regulatory styles, perceived locus of causality and relevant regulatory processes.

Level 2 of the Self-Determination Continuum is introduced by discussing each type of motivation accordingly, followed by a brief discussion of the different types of regulatory styles (Level 3) and perceived locus of causality (Level 4) for each regulatory style. The relevant regulatory processes (Level 5) associated with the specific regulatory style are mentioned in the text.

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2.9.1 A-motivation

The first main type of motivation on the continuum (Figure 2.2), a-motivation (Level 2), on the extreme left, can be defined as the mental state of lacking the intention or willingness to act, and is manifested through no action at all. A-motivation is regarded as the lowest form of motivation (Ryan & Deci, 2002). A-motivation can arise when an individual does not perceive the link between their behaviour and the possible outcomes. Such individuals will feel that they lack competence, and believe that the activity is unimportant, irrelevant and regard it therefore as a waste of time (Ryan & Deci, 2000).

When an individual is a-motivated, there is no degree to which they can be regarded as autonomous. This type of regulatory style is termed non-regulation (Level 3), such an individual lacks intentionality and personal causation. The locus of causality is impersonal (Level 4). The impersonal locus of causality involves the belief that behaviour and outcomes are independent and that external forces are uncontrollable. The relevant regulatory style (Level 5) is based on the sense of an individual being incompetent in dealing with life's challenges. Impersonal functioning is unpredictable and non-intentional. The individual lacks the necessary psychological structures to deal with external and/or internal forces.

The first regulatory process (Level 5) relevant to a-motivation is referred to as non-intentional. Non-intentional indicates a complete lack of self-determination. When the regulatory process of non-intentionality is present, in terms of this study, it means that the participant has no intention of implementing CAL and does not value its importance in the Accounting classroom.

The second a-motivation regulatory process (Level 5) is non-valuing. The individual believes that no strategy will produce the desired outcome, and is therefore of no value to him/her. Because CAL is not compulsory according to the CAPS document (Department of Basic Education, 2011), some participants do not see the necessity for, or importance of, implementing CAL in their classrooms as it will have no influence on their learners' final results. Even though some teachers do value the use of CAL, they are very often unsure of how to use the computer appropriately in an educational setting (Underwood & Underwood , 1990).

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The third a-motivation regulatory process (Level 5) focuses on incompetence. Incompetence can be explained as the teacher's belief that the task, using CAL in the classroom, is too demanding, and therefore they lack the ability or even the confidence to start the task. The feeling of incompetence is likely to result in helplessness and a lack of motivation (Deci & Ryan, 2000).

The fourth a-motivation regulatory process is lack of control (Level 5). According to the SDT, lack of control refers to the individual's lack of personal control or competence. The individual has no control or autonomy over his/her decisions or choices.

In the past, theorists have treated motivation as a unitary concept. Such theorists (e.g. Bandura, 1982) have only been concerned with the differences between a-motivation and motivation. However, as visualised by Figure 2.2, to the right of a-motivation are four types of regulatory styles associated with extrinsic motivation (Level 3). These four types of regulatory styles have been organised from left to right to reflect their differing degrees of autonomy or self-determination, as discussed in the following section.

2.9.2 Extrinsic motivation

The second type of motivation on the continuum (Figure 2.2), extrinsic motivation (Level 2), can be defined as motivation that is contingent upon external rewards, threats, or external forces (Deci & Ryan, 1987). According to the SDT extrinsic motivation can vary in the degree to which individuals have internalised external motivation. Ryan and Deci (1985) propose that in some instances, extrinsic motivation can be self-determined and therefore may be performed through self-regulation. This fine calibration of the different types of extrinsic regulatory styles enhanced the conceptual framework of this study in becoming a robust quality model of the data collection and data analysis of this study.

Extrinsic motivation is categorised into four types of extrinsic regulatory styles (Level 3), which either promote or hinder the internalisation and integration of the regulation of these behaviours (Ryan and Deci, 2002). Regulatory styles are associated with varying levels of self-determination. These four types of extrinsic regulatory styles include: external regulation, introjected regulation, identified regulation and integrated regulation.

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As illustrated (Table 2.2), these types of extrinsic regulatory styles are categorised from most extrinsic to least extrinsic, from left to right, in the order of the extent to which the motivation for one's behaviour has been internalised. Table 2.2 shows a summary of the four types of regulatory styles.

Table 2.2 Four regulatory styles associated with extrinsic motivation

Regulatory Style	Meta Classification of motivation	Motivation
External regulation	Controlled	Such behaviour is performed to satisfy an external demand or obtain externally imposed reward contingency (Ryan & Deci, 2000).
Introjected regulation	Controlled	Such behaviour is performed with the feeling of pressure in order to avoid guilt or anxiety or to attain ego-enhancements or pride (Ryan & Deci, 2000).
Identified regulation	Autonomous	Such behaviour is performed when people believe in the personal importance of the activity. Although this activity may once have been unfamiliar to you, now you endorse it freely and value its importance (Ryan & Deci, 2000).
Integrated regulation	Autonomous	Such behaviour is performed through introspection and bringing new regulations into congruence with one's other values and needs (Ryan & Deci, 2000).

a) External regulation

To the right of non-regulation in Figure 2.2 is a regulatory style, external regulation (Level 3), which represents the least autonomous level of extrinsic motivation in terms of how individuals' behave. Such behaviour is enacted to satisfy an external force or obtain an externally imposed reward eventually. Individuals typically experience externally regulated behaviour as controlled. Their actions therefore have an externally perceived locus of causality (Level 4). An individuals' behaviour is a function of external contingencies of compliance, external rewards and punishments (Level 5). If CAL becomes mandatory in the Accounting curriculum, Accounting teachers will have to comply with the policy or face disciplinary action. This means that severe extrinsic aspects are used to enforce the use of CAL. Some principals and governing bodies expect the implementation of CAL in their schools by teachers. This context can also be regarded as the regulatory process of compliance (Level 5).

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b) Introjected regulation

The second type of regulatory style is introjected regulation (Level 3). Introjection describes a type of regulation whose perceived locus of causality is regarded as somewhat external (Level 4) in the sense that it is still quite controlling. A regulation that has been taken in by the person but has not been accepted as his/her own is said to be introjected (Gagne & Deci, 2005).

Introjected regulation therefore describes a type of internal regulation that is relatively intrinsically controlled as people perform particular actions due to feeling internal pressure to avoid anxiety, punishment, or guilt and in that way, they practise self-control. Self-control (Level 5) can be defined as an individual's ability to control their emotions and behaviour. Self-controlled individuals also desire external pressure in order to function in society. This process of introjected regulation is only somewhat self-determined due to a lack of true perceived autonomy (perceived locus of causality), but is associated with ego-involvement, internal rewards and punishments (Level 5) that might play an important part in internalisation. Ego-involvement is a classic form of introjection, in which an individual performs or participates in an activity in order to enhance or maintain self-confidence, and feeling worthy. Introjection represents regulation by dependent self-control or self-confidence. A relevant example is Accounting teachers who implement CAL in their classrooms to feel worthy and important.

External regulation and introjected regulation have an external perceived locus of causality because they come from outside the self (De Charms, 1968). Accordingly, these two styles of regulation are experienced as controlled motivation. It is regarded as controlled behaviour because individuals perform activities because they feel pressure in order to avoid guilt or to attain a feeling of pride. Some principals promise their teachers that they will receive a reward or be remunerated if they implement CAL successfully in their classrooms. Others may be threatened with undesirable consequences if they do not do so.

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c) Identified regulation

The third type of regulatory style is identified regulation (Level 3). After experiencing introjected regulated behaviour, the individual starts to identify and accept the reasons for their actions. Identifying the reasons for their actions occurs when an individual accepts influence from external forces, because it is of personal importance (Level 5) to the individual to establish or maintain a satisfying relationship with a certain phenomenon, another individual, or a group of individuals that is of great importance to them (Boyce, 1999). Behaviour is carried out freely because the behaviour is more congruent with their personal goals and identities, thus suggesting a shift towards greater self-determination and more autonomy with a somewhat internally perceived locus of causality (Level 4) (Gagne & Deci, 2005). Identification is an autonomous or self-determined form of extrinsic motivation, and therefore becomes autonomous in nature. The individual accepts with conscious valuing (Level 5) the personal goals and identities as important to him/her in such a way that the action is accepted or owned (Ryan & Deci, 2000).

For example, Accounting teachers strongly value their learners' performance and futures and therefore understand the importance of doing their share by improving their own technological skills. These teachers would feel relatively autonomous when attending workshops and training, even though it was not intrinsically interesting or fun for them.

d) Integrated regulation

Lastly, the fourth type of regulatory style is integrated regulation (Level 3). Integrated regulation is regarded as the most autonomous form of extrinsic motivation. Integration occurs when identified regulations have been fully integrated with the self (Level 4), which occurs through self-examination. The more one internalises the reasons and motivation for partaking in an activity and integrate them with the self, the more one's extrinsically motivated actions become self-determined. Integrated forms of motivation share many qualities with intrinsic motivation; however, they are still extrinsic in nature (Level 2) because the individual is motivated by some expected reward that is outside the self.

Cox *et al*. (2004) write that teachers, who value the integration of technology, will make an effort to change their current teaching strategies to better integrate CAL. Additionally, according to Becker *et al.* (cited in Sabzian, Gilakjani, & Sodouri, 1999:69), "teachers who report a strong commitment to teaching, as well as their own professional/personal

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development, have been found to integrate computers more readily" into their classrooms. Integrated regulation can therefore be further explained as a choice-driven motivation which occurs when an individual accepts influence because it is congruent with their value system (Vallerand, 2001). Being congruent (Level 5) refers to behaviour that is carried out freely because the behaviour is similar to an individuals' personal goals and identities. The individual has a full sense of self (synthesis with self) and is thus recognised as self-determined (Level 5). The internalisation process is, however, not complete until integration has occurred. This type of regulation, although still classified as a regulatory style of extrinsic motivation with an internal perceived locus of causality (Level 4), is considered to be almost intrinsically motivation and highly self-determined.

In terms of the Self-Determination Continuum, in order to assist Accounting teachers towards self-determination, one must commence with external regulation. It should be noted that as extrinsic motivation internalises, it does not necessarily mean that it will be transformed into intrinsic motivation. It is possible for an individual to adopt a new behaviour at any point along the continuum, depending on prior experiences and situational factors (Ryan & Deci, 2000). It is worth noting that the Self-Determination Continuum is not a stage theory and does not suggest that individuals must invariantly move through these 'stages' with respect to particular behaviours (Gagne & Deci, 2005). It is therefore not necessary for the individual to progress through each stage of internalisation.

2.9.3 Intrinsic motivation

The third type of motivation on the continuum (Figure 2.2), intrinsic motivation, is positioned on the far right on the continuum. Intrinsic motivation is considered as the ideal type of motivation as one is said to be operating in a self-determined fashion, producing higher enjoyment levels and greater self-regulation of behaviour (Vallerand & Losier, 1999). The only type of regulatory style for intrinsic motivation is intrinsic regulation (Level 3). Intrinsic regulation can be assumed to be the most autonomous regulatory style as individuals follow their personal interest, enjoyment, or are inherent satisfied when performing such activities, with an internal perceived locus of causality (Level 4) (Deci & Ryan, 1985). Intrinsic motivation occurs when the individual engages in activities for the satisfaction experienced while learning, exploring, or trying to understand a concept. Intrinsic motivation consists of three regulatory processes (Level 5): personal interest, enjoyment, and inherent satisfaction (Ryan & Deci, 2002). It is important to understand these different relevant regulatory

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processes that have an influence in fostering the successful integration of CAL. Individuals are intrinsically motivated for some activities, while others are not. Individuals differ, and not everyone is intrinsically motivated to perform a particular task (Ryan & Deci, 2000).

2.10 Conclusions

The literature review explored the concept of CAL, the background and history of CAL in Accounting education, and teaching strategies aimed at the inclusion of CAL in Accounting education. Different motivational theories were discussed, leading finally towards an explanation of why the SDT was selected as a theoretical framework. I rejected the methodological approaches of the motivational models discussed in Section 2.7, and support a relative stance for the research methodology, sustained by the theoretical and conceptual framework. Relativists express the view that the meaning and value of human beliefs and behaviours have no absolute reference, and can therefore not be measured or quantified (Denzin & Lincoln, 2003). I am of the opinion that behaviours, motivation, attitudes and beliefs can be interpreted and understood when considering the cultural, social and historical background of an individual.

The literature review provided a useful theoretical background that focused on the inquiry into motivational processes. The Self-Determination Continuum as a conceptual framework was introduced and discussed. It provided a scientific base for the findings of the multiple case study.

The next chapter, Chapter 3, deals with the research methodology used to conduct this study. A qualitative approach was followed, which ensured that a deeper understanding of the possible motivational aspects that influence Accounting teachers' attitudes towards CAL was achieved.

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CHAPTER 3

RESEARCH METHODOLOGY

3.1 Overview of the chapter

This chapter commences with an explication of the qualitative research approach that assisted me in my attempt to interpret phenomena in terms of the meaning that people bring to them. Making use of a multiple case study research design allowed me to answer the research question: 'How does the nature of Accounting teachers' motivation inform us about their self-determination to use CAL as a teaching strategy in their classrooms?', and further enabled me to explore differences within and between these cases. The paradigmatic assumptions and perspectives follow, which explain how this study is rooted in the interpretivist paradigm alongside the philosophical assumptions that underpin this approach to motivation. The value that conducting a pilot study added to this study is then discussed. A description of the sample and specific choice of participants for this study follows, as well as the homogeneous sampling strategy by which the participants were chosen. The procedures of data collection and analysis are clarified, in addition to the data structuring, quality measures and ethical considerations that governed the collection of data in this study.

3.2 Research approach

According to Myers (2009), qualitative research seeks to build an understanding of humans in their natural context. Qualitative research approaches its subject matter in an interpretive way, and attempts to make sense of phenomena in terms of the meaning people bring to them (Denzin & Lincoln, 2003). A qualitative research approach was used to make it possible for me to study the participants in their natural context. In this way, I was able to understand the phenomenon under study in this research through the meaning that I brought to it, the meaning that the participants brought to it, and the meaning that we created together. A qualitative research approach was most appropriate for this study as a research approach since it allowed me to develop an understanding of the aspects that influenced the participants' attitudes towards CAL as a teaching strategy, and why these teachers implemented it, or not, in their Accounting classrooms.

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Furthermore, the qualitative research approach was selected because much uncertainty existed about the dimensions and characteristics of the motivational aspects, both extrinsic and intrinsic, that have an influence on Accounting teachers' attitudes towards using CAL as a teaching strategy. Therefore, a detailed investigation was needed.

3.3 Research design

The research design of a study is the plan and the procedure for the research that spans the decisions, from broad assumptions to detailed methods. It involves the intersection of philosophical assumptions, specification of the selection of participants, the data collection strategies to be used, and the data analysis to be done (Creswell, 2013). The research design is important in determining the type of evidence that is required to answer the research questions (Mouton, 2001). According to Creswell (2013), a case study research design is a qualitative strategy wherein the researcher explores an event, activity, process, or one or more individuals in their natural context in an in-depth manner. The multiple case study research design was used as multiple cases were selected. This gave me a more in-depth look at the proposed problem of this research than a single case would have done. Using a multiple case study research design enabled me to explore the differences within and between the cases.

I focused on six particular cases in three private high schools, which are discussed in detail in Section 3.6. The purpose of applying the multiple case study design in this study was to examine the range of motivations and attitudes of the participants, and to develop a shared understanding between myself and the participants. The advantage of applying a multiple case study was that it allowed me to look beyond the individual case, to the phenomenon (Creswell, 2013). In this case, the aspects motivating the participants who had access to computers, application software or subject-specific software, and who had received training to implement it as a teaching strategy were investigated. I, therefore, considered the evidence of relevant regulatory processes that characterised the qualities of behaviour from the Self-Determination Continuum (Figure 2.2) of multiple cases as compelling.

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3.4 Paradigmatic assumptions and perspectives

Ary *et al*. (2013) define a paradigm as a way of looking at the world. A paradigm is further defined as a set of assumptions or beliefs (Shuttleworth, 2008). A clear paradigm guides the researcher in making and justifying all of the necessary decisions about the design of the research project (Maxwell, 2005). The interpretivist research paradigm that was selected guided the study's philosophical assumptions about the research and also guided the selection of data collecting instruments, selection of participants, and methods used in the study. Applying a qualitative research approach necessitated an interpretivist research paradigm (Hartley, 2010) in order to understand the natural context of the participants as is, which is derived from an individual's subjective experiences.

3.4.1 Interpretivist research paradigm

Interpretivists agree that the reality of human's subjective experiences of the world may adopt an inter-subjective epistemology, and the ontological belief that reality is socially constructed as the truth (Cohen *et al.*, 2001). This study was carried out from an interpretivist point of view. In this study, the focus was on the reality of the aspects that influenced Accounting teachers' attitudes towards the use of CAL. Therefore, everyone involved in the research, whether the participants or myself, constructed meaning out of whatever we have encountered and experienced, thus contributing our own personal interpretations to the research process. In defining the paradigmatic perspective as a qualitative researcher, I was aware that I approached the research with certain basic assumptions about the world and how it should be studied.

Hitchcock and Hughes (in Cohen *et al.*, 2001) suggest that it is useful to think in terms of three lenses (ontology, epistemology and methodology) to examine the practice of research. In this section, the fundamental assumptions about the nature of reality are presented:

(a) Ontology (what can be known about the nature of the reality),
(b) Epistemology is concerned with the relationship between the "knower" (the participant) and the "would-be knower" (the researcher), and
(c) Methodology (the process and procedures of the research) (Ponterotto, 2005).

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Through continuous discussion, the interpretivist research paradigm allows the researcher to create a rich description of the findings, which creates a deeper shared understanding. Using the interpretivist research paradigm further allowed the acknowledgment of the complexities of different motivational aspects, and for an affirmation of the significance of the participants' knowledge. I thus adopted an inter-subjective stance towards the reality that was investigated in this study.

(a) Ontological assumptions: relativism

Ontology refers to the researchers' philosophical assumptions about the nature of reality, which has a significant influence on the perceived relative importance of the aspects of reality (Denzin & Lincoln, 2003). Relativism is the concept that no ideas or beliefs are absolutely true, but that all are instead 'relative', that is to say, their credibility depends on the circumstances in which they are applied (Section 1.7). Different researchers have different viewpoints of analysing and interpreting data. The interpretive research paradigm provided a greater scope to address issues of influence and impact. It furthermore allowed me to ask the 'what' and 'how' questions. I wanted to explore the nature of intrinsic and extrinsic motivation, and the nature of people's reactions regarding motivation. This study required that the participants shared and contributed to the construction of developing an understanding of the research objectives (Denzin & Lincoln, 2003). Ontological assumptions tend to give rise to epistemological assumptions, which form knowledge of that reality.

(b) Epistemological assumptions: subjectivist

Epistemology can be defined as the study of the possibility, limits, origin, structure, methods and truthfulness of knowledge and how knowledge can be acquired, validated and applied (Hitchcock & Hughes, 1995). According to Schwandt (2007), the epistemology of interpretivism is to know the world of human action, and to understand possible subjective norms that have influences on research participants. One's understanding of the world is informed by how one views and understands it, what one views understanding to be and what one sees as the purpose of understanding (Cohen *et al*., 2001). Together, the participants and I co-created a cohesive understanding.

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My epistemological stance as a subjectivist allowed the participants to talk about their unique experiences with regard to the integration of CAL and their attitude towards CAL during the structured interviews. The structured interviews gave the participants the opportunity to share their reality with me. I had the opportunity to reflect on my interpretations of the structured interviews, which were influenced by the interaction with natural contexts. I was interested in knowing and understanding what the participants' attitude towards CAL was, and which aspects had an influence on their attitude towards CAL. The subjectivist epistemology provided the study with the basic interpretive and descriptive characteristics of qualitative research that unfolded throughout the research process. This process was valuable to me in thoroughly explaining and reporting on the data that were gathered. My understanding of the world and meaning thereof was mediated through myself as the instrument, the strategy was inductive, and the research outcome was descriptive.

(c) Methodology assumptions: qualitative

Qualitative research is naturalistic and attempts to study the everyday life of people in their natural context (Mouton, 2001). In this study, the qualitative research approach (Section 3.2) was used because interacting with the participants required me to develop a sensitive understanding of the possible aspects that might influence the Accounting teachers' attitudes towards CAL as a teaching strategy, and why they implemented CAL in their Accounting classrooms.

As a researcher, I shared the participants' frame of reference and tried to understand how their views shaped the actions they took within that reality (Beck, cited in Cohen, Manion & Morrison, 2005). I acknowledge that an inter-related relationship between myself and the participants existed. Their experiences were the medium through which this study explored Accounting teachers' reflective natural context.

These assumptions impacted on the methodological choices made in this study, and required the consideration of different research methods. The data collection process for this study involved face-to-face, structured interviews and a self-constructed questionnaire. The inter-related relationship with the participants' natural context can be linked to relativist ontology. I attempted to explore the nature of the Accounting teachers' world.

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Structured interviews and questionnaires were used to determine the motivation behind the Accounting teachers' decision to implement CAL as a teaching strategy in the classroom, and the purpose for which they decided to implement CAL.

3.5 Pilot study

A pilot study can be defined as a mini-version of a full-scale study, or a trial done in preparation for the study (Cohen *et al*., 2000). As such, the aim of conducting a pilot for this study was twofold. Firstly, I specifically carried out the pilot study to pre-test the suitability of the qualitative approach that was adopted for this study. Secondly, I wanted to assess the data collection instruments to determine if the research questions from the structured interview protocol and questionnaires were unambiguous and clear for the participants to understand and answer.

The pilot study was conducted in September 2014 with one Accounting teacher at a government school in the Tshwane District. The value of the pilot study was that it allowed the identification of a need to amend both data collection instruments accordingly. I noticed that there were a few questions that were vague or repetitive, which resulted in the participant struggling to answer the questions properly. After revisiting the data collection instruments, the clarity and quality of questioning was improved to enhance understanding and to eliminate possible confusion and repetition.

Conducting the pilot study also contributed to increased credibility and triangulation (Section 3.10.5). Ensuring data triangulation, I arranged questions with similar traits that tested the same type of attitude or motivation to be spread across the interview. Randomising the order of the questions prevented the answers to questions asked later in the interview or questionnaire being biased by the presentation of earlier questions. This meant that the influence was no longer subject to this ordering bias, and therefore reduced response bias. A second advantage of randomising the order of the questions was to reduce the occurrence of participants guessing answers. I was also alert to a possible waste of time by confirming every meeting in advance with the participants, taking their busy schedules into consideration.

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3.6 Selection of participants

The selection of participants, also known as sampling, is used to identify the objects or people that are best suited for the research (White, 2005). Sample selection is critical for the outcome of qualitative research as the sample that is chosen determines the quality and the depth of the themes/patterns that are produced. The sample of this study comprised six FET Accounting teachers that had access to computers, application software and subject-specific programs that can be employed as a teaching strategy.

In this study, I purposefully and intentionally selected a specific group of individuals that had defining characteristics based on homogeneity. To use the homogeneous sampling strategy, I had to find and identify individuals with similar characteristics (Creswell, 2008).

The following criteria were used to select participants:

- Participants should be practicing Accounting teachers.
- Participants should teach Accounting at a private secondary school situated in the larger Tshwane District of Pretoria, the administrative capital of South Africa.
- Participants should have access to application software that can be used as a teaching strategy in the Accounting classroom.
- Participants should have access to a computer and/or other types of technology tools in their classroom.
- Participants should be conversant in English or Afrikaans.

The reason for having a small sample size in comparison to quantitative studies is twofold. The sample size of qualitative studies is commonly quite small, averaging between one and twenty participants (Creswell, 1998). Ritchie, Lewis and Elam (2003) support Creswell (1998) in his view on sample size, and confirm that qualitative samples are usually small because a phenomenon has to appear only once to be part of the data structure. However, the sample size of qualitative samples should be large enough to assure that all of the perceptions that might be important are revealed, but in contrast, if the sample size is too large, data becomes repetitive and might end up being redundant.

When determining the sample size of this qualitative study, I followed the concept of data saturation, which is the point in the data gathering process when no new or relevant information emerges, and no more data needs to be collected (Tashakkori & Teddlie, 2010).

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Thus, estimating an adequate sample size is directly related to the concept of data saturation (Cohen *et al.*, 2001). There was no motivation for increasing the sample size after data saturation was reached. While gathering the data, I found that the evidence was slightly repetitive, and therefore I felt no need to continue the search for more participants, which concluded in reaching a perceived data saturation.

3.7 Data collection procedure

Van Aken, Berends and Van der Bij (2007) describe data collection as the "building blocks for research". As such, I first emailed 23 principals of private schools in the Gauteng province with a formal protocol letter of invitation to participate in this study. Three schools accepted this invitation, these were located within the larger Tshwane District, in the Gauteng province. I telephonically contacted the schools to schedule appointments with the school principals. The school principals acted as gatekeepers, which were used to gain access to the participants (Creswell, 2008). During the meeting with the school principals, they arranged that I meet the Accounting teachers at the school. I introduced myself, and informed the Accounting teachers of the nature of this study. All six Accounting that I met verbally agreed to participate in this study. I set a date, time and venue that was convenient for each teacher for gathering the data.

On the negotiated date, time and venue, the Accounting teachers gave their informed consent to be part of this research study. I started the data gathering on all occasions with the structured interviews before moving on to the questionnaires. Talking about one's attitudes and motivation might result in emotional discomfort. I therefore decided to conduct the structured interviews first, aiming to help the participants feel at ease. I further tried to gain the participants' trust by treating them with respect and by using professional interviewing skills before the completion of the questionnaire. The duration of the structured interviews varied from 12 minutes to 27 minutes.

Directly after conducting the structured interview, the participants proceeded in completing the questionnaire. I offered a short break between the structured interview and questionnaire, although the participants all preferred to continue without a break. The participants completed the questionnaire within ten minutes.

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3.8 Data collection instruments

The data collection process involved the use of two types of data collection instruments, which were used in order to achieve methodological triangulation (Section 3.10.5 (b)), namely, structured interviews and questionnaires. My inter-related relationship with the Accounting teachers' natural world can be linked to the relativist ontology, where I endeavoured to explore the nature of the participants' world. As such, I used both the data collection instruments to determine, among other things, the possible motivational aspects responsible for the participants' decision to implement CAL as a teaching strategy in the classroom, and the reasons why they had decided to implement CAL.

The principles of constructing structured interviews and questionnaires that elicit credible data from participants were based on psychological foundations. When developing the data collection instruments, I took psychological measures into consideration such as arranging the questions in a way that asks the same question but in a different manner, positioned away from the first question (Williams, 2003), ensuring data triangulation (Section 3.10.3 (a)). I further developed the data collection instruments after an extensive review of the literature guided by the theoretical base of the study. Both data collection instruments were reviewed by an expert specialising in ICT and education, more specifically in the blended-learning approach in Accounting and business information systems. This expert was a section head at another South African university, and acted as reviewer, and later as interrater (Section 3.10) to determine content credibility.

3.8.1. Structured interviews

Structured interviews enable the participants of a study to better express their opinions, beliefs, and their feelings about situations in their own words. Structured interviews are also used to help the researcher understand the experiences people have and the meanings they make of them (Ary *et al.*, 2013). These interviews were only conducted after receiving written consent from the participants. The interviews were carried out during the third school term after school hours for approximately 45 minutes in a noise free area that was convenient for each participant. Creswell (2013) noted that structured interviews is a type of interview that may be used in qualitative research. Structured interviews are planned, and every participant is asked the same set of questions. The questions are still posed as open-ended (Appendix A). I conducted face-to-face structured interviews with each of the six participants

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individually, which consisted of open-ended questions. I used open-ended questions, to allow the participants to elaborate on the underlying reasons for the answers that they have provided. This open-endedness allowed me to ask probing questions as a means of follow-up, but also giving the participants the opportunity to fully express their responses in as much detail as desired. I prepared a pre-existing set of questions serving as my interview protocol, to ensure that the same questions and sequence of questioning are applied with each participant. An interview protocol is a guide used by a qualitative researcher for recording and writing down information obtained during an interview (Creswell, 2013).

I recorded the interviews while also taking handwritten notes on the interview protocol, which served as field notes and digital audio recordings during the interview. Using both methods of recording the structured interviews enhanced this study's credibility to provide a good audit trail (Section 3.10.4). The value of making field notes during the interviews was that it helped me to become familiar with the data while transcribing the audio recordings. It further supported my memory while analysing and interpreting the data, as it was possible that I could have forgotten the context of a comment or something important.

3.8.2. Questionnaires

Questionnaires are used to gather information about the opinions and behaviour of individuals (Williams, 2003). A questionnaire was administered to the participants once the structured interview was completed (Appendix B). All the posed questions in the questionnaire were directly related to the primary and secondary research questions, founded in the theoretical and conceptual framework, thus ensuring theoretical triangulation (Section 3.10.3(a)). The sequence of the questions, according to Cohen *et al.* (2001), is important for the overall balance of the questionnaire, which may set a tone for later questions. I therefore followed the common sequence of questionnaire setting as explained by Cohen *et al.* (2001). Cohen et al. (2001) explain that the first questions should be fairly simple and encourage participation as this will build up the confidence and motivation of the participants. The middle section of the questionnaire should contain the more challenging questions and the last questions should be of high interest in order to encourage participants to return the completed questionnaire feeling satisfied after participating in the study.

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The layout of the questionnaire for this study consisted of two sections. Section A included five biographical questions related to gender, age, teaching experience and race, which served as an introduction. Following the guidelines set by Cohen *et al*. (2001), these introductory questions were simple and easy to answer. These biographical questions encouraged participation as no references were made to names, addresses or the naming of their school, and no distinction between or bias towards any age, race, culture, and gender was exhibited, as dictated by the ethical guidelines of this research. Research conducted in different countries, including some cultures with collectivist, traditional values and others with individualist, equalitarian values, have confirmed that the satisfaction of the needs for autonomy, competence and relatedness foresee psychological well-being in all cultures. (Deci & Ryan, 2008). I have not included or made any reference to biographical details in this study's analysis and findings because all of the participants were viewed as humans according the Organismic Meta-Theory (Section 2.6).

The progression from Section A to Section B was a discreet bridge from objective facts towards subjective attitudes and opinions. Section B included dichotomous questions examining the general attitude of Accounting teachers to using CAL in Accounting, using closed ended questions, e.g. choosing only yes/no (Cohen *et al.*, 2001). The dichotomous questions were easy to understand and quick to complete, but were a bit more challenging to answer than Section A. The advantage of using dichotomous questions was that it allowed me to determine the participants' general attitudes towards a certain phenomenon.

A challenge in the questionnaire's design, which was only noticed while conducting the full-scale study, was that the participant's experienced frustration at answering the 11 dichotomous (yes/no) questions. I did not make provision for "don't know" or "maybe" answers in the questionnaire, as the questions were dichotomous. I noted that some participants did not have a definite yes/no answer to the dichotomous questions posed, and therefore asked me if they could elaborate on their replies. This challenge did not become apparent in the pilot study as the pilot participant did not express the need to elaborate or express his reply to the dichotomous questions, other than yes/no.

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3.8.3 The researcher's role

During the interaction with the participants, I tried to protect their general and psychological well-being by respecting them as individuals, as well as professional teachers. I aimed to achieve this by creating a setting as naturalistic as possible to ensure that the participants' felt as comfortable as possible. During our first meeting, I tried to establish as much trust as possible through the explanation of my intentions, exposing my academic as well as personal interest in the field of study. During our casual conversations when we met, the participants became aware of the social as well as academic potential and benefits that this study may hold for educational as well as Accounting professional purposes.

Having experience as an FET teacher, I ensured a trust relationship with which the participants could identify. My experience as a teacher allowed the participants to feel comfortable in sharing their experiences with me. The experiences that the participants shared with me in the interviews were used throughout the findings by means of thick descriptions so that the reader can immerse themselves and share in the experiences of these Accounting teachers.

Throughout this research, I was actively involved in the research component of the study. In accordance with the interpretivist paradigm, I established and maintained a close personal relationship with the participants in this study by meeting them prior to the data collection to introduce myself and help them feel at ease. Both the participants and I brought our own individual meanings to the study to co-create understandings, for example: the participants constructed a variety of meanings while functioning in different realities, such as the CAL event in the Accounting classroom, as well as those realities encountered outside that Accounting classroom.

3.9 Transcription procedure

The data of the structured interviews were verbatim accounts of what transpired in the interview session (McMillan & Schumacher, 2001). Audio recording the interviews ensured completeness of the verbal interaction between myself and the participants. In addition to this, it provided an audit trail that enhanced the trustworthiness of this study. Braun and Clarke (2006) state that the transcription process is an interpretive act, where meanings are initiated, rather than simply a mechanical act of putting spoken words on paper. Bird (2005)

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suggests that the transcription process could be viewed as a key phase of data analysis within interpretative qualitative methodology. Therefore, I decided to transcribe the digital audio-taped structured interviews personally, using a word processor application programme. I used my field notes to guide me where I experienced difficulty in hearing properly what the participant said.

In order to contribute to the quality of the study (Section 3.10.3), once the transcription process was completed, I read and re-read the transcribed data while listening to the digital audio recordings repeatedly to check that the transcription was an accurate account of the structured interviews. The transcription process contributed to me becoming more familiar with the content of the transcribed data, which enabled me to identify overt themes or repeated issues that occurred in one or more interview.

3.10 Data analysis

Immediately after data collection, I had to make sense of the information supplied by the participants in the study. Data analysis consists of "taking the data apart" to determine individual responses and then "putting it together" to summarise it (Creswell, 2009). The purpose of data analysis is to find answers to the research questions (Kumar, 2005). I approached the data analysis process for this study by following the six phases of data analysis (Section 3.10.1), as stipulated in the Thematic Analysis (TA) procedure. TA is a technique for identifying, analysing and reporting themes and patterns within a data set. According to Guest (2012), most qualitative researchers consider TA to be a very useful method in capturing the intricacies of meaning within a data set.

TA was appropriate for this study as it required me to familiarise myself with the data so that themes and patterns could be identified and classified. Themes are patterns across data sets that are important to describing a phenomenon, and are directly linked to a specific research question (Braun & Clarke, 2006). The themes of the data sets led to an understanding of the aspects that had an influence on the participants' attitudes towards CAL.

Therefore, the data analysis process involves making sense of participants' lived experiences, as Accounting teachers' that use CAL in their classrooms, which is expressed in structured interviews and questionnaires. Making sense of texts describing the participants' lived experiences involved interpreting the meaning of these texts, and determining which aspects

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influenced them to implement CAL in their classrooms. The data analysis process of this study helped to make sense of the data and were helpful in finding answers to the research questions.

The five themes are rooted in the SDT theory and the Self-Determination Continuum. I outline these themes, as well as sub-themes in Figure 3.1. These themes are supported by the participants' lived experiences as they described it during the data collection process, as well as handwritten field notes that I recorded on the interview protocol during the structured interview

Phase 1: Familiarity with the data

Phase 1 of TA commenced after the completion of the transcription process. The transcribed data and questionnaire data were captured on a MS Excel spreadsheet, coded and summarised. I conducted the interviews for this study myself, which facilitated the initial development of some analytic thinking regarding the collected data. The critical process that occurred in Phase 1 required getting familiar with the data, which usually involves repeated reading of the data and reading the data in an active way – searching for themes and patterns (Braun & Clarke, 2006). I immersed myself in the data to the extent that I was acquainted with the content of the data corpus. Hammersley and Atkinson (1983) propose that the activity of familiarising oneself with the data set requires one to read and re-read the data so as to become thoroughly familiar with it, noting interesting patterns, any surprising features, and any apparent inconsistencies. To become even more familiar with the data set, I formulated an initial list of ideas about the data that I collected. I then manually arranged the data according to themes, which served as a draft process.

Phase 2: Coding

The coding process in qualitative studies is the process in which the researcher makes sense out of text data, divides it into segments, then labels the segments, examines the codes for overlapping, and then collapses these codes into themes (Creswell, 2009).

From the data corpus, interesting facts and opinions emerged from the participants' lived experiences with CAL, their attitudes towards CAL, as well as their motivation for using CAL. The data set constituted many individual data items within the data corpus. That means that the data collected and used would be defined as the data set of this study (Braun &

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Clarke, 2006). The data item in this study would be each individual piece of data collected, such as an individual participant's interview or questionnaire. Finally, data extract refers to an individual coded chunk of data, which was identified within, and extracted from, a data item. There were many data extracts taken from the entire data set, but only a collection of these extracts were featured in the data analysis and interpretation. Codes are labels that are used to describe a segment of text.

Firstly, I created a set of preliminary codes. The aim for creating preliminary codes was to be as thorough and consistent as possible when organising the data into meaningful groups. I manually coded interesting ideas and features that emerged from the transcribed data at first into six themes: competence, compliance, resources, rewards, support, and usefulness, thus experimenting with structure and identifying themes and patterns. I initially created and used these codes to assign meaning to the data. Following the initial coding process, I constructed profiles for each participant. I labelled the potential themes and characteristics that I identified and extracted from the data for each participant in a spreadsheet, as well as contextual data relating to the participants' experiences.

Secondly, I finalised the codes. It occasionally happened I had to adapt the codes that were initially used in the coding process, which meant that I had to reread the data several times in the interest of quality assurance and to ensure refinement, consistency, and modification. By coding the data personally and manually, I was able to detect which codes occurred most frequently, and patterns (which codes occur together). Coding the data helped me to become even more familiar with the data set.

Phase 3: Identifying potential themes and sub-themes

Sorting the codes into possible themes involved categorising all the relevant coded data extracts into themes. For this purpose, I referred back to the SDT and the Self-Determination Continuum enabled the creation of six themes, which were inter-related with the conceptual and theoretical framework. I then rejected the preliminary codes that were created in Phase 2.

The critical component of the SDT concerns the degree to which individuals fulfil their basic psychological needs; the more they attain these three basic psychological needs, the more their behaviour will be autonomous. Humans tend to internalise regulation of behaviour that was initially external in order to develop autonomous, self-determined behaviour (Ten Cate,

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Kusurkar, & Williams, 2011). Therefore, the themes are directly linked to Figure 2.2. Organising the data into the six themes made it possible to summarise the coded data. After organising and summarising the coded data, the coded data was categorised into the six predominant themes, and 37 sub-themes. All data relevant to each theme were sorted.

Phase 4: Considering and reviewing the themes and sub-themes

Considering and reviewing the final themes helped me to refine them. Phase 4 evolved during two stages. Stage one required me to re-read the coded data for each theme to evaluate whether the data formed a clear and logical pattern. This process continued until I was satisfied with the characteristics of the data.

Once the themes accurately captured the fundamental nature of the coded data, Stage two started. Stage two involved reviewing the entire data set. I made use of an interrater to review the data analysis. The interrater was an expert working in the field of ICT in education, specifically in the field of Accounting at another South African university. The interrater determined the content credibility of this study (Section 3.10). In this study, the credibility of individual themes in relation to the data set was considered. Additionally, I assessed whether the themes accurately represented the meanings evident in the data set as a whole, and then re-read the data set again. Repeated reading of the data contributed to increased quality, by ensuring that important information was not overlooked. When this step was completed, I had a clear understanding of what the themes represented and how the themes were related to each other.

Phase 5: Defining and naming themes

Phase 5 was implemented once a satisfactory data structure was created (Braun & Clarke, 2006), as illustrated in Figure 3.1. The six final themes that were decided on are a combination of the three basic psychological needs according to the SDT: Autonomy, Competence and Relatedness, and Level 1-5 of the Self-Determination Continuum (Figure 2.2). The themes are labelled as: Quality of Behaviour, Meta Classification of Motivation, Types of Motivation, Regulatory Styles, Basic Psychological Needs, and Relevant Regulatory Processes.

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Figure 3.1 serves as the data structure and illustrates the final themes and sub-themes. More details regarding data structure are discussed in Section 3.10.1. The themes are colour coded on the left within the data structure that guided me to code and analyse the data.

By interpreting the data, I attached meaning and coherence to the themes and sub-themes. Linkages and a story line of participants' stories developed in a way that made sense. As Patton (2002:480) notes, "Interpretation means attaching significance to what was found, making sense of the findings, offering explanations, drawing conclusions, making inferences, consider meanings, and otherwise imposing order". Part of the interpretation in this study was to evaluate the data for their usefulness. For the purpose of this study, regulation of behaviour was considered as the ability to respond to the demands of experience with a range of emotions, as well as the ability to delay unplanned reactions as needed. My understanding of how motivational levels and regulation of behaviour of the participants are connected assisted me in judging how these useful data segments were related to the narrative of this study about the aspects that influenced the participants' attitudes towards CAL.

Phase 6: Reflecting on findings and recommendations

In Chapter 5, I present a report on the findings that narrates the data in a way that will convince the reader of the credibility of the study's data analysis and interpretation. Chapter 5 consists of a selection of vivid, compelling extract examples, as well as the final analysis of selected extracts, which are all linked to the research questions and the literature.

The data analysis process involved extensive data structuring. This will be described in the following section in terms of well described themes and sub-themes derived from theory, which anchor the analytic claims that have been made. These themes provided a framework for preserving the theoretical coherence of this study.

3.10.1 Data structuring

A data structure refers to the way in which the data can be visualised and categorised. It is regarded as an important task for researchers to use data structuring to gain control over the data. Creating the data structure (Figure 3.1) helped me to recognise the different hierarchical levels at which the data resided. This conceptual process brought meaning to the 37 sub-themes, and clearly indicated that inductive reasoning should be followed in the interpretation of the data (Figure 3.1). Inductive reasoning can be explained as moving from specific sub-

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themes (detailed data) toward broader theories, which is sometimes described as a "bottom-up" approach. The inductive reasoning process is indicated in the data structure by means of an upside-down triangle. The upside-down triangle symbolises the bottom-up approach that was used to interpret the data. Analysing Figure 3.1, it is evident that at the bottom of the figure, the Relevant Regulatory Processes, which is colour coded in red and serves as the specific sub-themes. Moving up towards the top of the figure, the broader macro- and meta-theories underpinning this research study follow, as discussed in Section 2.6 and 2.8. Boyatzis (1998) finds that assumptions are data driven, which is shown on the left end of the data structure figure (Figure 3.1) indicating the themes that I used in this study. This means that the process of data structuring occurred without trying to fit the data into a pre-existing framework.

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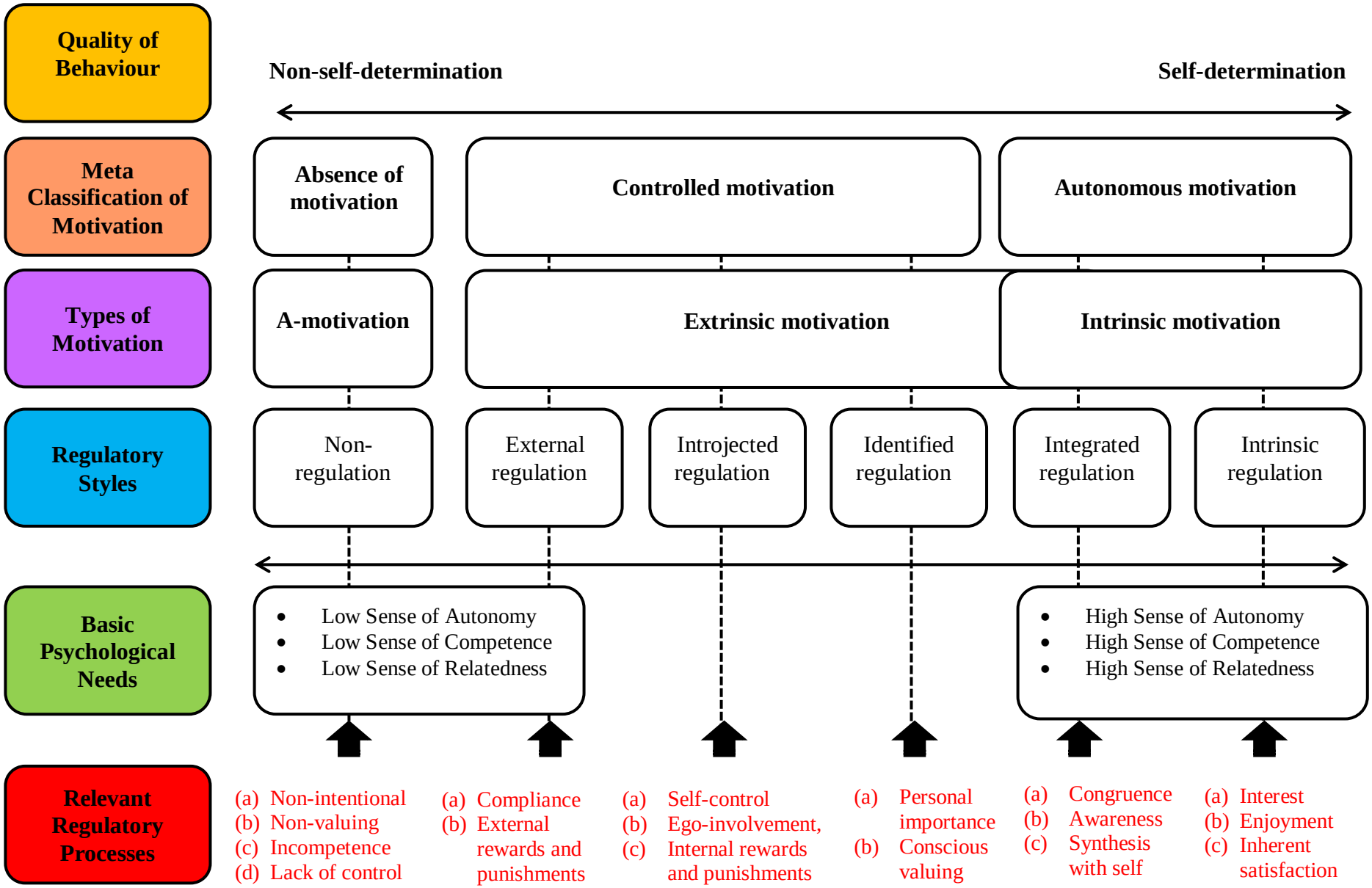

Figure 3.1: Data structuring

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3.10.2 Data interpretation

Interpretation in qualitative research means that the researcher draws meaning from the findings of analysed data. The meaning that was created in this study may result in lessons being learned, gaining information to compare with the literature, or learning about personal experiences (Creswell, 2013).

There are two levels in data interpretation, namely, a latent level and a semantic level. The latent, also known as the interpretive level, guides the researcher to identify the underlying ideas, which are unseen and unobservable assumptions that are theorised as shaping the semantic content of the data (Braun & Clarke, 2006). The semantic level occurs when themes are identified within the surface meanings of the data, and the researcher is not looking for deeper concealed meanings beyond what a participant has said (Braun & Clarke, 2006). I used the latent approach to interpret the data from an interpretivist point of view (Section 3.4.1). I acknowledge that the development of the data interpretation of this qualitative research study involved interpretive work and that the findings that were produced were not simply a description of the data, but had already been theorised.

The quality of interpretations is very important to users of research, who must find them trustworthy if they are to take action based on these (Tashakkori & Teddlie, 2010). Researchers have considered the complexity of this issue and a call has been made for standards for the evaluation of the accuracy, or authenticity, of interpretations from qualitative studies to be created. Interpretive rigour considers whether conclusions are based on the findings of the study. The six criteria pertaining to interpretive rigour include the following items:

a) Interpretive consistency

Interpretive consistency is concerned with whether interpretations are consistent with the findings on which they are based. In addition to this, a number of interpretations can be drawn from a small set of findings, which must be consistent with each other (Tashakkori & Teddlie, 2010).

I have attempted to achieve interpretive consistency by cross-referencing examples of the participants' utterances by quoting their exact words from the transcribed text of the audio-recordings.

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b) Theoretical consistency

Theoretical consistency is where the interpretations are consistent with the current state of knowledge or theory (Tashakkori & Teddlie, 2010). Maintaining consistency is seen as a way of producing more 'trustworthy' findings (Morse *et al.*, 2001).

I have tried to be consistent with the current state of the SDT theory by reading Deci and Ryan's newest publications on SDT.

c) Interpretative agreement

Interpretive agreement means that others, including other researchers and study participants, are likely to reach the same conclusions based on the findings presented, (Tashakkori & Teddlie, 2010).

I have attempted to achieve interpretative agreement through the process of using outside-in legitimation, where my interpretations were considered and reviewed by an outside party, which was the interrater.

d) Interpretive distinctiveness

Interpretive distinctiveness considers whether the conclusions drawn are more credible than any other conclusions (Tashakkori & Teddlie, 2010). The researcher must be able to eliminate other possible interpretations.

I have aimed to achieve interpretive distinctiveness by considering all possible interpretations linked to the collected data. The data has been analysed from an interpretive view, a latent level, which guided the identification of underlying ideas. Underlying ideas refers to unseen and unobservable assumptions, and conceptualisations that are theorised as shaping or informing the content of the data (Braun & Clarke, 2006).

e) Integrative efficacy

Integrative efficacy is the degree to which interpretations are effectively integrated into a theoretically consistent theory (Tashakkori & Teddlie, 2010).

I have endeavoured to integrate my interpretations effectively into the theoretical and conceptual framework. The data collected were directly linked to the SDT theory as the posed questions were created from the relevant regulatory processes of this theory.

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f) Interpretive correspondence

Interpretive correspondence can be explained as the extent to which interpretations satisfy the conclusions that are made on the basis of the results. The interpretations must resemble the research questions (Tashakkori & Teddlie, 2010). I have aimed to achieve interpretive correspondence by presenting my findings in accordance with the four sub-questions, which were formulated to guide the study and to answer the main research question.

3.10.3 Quality measures

Quality measures relates to verification measures taken by the researcher to ensure that data is legitimate (Maxwell, 2005). Trustworthiness is the measure of the quality of research. It can be explained as the extent to which the data and data analysis are authentic and trustworthy. Lincoln and Guba (1985) suggest that the following criteria for assessing the trustworthiness of naturalistic inquiries have been developed specifically for qualitative research, addressing (a) credibility, (b) confirmability, (c) transferability, and (d) dependability. Each strategy in turn uses criteria like triangulation and dense descriptions. I take congnisance of this argument and prefer to use the term trustworthiness to cover quality measures in this qualitative study. In the following section, I describe how I attempted to achieve these quality measures in this study.

(a) Credibility

Credibility in qualitative research is defined as the extent to which the data and data analysis are believable and trustworthy (Patton, 2008). In this first attempt to achieve credibility, I have made an effort to consider rich contextualised detail in each stage of the research methodology, to make clear connections between reality and the way I interpreted it. I actively sought, through reflexivity, to recognise my own bias, and attempted to stay neutral by focusing on the theoretical basis of my interpretations. Confirmable coding and data interpretation of the theoretical framework, supported by the conceptual framework and reflected in my data structuring, assisted me to maintain neutrality.

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From an interpretivist stance, understanding is co-created and there is no objective truth or reality to which the results of a study can be compared. Lincoln and Guba (1985:314) consider the use of an interrater as "the most critical technique for establishing credibility". Therefore, the inclusion of an interrater in this study, that is, gaining feedback on the data analysis and interpretations, is the second attempt to achieve credibility in this study.

Hendricks (2006) argues that triangulation helps to increase the credibility of a study. According to Cohen *et al*. (2001), triangulation refers to the use of two or more data collection instruments in the study of some aspect of human behaviour. Denzin (1970) extends the idea of triangulation beyond its conventional association by using different research methods and designs. He distinguished four forms of triangulation, which were applied in this study. These are discussed below.

Firstly, data triangulation was used, which entailed gathering data through several sampling strategies and criteria so that portions of data at different times and social situations are gathered. The sample that had defining characteristics based on homogeneity were purposefully and intentionally selected, as discussed in detail in Section 3.6.

Secondly, limited investigator triangulation was applied. Although I was the only researcher, an interrater was used to review my interpretations of the data. Denzin (1970) explains that by using a second investigator, the potential bias inherent in one person is overcome and thereby greater credibility is insured.

Thirdly, theoretical triangulation was conducted. By applying theoretical triangulation, multiple theories are considered in the study of the same phenomenon (Denzin, 1970). In this study, theoretical triangulation referred to the use of more than one theoretical position to interpret the data, this is evident in the data structure (Figure 3.1). The theoretical framework of this study is the macro-theory of SDT, which developed from the Organismic Meta-Theory. The SDT consists of five mini-theories, some of which contributed to the development of the Self-Determination Continuum (Section 2.6 and 2.8).

Fourthly, methodological triangulation was used, which refers to the use of more than one data collection instrument to gather data, namely: a structured interview and a questionnaire, as discussed earlier in Section 3.8. Since much social research makes use of a single data collection instrument, and as such may suffer from limitations associated with that method, triangulation offers the prospect of improved confidence in the findings.

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Triangulation strengthens a study by combining methods (Patton, 2001). To avoid such a limitation, I used methodological triangulation to ascertain the credibility of my interpretations (Cohen *et al.*, 2007). In order to establish the multiple truths and realities in this study, I used different data collection instruments, as discussed earlier in Section 3.8, and my professional knowledge assisted in constantly reviewing the data in terms of the participants' perspectives. Using methodological triangulation enabled an awareness of the different aspects of the study that needed attention

(b) Confirmability

Confirmability can be defined as the degree to which the research findings can be confirmed, tracked to their source or validated by others (Guba & Lincoln, 1994). It deals with neutrality, and the logic that was used to interpret the data should be explicit.

Seale (1999) argues that auditing could also be used to demonstrate confirmability. Guba and Lincoln (1994) support Seale (1999) by recommending a clear audit trail to prove that the data can be traced to original sources and that the process of interpreting data to reach findings and conclusions can be confirmed. I further made provision for the research findings to be confirmed by clearly explaining all of my actions, and the reasoning that resulted in the findings and interpretation of the data. I further provided rich contextualised detail for each stage of the methodology process, as accounted for in Chapter 3.

In order to make the audit trail of this study accessible to others to trace the raw data, I archived all collected data at the University of Pretoria in a well-organised, retrievable form so that it can be made available to anyone. Some of the data is accessible through the appendices attached to this study.

(c) Transferability

Transferability, according to Guba and Lincoln (1989), enables the readers of a study to make judgments based on similarities and differences when comparing the research situation to their own. It was my responsibility as the researcher to provide sufficient detail to enable the research to make such a judgment. Extensive and careful descriptions of the time, place, context, and culture are defined as thick description.

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The aim of providing a thick description of the context of these cases was to provide the reader with sufficient information to be able to judge and assess similarity. This was done in order to achieve the transferability of the findings to other settings.

I consider transferability a challenge in this qualitative research study due to the subjectivity that I might add to the research findings. However, I have tried to enhance transferability by describing the research methodology that was used in rich detail. The methodology was contextualised, and the paradigmatic assumptions and perspectives underlying this study were described in detail.

More detail is provided on the critical processes that I used to define the meanings that were embedded in the participants' utterances, and to link these to my findings. Moreover, throughout the duration of the study, I was sensitive to possible biases by being conscious of the possibilities for multiple interpretations of reality, and had to guard against my own misperceptions and the need to find answers that might support my preconceived notions of the research. As a result, an interrater was called upon for assistance in this study.

(d) Dependability

As per Merriam (1998), dependability can be described as the extent to which research findings can be replicated with similar studies in similar contexts. Dependability can therefore be described as the consistency of observing the same findings under similar circumstances.

Dependability was achieved in this study through a legitimate audit trail, which consisted of documentation and records of the data, methods and decisions made during the study, as well as that of the final report. Dependability further emphasised the important role I played as the only researcher. I had to account for and describe the changing contexts and circumstances that were fundamental to the consistency of the research findings. The transcripts were checked to ensure that they corresponded with the audio-recordings, and these were re-read multiple times to ensure that they were the same. Auditing for dependability requires that the data and descriptions of the research study should be elaborate and rich.

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3.10.4 Audit trail

Koch (2006) suggests that research can be labelled as trustworthy if the reader is able to audit the study from the theoretical basis, to the methodology, to the conclusion reached by the study. Lincoln and Guba (1985) suggest that by implementing an audit trail, an external party can clearly follow the decision trail used by the researcher. The characteristics of an audit trail in qualitative research entail a thorough collection of documentation regarding all aspects of the research, safe storage of raw and processed data, and the accessibility of the documentation from a second party (Rodgers, 2008).

A thorough collection of all the documentation involved in this study makes it is possible for a second party to examine the documentation on which the research findings were based in order to confirm the results. The collection of documentation consists of researcher-generated data, which includes: field notes, notes about the context of the study, methodological and conceptual decisions, and data analysis procedures.

I further attempted to provide a clear audit trail by storing all audio-recorded data electronically on my computer, virtually and on an external electronic storage device as a means of record keeping, and for back-up purposes. All of the raw data was kept in a safe place while in my possession during the course of the study. All data will be held in the custody of the Department of Science, Mathematics and Technology Education at the University of Pretoria's Groenkloof campus in a locked facility after the completion of this study.

I have attached several documents pertaining to the data of this dissertation (see the appendices). After the completion of this study, the remaining data will be accessible through the University of Pretoria.

3.11 Ethical considerations

This being a qualitative study, I had to interact with the participants. In this way, I entered their personal domains of values, explored their motivations and attitudes towards CAL, and exposed possible weaknesses or strengths and the like to collect data. Silverman (2000) reminds researchers that they should always remember that while they are conducting research, they are entering the private spaces of their participants.

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During the course of this study, I complied with the requirements of the University of Pretoria for ethical research. These requirements determined the considerations of voluntary participation, informed consent, safety in participation, privacy, confidentiality and anonymity.

In line with the requirements set by the Ethical Committee of the University of Pretoria, I ensured that permission was obtained from the Gauteng Department of Basic Education to conduct the pilot study in one of their schools. For the full study, permission was obtained from the principals of each participating private school to conduct research in their schools on their teachers.

Throughout the research process, the researcher should ensure that participants have participated freely and without unreasonable risk (Cohen *et al*., 2002). This means that participants have the right to choose whether or not to participate in the study after being informed of details that might influence their decisions (McMillan & Schumacher, 2001).

On the basis of this information, teachers could decline or accept the invitation to participate. I informed the participants of this study that they had the right to refuse to participate in the study. Througout the entire research process, I repeated this and made the teachers aware that they could discontinue their participation at any stage.

The Accounting teachers who were willing to take part in this study were contacted through their school principal, who acted as a gatekeeper. The Ethics Approval letter from the University of Pretoria which allowed this research to be conducted was presented to the principals of each school. The Ethics Approval letter could not have been granted if any unethical malpractices were involved. I explained to the participants that no incentives of any nature would be used at any stage. Avoiding incentives promotes voluntary participation. The research took place at a venue and time decided upon by the participants and, as such, there was at no stage a captive audience involved in the research, which resulted in voluntary participation.

Before participating in research, individuals need to know the purpose and aims of the study, how the results will be used, and the likely social consequences this will have on their lives (Creswell, 2008). Informed consent is the process of informing the participants of the nature and purpose of the study, possible benefits thereof, the processes involved, and the

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implications that it might have for the participants. This information was stipulated in the letter of invitation addressed to the participants, and was again repeated prior to conducting the research. Obtaining the participants' consent to proceed in an informed manner according to ethical requirements is of high importance.

After gaining access to the participants, I handed each a letter in which I included the purpose of the study, the nature, data collection instruments, and the extent of the research. Prior to conducting the research, all of the participants provided written voluntary informed consent forms by returning signed letters, thus accepting the risks involved.

Research of all types holds inherent risks. The participants risked experiencing potential discomfort and inconvenience, as talking about one's attitudes and motivation might result in emotional discomfort.

I was therefore sensitive to make them feel at ease. I also made an effort to gain their trust by treating them with respect and professional behaviour from the very first encounter (Section 3.8.3). This entailed being well prepared for the interview, and displaying self-confidence in my voice and body language. To enhance the participants' perceived feeling of safety in participation, I repeatedly explained to them prior to the commencement of the data collection that they could withdraw at any time or stage. I made it clear to the participants that the research was for academic purposes only. I respected the participants' privacy by excluding any identifying information with respect to the schools they taught at, their professional identities, biographical information or any other personal information mentioned in the course of writing this dissertation.

I achieved confidentiality by concealing their real identities. The real identities and names of the participants are known only to myself and to the principal of the relevant school where the teachers were employed at the time of this study. I asked the principals not to reveal their real identities to anyone in relation to this study. Their anonymity was protected in that each participant was given a pseudonymn, which was used on the interview protocol and questionnaires during the data collection process. The pseudonyms were further used instead of the participants' real names when audio recording the interviews, and during the course of writing this disseration. I assured them that their names would not appear in this dissertation or any other publication, and that no information revealed would be used against them at any stage.

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3.12 Methodological challenges

On the one hand, a challenge can be defined as a difficult task or a task that requires great effort in order to be completed successfully. Limitations, on the other hand are potential weaknesses or problems within the study that are identified by the researcher (Section 5.5). Stating the challenges and limitations is useful to other potential researchers who may choose to conduct a similar study, or replicate the study (Creswell, 2008).

The first challenge experienced was to create adequate data collection instruments to provide sufficient data to answer the research questions. Standardised data collection instruments would have assisted in avoiding subjectivity. In striving to reach neutrality, I was guided by the quality measures of Lincoln and Guba (1985) (Section 3.10.3).

The second challenge related to the selection of participants was their access to computers and related technologies. Olson (2000) regards a lack of access to computer resources and infrastructure as a hindrance for the successful implementation of CAL in an environment. In this study, participants that did not have access to computers or related technologies were excluded by the set criteria.

3.13 Conclusions

This chapter explained the qualitative research approach and research design for this study, which was an interpretive, multiple case study. The qualitative research methods and the application of two self-developed data collection instruments were explained, which included a structured interview and a questionnaire. The transcription process of the structured interviews and the six phases of TA were discussed. I concluded Chapter 3 by giving a detailed description of data structuring and data interpretation, with an overview of the quality measures put in place to enhance the trustworthiness of this study. Lastly, the ethical considerations that ensured that I complied with the requirements of the University of Pretoria were presented, ending with the challenges and limitations that were experienced in this study. The next chapter presents the findings that were obtained from the interviews and questionnaires using the TA.

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CHAPTER 4

FINDINGS: ASPECTS INFLUENCING ACCOUNTING TEACHERS' ATTITUDES TOWARDS COMPUTER AIDED LEARNING

4.1 Overview of the chapter

In this chapter, a discussion is presented on the qualitative findings that were obtained from the structured interviews and questionnaires regarding Accounting teachers' motivation to implement CAL in their classrooms, and their attitudes towards CAL. The findings were discussed in an attempt to answer the main research question:

How does the nature of accounting teachers' motivation inform us about their self-determination to use CAL as a teaching strategy in their classrooms?

In an attempt to answer this question, four secondary questions were formulated to guide the study. The responses to the structured interviews and questionnaires were organised using TA (Figure 3.1). The findings were derived from the data analysis and interpretations, which are discussed in this chapter. The results of this study are presented in terms of the formulated secondary questions. Examples of utterances of the participants are included to serve as evidence of a continuum of motivational behaviour; enhancing the credibility of this study (Section 3.10.3(a)).

Regulatory processes of motivation can overlap and are not static in nature, implying that one aspect of a participants' relevant regulatory process interpreted from the data does not exclude other regulatory processes. For this reason, it is possible to describe the relevant regulatory processes in terms of a continuum. In addition to this, a participant does not have to progress through each stage of internalisation with respect to a particular regulatory style, and can move along the continuum toward a particular quality of behaviour (Figure 3.1). As such, it is possible for an individual to adopt a new type of regulatory style at any point in time along the Self-Determination Continuum (Figure 2.2), depending on their lived experiences.

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The structured interview and questionnaire responses are integrated into the discussion so that the participants' reality of their motivational experiences can be understood in their social context. The motivation for structuring the findings in such a way was to introduce the relativity of each participant's own reality. Finally, at the end of each secondary question, the results are interpreted in relation to the relevant literature.

4.2 Sub-question 1

Figure 3.1 was used to answer sub-question 1 as it informed the data structure, and guided the interpretation of the data. Sub-question 1 is related to a-motivation, a type of motivation that is positioned on the far left of the Self-Determination Continuum (Figure 2.2). Aspects that have been interpreted as contributors to Accounting teachers' a-motivation to implement CAL will be discussed, as sub-question 1 states:

What aspects contribute to Accounting teachers' a-motivation to implement CAL as a teaching strategy?

A-motivation is a type of motivation that is regarded as the lowest type of motivation, and refers to the absence of a contingency between one's actions and outcomes (Vallerand, 1997). A-motivation is regarded as a non-regulation state guided by non-intentional and usually automatic and effortless processes. The facilitation of a-motivation occurs through a lack of fulfilment within a social context of three basic psychological needs: autonomy, competence and relatedness (Section 2.6.2(a)). Deci and Ryan (1991) refer to a-motivation as a non-self-determined quality of behaviour (Figure 2.2). In Figure 3.1, a lack of fulfilment of the three basic psychological needs results in non-self-determined behaviour, which is an indication that an individual has a low sense of autonomy, a low sense of competence and a low sense of relatedness (Deci & Ryan, 2000).

A-motivated individuals are characterised as individuals who do not demonstrate the intent to engage in an activity. Such individuals further withdraw effort to engage in an activity because of their own perceptions of incompetence and lack of control. A-motivation concerns non-intentional behaviours that lack energy and are regulated by aspects that appear to be completely beyond an individual's control (Ryan & Deci, 2000). A state of a-motivation may arise from an individuals' belief that an activity is unimportant or consider such activity to be of no value (non-valuing), and therefore have no intent to participate (non-intentional).

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A-motivation can further develop from an individuals' lack of competence (incompetence), or an individuals' absence of perceive contingencies between his or her behaviour and the desired outcomes (lack of control). These aspects are regarded as regulatory processes prompting the state of a-motivation, as indicated in Figure 3.1.

4.2.1 Non-regulation

SDT theorists distinguish between being regulated by controlled or autonomous meta-classifications of motivation, or the absence of motivation (Figure 3.1). The absence of motivation has a non-self-determined quality of behaviour, and non-regulatory style. Non-regulation refers to a state where individuals do not perceive a relationship between their actions and the outcomes of these actions.

(a) Non-intentional

SDT theorists have included non-intentional as a regulatory process, which refers to the state wherein an individual has no intention of participating in an activity. The individual makes no commitment to carrying out an action in the future either. Unintentional and non-intentional therefore do not have the same meaning in the context of the SDT. Unintentional means unintentional or accidental.

It should be noted that there was no triangulation between the questionnaire and the structured interviews with regard to non-intentionality as a regulatory process. The questionnaire did not include any questions on intention, whereas the interviews did.

Teacher 1 made utterances in Question 2 of the structured interview that she tried to avoid the computer as much as possible. This utterance was interpreted as non-intentional, as she had no intention to implement CAL in her classroom because she avoided using the computer.

Teacher 1: "Well I try to avoid the computer as much as I can…"

The utterance made by Teacher 1 using the word "avoid" alluded to the fact that she had no intention to implement CAL. This led to the assumption that Teacher 1 had an a-motivated attitude towards the use of the computer. She further elaborated that she postponed the use of CAL for nearly a year at the time of the interview. Teacher 1 made the following utterance in Question 12 of the structured interview when asked what she saw as the cause of the most prominent issues or challenges that might hinder teacher motivation to implement CAL as teaching a strategy.

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Teacher 1: "… there's so many other things I must fit into my time and let that gets the back seat. So I have had that thing for nearly a year now and I still haven't set it up properly."

Teacher 1's reference to "that" is, in her social context, the installation of newly purchased clickers for her classroom, which she had postponed on numerous occasions. Her postponement or avoidance of implementing CAL is assumed as non-intentional behaviour, as she avoided accepting and committing to carrying out the process of setting up and using the clickers as a teaching strategy in her accounting classroom (Section 4.4).

I further interpreted that Teacher 1's reference to clickers as "that" and "that thing" in her utterance is a subtle way of distancing herself from the reality of implementing CAL. When asked if she was ever anxious or cautious about using a computer as a teaching strategy in Question 13 of the structured interview, Teacher 4 uttered that at a stage there was a type of program that the school used that made her cautious. She could not remember the name of the program, and confessed that she was never into it, referring to the use of the program. Teacher 4's "forgetfulness" is interpreted as a non-valuing regulatory process.

Teacher 4: "And there was another program...I can't remember it. But they...I was never into it…"

Teacher 4's reference to: "I was never into it" seems to indicate that she had no intention of implementing that program in her classroom. The above utterance consists of two different types of regulatory processes, having non-intention and non-valuing attributes of a-motivated behaviour. In her own reality, Teacher 4 explained that the reason she was never interested in that program was because of the trainer. Teacher 4 further elaborated that the trainer was not a good teacher, and made her feel lost during training.

Teacher 4: "…she was very advanced and then she made you feel…you got lost."

Teacher 4's behaviour suggests that she deliberately had a non-intentional attitude towards that program, thus devaluating the program. I am of opinion that the trainer, and the quality of training that she received, played an important role in her attitude towards the program. Teacher 4's utterance and opinion about the trainer is interlinked with training opportunities, a topic that is discussed in Section 4.3.2 (c).

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When referring to the conceptual framework (Figure 2.1), Teacher 1 and Teacher 4's motivation to implement CAL as a teaching strategy had a tendency to incline towards a-motivation. This means that the existence of non-intentionality, as a regulatory process, might have contributed to the non-self-determined behaviour.

(b) Non-valuing

Non-valuing is a regulatory process of A-motivation. Non-valuing refers to a type of behaviour where the individual does not consider an activity to be important or beneficial to him/her. The individual has no intention of participating in the activity because he/she does not value the activity.

In Question 11 of the structured interview, I asked Teacher 1 what the most prominent issues that might hinder motivation were, and how they influenced her own teaching context. Teacher 1 uttered a comment that expressed her non-valuing attitude towards CAL. In the context of her utterance "it" refers to CAL.

Teacher 1: "…it doesn't lend itself to what the syllabus asks…"

I interpret Teacher 1's utterance as an indication that she did not value CAL, and had no intention of using it in the future as a teaching strategy. Non-valuing, as a regulatory process, overlaps with conscious valuing, this is discussed in Section 4.4.1 (b). In Question 14 of the questionnaire, the participants had to agree or disagree with a statement. Teacher 1 agreed with the statement that CAL helped the learners to improve their accounting marks. Teacher 1 did, however, make a handwritten note next to her answer, reading: "indirectly". I interpret that this gesture implied that she was unsure of her opinion on the value or non-value of CAL. Teacher 1 made the following utterance when asked what she saw as the cause of the issues or challenges that might hinder motivation, and how they influenced her own teaching context.

Teacher 1: "What you need to do in the syllabus does not easily fit a computer…"

I acknowledge that Teacher 1 was of the opinion that the accounting syllabus does not easily accommodate the use of a computer as a teaching strategy. In Section 2.5, teaching strategies aimed at the inclusion of CAL in accounting education have been discussed, which have been used for many years in Accounting education worldwide. There are numerous different types of computer software on the market that compliment Accounting, including application

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software (including the Pastel Certified School Programme, created according to the CAPS document for Accounting in South African schools), modelling and simulation software, drill-and-practice software, and the internet. Teacher 1 supported her opinion by providing a reason why she claimed that CAL is not valuable to the accounting syllabus. I considered her reality, which was shaped from the bad experience she had with the use of CAL in the past. This is evident in the utterances below.

Teacher 1: "…we used to do Pastel…A few years ago, the problem with it was that the actual Pastel programme didn't open up on the computer and when we actually did the exams, it didn't record all the marks… so then they learnt off by heart where the errors were, so they couldn't actually work Pastel they just knew to do the tests it's in this order….Very much parrot work and it took a lot of time so a lot of it they had to do by themselves. So I think that was very frustrating and Pastel did come but it still didn't quite work properly…"

I asked Teacher 1 a probing question and she further elaborated that:

Teacher 1: "Well, the kids kept on complaining about it you know and after like three years of kids complaining about it they, the IEB, then cut down the projects from three projects to two projects. So I just thought there are better projects to do than Pastel because you learning off by heart how to pass a test, you are not learning Pastel actually."

It is evident from her utterances that she experienced frustration and a lack of external computing support from the service provider. She also questioned the quality of the method of assessment that the Certified Pastel School Program used to test the learners' knowledge. I interpret that the reasons she provided, along with her frustrations, contributed to her non-self-determined, a-motivated behaviour towards the implementation of CAL.

In Question 17 of the structured interview, I asked what support opportunities were available for accounting teachers who implemented CAL in their classrooms. Teacher 4 elaborated and explained that she had a mobi-learner in her class who assisted her and provided her with computing support when needed. She then described how and when the mobi-learner assisted her. She had to download an application program about flipped classroom as teaching strategy, and encountered a complication (Section 4.4).

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Teacher 4's utterance indicated that she was not a fan of the use of a flipped classroom as a teaching strategy.

Teacher 4: "I'm not all that into it as you can see. I'm usually like not number one in the line to do it. So once one or two of the fast guys have done it, then I'll look at it, but I've been to two courses on it, so..."

At this stage, she was not motivated to use the flipped classroom as a teaching strategy. She uttered that she would only consider the implementation of the flipped classroom teaching strategy once others had used it. The type of behaviour expressed by Teacher 4 suggests a possible overlap with a sense of relatedness and the external regulatory process, compliance (Section 4.3.1 (a)).

When referring to the conceptual framework (Figure 2.1), Teacher 1 and Teacher 4's motivation to implement CAL as a teaching strategy, again, had a tendency to incline towards a-motivation. This means that the existence of non-valuing, as a regulatory process, may have contributed to the participants non-self-determined behaviour.

(c) Incompetence

Incompetence can be defined as an individual's perceived inability, and lack of skills or knowledge to do an activity. According to the SDT, the three basic psychological needs of autonomy, competence and relatedness must be acquired for an individuals' psychological well-being and self-determined behaviour to develop. The feeling of incompetence is therefore a serious problem and should be investigated.

Teacher 1 mentioned during the structured interview (Question 12) that she sometimes felt incompetent because she had to ask for support on a regular basis as she forgot how to use it. The context of this scenario is that she forgot how to use CAL because of her avoidance to implement CAL often as a teaching strategy. Teacher 1's feeling of incompetence is confirmed in Question 12 of the questionnaire. She agreed with a statement that she was not good at teaching with CAL. Her frustration and feeling of incompetency was confirmed by her utterance:

Teacher 1: "You know then you feel like such an idiot having to go ask again and then the next time you have to ask again and then…It makes you feel incompetent…"

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Teacher 1's frustration was due to a special occasion at her school, called Digi-Day. Digi-Day requires teachers to present their lesson for a whole day online. Learners do not attend school, but participate in an online discussion. It is expected of all the staff to adhere to the concept of Digi-Day, which takes place only once a year. In Question 11 of the questionnaire, Teacher 1 disagreed with a statement: "I am satisfied with my performance in CAL as teaching strategy in my classroom." I interpret from these utterances and selections that if Teacher 1 received the necessary support and training, she would not have felt so frustrated and incompetent at using CAL as she did at the time of the data collection.

In Question 21 of the structured interview, I asked Teacher 6 what strategies she employed or saw as most effective for addressing low teacher motivation or maintaining high teacher motivation to successfully use the computer in the Accounting classroom. Teacher 6 advocated that teachers should receive training, but also that the training should be followed up.

Teacher 6: "…and the other thing is, training, then should follow up…"

I interpret that the participants felt that relevant training should be provided. It is evident from the utterances that the participants' made that when an individual's attitude towards CAL is more positive, this results in the participants' quality of behaviour inclining more towards autonomous (Figure 3.1), if they receive the relevant training and feel competent. This phenomenon of feeling incompetent eventuates in teachers being negative, and having an a-motivated attitude towards CAL, as described by the SDT. When referring to the conceptual framework (Figure 2.1), Teacher 1's motivation to implement CAL as a teaching strategy had a tendency to incline towards a-motivation. This means that the existence of incompetence, as a regulatory process, might have contributed to her non-self-determined behaviour.

The literature suggests that inadequate training and a lack of experience are two of the main reasons why teachers do not implement technology in their teaching, and consequently are regarded as incompetent in using CAL in the classroom (Tsitouridou & Vryzas, 2003). The interrelationship between training and feeling competent are further discussed under the category: Training opportunities (Section 4.3.2 (c)).

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(d) Lack of control

Lack of control generally refers to the lack of ability to control one's emotions and desires, especially in difficult situations. In the context of this study, lack of control may refer to the participants' frustration, fears, anxiety and feelings of incompetence with regard to implementing CAL. The questionnaire and the structured interviews were not triangulated in terms of the regulatory process 'lack of control'. In Question 13 of the structured interviews, I asked Teacher 1 if she was anxious or cautious in using computers as a teaching strategy.

Teacher 1: "So you kind of avoid doing something different because you have got to spend time thinking about it, so yeah, so most of the things, except for the JSE, the most of them have been forced upon me some or other way."

In the context of the above utterance, Teacher 1 experienced a lack of control. She was of opinion that the implementation and use of CAL was forced upon her, robbing her of autonomy. Such behaviour displayed by the principal and school management is controlled behaviour according to the SDT (Figure 3.1). Teacher 3's answer to Question 13 was that there were too many different types of CAL that the principal and school management wanted to implement, too often.

Teacher 3: "...I still needed to start teaching and just when I got into it, already "poof" here is the...here you need to start using computers and everything, new methods as well, so I was still wanting to get comfortable with the normal methods as we have always used and now also I have to implement new methods as well so yes, that made a person a little bit nervous."

I interpret Teacher 3's utterance as a feeling of lacking control, which contributed to his anxiety and nervousness about the implementation of different CAL teaching strategies. In Question 21 of the structured interviews, I asked the participant what strategies she employed or saw as most effective for addressing low teacher motivation or maintaining high teacher motivation to successfully use the computer in the classroom. Teacher 4 answered by making reference to a situation where she experienced a lack of control, and subsequently burst into tears. She explained the context of her lack of control in the following utterances:

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Teacher 4:" So that...I was in tears. I was so frustrated and I didn't know how to download the books. Luckily my mobi-mentor helped me and I was in a state and I was shaking and then you had to get a code and …sometimes the networks are down…sometimes the networks are slow…I was in tears.. someone must do that stuff. I'm not a technical expert. They must do the technics, get the stuff there for me and then I run with it."

According to the conceptual framework (Figure 2.1), the feeling of lacking control adds to an individual expressing an a-motivated attitude towards the implementation of CAL. This means that the existence of a lack of control, as a regulatory process, might have contributed to Teacher 1, Teacher 3 and Teacher 4's tendency to incline more towards non-self-determined behaviour.

4.3 Sub-question 2

To answer sub-question 2, I used the data structure (Figure 3.1) to inform the interpretation of the structured interview and questionnaire data. Sub-question 2 is related to extrinsic motivation, which inclines to the left of the Self-Determination Continuum (Figure 2.2). Extrinsic aspects that have an influence on Accounting teachers' attitudes towards CAL is discussed in this section, as sub-question 2 states:

What extrinsic aspects have an influence on Accounting teachers' attitudes towards CAL as a teaching strategy?

Extrinsic motivation is a type of motivation on the Self-Determination Continuum that pertains to when an activity is executed in order to attain some outcome (Ryan & Deci, 2000). SDT theorists propose that extrinsic motivation can vary greatly in the degree of meta-classification of motivation, which can range from controlled to autonomous motivation (Figure 3.1). Extrinsic motivation consists of four regulatory-styles: External-regulation, Introjected-regulation, Identified-regulation, and Integrated-regulation. These regulatory-styles were discussed in detail in Section 2.9.2 (a) – (d).

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4.3.1 External regulation

External regulation refers to behaviour for which the perceived locus of causality is external to the self. A participant that implements CAL to get praise from an important other or to avoid confrontation can be described as externally regulated. This behaviour is performed because of an external force, and these forces are considered the locus of causality. External regulation is considered the least self-determined regulatory style of extrinsic motivation.

(a) Compliance

Compliance refers to an active form of social influence where an individual does what someone else wants them to do by following their request or suggestion (Cialdini & Goldstein, 2004). Compliance can be associated with peer pressure, for instance, when an individual is merely going along with a group or changing his/her behaviour to fit in with the group. It should be noted that although the individual goes along with the group, he/she still has the choice to refuse or decline to take part in the activity (Breckler, Olson, & Wiggins, 2006). Compliance is a regulatory process that is conceptualised as an external form of regulation, and is meta-classified as a controlled motivation.

There were a number of participants that mentioned compliance as a motivational aspect for implementing CAL, but I have used Teacher 1 and Teacher 4 as evidence. When the participants were asked who or what influenced their decision to use the computer in their Accounting classroom (Question 6 of the structured interview), Teacher 1 mentioned that the principal had asked her to write an online Accounting course for the school. She was of the opinion that if it were not for the fact that the principal had asked her to do so, she probably would not have considered implementing CAL as a teaching strategy. Compliance also served as Teacher 1's motivation when learners asked her Accounting related questions best explained by using the computer.

Teacher 1: "…Well, that's because the kids were asking me questions, because you know when you are teaching you can relate it back to your own life and… it's much better. So that's why I started showing them…The headmaster has asked me to write online Accounting for the online school… if it wasn't for the fact that I will have to do the online school at some stage, I doubt I would have done it."

Teacher 1 used the computer and the internet as a teaching tool at the request of the learners. The learners, along with the principal, acted both as the subjective norm in Teachers' 1

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reality. The above utterance serves as evidence, supported by her response to Question 7 of the questionnaire. Teacher 1 agreed with Question 7's statement that she believed that she had some choice about implementing CAL. This statement serves as evidence that the use of CAL extrinsically motivated Teacher 1 to implement CAL as a teaching strategy when considering the Self-Determination Continuum (Figure 2.2).

Teacher 1: "…The exec is trying to encourage it, that's why they force the Digi-Day on us."

Teacher 1, however, answered that she felt somewhat forced by the principal to implement CAL as he asked her to write online Accounting content for the online school. She was of the opinion that if it was not required of her to do so at some stage, she doubted that she would ever have implemented CAL. In Question 8 of the questionnaire, Teacher 1 answered both answers when she agreed and disagreed with the statement: "I am using CAL because it is required". Next to both answers, she made a handwritten note: "some is forced". It is apparent that both of the responses provided by Teacher 1 are related to compliance. Teacher 1 seemed to have changed her teaching strategies as a result of external pressure from the school principal and learners. Teacher 1 felt somewhat forced to do so, which I interpret as the participant's fear of an external or internal punishment, or desire for appraisal following compliance. Teacher 1's confession that she doubted that she would ever have implemented CAL is an indicator of external locus of causality, resulting in being extrinsically motivated, which shows an inclination towards a-motivation. Compliance as an extrinsic behaviour overlaps with the influence of external rewards and punishments on motivation, as discussed in Section 4.3.1.

In Question 6 of the structured interview, I asked the participants who or what influenced their decision to use the computer in their classroom. Question 7, 8 and 9 of the questionnaire enhanced triangulation with Question 6 of the structured interview, which also investigated compliance. It is evident in both data instruments that the subjective norm influenced Teacher 3 and Teacher 4's decision to implement CAL. Compliance as an extrinsic motivational regulatory process is supported by the following utterances made by Teacher 3 during the structured interview (Question 5) on why he decided to use the computer in his accounting classroom. Teacher 3 answered that he decided to implement CAL due to compliance with the institutional policy to implement CAL.

Teacher 3: "…I would like to say it was my own initiative but it's more actually our school that decided that we want to implement it as a whole…"

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Through elaboration, Teacher 3 confirmed this statement. He identified the subjective norm that influenced his decision to implement CAL as the school management, and also their IT teacher.

Teacher 3: "…More from management… So it was more from management that the idea came and also our IT teacher… they encourage us to implement it more and more… our whole idea is to go paperless as much as possible."

I queried Teacher 3 about the reason why teachers were encouraged to go paperless, and if it was because of finances. He explained that it helped with finances, but that it also benefited the learner for his/her future in the real world of work. When I asked Question 5 of the structured interview to Teacher 4 on why she decided to use the computer in her Accounting classroom, she mentioned that she was also encouraged by the school environment.

Teacher 4: "…It's actually the school environment that encouraged me, because they're very forward thinking…"

The subjective norm is not necessarily a person. In Teacher 4's reality, the subjective norm that externally forced her to implement CAL was the school environment. Teacher 4 elaborated on who motivated her to implement CAL later during the interview and alluded to some intrinsic motivational aspects that involved, among others, compliance as reason for implementing CAL. This confirms my suspicion that individuals can simultaneously be placed on both extremes of the Self-Determination Continuum.

Teacher 4: "…when I arrived, everything was electronic and I realised within… And then I just decided that I'm going to master this."

Teacher 4's reality can be understood from her social context. She was an experienced Accounting teacher, who was not computer literate when she first started working at the school where she taught at the time of this study. She felt incompetent to use CAL as a teaching strategy, and therefore investigated personal development opportunities. Teacher 4's utterance that she "decided that I'm going to master this", displays positive emotion, with an internal locus of causality. Teacher 4 further elaborated, providing more intrinsic aspects as motivation.

Teacher 4: "So when I was in it, I got my husband, my son, my daughters, the lady here with computers, I took myself on courses and praise the Lord, He helped me and I've mastered the stuff…"

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Teacher 4 went for training, seeking a higher sense of competence to enhance her computer knowledge and skills. Teacher 4's apparent intrinsic motivation for implementing CAL in her accounting classroom is evident in the above utterances. She also commented during the structured interview and made references to the schools' management, which expected the staff to implement CAL quite often. When I asked her who or what influenced her decision to implement CAL (Question 6 of the structured interview), she answered without hesitation:

Teacher 4: "I can't say anything outside of the school. The school requires it…so basically you have no choice…you can grumble and moan, but you're going to do it."

I interpreted the above utterance as the regulatory process, compliance, thus emphasising the potential overlap between regulatory processes. Teacher 4's motivation to seek personal development appeared to be intrinsically motivated. It became apparent after interpreting her responses that compliance, as a regulatory process, dominated her somewhat internal perceived locus of causality of personal importance. It is my opinion that her motivation to implement CAL had traces of a somewhat internally perceived locus of causality, but mostly constituted extrinsic motivational aspects when referring to the Self-Determination Continuum (Figure 2.2).

Teacher 4 mentioned that the school staff had managed to implement CAL in their classrooms by helping one another. This action might indicate a form of peer pressure and compliance, as it seems that once a colleague had implemented CAL, others did not want to be left behind. I make the cognitive link that compliance, as a regulatory process, can possibly result in a high sense of relatedness between colleagues. This overlap might surface when individuals feel connected by similar demands or activities.

According to the conceptual framework (Figure 2.1), feeling compulsion to participate in an activity contributes to an individual expressing extrinsic motivation towards the implementation of CAL. This means that the presence of compliance, as a regulatory process, might have contributed to most of the participants' tendency to incline more towards a non-self-determined quality of behaviour.

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(b) External rewards and punishments

Extrinsically motivated behaviour has an externally perceived locus of causality. The individual participates in the activity to obtain an extrinsic reward or to comply with an external constraint. Extrinsically motivated behaviour is no longer performed because it is interesting to the individual, but rather considered as behaviour that is performed by the individual to obtain an external reward (Deci & Ryan, 1985). De Charms (1968) finds that in some cases, external rewards act as an extrinsic mechanism that induces a change in the perceived locus of causality of individuals, moving from autonomous to controlled behaviour. Monetary rewards are a popular type of external reward, and may be in the form of a pay cheque, a bonus, or anything else with cash value. Other types of external rewards may include thanking the teacher or expressing appreciation.

Punishments, referred to euphemistically as consequences, tend to generate negative attitudes. Moreover, threatening people with punishments (external) supports the use of power rather than reason, and damages the important relationship between employer and employee. In the context of this study, it refers to the relationship between the principal (or management) and the Accounting teacher. As with external rewards, external punishments can elicit temporary compliance, which are also a relevant regulatory process of external regulation. This inter-related movement between the two external regulatory processes indicates that behaviour is not static, and therefore emphasises the relevance of the Self-Determination Continuum as the conceptual framework (Figure 2.2) of this study. According to the conceptual framework (Figure 2.2), participating in an activity because of possible external rewards or punishments adds to an individual expressing extrinsic motivation towards the implementation of CAL. This means that the presence of external rewards and punishments, as a regulatory process, might contribute to an individuals' tendency to incline more towards a non-self-determined quality of behaviour.

4.3.2 Introjected regulation

Introjected regulation can be described as behaviour that the individual has complied with, but the individual did not accept the regulation as internal to the self. Such regulation involves internalised demands that pressure an individual to behave a certain way, and are strengthened with guilt or promised internal rewards. Introjected regulations, with a somewhat externally perceived locus of causality, are not part of the integrated self.

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Therefore, introjected regulated behaviour is not self-determined. A participant, who implements CAL in the Accounting classroom to avoid feeling incompetent, is regulated by an introjected regulatory style.

(a) Self-control

Self-control is a regulatory process of introjected regulation, and refers to an individual participating in an activity in order to experience a feeling of worth or appreciation, or to avoid guilt or anxiety. Self-control can be defined as the ability to control one's emotions, behaviour, and desires in the face of external demands in order to function in society (DeLisi, 2014).

Some participants cited an excessive workload that left them exhausted and pressurised to cover the Accounting curriculum as one of the reasons why they did not implement CAL in their classrooms on a regular basis. Teacher 3 explained that using CAL is extremely time consuming.

Teacher 4: "I thought I actually needed motivation. I was so...I was in tears at the beginning of the year. You know why? Because our books wouldn't download and I've got to start working and I know the curriculum. So there were hiccups at the beginning of the year. So because of these hiccups the teachers were so demotivated…And then you're so exhausted because you've got a hundred things to do and then they say this afternoon it's meeting...you're busy with IT training and it goes in one ear and out the other and then you're demotivated."

Teacher 4's social context is related to the amount of pressure that Accounting teachers experience to cover the Accounting curriculum. She explained that experiencing technical difficulties while implementing CAL results in demotivated behaviour because of the valuable time that is lost while trying to solve the problem.

Teacher 6's reality of self-control is evident in her elaboration of what the most prominent issues were that might hinder motivation and how they influenced her teaching context (Question 11 of structured interviews). She explained that Eskom's interruption of electricity supply, known as load shedding, had a negative impact on her motivation to implement CAL in her classroom.

Teacher 6: "So if I've got a test, I always get panicky."

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I interpret Teacher 6's reference to load shedding as an external aspect that influenced her to panic and feel insecure. These emotions of panic and insecurity have an internally perceived locus of causality. Teacher 6 later responded to Question 13 of the structured interview when asked if she ever got anxious or cautious in using computers as a teaching strategy. Teacher 6 answered that she was very confident about using computers as a teaching strategy, which can be classified as a high sense of competence.

Teacher 6: "I was very confident about using it. I said I had no doubt in mind."

When analysing these two utterances made by Teacher 6, I assume that Eskom's load shedding acts, as an exteral force, had an impact on her attitude towards CAL, making her panic when she had to assess the learners. The influence of such an external force results in a decline of motivation, inclining towards a non-self-determined quality of behaviour. This incident contributed to the value of the conceptual framework (Figure 2.2), indicating that behaviour is not static in nature, and that it continuously moves along a continuum. This suggests that the presence of self-control, as a regulatory process, might have contributed to Teacher 4 and Teacher 6's tendency to incline more towards a non-self-determined quality of behaviour. It also shows that they were on the verge of inclining towards self-determined behaviour.

(b) Ego-involvement

Ego-involvement is a regulatory process of extrinsic motivation, with an introjected regulatory style, in which an individual performs a certain activity in order to enhance psychological health and the feeling of worth and appreciation. Although ego-involvement is internal to the self, introjected behaviour is not experienced as fully part of the self, and is thus still classified as a regulatory process that has a somewhat external perceived locus of causality (Figure 2.2). I asked Teacher 2, in Question 6 of the structured interview, who or what influenced her decision to use the computer in the classroom.

Teacher 2: "…I suppose I thought I am at a good private school, I want to present a good image…the desire to be at your fore"

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This utterance made by Teacher 2 indicates that she implemented CAL in her accounting classroom possibly because of ego-involvement. She explained that she was teaching at a good private school, and that she wanted to present a good image. In the same breath, she mentioned the desire to be at her best. This utterance made by Teacher 2 supports my assumption that she implemented CAL because of her inherent desire to be above average, rising from an internal locus of causality. Although Introjected regulation has a somewhat external perceived locus of causality, a trace of intrinsic motivation is noticeable. Teacher 2 saw herself as the main facilitator of the use of CAL in her classroom, which also supports my interpretation that she showed qualities of intrinsic motivation.

In Question 16 of the structured interview, I asked Teacher 2 what her opinion was of the role she played in the successful implementation of CAL in her accounting classroom. She answered that she was the main facilitator, thus accepting responsibility for it.

Teacher 2: "…so at the moment my role is main facilitator, I am the one interacting with it."

This utterance made by Teacher 2 resembles qualities of the regulatory process, synthesis with self (Integrated regulation), highlighting the possible overlap in motivation. In question 7 of the structured interview, I asked Teacher 6 what the opinion of her colleagues, her school principal and the district officer was towards the use of computers in the classroom. Teacher 6 answered that her colleagues were impressed with her technology skills.

Teacher 6: "…my colleagues are impressed…"

When listening to Teacher 6's tone of voice in the audio-recording, it is clear that she answered the question with pride in her voice. It is my opinion that Teacher 6 implemented CAL in her classroom, not because of compliance, but rather because of ego-involvement. I therefore assume that ego involvement, as an extrinsic regulatory style, pressures people (internally) to behave in order to strengthen their egos or to impress the significant other, resulting in the next Introjected regulatory style. The influence of ego-involvement, as a regulatory process, results in a decline in motivation, inclining more towards a non-self-determined quality of behaviour, according to the conceptual framework (Figure 2.2). However, the behaviour is also on the edge of incling towards self-determined behaviour. This indicates that ego-involvement might have contributed to Teacher 2 and Teacher 6's extrinsic motivation towards CAL as a teaching strategy.

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(c) Internal rewards and punishments

Internal rewards are related to the satisfaction an individual experiences when achieving a personal goal. Internal reward satisfaction depends on the personal importance and value that an activity has for the individual. Internal rewards have an internal perceived locus of causality. The satisfaction of knowing you have completed a project, achieved a goal or knowing that you applied your best effort to your work is regarded as internal rewards, which contribute to an individual being motivated.

In question 3 of the structured interview, "What do you use the computer for? What do you teach the learners?" Teacher 3 mentioned that implementing CAL successfully in the classroom would be a big reward in the end. I infer that the nature of the big reward Teacher 3 mentioned seems to refer to an internal reward.

Teacher 3: "Initially, yes, it will be a lot of work but it's going to be… I believe it's going to be a big reward in the end because then they can go at like flip learning, before the class, they can go through the lesson, you can upload it onto YouTube or as we do on ColCampus."

I interpret Teacher 3's context as an internal reward because he had the intention of completing the project, even if it turned out to be a lot of work. Teacher 3 referred to a reward, which could possibly indicate the internal satisfaction that he would feel when done, knowing that he and the learners could use it in the future on a regular basis as a teaching strategy. The flipped classroom as a teaching strategy is discussed in more detail in Section 4.4.

- *Resources and support available*

The data indicated a complex relationship between the teachers' attitudes towards CAL and the availability of resources and support. Private schools are independent of government funding, and generally have more funds available to purchase state of the art computer resources. In the context of this study, the participants did not express the need for better quality resources, computer equipment or other types of CAL tools.

Having access to resources and available support may enhance and result in an individual obtaining an internal reward. Such an internal reward may be realising one's privileges, being thankful, and recognising one's strengths and weaknesses, to mention a few. Computing support can be divided into two streams, internal and external computing support (Selamat &

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Jaffar, 2011). Internal computing support can be contextualised in the participants' reality as the technical support provided by colleagues or a learner, which I assumed to influence the ease of implementing CAL in the classroom. In contrast, external computing support is support provided by experts, trainers or support groups, who possess expert knowledge of the relevant technology that the participants need to successfully implement CAL in the classroom.

I interpret that participants who received support on a continuous basis will be motivated to adopt new technology. When I interpret the reasons why accounting teachers implement CAL in their classrooms, I agree with Igbaria, Zinatelli, Cragg, and Cavaye (1997), who find that internal computing support is a significant predictor of perceived usefulness and perceived ease of use of newly introduced technology, like CAL, which in turn has an influence on an individuals' attitude towards CAL. It is my opinion that, according to the utterances of the participants, support and encouragement from management positively improves teachers' attitudes towards CAL. This increase in attitudes distanced the participants from the relevant regulatory processes of a-motivation: nonintentional, non-valuing, incompetence and lack of control. I can make this assumption in light of the reasons provided by the participants in referring to the principals and school management's attitudes towards CAL and the encouragement and support they received, which are classified as internal computing support.

However, some participants described a lack of support regarding technical difficulties as one of the main reasons why they did not implement CAL on a regular basis in their classrooms. All six of the participants were teachers at privilidged private schools, and all six had access to the latest technologies at their school. Having access to these state of the art technologies does not mean that they used these resources as often as they would have liked to use them. A possible reason for not using these technologies on a regular basis could be a lack of support or training to use them.

Teacher 1 felt frustrated as a result of technical difficulties that she experienced with the installation of software in the classroom. Frustration negatively impacted on her attitude towards CAL, and left her feeling demotivated to implement CAL. Question 12 of the structured interview asked Teacher 1 what she saw as the cause of these issues or challenges. She answered:

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Teacher 1: "…there is not much support, so I try to load another where you can write on your computer with like a pen thing… then the IT guy is like oh well, just try it again, like there's not much support..."

The context of Teacher 1's frustration was linked to a continued lack of external computing support at her school. She referred to a time when she tried to load software to use a stylus to write with on her computer screen. Question 13 of the questionnaire confirmed Teacher 1's belief that she lacked support. She disagreed with the statement: "When I was unsure how to implement CAL in my classroom, I was able to ask the available support from the software provider for assistance and help". This possible cross-referencing between the two data instruments emphasises the mehodological triangulation. After listening to the audio-recordings of the structured interview, I interpret that she was irritated and frustrated with the poor external computing support that she received from the IT technitian employed at her school. This was evident in her tone of voice.

Teacher 1: "…Well eventually I managed to track down our IT guy and eventually after asking him several times I got another connection for my computer so now then, it works also after speaking to him after several times I now have internet connection. Not always good, but it's there."

I interpret that the feeling of helplessness that Teacher 1 experienced, as evident in the above utterance, influenced her attitude towards CAL negatively. Frustration and a feeling of helplessness is an internal punishment, which overlaps with the regulatory process of lack of control. The occurance of lack of control and internal rewards and punishment share qualities of a non-regulation regulatory style, as well as an introjected regulatory style. Extrinsic motivational aspects, and internal rewards and punishments dominate lack of control as a regulatory process of a-motivation. Teacher 1's behaviour therefore inclines more towards a somewhat external perceived locus of causality according to the Self-Determination Continuum (Figure 2.2).

Teacher 2 referred to the internal computing support that the staff received. Teacher 2's context of internal computing support was that the school hosted a technology circle meeting on a monthly basis. During the technology circle meeting, the IT expert at the school introduced the staff to the new technologies available that can be implemented as a CAL teaching strategy in the classroom.

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Teacher 2: "… I think it's once a month, there is a technology circle, a technology group that meets and it's been very sporadic, but we're trying to like develop…"

To compliment the technology circle meeting, the school also started a student support group. The student support group consisted of learners with an interest in technology. The teacher could then ask the learner to assist him/her with technical difficulties and receive immediate support in the classroom.

Teacher 2: "The school started a student support group, so in every grade there would be a student who you could… it's like your "go to" person."

I interpret that Teacher 2 had a postive attitude towards the implementation of CAL because of the internal computing support that she received. The support that she experienced was not a once-off training session, but a continued process of training and support, such as the technology circle and student support group.

Teacher 4 also mentioned that her school's management team implemented a mobi-mentor system, as the IT support could not address all the issues raised on a daily basis. The mobi-mentor system is based on the same principles as the student support group Teacher 2 mentioned. The mobi-mentor system is made up of a learner in each class identified by the school's IT support. This learner shows an interest in technical support and also assists the teacher when he/she experiences technical difficulties in the classroom, e.g. downloading software or network problems.

I interpret that Teacher 2 and Teacher 4 regard technical support as an important part of implementing CAL. Teacher 4 experienced similar frustration as Teacher 1 prior to receiving technical support. In the context of her utterance below, Teacher 4 referred to the IT technitian or mobi-mentor as "they", and expect them to provide her with technical support, so that she could concentrate on teaching and learning.

Teacher 4: "…sometimes the networks are down…sometimes the networks are slow…I was in tears.. someone must do that stuff. I'm not a technical expert. They must do the technics, get the stuff there for me and then I run with it."

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Gulbahar (2008) finds that insufficient computer resources are one of the factors that has a significant influence on teachers' attitudes towards, and the effective use of technology by teachers in their classrooms. Technical support for Accounting teachers to implement CAL in their classrooms needs immediate improvement. Having access to state of the art technology resources does not promise the successful implementation of CAL in the Accounting classroom. It became evident that teachers could be convinced of the value and possible benefits of CAL and that it could improve teaching and learning experiences in their classrooms. This suggests the need for effective internal and external computing support and continued training opportunities for teachers to use computer technology in their Accounting classrooms.

I conclude that no matter how modern and influential the available technology is, the extent to which CAL is implemented in the classroom relies on the teachers having a positive attitude towards it (Huang & Liaw, 2005).

- *Training opportunities*

It became evident when analysing the data that the participants referred to their need for training. I did not make any reference to training in any of the data instruments, but the participants mentioned it themselves, as evidenced in two participants' utterances:

Teacher 3: "… I myself still need a lot of training…"

Teacher 3 and Teacher 2 expressed the desire to develop their computer skills and CAL knowledge by attending training courses. They expressed interest in improving their knowledge about CAL, as they possessed a lot of theoretical Accounting knowledge to teach their learners.

Teacher 2: "…I need training …"

Training Accounting teachers to implement CAL, can considerably influence the ways in which a teacher uses the available technology. The training that Accounting teachers should receive must specifically be related to the Accounting curriculum, emphasising the pedagogical practices associated with the subject. The training should thus not be limited to how to use CAL, but show teachers how they can use the available technology tools in improving the quality of their teaching. Training should also equip the teacher how to

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effectively integrate CAL into the Accounting curriculum for him/her to see the value thereof.

Accounting teachers should be convinced of the usefulness, benefits and value of CAL in improving teaching and learning (Section 4.3.2). Convincing Accounting teachers of the usefulness, benefits and value of CAL, suggests the need for sustained support and training. I interpret that Accounting teachers should receive sustained support and training where needed in integrating CAL into the Accounting classroom through direct practical experience.

Although it is important to acknowlegde that some participants require better resources or more time to prepare for the use of CAL, it may not be sufficient support. While introducing CAL to teachers, CAL's pedagogical potential should be emphasised, sustained support and assistance should also be provided on ways of integrating CAL into teaching, specifically complementing certain themes of the Accounting curriculum (Table 1.1). It is advised that principal's, trainers and colleagues need to demonstrate that they are willing to assist Accounting teachers in navigating the use of CAL. They should also get the opportunity to reflect on and discuss the integration of CAL, share ideas and possible problems experienced with others. This will increase their feeling of relatedness.

Teacher 6: "…They need to be trained… they are afraid to use it because it's the unknown… if they are trained, they'll be more willing to use it."

As evident in the data, the participants did not know how to implement CAL successfully in their Accounting classroom, referring only to the use of word processors, presentation software, and spreadsheets for their daily teaching tasks (Section 4.4). I suggest that training teachers to use CAL should not be limited to basic computer literacy, but that teachers should be trained how to use CAL with the aim to improve the quality of their teaching, as well as how to integrate CAL effectively into the Accounting curriculum. CAL's pedagogical potential should be highlighted, explaining and guiding teachers on ways to integrate CAL into their current teaching strategies to improve the quality of learning. Teacher 2 mentioned that she had a Mimeo, a type of technology tool, but that she had not received training on how to use it.

Teacher 2: "…I really don't know how to use it, I um only know how to calibrate it at this point, so."

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This occurrence indicates that although teachers have access to the most recent technology resources available, they are not regularly used or implemented due to a lack of confidence or knowledge of how to use it. Mcalister *et al.* (2005) state that more training and support with regard to information technology should be given to teachers. I conclude that a positive relationship between training and teachers' attitudes has been identified. I have observed that training has the power to meaningfully impact the ways in which a teacher adopts technology tools as a teaching strategy when feeling competent to use and implement it.

When referring to the conceptual framework (Figure 2.2), most of the participants' motivation to implement CAL as a teaching strategy had a slight tendency to incline towards non-self-determined behaviour. This means that the existence of internal rewards and punishments, as regulatory processes, along with the two categories discussed, might have contributed to the participants' motivation to be on the boundary inclining either towards non-self-determined or towards self-determined behaviour.

4.4 Sub-question 3

To answer sub-question 3, I used the data structure (Figure 3.1) to inform the interpretation of the structured interview and questionnaire data. Sub-question 3 is related to intrinsic motivation, which inclines to the right of the Self-Determination Continuum (Figure 2.2). Sub-question 3 states:

What intrinsic aspects have an influence on Accounting teachers' attitudes towards CAL as a teaching strategy?

When intrinsically motivated, a person takes part in an activity for the fun or challenge the activity entails rather than because of external rewards or punishments (Ryan & Deci, 2000). Intrinsically motivated behaviour has an internal perceived locus of causality, resulting in the individual displaying certain behaviour.

4.4.1 Identified regulation

Identified regulation transpires when the participant has come to consciously value the behaviour. With identification, the regulatory process has become integrated with the self, contributing to the individual participating in the activity freely. Therefore identified regulated behaviours are considered more autonomous or self-determined than behaviours regulated by external or introjected contingencies. This phenomenon is expected because

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identified regulation allows the individual to feel a sense of choice regarding participation. An example would be a participant who willingly attends CAL courses and related training sessions because they believe that it is important for personal or professional development.

(a) Personal importance

In terms of the SDT, personal importance and conscious valuing are relevant regulatory processes that lead towards intrinsic motivation. When referring to personal importance, the individual identifies with the personal importance of certain behaviour and integrates its regulation into the self (Ryan & Deci, 2000). The behaviour is of value to the self, and of personal importance.

In question 1 of the structured interview, I asked the participants how they would describe their level of computer literacy. In order to understand the participants' view of their own level of computer literacy and ability to use CAL in the Accounting classroom, I encouraged them to elaborate exactly how they used computers in Question 2, 3 and 4 of the structured interview. The participants explained their own reality of computer literacy and how they perceived their computer literacy level. Computer literacy can be defined as the knowledge and ability to use computers and related technology efficiently (Lynch, 1998). Computer literacy in this study's context refers to the participants' level of competence when using computer application programs, as well as the efficient use of internet technology, while teaching Accounting.

Competence is an inherent psychological need of human beings (Ryan & Deci, 2000), and may be defined as a condition or quality of effectiveness, ability, sufficiency or success. Teachers' attitudes toward CAL are related to their level of computer competence, and their motivation to use it. It is assumed that teacher's computer literacy level improves when they increase the integration of computer applications into their teaching. Another obstacle to the successful integration of CAL that I have interpreted from the data is the lack of competence to use CAL as a teaching strategy. Therefore, it can be concluded that the lack of using a computer on a regualar basis by the teacher has an influence on the teachers' feeling of competence and attitude towards the use of CAL. Some participants expressed frustration in that while they felt that they possessed adequate knowledge to use CAL to teach Accounting, they failed to receive the necessary internal and external computing support from IT services when they experienced hardware or network problems (Section 4.3.2 (c)).

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Although computers are freely available in the participants' classrooms, many teachers are still uncertain of the value thereof. Cox *et al*. (2004) write that teachers who value CAL will change their current teaching strategies to improve the use of technology tools into their classrooms. Furthermore, according to Becker *et al*. (1999), teachers who report a strong commitment to teaching and taking responsibility for their own professional or personal development, have been found to value CAL more, and integrate computers more readily into their classrooms.

The influence of the personal aspect, as a regulatory process, results in increased extrinsic motivation, leaning more towards a self-determined quality of behaviour, according to the conceptual framework (Figure 2.2). This behaviour is also on the verge of incling towards non-self-determined behaviour. This suggests that personal importance might have contributed to five of the participants' extrinsic motivation towards CAL as a teaching strategy.

According to the data, I interpreted that five participants valued and had positive attitudes towards CAL. Teacher 1 showed a tendency of non-valuing according to the Self-Determination Continuum, as evidenced in her utterances (Section 4.2.1 (b)). I noticed a pattern in the data that indicated that participants' who had a high computer literacy level increased their integration of CAL as a teaching strategy in the classroom. Positive attitudes towards CAL increase teachers' interest in using CAL in teaching and learning, whereas negative attitudes constrain it. Participants who reported that they valued their learners' interest, as well as their own professional/personal development, were found to integrate CAL more willingly into their classrooms.

(b) Conscious valuing

Teachers should value their learners' interest and personal development, even with respect to activities they find boring. This will ensure that they value the inclusion of CAL in their classrooms. According to the SDT, individuals internalise the regulation of boring behaviours when these behaviours are required to function effectively in society (Ryan & Deci, 2000). When an individual recognises the value of an activity, they do not necessarily become more interested or more intrinsically motivated to participate in the proposed activity. Nonetheless they do become willing to take part in such an activity because of its possible value.

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Conscious valuing requires that participants feel autonomous, competent and related to others while taking part in activities. In this study, the participants' opinions of the use of CAL were quite diverse, ranging from those who consciously valued its potential, to those teachers who were uninterested and had tried to avoid participation as much as possible. It became apparent that the participants valued the potential time saving, convenience and practical benefits more than the would-be academic benefits CAL might have for their Accounting learners. This was evident in their responses regarding why they decided to use the computer in their accounting classroom (Question 5 of the structured interview).

Teacher 2: "Because it's easier than cleaning the board every… after every lesson, so at the moment I'm doing… I use the computer and a projector, but sometimes I'll still write, but it just makes it easier as a paragraph, then you have the exact same work for all the classes that you teach. It is easier…Laziness. Just wanting things to be easy and streamlined and wanting to look professional so…"

Teacher 3: "It speeds up teaching."

Teacher 4: "It makes me more effective…and saves an enormous amount of time."

Teacher 4: "… Once you start using it, you realise: I can build a sort of a library of exam papers and of notes and there is so much information that is accessible. It makes your life so much easier and quicker. And you're actually more effective".

Teacher 6: "Convenience, Convenience. The neatness, because there is no handwriting. And even time saved that is the more, main, main reason, the time saving."

The above utterances confirm that the participants did not seek to improve the quality of teaching and learning, but simply to relieve their workload. These subtle hints regarding time constraints indicate that Accounting teachers experience pressure to complete the Accounting curriculum in time, and regarding their general workload. According to the participants' reality, I interpret that from their point of view, the basic advantage of CAL is that it saved them time spent on relatively simple tasks and topics. CAL as a teaching strategy thus allowed them more time to spend on difficult topics that cannot adequately be explained by using CAL. CAL must play a supportive role in relieving teachers' workloads.

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In expansion of the above comments about the value of computers in the Accounting classroom and time saving possibilities, Teachers 1, 3 and 4 were also of the opinion that the implementation of CAL initially takes a lot of time to prepare, and that it may be demotivating. In a probing question, Teacher 1 elaborated that once a presentation is set properly, it can be used again the next year, but it initially takes a lot of time.

Teacher 1: "It's just, it take a lot of time to set it up, much more if we were just to write on the board."

I interpret that Teacher 1 did not see the possible educational benefits of CAL. This is evident in her non-intentional and non-valuing behaviour, as discussed earlier. Teacher 1 disregarded the potential value of CAL, only considering the convenience of writing on the board (Section 4.2.1). Teacher 4 also mentioned time constraints.

Teacher 4: "They come with too many things and you're so busy trying to teach and you've got to put the students first. And you find that you're clutching at straws and that's demotivating. So it's a time thing."

Teacher 3 also expressed an opinion on the amount of preparation time it may take to integrate CAL successfully into the classroom. Like Teacher 1, Teacher 3 also considered that he would be able to reuse CAL prepared activities.

Teacher 3: "it's just going to take a lot of time and… a lot of preparation but it in the end, once you have done it, you have it and you can just build on it from there onwards..."

Teacher 3 further remarked that teaching Accounting using CAL is useful in providing the learner with Accounting knowledge and valuable electronic Accounting skills, which are in demand due to the growth of technology advances in the real world of work.

Teacher 3: "...when you go into the work environment the people don't sit anymore and do accounting on… on paper, everything is completed on computer."

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Using CAL in Accounting education refers to the inclusion of computers as a teaching strategy to contribut to the learning process. Teacher 6 stated that CAL should be used to assist learners to learn Accounting electronically, rather than using it in isolation. Teacher 6's answer (Question 9 of the structured interview) echoed that of Teacher 3 that Accounting should be taught using a combination of teaching strategies (manual and electronic) in the instruction thereof to add quality to the teaching and learning of Accounting.

Teacher 6: "My problem with that is that, I feel there must be that little bit manual in it."

According to the conceptual framework (Figure 2.2), conscious valuing enhances an individual's extrinsic motivation, which inclines more towards a self-determined quality of behaviour. This means that the presence of conscious valuing, as a regulatory process, might have contributed to the participants' tendency to incline more towards self-determined behaviour.

4.4.2 Integrated regulation

Integrated regulation is the most progressive extrinsic regulatory style and is completely integrated with the individual's synthesis with the self. That is, the identifications are mutually integrated and are in harmony with the individual's psychological needs. It is possible that identifications with both external and internal motivations could seem conflicting to the participant and thus cause internal tension, even though both identifications are valued by the participant. When the two identifications become integrated with each other and synthesised with the self, the internalisation process will be complete. When regulatory processes are integrated, behaviour is an expression of the identity of the individual, and an expression of what the individual value as important. Integrated regulated behaviour is therefore totally self-determined.

Integrated regulation bears some relation to intrinsic motivation because both are meta-classified as autonomous motivation. Yet, intrinsic motivation and integrated regulation are inherently different.

(a) Congruence

Congruence can be defined as the degree to which the pattern of an individual's personality attributes matches their behaviour in a particular situation (Sherman, Nave & Funder, 2012). Congruence is classified as the most autonomous type of extrinsic motivation, with an

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integrated regulatory style (Figure 3.1). Integration seems to occur when identified regulations have been completely integrated with the self. The more one internalises the reasons for an action and assimilates them to one's self, the more one's extrinsically motivated actions become self-determined. In Question 9 of the structured interviews, I asked the participants what motivated them to use the computer in their Accounting classroom. Teacher 4 first started to answer that everyone else was doing it (compliance), but then she explained that she accepted the behaviour and embraced the possible value that CAL may pose to the learner.

Teacher 4: "Okay, everyone else is doing it, but what motivated me was the fact that, um, the kids had...actually, I had to. Originally. But I found that it was the way to go. You had, you know, what do they say...do or die type of thing."

Teacher 4 therefore acted with congruence, as it was through self-examination that she realised that she should adapt and implement CAL as a teaching strategy. She mentioned aspects related to synthesis with the self when she used the term "do or die…" It is evident that Teacher 4 realised that she should make an internal change and change her attitude towards CAL.

This incident contributed to the value of this study's conceptual framework (Figure 2.2), indicating that behaviour is not static in nature, and that it continuously moves along a continuum. This indicates that the presence of congruence, as a regulatory process, might have contributed to Teacher 4's tendency to slant towards a self-determined quality of behaviour.

(b) Awareness

Awareness is the ability to perceive, feel, or be conscious of activities, objects, thoughts, emotions, or sensory patterns. It is the state or quality of being aware of one's internal and external experiences, including thoughts and emotions (Brown & Ryan, 2003). It is evident in Teacher 3's utterance that he was aware of the important role he played in the successful implementation of CAL as a teaching strategy.

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Teacher 3: "Well I feel my…the role that I play for my classroom is very big because I am the one implementing it, the learners react to what the Teacher does, so if I choose to use only the old methods, that's what they going to…that is the way they are going to learn, if I choose to implement CAL more and more, then the learners also benefit from that because they work from what I give them."

I interpret this utterance as very important as it is directly linked to the SDT, which serves as the theoretical framework of this study. We, as living organisms, are in charge of our behaviour and are aware of the significant impact that our decisions have on our environment. In the context of Teacher 3's reality, he was aware of the impact that his choice of teaching strategy had on his accounting learners.

Teacher 4 was aware of the fact that change is not easy. This was evident in her answer:

Teacher 4: "And I mean I was also there. I was, uh, why must I do this? It's painful. But I know it develops you and it's a way forward."

I interpret that Teacher 4 was aware of the value that CAL could add to the quality of her teaching, but she was also conscious of the challenges that it entails, and that the individual as a whole (emotionally, psychologically and physically) must be considered before the motivation can be autonomous, with a self-determined quality of behaviour.

When referring to the conceptual framework (Figure 2.2), Teacher 3 and Teacher 4's motivation to implement CAL as a teaching strategy had a tendency to incline towards intrinsic motivation, although it is still regarded as an extrinsic motivational aspect. This means that the existence of awareness, as a regulatory process, may have contributed to Teacher 3 and Teacher 4's slope towards self-determined behaviour.

(c) Synthesis with self

Synthesis with self refers to a combination of components that forms a connected whole. The process of synthesis with self involves a dynamic in which a person struggles to realise his/her potential while attending to the emotional and physical constraints natural to everyday life. I infer that professional/personal growth and development in the integration of CAL in the classroom influences teachers' use of computers in the classroom. The participating teachers expected to be supported in their professional development. This included initial support from their colleagues and principal, and training as they started to use CAL.

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There was a general agreement that they expected to be trained how to use CAL in their Accounting classroom, and have somebody to support them before they assumed independence. Effective professional/personal growth and development must be sustained, subject-specific, and integrated to effect possible change in teacher practices in ways that might improve learning.

It is evident in Teacher 2's utterance that she synthesised with the self, realising the value and accepting the influence that CAL had on her life.

Teacher 2: "I am much more organised."

Teacher 3 was aware of the process of integrated regulation, and the synthesis with the self, when he explained that he slowly integrated CAL in his Accounting classes, phasing in new teaching strategies over a period of time.

Teacher 3: "Um, the strategy I think is maybe one that I'm currently employing, of slowly implementing it, don't just jump into a new way of doing things, slowly integrate it with what you are already doing and the more…and then you can more and more phase it as you get comfortable with it, into working with more and more with technology…"

I interpret Teacher 3's behaviour as synthesis of the self. He realised and addressed the obstacles and challenges that the integration of CAL may have, while making an internal, informed choice to implement CAL as a teaching strategy. He did this because of the possible benefits that he and the learners could experience.

Teacher 4: "As well. You've got...the thing is why you should be motivated is because it's personal development."

Teacher 4 viewed the integration of CAL as valuable, not only for the learners, but for herself. She realised her own potential, and therefore embraced the change, seeing it as an opportunity for personal development.

These utternaces contributed to the value of the conceptual framework (Figure 2.2), indicating that the presence of synthesis with self, as a regulatory process, might have contributed to Teacher 2, Teacher 3 and Teacher 4's tendency to incline towards a self-determined quality of behaviour. However, synthesis with self is still regarded as extrinsic motivation.

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4.4.3 Intrinsic regulation

Intrinsic regulation can be described as an individual participating in an activity for the interest, enjoyment and satisfaction in engaging in the behaviour itself (Gagne & Deci, 2005). When individuals are interested in an activity, their actions acquire an intrinsic quality. Such individuals are driven by enjoyment, rather than external forces (Krapp, 2002). Deci and Ryan (2000) argue that when an activity is not interesting or enjoyable, the possible reason why individuals take part in such activities is because they are valued by the subjective norm (i.e. colleagues, family, and friends). Intrinsic motivation theorists argue that behaviour (usage) is determined by intrinsic as well as extrinsic motivation. Individuals take effort because a task is interesting, enjoyable and offers potential external rewards.

(a) Interest

No participant made any reference to having an interest in CAL during the structured interviews. Initially, I thought that this could be because of their Accounting background, and that they were not really interested in technology. Question 17 of the questionnaire asked: "Do you think using CAL is boring?" All of the participants answered "no" to this question, which means that they disagreed.

I infer that this phenomenon indicates that the participants all showed an interest in CAL. The context and type of interest the participants had towards CAL may be different to each participants' own relativity. According to the conceptual framework (Figure 2.2), behaviour is not static in nature, and continuously moves along a continuum. This indicates that the presence of interest in the questionnaire, and absence thereof in the structured interviews, alludes to the fact that a participant's behaviour can change in a short period of time, depending on which motivational aspect can be attributed to the phenomenon.

(b) Enjoyment

While analysing the data, it became evident to me that on different occasions, the participants referred to learners enjoying the use of CAL as a teaching strategy. It was only Teacher 6 that promptly answered that she enjoyed the use of CAL as a teaching strategy.

Teacher 6: "I enjoy it; they enjoy it, and everything else that comes with it just fits into place."

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I interpret that personality attributes played a role in the fact that she enjoyed teaching with CAL. When I considered her social context, referring back to the structured interviews, I found that she was not only an Accounting teacher, but also a Computer Application Technology teacher. This background in using and integrating the computer in another subject might have had a positive influence on her enjoyment in using CAL as a teaching strategy in Accounting, resulting in intrinsic motivation.

It is worth noting that in the questionnaire (Question 16), all of the participants agreed that they enjoyed teaching with CAL. Teacher 1, who also agreed that she enjoyed teaching with CAL, made a handwritten note next to the answer: "sometimes". I find it interesting that the participants gave predominantly extrinsic aspects as reasons for implementing CAL, but in Question 16 of the questionnaire, answered that they did enjoy teaching with CAL.

I interpret this phenomenon not as an alarming contradiction to the participants' utterances in the structured interviews, but rather as evidence that an individuals' motivation towards an activity is not static. This occurrence is therefore directly related to the Self-Determination Continuum (Figure 2.2), which served as the conceptual framework of this study.

(c) Inherent satisfaction

Inherent satisfaction can be defined as a permanent and inseparable element, quality or attribute in an individual. Intrinsic motivation propagates from the desire to engage in an activity because of the inherent satisfaction it offers. No participant mentioned being inherently satisfied with the integration of CAL. This could be because of the variety of extrinsic aspects that over-shadow the deeprooted satisfaction of teaching.

4.4 Sub-question 4

Computer Aided Learning in the context of this study refers to the integration of a computer as a teaching strategy to support traditional teaching and learning in the Accounting classroom. To answer sub-question 4, I used the data structure (Figure 3.1) to inform the interpretation of the structured interview and questionnaire data. Sub-question 3 is related to the teaching strategies used in the Accounting classroom. The teaching strategies that the participants used to integrate CAL in Accounting will now be discussed, as sub-question 4 states:

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How is the motivation to use CAL reflected in the teaching strategies of Accounting teachers?

Question 2 of the structured interview asked the participants what type of software they used and why. All six participants answered that they used computer application programs for daily teaching and preparation tasks, e.g. recording of marks in MS Excel, creating assignments, setting tests in MS Word and MS PowerPoint for presentations. Subject specific educational software were mentioned by four participants from two different schools. The subject specifc educational sotware that was referred to were Moodle and ColCampus. The participants used these types of software for classroom management and uploading homework, downloading e-books, online assesments and distribution of classnotes, thus, for general teaching tasks. Teacher 1 and Teacher 4 referred to using the internet to show learners real-life events that are relevant to Accounting, such as online trade.

Teacher 1: "So, yeah and this year we played the JSE game so they were also using my computer to go on to see how their shares were doing and what they should invest in and stuff like that. So that's the one thing I use it for and then I have done a couple of PowerPoint presentations…"

The internet can be used to find alternative information sources. Hyperlinks on the internet lead to various sources of applications and documents and are preferable due to the convenience and ease of access; it is also an attractive interface for learners. For example, the internet provides a useful means of giving learners access to an online lessons, e-books, videos, podcast and other valuable academic resources.

Teacher 1 also referred to the Pastel School Programme that IEB schools used in the past in the Accounting classroom. I assume that the Pastel School Programme seemingly failed due to a lack of continuous technical support, as is evident in her answer and discussed in Section 4.2.1 (b). Teacher 3 also made a comment about Pastel that he did not recommend using the program without basic Accounting principles. This is evident in his answer:

Teacher 3:"you need to teach them the basics upfront, if they want to go in sort of like an accounting type of profession, they need to understand the basics behind it…there is still that background that they need to learn – why…why do certain accounting accounts um…why are they treated the way they are treated and you can only know that once you've done it from the basics, from the beginning, um and completed itself basically by hand."

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I probed Teacher 3 for more detail when I asked "So you believe the old manual system is also still held valid?"

Teacher 3:"...you can't look past it, because many people, they look at something for instance like Pastel, they haven't done no accounting ever in their lives, Pastel it is easy to learn, easy to use, but they have no idea why those accounts work the way they work...you need to teach them the basics upfront, if they want to go in sort of like an accounting type of profession, they need to understand the basics behind it"

As is evident in Teacher 3's utterance, I interpret that he preferred the use of CAL in conjunction with traditional teaching strategies. The supporters of traditional manual Accounting are not opposed against utilising CAL, but they emphasise the importance of first completing Accounting basics manually for a better understanding of basic Accounting concepts and principles. Their opinion is that the Accounting learner should not know the work off by heart, or engage in rote learning. They felt that learners should have a deeper understanding of basic Accounting concepts and principles.

Teacher 6: "The fact that the learners enjoy a projected rather than a written out. It's the in thing, it's what they know. They enjoy. Give them a device and I think they're happier than giving them a piece of paper. They ask me to email the solutions to them. They don't want to even write it down. If I don't have an email available, they say, can we take a photo? It is a solution. They've got pictures, they just zoom in, zoom out and they've got the solution. They don't have to write it. My problem with that is that I feel there must be that little bit manual in it. The fact that they write it, I know for sure that they've gone already over it once. If they take a photo I don't know whether they will ever open it again. That side, ja. If I know they wrote it, I know they've done it at least once."

Teacher 3 referred to software that is Accounting specific and currently used as a teaching strategy, Educreations. Educreations is an application that transforms your tablet into a recordable whiteboard. It records the teachers' voice, handwriting and also allows the teacher to insert pictures to produce video recordings of their lessons. The teacher is able to store and share the video recordings online with the learners, who can remotely access it. Teacher 3 also mentioned being eager to attend more training that specifically focused on improving the teaching of Accounting with the use of CAL. I have identified and interpreted the need for sustained training to assist teachers to better employ CAL in pedagogic practices.

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Teacher 3: "… I want to put the whole lesson onto uhm… onto Educreations where you would see like a blank general ledger, for instance… Because it's a programme that as you… as jou see those things get listed there, everything gets drawn, you can hear the person also in the background describing what is busy happening and so…so it is almost like you're seeing… you're looking at someone teaching…"

Teacher 3: "…we do have training sessions on a regular basis, but the training opportunities that I seek are more subject specific, specifically created for accounting…"

Teacher 3: "Yes, so don't just completely do only what you do or what you know, use what you know, stick to what you know and use that to compliment the new method of teaching."

I assume that Teacher 3 would get satisfaction from knowing that he contributed to changing the Accounting classroom into a 'flip classroom' after putting in effort to change his teaching strategies. Implementing this proposed change from traditional teaching to a 'flip classroom' will seemingly benefit the learner, and therefore the teacher will feel internally rewarded. I interpreted that the desire for an internal reward controlled Teacher 3's motivation to implement CAL, supported by conscious valuing of the benefits CAL may have for him. This behaviour has a dominant, somewhat external perceived locus of causality (internal reward and punishment), with an inferior, somewhat internal perceived locus of causality (conscious valuing) according to the Self-Determination Continuum (Figure 2.2).

The concept of flip learning that Teacher 3 referred to is also known as the flipped classroom. The flipped classroom is a teaching strategy and is regarded as a type of blended learning. The flipped classroom reverses traditional teaching strategies by the way it delivers content. It 'flips' traditional teaching strategies by delivering some of the teaching online, outside the classroom and moving 'homework' into the classroom. The 'flipped classrooms' teaching strategies are designed in such a way that they engage learners on a high cognitive level and facilitate deep learning (Abeysekera & Dawson, 2015).

In this study, most of the participants used the internet and spreadsheet packages, such as CAL, in their Accounting classrooms. This is supported by Teacher 2's statement:

Teacher 2: "I use PowerPoint to, you know, create presentations and to teach, I use Microsoft Word, also for if there is any notes and I use Excel for journals…"

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Different types of application software are used in the Accounting classroom. Presentation software is one of the most popular types of application software used in the classroom. Research conducted by Sugahara and Boland (2006) found that teachers using MS PowerPoint motivated learners more to download classnotes from electronic resources. This result may indicate that obtaining classnotes through little effort could possibly discourage learners from summarising what they learn in class through making handwritten notes. Additionally, while teaching with MS PowerPoint slides may give learners better opportunities to concentrate on the lesson, it may simultaneously take away many other important learning chances such as summarising content, drawing diagrams, note taking and recording simple jargon. The effect of presentation software has also been mentioned by Jones (2003) in that PowerPoint may encourage learners to sit passively through the lesson because they may perceive that they can rely on the electronically available classnotes for knowledge acquisition.

Teacher 4 explained that she sometimes integrated video clips into her teaching.

Teacher 4: "If I've got extra work which the book that I'm using doesn't entail and I want to go into more depth…I also often put up video clips from YouTube…we do a lot of video clips"

I queried Teacher 4 to find out if she created them herself, but she answered that she usually got a reference from someone or did research on the internet to find a video clip.

Teachers 3 and 6 agreed with Boyce (1999) that CAL should only be used as an aid alongside manual accounting for a more comprehensive overall teaching strategy.

Teacher 3: "Initially, yes, it will be a lot of work but it's going to be… I believe it's going to be a big reward in the end because then they can go at like flip learning, before the class, they can go through the lesson, you can upload it onto YouTube or as we do on ColCampus."

Teacher 6 mentioned that with other subjects, e.g. Mathematics and Science, there was a variety of software available on the market to enhance teaching and learning. She investigated Accounting specific software and there was only a limited amount of software available, and none of these pertained to teaching with a smartboard.

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4.5 Conclusions

I conclude that, based on the research findings, Accounting teachers' motivation towards CAL are predominantly influenced by extrinsic aspects. I found that the participants expressed compliance, as a regulatory process, as the main reason for implementing CAL in the Accounting classroom. Compliance with an external regulatory style is regarded as the lowest form of extrinsic motivation (Figure 3.1). This can be of significant value in the way school principals and the DBE approach teacher motivation to implement CAL. Two valuable aspects were emphasised by the participants, as was evident in the transcripts of the structured interviews. According to the participants, the other aspects that had an influence on their attitude towards CAL were training and support. These two aspects are associated with internal rewards and punishments, which is classified as a regulatory process of extrinsic motivation.

I also found that even in well-resources schools the teachers of accounting are sceptical of updated ways of teaching and thus hesitant to move from clear zones of comfortable expertise and known teaching methods to more digitally supported teaching methods, such as CAL.

This chapter explored the experiences of six accounting teachers in relation to the research question with the aim of identifying aspects that influence Accounting teachers' attitudes towards CAL. This was done by building on the rich detailed results of this study, as presented in this chapter. I structured the discussion around a detailed interpretation of possible aspects that might have played a role in these teachers' motivation to using CAL.

In Chapter 5, a synopsis of Chapters 1 to 4 is provided, as well as the final conclusions of this study, which are based on the literature and the findings. Each research question is presented and conclusively discussed and answered. This is followed by the limitations of this study and recommendations for future research.

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CHAPTER 5

REFLECTING ON FINDINGS AND RECOMMENDATIONS

5.1 Overview of the chapter

In this chapter, I conclude this study by referring to the research problem, the literature review, the research questions, and the research methodology in an overview of the study. I will reflect on the findings of the study and a discussion of the limitations of this study follows. Finally, I discuss the implications of the study, referring to teaching practice and institutional support. On the basis of the findings, I conclude the chapter by making recommendations with regard to potential future research studies.

5.2 Overview of the study

In this study, I set out to explore and reveal the motivational aspects that influence the attitudes of Accounting teachers (in private schools in the larger Tshwane District) towards CAL. The Accounting profession has a greater reliance and dependence on technology today than in the past. Accounting is regarded as one of the professions most affected by the constant and rapid changes of information technology, as advances in technology necessitate Accountants to apply computer skills in their daily tasks (Fridman, Dasoo, & Basson, 2003). The speed of technological advances and growing market globalisation have significantly changed the way in which Accounting processes are conducted in the real world of work. Computerised Accounting systems have replaced dated manual Accounting systems in businesses, emphasising the need for implementing CAL as a teaching strategy in Accounting classrooms. It is therefore critical for Accounting teachers to integrate technology into Accounting education for the learner to be adequately prepared for the real world of work, or tertiary studies in Accounting when matriculating.

There is an appeal from the Accounting profession that subject specialists, policy makers and curriculum developers should review the Accounting curriculum, subject content and delivery of Accounting as a subject in South African schools (Fridman *et al.*, 2003). This stresses the necessity for a shift from traditional teaching strategies towards the use of CAL to equip learners with a range of electronic skills, as demanded by the Accounting profession.

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It is unfortunate that the Accounting curriculum and teaching strategies in South African schools have lagged behind in this technological advancement. It is also recognised that the demands from the real world of work are not fully realised when teachers do not accept and apply these technologies in the classroom (Geisert & Futrell, 1995). Possible skills that the learner can obtain through learning Accounting with CAL, is the ability to structure and input data and interpret outputs from accounting software. The literature indicates that Accounting teachers still predominantly use traditional teaching strategies (Dimitrios, Libro, Nikolaos, Maria, & Athanasios, 2013), and is confirmed by the findings of this study. Cooper and Coomb (1992), emphasise that learners should have computer skills specifically related to Accounting. They further stress the necessity for Accounting teachers to adopt the integration of CAL as a teaching strategy to benefit their learners.Using traditional teaching strategies results in Accounting learners not getting the opportunity to apply or be familiar with electronic Accounting skills. It is proposed that CAL should be used as a teaching strategy to prepare learners who intend to pursue a career in Accounting with the necessary skills that will enable them to secure employment and be aware of the relevance of technology to further their careers.

This study's long-term aim was to inform fellow researchers and the Accounting profession. The identification of possible strategies for implementing CAL in Accounting could provide fellow researchers and the DBE with useful information when consideration is given to enforcing CAL in the South African Accounting classroom. With this research, I attempted to provide support to Accounting teachers in gaining self-awareness of their teaching strategies and attitudes towards CAL.

The study focused on the relative motivational levels of Accounting teachers with regard to CAL. This study's research questions positioned it as qualitative in nature, being grounded in the interpretive paradigm. The research questions' (Section 1.5) specific purpose was to explore and interpret teachers' self-determination in their adoption or non-adoption of CAL as a teaching strategy in their Accounting classrooms.

I took a relativist stance towards the research methodology, which was sustained by the theoretical and conceptual framework. I selected a conceptual framework that allowed me to consider my participants' motivational tendencies in terms of a continuum, rather than measured values. I believe that behaviour, motivation, attitudes and beliefs can be interpreted and understood when considering the cultural, social and historical background of an

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individual. My sample consisted of six FET accounting teachers from three private schools in the larger Tshwane District of the Gauteng province in South Africa.

Individuals have not only different motivational levels, but also different types of motivation. I followed a qualitative approach, which ensured that I obtained a deeper understanding of the possible motivational aspects that influenced these accounting teachers' attitudes towards CAL. I used qualitative research methods and the application of two self-developed data collection instruments, which included a structured interview and a questionnaire. The transcription process of the structured interviews and the six phases of TA (Section 3.10) were used to analyse the data. I used the data structure to analyse the data, as discussed in Section 3.10.1, which I designed based on the Self-Determination Continuum (Figure 2.2). According to the theoretical framework, the SDT (Deci & Ryan, 2000), self-determination lies on a continuum which distinguishes between a-motivation, extrinsic motivation and intrinsic motivation as different types of motivation.

In the data structure (Figure 3.1), the 17 relevant regulatory processes are colour coded in red, and served as the specific sub-themes. Moving up towards the top of the figure, the broader macro- and meta-theories underpinning this research study followed. The six themes of this study (Phase 5) are indicated on the left of the figure, in shapes of different colours and are strongly linked to the data. This interrelationship between the data and the conceptual framework confirms that the process of data structuring occurred without me trying to fit the data into a pre-existing framework.

I analysed the data and discussed my findings related to the motivational aspects that influenced the Accounting teachers' attitudes towards CAL. Building on the detailed results of my study, I structured my discussion around an in-depth interpretation of possible motivational aspects that might play a role in the teachers' motivation towards CAL, using the relevant regulatory processes of Figure 3.1.

5.3 Reflecting on the findings of my study

This section reflects on the findings to answer the research questions. I will discuss the most significant tendencies from the findings, the implications for teaching practice and institutional support thereof. In this study, I also sought to draw implications from my understanding of the nature of Accounting teachers' motivation.

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The available literature on this topic, and specifically in the South African context, is inconclusive in answering several vital questions within the topic of motivational aspects. The study aimed to answer the following sub-questions intergratively in terms of the conceptual framework (Figure 2.2):

1. *What aspects contribute to Accounting teachers' a-motivation to implement CAL as a teaching strategy?*

The elements that were used to answer the above research question were the relevant regulatory processes of: non-intentional, non-valuing, incompetence and lack of control, according to the conceptual framework (Figure 2.2). I have found that only Teacher 1 had an a-motivated attitude towards the use of CAL as teaching strategy. The questionnaire data has been triangulated with the structured interview by confirming her perceived low feeling of competence. Her non-self-determined behaviour was subjective to a-motivational aspects such as non-intention, non-valuing, incompetence and lack of control. Her a-motivated attitude towards CAL can be observed as the tendency to incline towards the left of the Self-Determination Continuum.

2. *What extrinsic aspects have an influence on Accounting teachers' attitudes towards CAL as a teaching strategy?*

According to the conceptual framework (Figure 2.2), the elements that were used to answer the above research question were the relevant regulatory processes of: compliance, external rewards and punishments, personal importance, conscious valuing, congruence, awareness, and synthesis with self. The structured interview data revealed that the majority of the participants had an extrinsically motivated attitude towards the use of CAL as a teaching strategy. The questionnaire data has been triangulated with the structured interview by revealing that, according to the conceptual framework, compliance as a relevant regulatory process is the aspect that has influenced the Accounting teachers most to implement CAL as a teaching strategy. The participants' extrinsically motivated attitudes towards CAL can be observed as the tendency to incline towards the middle part of the Self-Determination Continuum, which includes the regulatory styles of external regulation, introjected regulation, identified regulation and integrated regulation.

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3. *What intrinsic aspects have an influence on Accounting teachers' attitudes towards CAL as a teaching strategy?*

Referring to the conceptual framework (Figure 2.2), the elements that were used to answer the above research question were the relevant regulatory processes of: interest, enjoyment, and inherent satisfaction. The structured interview data revealed that none of the teachers had an exclusively intrinsic attitude towards the use of CAL as a teaching strategy. The questionnaire data revealed that some participants' showed elements of interest and enjoyment as intrinsic aspects that influenced their attitudes towards CAL. These traces have, however, not occurred enough for me to regard these participants as intrinsically motivated to implement CAL. Teacher 5 and Teacher 6 showed tendencies of intrinsically motivated attitudes. Their intrinsic attitude towards CAL can be observed as the tendency to incline towards the right of the Self-Determination Continuum.

4. *How is the motivation to use CAL reflected in the teaching strategies of Accounting teachers?*

This question could not be answered satisfactorily due to the nature and inherent purpose of the conceptual framework used in this study. The structured interviews' data was used to answer this research question, which is related to the relevant regulatory processes of the conceptual framework (Figure 2.2). According to the findings, I inferred that all the participants who had an extrinsically motivated attitude towards the use of CAL as a teaching strategy were the teachers who already implemented CAL as a teaching strategy in their classrooms. It became apparent to me that all of the participants had access to state of the art technology at the schools they taught at, but were sometimes reluctant to use it as they were unsure of how to use the technology, or when to integrate it into the Accounting curriculum.

The main finding of this study was, therefore, that out of the six participants in this study, only two actually used CAL in their classrooms as a supplement to their traditional teaching strategy. This has implications for the learners' level of preparation for the real world of work, this is further discussed in Section 5.6. I also found that even in well-resourced schools, the Accounting teachers are sceptical of updated ways of teaching, and thus hesitant to implement new teaching methods into the classroom. I further found that congruence as an extrinsic aspect influence Accounting teachers' motivation most as motivation to implement CAL.

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5.4 Limitations of this study

This study has offered an investigative perspective on motivational aspects of teacher motivation and the successful implementation of CAL as a teaching strategy in the Accounting classroom, based on the SDT. As a direct consequence, I encountered and identified limitations, which need to be considered. Some of the limitations identified in this study may provide opportunities for other studies.

Firstly, in the context of this study, the 17 relevant regulatory processes of the Self-Determination Continuum (Figure 2.2) are a reality that Accounting teachers experience when integrating CAL as a teaching strategy. External forces or influences play a role in teachers' motivation and attitudes towards a phenomenon, in the context of this study, towards CAL. The current study was a multiple case study that only required once-off data collection. I regard this as a methodological limitation of the study as the participants' movement along the Self-Determination Continuum (internalisation) could not be observed; only relative tendencies could be determined. I am of the opinion that it is worth investigating how participants could possibly move along the continuum over a period of time, suggesting a longitudinal study.

Secondly, a theoretical limitation of using the SDT as the theoretical framework is that, due to the nature of the theoretical framework, it was not possible to determine the role that specific Accounting knowledge and the practical application thereof play in the profession of a teacher as the driving force to implement CAL.

Thirdly, a theoretical limitation of the study is the role that personality types play in the use of CAL. It became evident that the interrelationships between participants' personality and their motivational levels could not be addressed with the SDT as a theoretical framework. For example, if a participant is bi-polar or self-determined by nature, it could possibly have an influence on their attitudes towards a phenomenon.

Fourthly, a methodological limitation of the study is a shortcoming that I noticed in the triangulation between the data collection instruments. I noticed this shortcoming only while interpreting the data, and am of the opinion that the triangulation between instruments could have been more structured to obtain more details. In retrospect, I would advise further researchers to offer the questionnaire first to obtain a holistic overview of the participant, which can then be supported and confirmed by the structured interviews that follow.

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Finally, a methodological limitation that I experienced was the sample size of this qualitative study. Due to the relatively small sample size and qualitative nature of the study, the findings cannot be generalised. It was not my aim to generalise the findings, but rather to construct meaning by providing a contextualised understanding of aspects influencing motivation through the study of multiple cases. I followed the method of data saturation (Section 3.6), which contributed to concluding the sample size at six participants, which is acceptable for a qualitative research study's sample size.

5.5 Implications

At the time of this study, it was inferred that these teachers were reluctant to implement CAL in their Accounting classrooms. I found that teachers used CAL to a limited extent, they tended to use word processors, presentation software and spreadsheets for their daily teaching tasks. However, they seemed unenthusiastic about using Accounting software in their teaching. This interpretation is related to sub-question 4. I found that the internet was mostly used as a means of presenting information in in digital format. As evident in the findings, the internet provides a useful means of giving learners access to classnotes, e-books or application software in the Accounting classroom.

Different types of application software are used as teaching strategies in the Accounting classroom. It was evident from the findings that Accounting teachers occasionally use spreadsheets to teach certain content from the curriculum. Word processor programs are dominantly used for administrative tasks, such as setting a test, and are not integrated as a teaching strategy. It is my opinion that it could be an advantage to teachers to be trained to use CAL. I suggest that such training should not be limited to computer literacy only, but teachers should be trained to use CAL to improve the quality and effectiveness of their teaching practice. I am of the opinion that CAL's pedagogical potential should be highlighted during training through explanation and guidance regarding ways to integrate CAL with their current teaching strategies to improve their teaching practice.

I also recommend that educational institutions should consider including a course on how to integrate CAL into their Accounting curriculum for aspiring Accounting teachers. Such a course might provide undergraduate Accounting teachers with the necessary skills to apply CAL as a complementary method to the traditional teaching strategy. It should be considered that practicing Accounting teachers should be granted the opportunity to attend computer

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literacy courses to acquire the necessary skills to implement CAL effectively in the classroom. Such training might enhance their motivation if the need for competence is fulfilled. It is my finding that the commercial, financial and industrial sectors of the real world of work should be encouraged to lend support to the integration of CAL as a teaching strategy into the Accounting curriculum, as they will benefit from the output of learners who are skilled in the use of computers when they enter the work force. According to Gulbahar (2008), insufficient training and poor infrastructure are aspects that have a significant influence on the effective use and implementation of computers by teachers. Olson (2000) argues that integrating CAL into the classroom presents a challenge to teachers, as some are not confident and competent in using computers. Additionally, a lack of computer experience often accounts for teachers' low levels of autonomy, competence and relatedness when they initiate the use of a computer. This feeling of low competence often results in high levels of anxiety towards the use of computers, which could lead to a negative attitude towards computers and, in time, negatively influence the implementation of CAL in the classroom. Therefore, I suggest the implementation of well organised and researched training programs. Accounting teachers should have the opportunity to become acquainted with and confident in using newly introduced technology in terms of Accounting software. Therefore, training is of the utmost importance. Receiving the necessary training may have a positive impact on the way in which teachers embrace technological tools in their classrooms. In a study conducted in Italy, research has indicated that teachers' personal attitudes towards teaching and their perceived level of competence in technology play a key role in how they implement technology in their classrooms (Gobbo & Girardi, 2001). This was confirmed in my study through the structured interviews where the participants expressed a lack of enthusiasm towards the use of CAL in the classroom.

This means that decision makers in the training of teachers, such as the Department of Basic Education, district officials, and school principals, should offer organisational support to Accounting teachers. They should understand and engage in conversations with Accounting teachers about their social context, the available infrastructure and the technological resources, and the implications of new approaches to those technologies.

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This will enable trainers to know and understand teachers' training needs and what should be taught during a training session. According to the literature consulted for this study, there is agreement on the positive relationship between training and teachers' attitudes towards computers (Boyce, 1999; Gobbo & Girandi, 2001; Helmi, 2001; Sabizan, Gilakjani, & Sodouri, 2013; Williams, 2015).

In this study, the participants discussed their lack of motivation and frustration, and how this was linked to their lack of support/training, which demotivated them to use the new technologies available to them. According to Tolmie (2001), state of the art technology resources do not guarantee the successful implementation of CAL in the Accounting classroom. I found that the teachers' self-determination to implement CAL as a teaching strategy in the Accounting classroom contributed to the successful implementation thereof. Those Accounting teachers who were already implementing CAL as a teaching strategy at the time of this study were still hesitant as to how and when to use CAL in a way that is efficient and relevant to the subject content.

According to the results of my study, the participants who supported manual accounting were not against utilising CAL. They did, however, emphasise the importance of first completing Accounting cases manually for a better understanding of basic Accounting concepts. The participants that favoured manual Accounting were concerned with learners understanding and being familiar with the basics of Accounting before commencing with electronic Accounting. This finding is supported by Fridman *et al.* (2003), who find that teachers prefer the use of CAL in conjunction with traditional teaching strategies. The participants did acknowledge that the real world of work mainly requires the application of skills using electronic Accounting systems, but they felt strongly about the fact that learners should first understand manual Accounting before being exposed electronic Accounting.

Some of the participating Accounting teachers showed little interest in using CAL, while others were resistant to its use. Some of the teachers positively accepted CAL, but felt somewhat incompetent and restricted by a lack of knowledge to effectively integrate it into their classrooms. Feelings of non-intention, non-valuing, incompetence and lack of control led to many of the teachers' reluctance or resistance to implement CAL, resulting in a-motivated behaviour. They preferred to adhere to their familiar and traditional practices with which they felt more confident and comfortable. In this respect, when the importance of the teacher's role in the process of implementing CAL is taken into account, I am of the opinion

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that it is essential to know how interested teachers are in technology and what their attitudes are towards the implementation of CAL. Norum, Grabinger and Duffield (1999) studied the beliefs, thoughts, perceptions, knowledge and experiences of teachers attempting to integrate the use of CAL into their instruction. They found that teachers' felt that they needed to change their attitudes and take on new roles in order to integrate computers effectively. Integrating technology into the classroom may thus require changes in teaching strategies and teachers' beliefs.

In the literature review, I explored the concept of CAL, the background and history of CAL in Accounting education, and the relevant teaching strategies aimed at the inclusion of CAL in Accounting education. Different motivational theories were investigated, leading finally towards an explanation of why the SDT was selected as the theoretical framework of this study. The literature review provided a useful theoretical background that focused on the inquiry of motivational processes. The Self-Determination Continuum as the conceptual framework provided a scientific base for the findings of the multiple case study.

5.6 Recommendations for future research

Using the SDT as a theoretical framework broadened the existing literature as it afforded the discussion of possible extrinsic and intrinsic aspects that govern Accounting teachers' motivation towards the adoption of CAL as a teaching strategy. The SDT will be of value to researchers in addressing the issue of how the DBE can facilitate Accounting teachers' motivation. It will further help researchers to determine how Accounting teachers' teaching strategies can be adjusted to be responsive to their learners' current and future needs by adopting CAL methods. Exploring my recommendations for future research could facilitate the attainment of this goal.

My first recommendation is to consider an enquiry with the constructs of intrinsic motivation, extrinsic motivation and self-determination to implement CAL in the Accounting classroom. Such a research study could possibly lead the researcher to determine if the themes that were used in the current study, based on the SDT's three basic human needs, might be generalisable across a more representative sample. Such an enquiry might also allow for an extension of the findings of this study with those Accounting teachers who were excluded from this study based on the selection criteria (Section 3.6).

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Although this study presented new knowledge regarding aspects that influence knowledge regarding aspects that influence Accounting teachers' attitudes towards CAL, further research (a longitudinal study) is required to acquire an in-depth knowledge and understanding of this topic.

I further recommend a project that considers the training of practicing Accounting teachers on the use, implementation and value of CAL. The focus of such a study would be to train South African Accounting teachers how to use CAL and integrated subject-specific software as teaching strategies by focusing on certain topics and themes, as stipulated in the CAPS document (Department of Basic Education, 2011).

I finally propose that in a further research study, it would also be of interest to determine how Accounting teachers at private schools' experiences and attitudes towards CAL differ from those of Accounting teachers teaching at government schools in South Africa.

Based on my findings, I recommend the following to the DBE and managerial staff at private schools:

- Enhance practicing Accounting teachers' skills for the use of CAL as a teaching strategy.
- Facilitate CAL acceptance by training practicing Accounting teachers regarding the benefits of such acceptance.
- Provide the necessary internal, external and managerial support to activate the acceptance of CAL in the Accounting classroom across South Africa.

5.7 Concluding comments

The purpose of this study was to investigate the motivational aspects that influence Accounting teachers' attitudes towards the use of Accounting software in a computer assisted learning environment.

The results reveal the need for a process of integration of CAL into Accounting education. The significance of this study is that its results would be beneficial to other researchers, the DBE, and the Accounting profession. With regard to the Accounting profession, however, in the current South African socio-economic climate, the education system has an output larger than the growing economy; hence the demand for jobs is greater than the number of jobs

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available. With this in mind, it may be helpful for Accounting teachers to be aware of the possible recommendations of the research outcomes for providing and assisting learners with skills that could enable them to develop and support themselves.

I hope to contribute to the existing literature on Accounting education in South Africa, and more particularly, to extend the existing theory of Self-Determination. There is a scholarly need to understand the aspects that motivate Accounting teachers to implement CAL, as discussed earlier.

Due to the fact that only a few learners are likely to end up as Accountants, this may affect teachers' perception of CAL as a necessity in the Accounting classroom. Many Accounting learners might end up working in the private practice, for the community or organisations, or in a field that does not involve the use of daily Accounting practices and principles. Thus, the implementation of CAL in Accounting education may not serve the number of learners who will never become professional accountants. However, teachers should not look at CAL in the light of the temporary demands of the Accounting profession, but should rather see it as a means of improving and strengthening their teaching strategies in the classroom.

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APPENDICES

Appendix A: Structured interview

Appendix B: Questionnaire

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