Adoption of Activity- Based Costing at Technical and Vocational Education and Training in KwaZulu-Natal

By

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DECLARATION

I, Mziwendoda Cyprian Madwe, certify that this dissertation which I now submit for examination for the award of Master of Accounting, is entirely my own work and has not been taken from the work of others save and to extent that such work has been cited and acknowledged within the text of my work.

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ABSTRACT

This study seeks to provide a guide for a more advanced costing method that is going to provide some cost allocation techniques from a wider range of TVET college specific activities, and that will provide a valuable insight for management of a college. Such a method was achieved through the development of a standard activity dictionary and the functional decomposition of the campus into small divisions as the methods of identifying major activities that are performed at TVET colleges. Thereafter, a conceptual framework for adoption of Activity-Based Costing (ABC) was developed. The main expected contribution to knowledge is represented in the development of conceptual framework for adoption of the ABC system in KwaZulu-Natal TVET colleges and the originality in the current study lies in bridging the gap in the knowledge and understanding of ABC system in education sector. In addition to providing a way to allocate resources more efficiently, ABC can help colleges to determine the best way to meet their goal by monitoring the use of resources in particular activities.

The theory that forms the basis of this study is contingency theory. This theory explains how ABC system is contingent upon contingency factors including organisational and behavioural and technical variables. This contingency theory suggests that the adoption of ABC systems within public TVET colleges is depend upon, or at least associated with size of the firm, cost structure, product diversity, training, resistance to change, internal champion support and innovation, top management support, internal resources availability and technical variables.

The new model of ABC adoption has been developed in order to examine reasons why the ABC adoption remains low. This study also seeks to establish factors that constitute barriers to ABC.

The hand-delivery questionnaire was appropriate for data collection in this study. The census survey undertaken comprised six public TVET colleges at KwaZulu-Natal (KZN). Thirty (30) questionnaires were submitted, and thirty (30) questionnaires were returned, generating a 100% responses rate. The quantitative data were processed using a SPSS version 24.0, leading to appropriate descriptive and inferential statistical analyses, including frequencies, means, standard deviations and chi-squares.

Nine factors were identified from the literature, seven were found to be statistically significant associated with ABC adoption.

The qualitative research method was also used. The research strategy was embedded with multiple cases studies to validate the results derived from the census survey. This was selected to validate the results derived from census survey. The data were gathered via 10

face-to-face semi-structured interviews. The semi-structured interviews were conducted with employees from top and middle levels of the five TVET colleges. The semi-structured interviews and survey helped the researcher to discovered new ways of identifying activities such as using business process and examining the colleges' organogram.

This study found that public TVET in KwaZulu-Natal (KZN) are using the Student Based Costing (SBS) and these colleges do not obtain accurate programme costs because they fail to allocate overhead costs to their respective campuses under costing currently in use in these TVET colleges. This study also found that the public TVET colleges in KZN use a uniform cost (number of students) to assign overhead costs to respective programmes.

The findings of this study indicated that ABC has not been adopted at the public TVET colleges in KZN, as 60% of respondents indicated that there is no consideration of ABC to date and 100% of participants also confirmed that their colleges has not been adopted ABC to date. This result confirms that public TVET colleges at KZN are still using Traditional costing system (TCS). This study also showed that eight out of nine factors assist in the adoption of ABC system, and there is positive correlation between these seven factors and ABC adoption.

The research findings of this study have exposed some loose ends that could not be answered conclusively by the data, it therefore recommended that a further empirical research should be conducted using case study and survey at all 50 public TVET colleges in South Africa to detect the difficulties and barriers that prevent the adoption of ABC at TVET colleges.

LIST OF ACRONYMS

AA	Activity Analysis
ABC	Activity-Based Costing
ABM	Activity-Based Management
AD	Assistant Director
ACC	Ahlia Cement Company
AICPA	American Institute of Certified Public Accountants
CFO	Chief Financial Officer
CIMA	Charted Institute of Management Accountants
CPD	Centre for People Development
DHET	Department of Higher Education and Training
DUT	Durban University of Technology
FET	Further Education and Training
FRC	Faculty Research Committee
GAAP	General Accepted Accounting Principles
ICDL	International Computer Drivers Licence
HEI	Higher Education Institution
IFRS	International Financial Reporting Standards
IREC	Institutional Research Ethics Committee
IT&B	Information Technology and Business
IT	Information Technology
KMO	Kaiser- Meyer- Olkin
LLC	Libyan Cement Company
KZN	KwaZulu-Natal
MAS	Management Accounting System
MTC	Majuba Technology Centre
NATED	National Accredited Technical Education Diploma
NC(V)	National Certificate (Vocational)
NEWTECH	Newcastle Technology Centre
OAR	Overheads Absorption Rate
PMB	Pietermaritzburg
PSO	Public Sector Organisation
PPE	Property, Plant and Equipment
RHR	Ransome Hoffman Polland
ROI	Return on Investment

RTC	Resistant to Change
SAD	Standard Activity Dictionary
SBC	Student Based Costing
SETA	Sector Education and Training Authority
SET	Stock Exchange of Thailand
SMEs	Small and Medium Enterprises
OLU	Open Learning Unit
PLC	Programmable Logic Controller
SPSS	Statistical Package for the Social Sciences
TCS	Traditional Costing System
TVET	Technical and Vocational Education and Training
UK	United Kingdom
UNESCO	United National Educational, Scientific and Cultural Organisation
US	United States

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CHAPTER 1: INTRODUCTION

1.1 Introduction

This chapter provides a brief background to the study and discusses the research problem, the aim and the objectives are discussed and the significance of the study. This chapter also includes a discussion of the research methodology, problem statement, as well as an outline of the dissertation.

1.2 Background to the study

Cost information is necessary for decision-making. Managers use relevant cost information for operational and strategic decisions. For example, cost information is used in determining the selling price, for measuring product profitability and in determining product mix. As managerial decisions are concerned with future events, cost information plays an important role in planning and control functions (Aldukhil 2012:1).

In the costing of product or services, the appropriate treatment of overhead or indirect costs has posed particular challenges. The traditional costing system deals with these costs by a two-stage process of allocation or apportionment to cost centres, from where they are charged to the product or service. One of the major drawbacks of these is that they employ inappropriate measures for assigning indirect or overhead costs, leading to distorted product costs. Critics have therefore argued for better costs systems that reflect cost information more accurately. Activity-based costing systems (hereafter called ABC) were developed to overcome the deficiencies found in conventional cost systems (Aldukhil 2012:16).

ABC is defined as costing methodology that assigns indirect costs to individual activities or process cost pools and then traces costs to users of the activities that included products and customers (Player and Keys 1995; Aldukhil 2012).

Abusalama (2008) states that ABC is an alternative to the traditional treatment of overhead costs. ABC recognises that many overheads vary in proportion to changes in activities, rather than the measure of production volume utilized as the absorption base in the traditional system. By identifying the activities that cause costs to change and thus assigning costs to products based on the cost driver usage, it is claimed that ABC can more accurately measure the resources consumed by products (Abusalama 2008). This cause and effect relationship provides a superior way of determining relevant costs. Furthermore, it is claimed that ABC can be used for a range of cost management application such as value analysis, customer profitability analysis, and business process management (Drury 2012).

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In general, the management accounting literature has four genres of ABC research: consulting, basic, critical and contingency research (Otley 1980; Young and Selto 1991; Lukka and Grandlund 2002; Abusalama 2008). It can be argued that the genre of contingency research is the most recent and important development in the ABC literature. However, contingency-based research has been given little attention particularly at South African TVET colleges.

1.3 Problem statement

In the Technical and Vocational Education and Training sector, to date there is no proper tool that really measures the accuracy of the cost of running the courses offered in the education industry. The ABC system is more rewarding in determining the training courses compared to traditional costing (Ali 2012:96; Manuel 2011:10; Naidoo 2011:4). However, only three educational and training sectors in the world are ABC users (Aldukhil 2012:130; Hashim 2015:16). While there is wealth of literature on factors relating ABC implementation, no investigation has been conducted in South African TVET colleges. Most of the ABC studies have used the cross-sectional survey method (Chenhall 2003). According to Chenhall (2003) cross-sectional survey collect routine data that may not be designed to answer the specific question and routinely collected data does not normally describe which variable is the cause and which the effect.

1.4 Justification of the research

There is a lack of empirical studies regarding the adoption of the ABC system around the South African TVET colleges. No study on ABC has been carried out in South African TVET colleges. Therefore, this study is expected to open the door to more studies in South African institutions of higher education and other public sectors.

The reasons for this relatively low adoption rate, which include the following: technical variables such as identifying and aggregating activities, assigning resources to activities, selecting cost drivers (Innes and Mitchell 1995, 1998; Clarke et al. 1999; Groot, 1999; Chonguksut 2002; Brown and Pierce 2004; Cohen et al. 2005, Sartorius et al. 2007; Abusalama 2008; Aldukhil 2012), behavioural and organisational variables such as internal resistance, lack of top management support, human resources availability, lack of knowledge, and an expressed satisfaction with current systems (O'Dea and Clarke 1994; Anderson 1995; Shield 1995; Clarke et al. 1999; Innes et al. 2000; Chongruksut 2002; Brown and Pierce 2004; and Cohen et al.2005.; Abusalama, 2008; Aldukhil 2012; Elagili 2015).

There has been no empirical investigation indicating the impact of behavioural and organisational variables and technical variables on successful implementation of ABC in South African Institutions of Higher Education.

This study will explore how these variables influence South African TVET colleges on the implementation of ABC systems.

1.5 Aim of the study

The aim of this study is develop a conceptual framework for the adoption of an Activity-Based Costing model in TVET colleges in KwaZulu-Natal (KZN). The following are the objectives of the study:

- To determine the current practices of the costing model at TVET colleges in KwaZulu-Natal;
- To investigate factors that constitute barriers to ABC adoption at TVET colleges in KwaZulu-Natal;
- To analyse adoption methodologies that might be applicable to TVET colleges in KwaZulu-Natal; and
- To develop a conceptual framework for the adoption of an Activity-Based Costing model in TVET colleges in KwaZulu-Natal.

1.6 Research methodology

This study adopted the onion model that involves the following six elements of research methodology: research philosophy, research approach, research strategy, research method, data collection, and data analysis (Elagili 2015).

Positivism and interpretivism or the phenomenological approach is adopted in this study, as suggested by Collis and Hussey (2009). Therefore, this study combines the deductive and inductive approaches.

The research approach adopted in this study involves the use of mixed methods, which encompass the use both quantitative and qualitative data collection techniques. This research approach is adopted to give an idea of numerical strength of the views and experiences of the respondents on the issues being studied and semi-structured interviews will later use in order to validate results derived from hand-delivered questionnaires.

Therefore, the convergent parallel mixed method is adopted where both quantitative and qualitative data will be analysed separately and then compares the results to ascertain whether the findings confirms or disconfirms each other.

1.7. Contingency theory in managerial accounting

The theory that forms the basis of this study is the contingency theory. This theory provides illustrations of the relationship between the contingent factors (behavioural and organisational and technical variables) and the features of management accounting systems. This theory provides an essential background for developing the research model developed in chapter 3. The contingency theory of this study suggests that ABC adoption is contingent on behavioural and organisational and technical variables (refer to Figure 3.6).

1.8 Organisation of the study

This dissertation comprises of eight chapters, delineated as follows:

1.8.1 Chapter 2: Activity-based costing (ABC) at TVET colleges

This chapter presents an overview of existing literature on ABC adoption and factors that constitute barriers to ABC adoption. This chapter aims to provide background information on the traditional costing system (TCS) and ABC systems. It reviews the nature of both systems, and will discuss the different approaches adapted by TCS to the treatment of overhead costs, comparing both systems using Cooper's examples (1988).

1.8.2 Chapter 3: Empirical findings of prior studies, TVET colleges' context and ABC adoption strategies

This chapter overviews the background of five TVET colleges as case studies of this study. It also reviews and analyses the findings of a number of studies regards adoption of ABC systems in different countries. It also analyses and discusses the adoption methodologies applicable to public TVET colleges and reviews the empirical studies relating to ABC adoption, in order to establish the extent that contingent variables and technical difficulties actually play a part in ABC adoption.

1.8.3 Chapter 4: Research design and methods

This chapter provides the appropriate research methodology in order to accomplish the objectives of this research. It also provides the philosophy, paradigms and the research question that will be answered in this study. This will be achieved by supporting each hypothesis posed in chapter 2 with arguments that are based on the literature on ABC adoption.

1.8.4 Chapter 5: Presentation and discussion of quantitative results

This chapter provides the analysis of the questionnaire data and presents analysis of the data collected from each question of the survey. These results are presented, question by question, in the sequence in which the questions appeared in questionnaire.

1.8.5 Chapter 6: Presentation and discussion of qualitative results

This chapter will present the findings and discuss of the empirical investigations of five case studies. The findings were produced from 10 face-to-face semi-structured interviews. This chapter will also findings will validate findings from the quantitative method conducted with thirty finance staff members from five public TVET colleges in KZN.

1.8.6 Chapter 7: Testing of the research model and conceptual framework for ABC adoption

This chapter shows how the results support the theoretical model developed in chapter 3 and how they support each of the nine hypotheses posed in chapter 2, in order to answer research question posed in chapter 4. This chapter also presents the conceptual framework as a guide for ABC adoption within TVET colleges.

1.8.7 Chapter 8: Conclusions, contributions, and future research

This chapter presents the conclusions and highlights the contributions of the study. It then discusses the theoretical and methodological contributions of the research, limitations of the study. Moreover, it suggests potential avenues for further research.

CHAPTER 2: ACTIVITY-BASED COSTING (ABC) AT TVET COLLEGES

2.1 Introduction

This chapter discusses the core terminology of Activity-Based Costing (ABC), and defines ABC and Technical and Vocational Education and Training (TVET) as the key concepts in this research. This chapter also discusses the deficiencies of conventional cost systems, the development and evolution of ABC and the benefits of ABC at TVET colleges. It also sheds light on the issues relevant to the research objectives in this dissertation by discussing the costing model currently in use at TVET colleges, and factors that constitute barriers to ABC adoption at TVET colleges. These considerations contribute to the development of the adoption methodologies that might be applicable to TVET colleges and a conceptual framework for adoption of an ABC model in TVET colleges.

2.2 Core terminologies of activity-based costing

According to Fountaine (2011), ABC entails a variety of specific terms. Fountaine (2011) states that, to assist in understanding ABC and develop methodology applicable to an organisation, the following fundamental terms should be described:

• **Resources (inputs):** The basic elements within an organization that are consumed in the production of its services – in a manufacturing environment these "resources" include the things that comprise the product such as materials and labour. Kumar and Mahto (2013:3) describe resource as an economic element needed or consumed in performing activities. For a TVET College, they would include lecturer time, other personnel time, facilities, etc.

• **Activity:** The most basic building block in the construction of the ABC model is an activity. An activity is an event that causes the consumption of resources (Brewer et al. 2010) and, when viewed in the sequences in which they are performed, activities represent the basic actions that can be connected together to form a process (Fountaine 2011:28). Potential activities in a school would include direct instruction, counselling, parental communication, etc. According to Fountaine (2011:3), an activity is an element of work to be performed to complete a project; it is a process or operation requiring time and associated resources. According to Kumar and Mahto (2013:3), people, equipment, technologies or facilities perform activity work.

• **Activity measure:** One unit of an activity is an "activity measure" and expresses how much of an activity is performed; these measures are the basic units of the activity used to accumulate them into activity cost pools, and then assign them out to processes (Brewer et al. 2010). A likely activity measure in a school would be an hour of a teacher's time.

• **Activity cost pool:** An activity cost pool is a collection of costs pertaining to a particular related set of activities; it is the "bucket" into which costs relating to a particular activity or closely related set of activities is accumulated (Brewer et al. 2010), and from which costs will be assigned to processes performed by the organization. In a school, a cost pool might be teaching costs, counselling costs, the college library costs, etc.

• **Cost drivers:** Cost drivers are the elements that have a direct bearing to causing costs (Kinney & Raiborn 2012); they are the factors that determine the level of costs in a particular activity or process (e.g., more of a driver causes higher costs); in a manufacturing environment, more production (the driver) would increase electricity costs (Sarkis et al. 2006). A cost driver is a factor that causes or relates to the change in the cost of an activity. It is either a resource consumption cost driver or an activity consumption cost driver (Kumar & Mahto 2013:3). In a TVET college, potential cost drivers could be a number of students, number of field trips, etc.

A resource consumption cost driver measures the amount of resources consumed by an activity. It is a cost driver for assigning a resource cost consumed by an activity to a particular activity or cost pool (Kumar & Mahto 2013:3). Examples of resource consumption drivers are the number of items in the purchase order or sale order, changes in a product design, size of factory building, and machine hours.

An activity consumption cost driver measures the amount of an activity performed for a cost object. It is used to assign an activity cost or pool costs to cost objects (Kumar& Mahto 2013:3). Examples of activity consumption cost drivers are the number of machine hours in the manufacturing of product X, or the number of batches used to manufacture product X.

• **Process:** A process is comprised of activities and any given entity (such as a manufacturing plant or a TVET college) will have several processes. A process is a connected series of activities performed to create an output (Kinney & Raiborn 2012); a process can also be thought of as a path through a set of activities (Fountaine 2011:28) that leads to an output. An example of a manufacturing environment process might be its production process – a collection of activities such as conversion of raw material into finished goods and more other activities leading to an output (producing finished goods).

• **Cost objects (outputs):** Cost objects are any product or service of an organization for which cost accumulations are desired – this is highly dependent upon the organization – in a manufacturing environment a typical object would be one unit of output (Sarkis et al. 2006). In the context of a service industry (e.g., school), those outputs are the results of services (service outputs); examples in a school might include the cost of graduating a student or a

measure of performance improvement on assessment tests. Kumar& Mahto (2013:3) state that a cost object is any product, service, customer, contract, project, process or other work unit for which a separate cost measurement is desired.

• **Activity analysis:** An activity analysis is the process of studying an organization's activities for categorizing them, and also to determine which are not adding value to the organization's purpose (Kinney &Raiborn 2012). This study performs this analysis through a series of interviews, observations, and other data collection instruments and techniques.

• **Process map:** A process map is a graphic representation – a detailed flowchart that depicts how activities are connected into processes and how processes, in turn, are connected to creating outputs (Kinney &Raiborn 2009); activities are combined together in a meaningful way to form processes (Fountaine 2011). A school might have a process consisting of various activities and other inputs identified as producing student achievement output.

To summarize, resources (that cost money) such as lecturer time or facilities usage, are consumed in the performance of activities (e.g., direct instruction) which in turn, drive costs (Kinney &Raiborn 2012).

Full costing method: stands for the ability to identify, calculate and allocate all direct and indirect costs of an organization. The full costing method demands a complete separation of direct and indirect costs occurring in an organization (Lutilsky and Dragija 2012:38).

2.3 Technical and vocational educational and training (TVET)

TVET stands for 'Technical and Vocational Education and Training'. It is an international educational term that is applied to certain post-school educational institutes (UNESCO-UNEVOC Conference on TVET 2014). TVET is used as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life.

TVET was created at the 1999 United National Educational, Scientific and Cultural Organisation (UNESCO) International Congress on Technical and Vocational Education in Seoul, South Korea. Following the congress, UNESCO-UNEVOC established the International Centre for TVET in Germany with the aim of helping member states to promote and upgrade their vocational post-school education systems. TVET has become an international educational initiative aimed at improving vocational training programmes around the world (UNESCO-UNEVOC Conference on TVET 2014).

2.4 The definition of activity-based costing

Ray (2012:7) defines ABC as a method of costing activities that are necessary for the production of products or services (i.e. activities being undertaken). ABC is a technique of measuring the cost and performance of activities and cost objects. Hence, the system assigns cost to activities based on their use of resources, and assigns costs to objects based on their use of activities (Ray 2012:7). Ray (2012) defines ABC as a system that allows organisations to track the cost associated with activities performed to produce a product or to deliver a service. The main assumption of the ABC system is: product consumes activities and activities consume resources (Lutilsky and Dragija 2012:37). In the ABC system, direct costs are also directly traced to products or services, but the main attention is paid to indirect costs, which are allocated to activities.

The American Institute of Certified Public Accountants (AICPA) and the Chartered Institute of Management Accountants (CIMA) (2015) describe activity-based costing as an approach to the costing and monitoring of activities, which involves tracing resource consumption and costing final outputs. Resources are assigned to activities and activities to cost objects. The latter use cost drivers to attach activity costs to outputs.

ABC was first defined in the late 1980s by Kaplan and Bruns. It can be considered as the modern alternative to absorption costing, allowing managers to better understand product and customer net profitability. This provides the business with better information to make value-based and, therefore, more effective decisions. ABC is a total quality management tool for cost and performance measurement of activities, resources, and cost objects (i.e., products and services). ABC is also known as the "horizontal" or cross-functional cost view and can provide fact-based insight into the spending and profitability of products, services, customers, districts, distribution lines, etc. (Naranjo-Gil 2009).

ABC focuses attention on cost drivers, i.e., the activities that cause costs to increase. Traditional absorption costing tends to focus on volume-related drivers, such as labour hours, while ABC also uses transaction-based drivers, such as number of orders received. In this way, long-term variable overheads, traditionally considered fixed costs, can be traced to products (Sarkis et al. 2006). ABC helps managers understand how they use their resources so they can improve the effectiveness and efficiency of their organization; the organization's leaders identify the outputs critical to their mission, and ABC realigns the resources and associated costs consumed according to those outputs. Sarkis et al. (2006:757) describe ABC as "a cost accounting methodology used to allocate costs across activities of an organization's

processes, and then accrue those costs based on services produced by an entity. It can also be used to help evaluate performance of activities and cost objects."

Activities are the building blocks that are connected together in the performance of processes (one process is comprised of several activities), and processes are the paths that ultimately lead to outputs (service outputs, in the case of a college or other service-providing entity). Activities are assigned to processes utilising units of the activity measure (e.g., how many hours of direct instruction are consumed in the process leading to improving performance on standardized assessment).Turney (1996) defines ABC as a method of measuring the cost and performance of activities and cost objects. It assigns the cost to activities based on their use of resources and assigns cost-to-cost objects based on their use of activities. Based on this definition, ABC is more than product costing; it provides a means to measure activity performance in order to determine how well work is done in that activity.

ABC systems refer to the method used to determine the cost of activity and cost objects. In contrast, Activity Based Management (ABM) systems refer to the use of ABC information in making strategic and operational decisions (Fountaine 2011). In this study, the terms ABC and ABM are used interchangeably to describe a management information system that can be used by managers to support strategic and operational decisions. The goal of ABC is to improve the accuracy of product costs and provide a means for the improved management of process and support activities. It is part of a process of continuous improvement aimed at improving the value received by the customer and enhancing profitability by providing this value (Fountaine 2011).

2.5 Deficiencies of conventional cost systems

Abusalama (2008:22) argues that the limitations of conventional cost systems arise from the use of volume-related bases in the second allocation stage, to assign costs from cost centre to products. Abusalama (2008) states that this procedure may have been adequate decades ago when direct labour was the principal value-adding activity in the material conversion process. The criticism of conventional cost systems (traditional costing cystems) for distorting product costs, which arose only during the mid-1980s, was not by change, but because significant changes in production technology made costing distortion unavoidable in traditional costing system (TCS) (Abusalama 2008:23).

ABC systems emerged as a result of the deficiencies in conventional cost systems (Aldukhil 2012:16). Aldukhil (2012:16) highlight the following limitations of conventional cost systems:

- Focus on financial information;

- Inaccurate costing; and
- Failure to encourage improvement.

2.5.1 Conventional cost systems focus on financial information

The conventional cost systems provide financial information that governs performance evaluation (Aldukhil 2012). Financially-orientated information, such as return on investment (ROI) and divisional profit, is important for internal managers as well as external constituencies. There is limited non-financial information that can be derived by conventional systems at macroeconomic levels of the organisation, for example, through-put time and number of production runs for specific products in the production function and inventory turnover in the inventory control function (Aldukhil 2012:16).

Significant non-financial information (for example, defect rate, cycle time and activity efficiency) is beyond the scope of conventional systems. Traditional financial information is an indirect measure of quality and time and is more difficult to interpret than non-financial information (Aldukhil 2012). For example, rework rate is easier to interpret than cost variance. Financial information in such systems is reported by the functions or departments (for example, purchasing and marketing), not by the activities (for example, inspecting and material handling). This implies that traditional cost information measures the resources that are actually spent rather than the way in which they are spent (Aldukhil 2012:16).

2.5.2 Inaccurate costing

When conventional cost systems were developed, the level of competition was moderate, and cost structures were dominated by direct material and direct labour (Abusalama 2008).

Further, there was similarity among products in the consumption pattern (labour consumption intensity). Typically, support overhead costs were allocated to the products based on direct labour hours. Direct labour hours represent a basis that changes in proportion to the change in production volume. This basis was warranted because the overhead costs' level was as low as five to fifteen per cent of the total product costs. However, since the early 1980s, the competition level has increased and technology has changed rapidly (Aldukhil 2012). This situation forced managers to change the way their firms operate. Labour was a costly resource and reasonably-priced technology was available to reduce labour requirements.

It was estimated that direct labour had decreased to fifteen percent in automated industries and five per cent in high-tech industries (Aldukhil 2012: 16).

The new cost structure causes distorted product costs. Conventional cost systems allocate overhead costs to products equally, regardless of the batch size or the complexity of the products. This method contributes to over-costing large batches and less complex products and under-costing small batches and more complex products. It is not necessarily true that high-volume products consume more overhead resources than low-volume products. For example, set-up costs do not change in proportion to the batch size (Lam 2006).

The problem is that conventional systems (TCS) do not recognise the fact that activities are performed on different levels (Aldukhil 2012:17). Aldukhil (2012:17) classified activities into four general categories which are discussed in figure 2.2.

Another source of cost distortion is production capacity. TCS calculate the overhead rate based on the budgeted production volume. This volume causes the rate to fluctuate according to the expected demand. For example, if the anticipated demand is low, the overhead rate will be high, causing the product costs to increase. A volume-related allocation base is used to assign factory costs to products. This means that high-volume products account for most of the costs. Consequently, management decisions related to pricing and product mix can be affected dramatically. In contrast, ABC uses practical capacity or the actual resources supplied to calculate activity cost drivers. This leads to consistency in such drivers and product costing as well as improvement in decision-making (Aldukhil 2012:19).

2.5.3 Failure of conventional cost systems to encourage improvement

Conventional cost systems do not provide managers with insights on how to improve business processes. Direct labour and machine hours represent significant cost drivers in the traditional environment. Managers focus their attention on cutting down these resources. Although using multiple cost drivers (direct labour and machine hours) may improve the accuracy of product costs, these drivers lag on capturing the work of non-unit based activities. The common characteristic among these drivers is that they are volume-related bases (Turney 1990).

The conventional organisational structure along hierarchical lines impedes effective communication between departments and other areas of the organisation.

This structure encourages departmental managers to take actions at the department level. One department may take action at the expense of other departments. For example, the production department may reduce direct labour or machine hours by redesigning a product but, in turn, cause quality problems in the quality control department or even increase overhead costs in the production department (Roberts & Silvester 1996).

Further, if management eliminates an activity (for example, inspection), conventional cost systems do not reveal the source of cost reduction because the savings are buried in a large overhead pool. In addition, products with the greatest machine hours or direct labour content are assigned the greatest benefits from the cost savings (Turney 1996). In general, TCS does not help managers identify opportunities for improvement or assess the consequences of improvement efforts.

2.6 Development and evolution of activity-based costing

When ABC was introduced, it was viewed as a methodology that could serve as a substitute for TCS (Abdallah and Wei 2008:7). Viewing ABC as an accounting system has helped managers to upgrade their existing systems. However, this view ignores the true value of ABC as a cost planning system that focuses on activities to provide timely and relevant information for managers (Xu 2012:15). ABC was designed in order to correct the deficiencies of conventional cost systems. The initial purpose of the ABC system was to provide a fair and accurate cost allocation, as well as the product profitability evaluation (Lutilsky and Dragija 2012:36). Accordingly, it was designed to focus on indirect cost allocation to cost objects. The core component of ABC approach is activities (Aldukhil 2012:14)

2. 7 Two-stage of overhead allocation process in ABC

This section illustrates the two-stage allocation process for ABC, and provides a general comparison between ABC and TCS. These two methods have differences not only in the nature of allocation bases, but also in the number of allocation bases utilized to allocate costs in the second stage (Abusalama 2008).

Expenditure which has element of production and services, the identification of which cannot be made economically with the help of specific sealable cost units, are defined as overhead costs Walker (2009). Innes and Mitchell (1995) explained the indirect nature of overhead costs as them having to be distributed reasonably and specifically among various units of cost.

The function of an organisation that has authority to acquire cost is kept in mind before the classification of overhead costs, which includes production, distribution, administration and selling of overheads (Kinney and Raiborn 2012). Except for general overheads, the majority of operational costs are classified by overhead allocation (Elagili 2015). However, Walker (2009) states that fixed production costs are of great significance as manufacturing is the key business function that changes inputs into finished goods within the organisation. The production or manufacturing department is composed of various production cost centres and service cost centres, such as the stores and the repairs sections. Elagili (2015) argued that

there is a direct connection between the production process and manufacturing cost centres, unlike service costs centres, which only offer support to the manufacturing cost centres.

Elagili (2015) states that the allocation of cost cannot be achieved without classifying cost to particular cost centres. Elagili (2015) elaborated upon this point by presenting the example that a picking division cost centre will deal with the wages of the manager of the picking section of an organisation. However, Elagili (2015) states that wage cost allocation over cost centres such as stores and repair section are not necessary. Cooper et al. (1992) present the basic steps of assigning indirect costs under TCS and ABC in figure 2. 1.

Figure 2.1: A comparison between TCS and ABC (Cooper et al. 1992)

First stage	Resources		Resources	First Stage
	Cost pools		Activities	
Second stage				Second stage
	Units of output		Units of output	
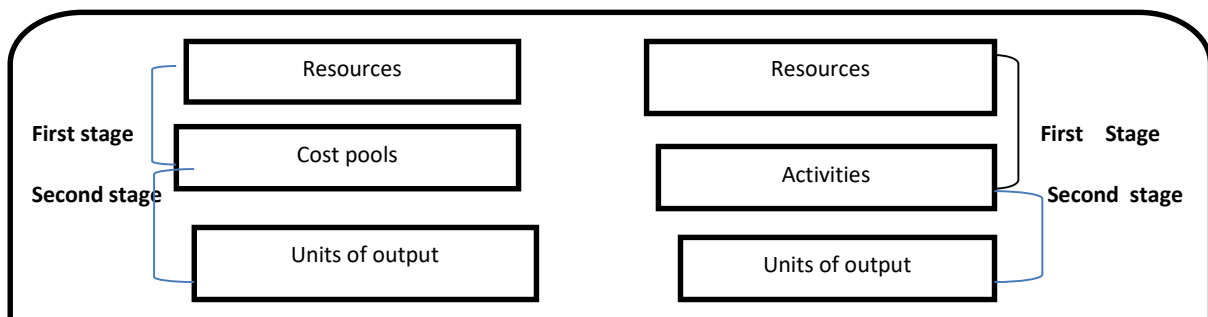
These basic steps can be combined into a two stage process:

The first stage assigns all indirect costs to the activities in activity centres based on resources driver. At this stage (stage one) a cost hierarchy technique is utilised to segregate the indirect costs into four categories (Abusalama 2008):

Figure 2.2: Manufacturing cost hierarchy

Output-Unit Level Costs

Batch-Level Costs

Product Sustaining Costs
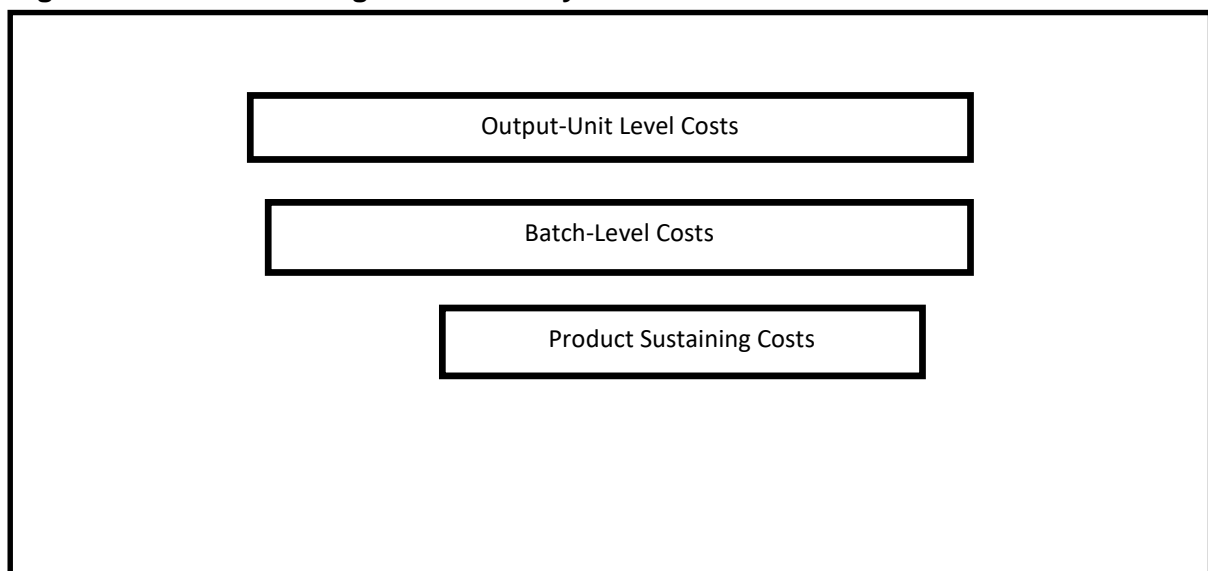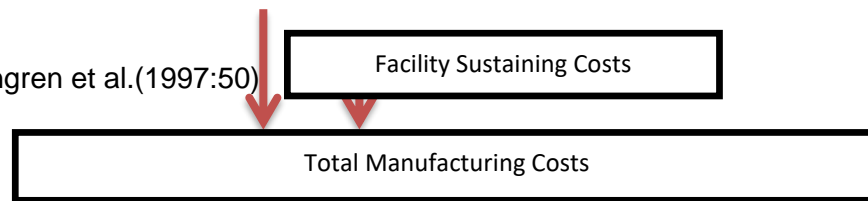
The above diagram shows four manufacturing cost categories:

- Unit-level activities: Costs are assigned to activities that act on each individual unit of product or service, such as direct labour or materials.
- Batch-level activities: Costs are assigned to activities associated with a group of units of products, such as set-up costs, material movements or purchase orders.
- Product-sustaining activities: Costs are allocated to activities which are performed to support a specific product or service, such as process engineering, product specifications or engineering changes notices; and
- Facility-sustaining activities: Costs viewed as period costs, are assigned to activities underpinning the organisation as a whole. Most of these activities are administrative, and include things as diverse as plant management, security, taxes, building and grounds maintenance, heating and lighting, given that the facility-sustaining activities are not based on product-related characteristics (quality, product complexity, product flexibility or volume).

In the second stage of the ABC process, indirect costs are assigned from activities to product based on the products' demand for these activities during the production process. Cooper and Kaplan (1998) state that ABC uses many second-stage bases to allocate costs to the products; some of these bases are used to trace input whose consumption varies directly with the number of items produced, while others are used to trace inputs whose consumption does not vary with quantity. Therefore, the ABC system utilises a greater number and variety of second-stage cost drivers than used in TCS (Elagili 2015). Abusalama (2008) describes the procedure of using the two-stage allocation for ABC as being quite simple to illustrate and even to implement in practice.

In multi-product manufacturing, the TCS smooth over all overhead costs to product on an equal basis (Vigario 2007; Kostakis et al. 2011; Shaikh 2010). This occurs as the system assumes that products consume indirect costs in proportion to production volumes (Van der Walt, De Wet & Meyer 2012). As a result, low volume products are under-costed and high volume products are over-costed (Mushonga 2015). This distortion occurs because the TCS allocates indirect manufacturing using a volume-related formula based on direct labour, direct material or machine utilisation, although these resources represent only a small percentage

of the total cost of most products or services (Macintosh 2011). Consequently, a company quoting on a cost plus basis may out-price itself on high volume products and sell the low volume loss making products (Vigario 2007). The ultimate consequence is a loss in sales (Reeve et al. 2012) and a decline in profitability and international competitiveness (Macintosh 2011). For this reason, the ABC system may be a more reliable costing system than theTCS (Mushonga 2015).

Mushonga (2015) views TCS as producing not only inaccurate but also incomplete information or statements for management. Mushonga (2015) views the current reporting using the traditional approach as producing data in the form of a chart of account view, which is incomplete and unprocessed. In Cokins's (2002) view, ABC techniques are used to further process the data from a TCS into more useful information for management decision-making. This view is confirmed by Benjamin et al. (2009) who argue that ABC is essentially an extension of the TCS. In other words, ABC may complement TCS and, in this light, should not be seen as a substitute for TCS.

Cokins et al. (2011) argue that ABC resolves the deficiency of the general ledger view by focusing on the activities that drive the costs. Cokins et al. (2011) add that ABC is work centric whereas a TCS (traditional general ledger) view is transaction centric. An ABC system resolves the structural deficiencies of the general ledger by converting the general ledger account balances into activity costs and assigning these to cost objects by use of an appropriate activity cost driver (Mushonga 2015). This is contrary to the view of other researchers such a Vigario (2007) and Johnson and Kaplan (1987), who regard ABC as a substitute and not a complement to TCS. Hence, companies may need to remove the limitations of TCS by implementing ABC (Mushonga 2015).

The ABC is required to further process and translate the total general ledger account balances into work activities that consume the financial general ledger's expenses, and this helps to increase the finance manager's insight into costs (Mushonga 2015). Cokins (2002) also assigns more importance to the wording used to describe activities in an ABC system than those in a TCS. He points that the ABC system uses action-verb-language of the traditional general ledger. This chart of activities language such as "inspect defective goods" or "analysis claims" is important to management as it suggests that the activities can be influenced favourably or terminated if they represent a waste (Mushonga 2015). The increased insight into what drives costs, coupled with the claim that ABC also reduces waste, may demonstrate that the system is more suitable to any companies than are TCS (Mushonga 2015). Therefore, companies may need to use both systems for reporting and decision-making.

The TCS reports costs but does not show the factors driving these costs (Mushonga 2015:23). The ABC, however, corrects this limitation by analyzing the work activities responsible for causing the costs (Mushonga 2015). Mushonga (2015) views ABC as a user interface that translates traditional reports into more useful information in the same way that a machine user interface in a computer system translate the machine language to human language.

Garrison et al. (2011) concur with Cokins (2002) and argue that ABC is ordinarily used to supplement a company's current costing system, and not as a replacement of the company's usual costing system. Garrison et al. (2011) found that many companies that use ABC have two costing systems: the official costing system that is used for external financial reporting, and the ABC system that is used for internal decision-making and management activities. Moreover, De La Villarmois (2011) concludes that the TCS is most widespread, either used alone or in addition to other costing systems. It may, therefore, be necessary for any company to make use of a so-called hybrid system that is a combination of TCS and the ABC (Mushonga 2015:23).

Mushonga (2015) states that many companies that were operating several decades ago could afford only a few product lines to a small number of customers. However, the same companies today might make-to-order many products for a large client base. Decades ago, the company could simply spread its overheads on a volume basis, such as number of units produced or direct labour hours consumed (Mushonga 2015). However, such allocation of overheads by the companies across product costs, such that spreading these costs across these products would produce misleading information on costs (Mushonga 2015).

Mushonga (2015) states that adding to the problems associated with the use of TCS in modern day businesses are technological changes that have affected many industries. Myers (2009) states that the current manufacturing environment is characterized by an increasing use of advanced technologies, such as robotics, computer- aided manufacturing and flexible systems. Automation has reduced the direct labour used in manufacturing, while the proportion of indirect overheads has increased (Mushonga 2015).

2.8 Application of activity-based costing in public organisation

Application of ABC into public sector and other service environments has eventually followed its growing use in for-profit environments (Garrison et al. 2011). Fountaine (2011:36) states that in the public sector, government's lack of a profit motivation has resulted in a lag of adoption of management techniques compared to industry, but introduction of a cost accounting system in a public sector can enhance awareness, strategies, and performance evaluation. Increasing fiscal pressures for performance accountability in public sector entities

will require leaders to adapt and improve; ABC is one of the methodologies for accomplishing this improvement (Fountaine 2011). ABC is a valuable tool to accurately determine product and service costs, something that is becoming more and more essential to government departments, many of which operate on a cost recovery basis (Fountaine 2011).

For example, Fountaine (2011) investigated the potential of shifting a public sector operation facing severe budget constraints from traditional chart of account line item budget to an output - oriented operating budgeting analysis, finding positive outcomes; England's Defence Logistics Agency achieved improvement in its efficiency and effectiveness through assessing its performance and cutting costs using the ABC methodology.

Kline (2003) notes ABC's increasing use, and makes an argument for its application in public sector entities, noting two specific reasons. First, ABC provides the means of benchmarking public service against private sector alternatives; second, government entities' usage of cost and efficiency as performance measures requires accurate cost information and placement.

A federal government organisation in Washington D.C. was among several that were mandated to adopt commercial measures as a means of streamlining operations and improving accountability (Fountaine 2011). In conjunction with this measure, ABC methodologies were adopted and utilised successfully to reduce costs and identify excess capacities; as noted earlier, however, there is an imperative that the organisation's participants possess the requisite technical abilities (Sagan 2004).

Fountaine (2011:38) states that related to these benchmarking-type efforts is an increase in public sector outsourcing when it is advantageous to do so. In many instances, government entities make the wrong decision regarding outsourcing a particular service, choosing to outsource when it would be better not to do so, or choosing not to outsourcing when it would be less expensive to have another entity perform the service (Fountaine 2011). Fountaine (2011) and Garrison et al. (2011) suggest government's constrained resource usage can be better understood when using ABC methodology. Hence, the decisions of whether or not to outsource in a particular instance can be made more accurately when the relative costs and benefits are understood properly.

Fountaine (2011:38) states that in one successful application of an ABC-type approach in a non-profit setting, traditional cost estimation was shown to be inferior to the strategic management methodology in examining cost drivers in Norwegian primary and secondary schools; the cost driver approach provided a framework for selecting a broader set of variables to explain costs that were yielded by the traditional cost estimation techniques. Cooper and Kaplan (1998) state that the US government has also utilised ABC to properly set fees for its immigration services as well as to better monitor and improve its cost of providing veterans' death benefits.

Veldarram and Sanchez (2006) analysed the relative advantage of utilising an ABC model for public universities and found that Activity-Based Costing methodologies contributed positively to producing the information needed for managers' problem solving. In another higher-education setting, United Kingdom universities successfully utilised Activity-Based Costing to understand faculty, department, programme, and support costs by linking them to income streams and determining value added (Mchlery et al. 2007).

2.9 The application of TCS in higher education institutions (HEI)

The higher education institutions (HEI) use the fund accounting system whereby the costs are allocated at the cost centres (Amir et al. 2012:3). These cost centres consists of faculties (campuses), administration and service offices (Amir et al. 2012).

The HEI costing system is designed for compliance and reporting purposes rather than for providing the information needed for effective management (Amir et al. 2012:3). Under the present system, the cost per student is calculated by taking into account faculty costs only.

Amir et al. (2012:4) also state that these costs later divided by the number of students in that particular faculty to derive to the student cost per faculty. In this case, only the number of students is considered as the cost driver. Therefore, HEIs are using Student Based Costing (SBC) in the calculation of the costs of each programme.

Maria (2013:3) concurs with Amir. et al. (2012) by stating that "There is almost a complete lack of visibility on how much it actually cost to deliver post-secondary education and how those costs compare to outcomes achieved".

Maria (2013) also states that the HEIs do not understand the cost of their educational activities and how they relate to outcomes under SBC. These HEIs cannot target cost reduction to specific activities (Maria 2013:3). So, when needing to reduce costs, many HEIs have turned to simplistic actions such as across-the-board cuts (Maria 2013:3).

Amir et al. (2010:3) state that "It is a well-known adage in the world of the business that what is not measured cannot be managed or improved". Amir et al. (2013) also state that, without knowing the costs of educational activities, under the costing systems (SBS/TCS) currently in use in HEIs, faculties and administrators lack the ability to improve productivity in a systematic and sustainable.

Shank and Govindarajan (1993) state that traditional management accounting is, at best, useless and, at worst dysfunctional and misleading. Shank and Govindarajan (1993) also state that it is not that conventional cost systems, such as TCS is inaccurate, it is just irrelevant.

The difficulty with the conventional cost system is that HEIs do not obtain accurate programme costs because they fail to allocate overheads costs, or they use a uniform cost driver (number of students) to assigned overhead costs to work divisions (Kim and Ballard 2011). There is a common concern on the ineffectiveness of HEIs in managing their financial resources as a result of TCS (Amir et al. 2012:1).

The traditional conventional system is not structured to measure costs in a way that can answer the fundamental value problem in the HEI and how institutions deliver improved outcomes at a lower total cost? (Maria 2013:4).

Maria (2013) also states that TCS such as, conventional cost system group data in a way that can answer high International Financial Reporting Standards (IFRS) and General Accepted Accounting Principles (GAAP) financial reporting needs, such as how much an institution spends on salaries and benefits (Maria 2013:4). However, existing accounting systems (TCS) do not provide information on an institution's activities and how changes in these activities affect their underlying cost structure (Maria 2013).

Maria (2013) believes that the costing system that is currently in use in HEIs cannot enable the IHE to spread overhead expenses among the different programmes and activities performed, this would not allow administrators to understand the cost of these activities as these new activities as they compare to their total resources.

Maria (2013:4) states that the only path available will help answer question (how HEIs deliver improved outcome at a lower total cost?), and that path requires institutions to look at their costs through a new lens, a lens that will allow them to compare their costs with whatever outcomes are deemed most important for the institutions. This new lens is a combination of ABC with a per course cost allocation strategy.

2.10 Comparing TCS and ABC system

The ABC system and the TCS system are two different costing methodologies with a common goal, i.e., to provide an instrument to establish product costs as accurately as possible (Drury 2012). In order to understand how and why the costing methodologies are different, it is important to understand the dynamics surrounding each costing methodology (Reynolds 2014:14). Reynolds (2014) also states that direct costs for both TCS and ABC remain the same. The differences result from the allocation of overheads to products or services. In order to illustrate the differences between TCS and ABC the following need to be considered as suggested by Faul et al. (2003):

The annual output for each product is as follows:

Table 2.1: Annual output for each product				
			Department A	Department B
Name of the product		Units	Labour hours	Machine hours
Product A		10 000	20 000	40 000
Product B		40 000	80 000	120 000
Product C		80 000	120 000	320 000
			220 000	**480 000**

Table 2.2 shows the costs of each service department/ activity cost pool before these costs are assigned to department A and B using TCS.

Table 2.2: The overhead costs for each activity pool are:	
Activity Pool	**R**
Material Handling	300 000
Material procurement	100 000
Set-up	150 000
Quality Control	250 000
Production	1 660 000
Material Receiving	420 000
Material Packing	380 000
Maintenance	420 000
Total	**3 680 000**

Source: modified and adapted from Faul et al. (2003)

The company has seven service departments: material handling, material procurement, set-up, quality control, material receiving, material packaging and maintenance and two production departments, A and B. Production department A has been identified as being labour intensive while department B is machine intensive: 35% of the production cost is allocated to department A and the remainder to department B. The overheads are traditionally recovered in department A on the basis of labour hours and in department B on the basis of machine hours. The overheads are allocated to the production department based on estimated usage as follows:

Table 2.3: Allocation percentages of overhead costs to Departments A and B		
	Department A	Department B
Material Handling	35%	65%
Material procurement	60%	40%
Set-up	30%	70%
Quality Control	45%	55%
Material Receiving	80%	20%
Material Packing	65%	35%

Maintenance	20%	80%

Source: modified and adapted from Faul et al. (2003)

Table 2.4 shows the allocation of overhead costs to each department on the basis of labour hours and machine hours.

Table 2.4: Overhead costs using Traditional Costing System (TCS)			
	Department A	Department B	Total
Production	581 000	10 79000	1 660 000
Material handling	105 000	195 000	300 000
Material procurement	60 000	40 000	100 000
Set-up	45 000	105 000	150 000
Quality control	112 500	137 500	250 000
Material receiving	336 000	84 000	420 000
Material packing	247 000	133 000	380 000
Maintenance	84 000	336 000	420 000
Total	1 570 500	2 109 000	3 680 000
Basis of allocation	220 000	480 000	
Recovery rate per hour	R7.17	R4.40	

Source: modified and adapted from Faul. (2003) and Vigario (2007)

According to Abusalama (2008:22), the major limitation of above calculation arise from the use of volume related bases (labour hours and machine hours) in the second allocation stage, to assign costs from cost centres to products. Cooper and Kaplan (1998) state that this procedure may have been adequate decades ago when direct labour was the principal value-adding activity in the material conversion process. Reynolds (2014:23) concurs with Cooper and Kaplan (1998) by stating that a TCS report costs but does not show the factors driving these costs, as it only relies on volume- related bases which are obsolete in modern- day management accounting.

Table 2.5: Overhead cost allocated to each product using TCS			
	Product A	Product B	Product C
Labour hours (20000/10000 x R7.17)	R14.34	R14.34	R10.76
Machine hours (40000/10000 x R4.4)	R17.60	R13.20	R17.60
Total cost per unit/ per product	R31.94	R27.54	R28.36

Source: modified and adapted from Faul et al. (2003) and Vigario (2007)

In table 2.5 the costs are allocated using a single allocation base, which is labour hours in department A and machine hours in department B. This method of allocating costs suggests

arbitrarily spreading overheard costs to different cost centres. Table 2.5 indicates that, in TCS, resources or overheads are allocated predominantly using labour hours regardless of the relationship with the product or service. Vigario (2007), Kostakis et al. (2011) and Shaikh (2010) also state that TCS smooth over all overheads costs to products on an equal basis. This occurs as the system assumes that products consume indirect costs in proportion to production volumes (Van Der Walt & Meyer 2012). These researchers also state that, as a result of allocating overheads in proportion to production volumes, low products are under-costed (compare product A in table 2.5 with product A in table 2.8) and high volume products are over-costed (compare product C in table 2.5 with product C in table 2.8). Reynolds (2014:25) states that, in order to calculate product costs in ABC for each product, cost drivers, activities and products need to be identified as illustrated in table 2.6:

Table 2.6: The link between activities, cost drivers and products					
Activities	Cost driver	Product A	Product B	Product C	Total
Material handling	Material movement	300	650	700	1650
Material procurement	Number of orders	750	1620	1750	4120
Set-up cost	Number of set-ups	560	1210	1310	3080
Quality control	Number of inspection	280	610	660	1550
Material receiving	Number of material orders	840	1830	1980	4650
Material packing	Number of external orders	450	600	900	1950
Maintenance	Maintenance hours	200	300	400	900
Production department A	Labour hours	20 000	80 000	120 000	220000
Production department B	Machine hours	40000	120000	320000	480000

Source: modified and adapted from Faul et al. (2003)

Table 2.7: Calculation of product costs using ABC methodology (Faul et al.2003)			
Calculation of activity rates			
Activities	Cost	Cost driver volume	Activity rate
Material handling	300 000	1650	R181.82 per material handling
Material procurement	100 000	4120	R24.27 per material movement
Set-up costs	150 000	3080	R48.70 per set-up
Quality control	250 000	1550	R161.29 per inspection

Production: department A	581 000	220000	R2,64 per labour hour
Material Receiving	420 000	4650	R90,32 per material
Material Packing	380 000	1950	R194.87 per external order
Maintenance	420 000	900	R466.67 per maintenance hour
Production: department B	1079000	480000	R2.25 per machine hours
Production: department A	581 000	220000	R 2.64 per labour hour

Source: modified and adapted from Faul et al. (2003)

Table 2.7 indicates that the total activity cost for each activity pool is divided by the total number of observed activities to arrive at a cost driver rate that, in turn, will be used to calculate total activity cost per product line. Table 2.7 summarizes the activity rates for each activity and illustrates how resources are consumed by each product.

Table 2.8: Costs per product using ABC			
Activities	Product A	Product B	Product C
Material handling (R 81.82 x number of material movement)	54 546	118 183	127 274
Material procurement(R 24.27 x number of orders)	18202.50	39317.40	42 472.50
Set-up costs (R48.70 x number of set-ups)	27 272	58 927	63 797

Quality control (R161.29 x number of inspection)	45 161.20	98 386.90	10645.40
Materiality receiving (R90.32 x number of material received)	75 868.80	16 5285.60	178 833.60
Material packing (R 194.87 x number of external order)	87 691,20	116 922	175 383
Maintenance (R466.67 x number of hours)	93 334	140 000	186 668
Production: department A	52 800	211 200	316 800
Production: department B	90 000	270 000	720 000
Total costs	544 876	1 218 222	1 660 874
Number units	10 000	40 000	80 000
Cost per unit	**R 54.49**	**R30.46**	**R 20.76**

Source: modified and adapted from Faul et al. (2003)

Table 2.8 indicates how ABC is used as a part of product costing, and illustrates the 2-stage allocation process of ABC from resources to activities and finally to products. The aim of table 2.8 is to trace all costs related to a product and service (Reynolds 2014:17). The table 2.8 indicates that ABC does not allocate the cost simply by using a single allocation basis, such as labour hours or machine hours. Instead, it uses different allocation bases (e.g., number of material movement, number of orders, number of set-ups, number of material received, number of external orders, number of maintenance hours and machine hours).

Table 2.9 demonstrates the costs distortion that the TCS causes in high-volume and low-volume products. It indicates that if the costs are assigned on labour hours and machine hours, the high-volume products receive most of costs, if, on the other hand, costs are based on the different number of cost drivers, high-volume products receive proportionally small costs. The system accounts for the fact that low-volume products require a disproportion of costs (Cohen 2004:25). The ABC system shows that the low-volume product (product A) increased unit costs by 70%, while the high-volume products (product C) decreased unit cost by 27%.

Table 2.9: Overhead costs comparison between traditional costing method and ABC.				
	Product A	**Product B**	**Product C**	**Total**
Volume	10 000	40 000	80 000	130 000

Cost per unit/ product (ABC)	R 54.49	R30.46	R 20.76	R105.71
Cost per unit/ product (TCS)	R31.94	R27.54	R28.36	R87.84
Change after ABC	R22.55	R2.92	(R7.60)	
% Change after ABC	**70%**	**11%**	**27%**	

Source: adapted from Cohen (2004)

The change is calculated by using the following formula:

ABC cost change = ABC cost – traditional cost x 100

                        Traditional cost

Source: Zhu (1999:13).

Aldukhil (2012:18) concurs with Cohen (2004) by stating that TCS contributes to over-costing larger batches and less complex products and under-costing smaller batches and more complex products. Aldukhil (2012) also states that "It is not necessarily true that high-volume products consume more overhead resources than low-volume products.

Lam (2006) states that the problem is that conventional systems do not recognise the fact that activities are performed on different levels. The distortion caused by traditional costing is very dangerous for product pricing and management strategy. This distortion can direct a company to drop profitable products in favour of products losing money. For instance, if the profit mark-up is 50% on cost based on TCS, the profitable product is A, but on the ABC the profitable product is product C (refer to table 2.9). Therefore, based on TCS this company may drop product C instead of dropping product A.

2.11 Benefits of activity-based costing at TVET colleges

Activity-Based Costing is the best way to allocate resources more efficiently. ABC can help colleges determine the best way to meet their goals by monitoring the use of resources in particular activities. As TVET colleges want to be responsive to the board's mandate to retain and graduate more students, ABC offers a mechanism for determining if its spending matches the activities related to this particular goal (Hurlburt and Kirshstein 2014:2). XYZ might want to know how it is allocating money across various student support activities that could help it to improve student retention and graduation. For example, XYZ needs to know if the admissions and recruitment activities are absorbing a much larger share of the budget than counselling and support activities that are tied to student success, once students are admitted.

Mushonga (2015:23) states that, without the knowledge of activity costs, it is difficult to comprehend how budgeted figures are calculated and whether or not they are subjective. As a result, some managers may not be convinced by the reported favourable variances. Mushonga (2015) argues that for this reason an ABC system is required to translate the total general ledger account balances into their work activities. Mushonga (2015) believes that both TCS and ABC systems have their place in accounting, although the general ledger information is too raw to be useful in decision-making. Unlike researchers such as Johnson and Kaplan (1987) and Vigario (2007), who view Traditional Costing Systems as obsolete in modern-day management accounting, Mushonga (2015) regards TCS and ABC as complementary.

To put it simply, ABC looks at how much time is spent on specific predefined activities and the personnel and non-labour costs of these activities. This approach focuses primarily on the work that is performed; it reflects the work process itself. In many respects, it can remove the "guesswork" from higher education institutions spending. ABC provides information on time spent in activities and what the labour and non-labour expenses associated with them —not what the activities "should" cost, which is often the basis of higher education budgets.

TVET college budgets are tight, requiring institutions to do more with fewer resources. Activity-Based Costing provides institutions with information for better projections and forecasting. For instance, consider a community college facing across-the-board cuts. By knowing the cost of different activities, administrators could protect high-impact activities or reduce spending in high-cost areas with low impact (Hurlburt and Kirshstein 2014:6)

ABC also facilitates a more targeted distribution of limited resources to meet specific goals or to focus on certain initiatives (Mushonga 2015). As an example, if a college is asked to increase the number of students who either get two-year degrees or transfer to four-year colleges, it will want to know how much time is spent on activities that are known to improve retention, graduation, and transfer. In activity-based costing, time translates into money and, if needed, the college could shift some of its resources to activities that support this goal. ABC can help colleges better identify where resources are needed. Cost behaviour activities vary significantly from subject to subject and from course to course within the same department. Thus, identifying and understanding the activities' behaviours is the first step in reducing costs, this application may result in tracing out the expected cost per unit of activity from year to year (Abu-Tapanjeh 2009).

Oseifuah (2013:38) states that the costing system in public sector organisations (PSOs), such as TVET colleges, are still important for several reasons. First, many PSOs provide goods and services that can be exchanged in the market, for example, garbage collection, water and sewerage treatments and supply, and other utility supplies. The production of these goods

and services requires a breakeven (where revenue =total cost), and the production is inefficient and not viable if breakeven is not achieved. Second, cost provides a measure of efficiency. In other words, how well is a resource spent to produce a product or service? ABC helps managers determine whether the use of a resource is maximised and waste is avoided. ABC also helps interest stakeholders, such as elected officials and private citizens, who pay for services. Third, the increasing use of performance- based budgeting requires the availability of performance measures including cost measures (Oseifuah 2013). In a performance-based budgeting, decision makers use cost information to assess a programme's efficiency and make resource allocation decisions. Finally, cost information is a useful standard in making privatisation or outsourcing decisions (Oseifuah 2013). Therefore, the selection of service providers should be based partly on costs using costing systems (Wang 2010). The goal of ABC is to accurately identify and measure the relationship between resources and activities and between output and activities. By identifying the causal relationship between costs and activities, ABC can be used to link an organisation's operational performance to its actual financial performance. This link is vital for public sector organisations because they usually determine future costs based on budgeted volume of activities. In addition, ABC can reveal how well an organisation's activities align with its strategic goals and objectives (Oseifuah 2013:39).

Schmelze and Buttross (2003) stress that applying ABC to the public sector can provide information on the cost of providing government services for strategic decisions, such as determining the affordability of providing government services (such as rubbish collection); setting user fees for water services); and determining whether to outsource government services. Oseifuah (2013:40) argued that costs are not incurred only as a consequence of productive activities but also as a consequence of supporting activities. ABC is, therefore, capable of assisting the public sector, such as colleges, to make the right decisions and take action to improve financial performance.

Oseifuah (2013:41) notes that "service companies are ideal candidates for ABC, even more than manufacturing companies. This is because most of the costs in service organisations are fixed and indirect. In contrast most costs are likely to be a much smaller proportion of total product costs."

Vazakidis et al. (2010) investigated the relevance of ABC in the Greek public sector. Their findings revealed that, when combined with new technologies and new methods of management, ABC could resolve all the deficiencies of the public sector and help produce service at minimal cost. Oseifuah (2013:42) identifies that, under appropriate "enabling conditions," ABC can provide organisations with improved cost information for improved

decision-making and improved performance. The enabling conditions include top management support, linkage of the cost management system to competitive strategies; linkage of the cost management system to performance evaluation and compensation; sufficient internal resources; training in designing, implementing and using cost management systems; non-accounting ownership; and consensus about and clarity of the objectives of the cost management system (Oseifuah 2013:46).

2.12 Analysis of TCS and ABC systems

The need for recording business transactions was felt long before the technological advancements of mankind (Elagili 2015:25). This was the need that has made accounting the language of business. financial accounting, which is seen as the father of accounting systems, is no more than business transactions by making financial results available via journals, financial positions, and in many more similar business recordings (Vanderbeck 2014).

Weygandt et al. (2009) state that this form of financial accounting has many limitations. Weygandt et al. (2009) stipulate that one of the limitations of financial accounting is that it identifies the products' cost in segments. According to Gupta et al. (2008), these limitations created the need for cost accounting, which is one of the branches of accounting that deals with recording, accruing and inferring existing and future costs. Three parts of any accounting system are financial, cost and management accounting (Weygandt et al. 2009).

According to Gupta et al. (2008), the management of any organisation requires cost accounting as it provides information about current operational costs under the guidance of which future planning is all about the allocation of resources in the most effective way in order to achieve high profit margins. Therefore, the allocation of operational costs to goods was needed in order to calculate product costs. It was important to trace costs to products so that product costs and selling prices are determined accurately and appropriate strategic decisions can be made (Mushonga 2015:15). However, Horngren et al. (2002) believe that cost accounting is all about the allocation of resources in the most effective way in order to achieve high profit margins.

In TCS and ABC, the two types of costs involved are classified as direct and indirect costs (Mushonga 2015:15). In both costing systems, the allocation of direct costs to product or service is not difficult (Mushonga 2015) as specific identifications with product lines are possible through material issue records in the case of direct material and work- time analysis for direct labour. However, indirect costs, also called overhead costs, pose some challenges when an attempt is made to trace them to cost objects (Mushonga 2015:16).

Indirect costs represent acquired resources whose consumption cannot be specifically linked to individual products since they are shared by more than one product and it is not feasible to establish a system to monitor their use (Mushonga 2015). TCS and ABC treat costs similarly. However, TC systems use overhead costs on the assumption that the product drives the costs directly (Mhamdia & Ghadhab 2011). Initially, costing systems (TCS) were designed for firms which manufacture one or two products with simple process line (Chivukula 2011). Chivukula (2011) also states that most of the accounting practices that are in existence were first used by 1920.

According to Mushonga (2015), the principal difference between TCS and an ABC system is the number of cost drivers used. ABC uses relatively more cost drivers in allocating overheads compared to the one- or two -volume based cost driver used in TCS (Mushonga 2015). However, both systems use a two-stage costing system involving firstly, the allocation of overheads to cost centres, usually the production and service centres in the case of TCS and activities in the case of an ABC system (Kostakis et al. 2011). Secondly, the allocated overheads are assigned from production and service centres (TCS) or activities (ABC) to individual jobs or products based on predetermined overhead absorption rates (OAR). According to Mushonga (2015:6), in TCS, the choice of an OAR for a particular cost centre depends on the cost centre's characteristics. For example, a machine- intensive cost centre would use a machine hours OAR to allocate overheads while a labour -intensive production cost centre would use a direct labour hours OAR.

The use of a direct labour hours OAR to allocate overheads is justifiable to some extent (Mushonga 2015). Mushonga (2015) argues that direct labour mostly varies with the production level such that it is plausible to view all overheads costs as ultimately driven by production volume. Chaing (2013) believes that the advocates of ABC systems would agree that traditional practice is largely satisfactory in its use of a volume- based OAR, since production overheads relate primarily to production volume. However, in many modern manufacturing organisations, products and services are not homogeneous in the way they consume overhead resources, and the application of TCS would only be valid for facilities producing less diversified products (Chaing 2013). As a result, TCS, by using direct labour hours as an allocation base, over-cost high-volume/low- complexity products and under-cost low -volume/high -complexity products (Mushonga 2015).

Therefore, the distinctive feature of an ABC system is the multiple activity-based overheads absorption rates which may make the system more realistic and more applicable than a TCS. According to Akyol et al. (2005) and Reeve et al. (2012), ABC is considered an alternative paradigm to TCS. ABC originated in the manufacturing sector as a result of dissatisfaction

with the traditional management techniques that relied on volume- based allocation systems when allocating overheads to products (Kont 2012). The view that ABC is not a system of costing may suggest that it may not therefore be possible to view it as an alternative to the TC systems. Mushonga (2015:16) states that the ABC system is very similar to a TCS as it involves a two- stage procedure; firstly, charging overhead costs to ABC pools; and secondly, deriving and using a series of cost driver rates to trace the pooled costs to products (Raffish & Turney 1991). In the first stage of ABC cost accumulation, resources are allocated to activity centres and then the cost of the activity centre is reported (Benjamin et al. 2009). The second stage of ABC is the allocation of activity to the cost objects after the selection of appropriate cost drivers has been made (Benjamin et al. 2009).

The TCS, on the other hand, assume a correlation between the incurrence of overheads and the volume of activities, such as labour, whereas the ABC systems recognise that there has been a shift away from labour-intensive production to capital-intensive production (Benjamin et al. 2009). As a result, there has been a significant increase in indirect fixed costs compared to direct variable costs of manufacturing (Baxendale & Foster 2010). A further change in recent manufacturing has been a shift away from single-product manufacturing to multi-product manufacturing (Vigario 2007). This shift from labour-intensive to capital-intensive production, coupled with the movement to multi-product manufacturing, may have resulted in a significant increase in indirect costs (Mushonga 2015).

According to Mushonga (2015), these indirect overheads can be categorised into four transaction-based categories:

- Logistical transactions: These include activities such as ordering, executing and confirming materials. Personnel performing these transactions include purchasing officers, clerks doing electronic data processing and accounting staff;
- Balancing transactions: Activities involve matching the supply of materials with orders, labour and machines with demand, purchasing, material planning, production control and scheduling personnel perform balancing transactions;
- Quality transactions: These are activities performed by staff in quality control, indirect engineering and procurement, which involve ensuring that production conforms to specification; and
- Change transactions: These are transactions performed by companies, industrial and quality engineers involved in schedules, specifications, routings and standards.

These overhead classifications represent a series of activities or transactions undertaken to facilitate production. The cost of these transactions can, therefore, not be traced to a specific

unit but should be allocated to the products using activity cost drivers (Mushonga 2015). It is possible that many companies will need to move away from their current costing systems and adopt the ABC system to benefit from more accurate product costing (Mushonga 2015).

2.13 The current practices of the costing system at TVET colleges in South Africa

Universities and TVET colleges face a similar problem to manufacturing firms, in that a large proportion of their service costs is overheads. Universities usually separate themselves into responsibility centres, such as departments, schools and faculties, department or school allocate revenue from the central budget to carry out their operations (Naidoo 2011:109). On the other hand, TVET colleges separate themselves into responsibility centres which are different campuses (student service departments). Campuses (student service departments) allocate revenue from central office (cost centre) to carry out their operations. According to Amir et al. (2012:3), under the present costing system in HEIs such as TVET colleges, only costs of teaching and learning output are formally recognised. Lutilsky and Dragija (2012:33) state that public demands for efficient managing within HEIs, but a very small percentage of these institutions has implemented full costing systems. According to Hurlburt and Kirshstein (2014:2), tertiary education institutions must report costs by function. The functional categories have a common definition across the industry and include broad categories (e.g., instruction, research, student services). Although accounting systems are set up to broadly categorize costs, tertiary education institutions rarely assign costs to the activities that comprise the function or break down the function into smaller units within the institution to allow internal decision makers to easily see how resources are used. As an example, instructional spending is generally reported in the aggregate, yet instruction encompasses a number of different activities, including course development, individual tutoring, advising, and teaching. However, is it efficient to have faculty/ campus do all of these instruction-related activities? Is it possible for advising or tutoring, for example, to be assigned to individuals hired for that specific purpose? This approach might save money and allow faculty/campus to spend more time teaching or even teach an additional section.

Oseifuah (2013) advocates the use of ABC within a university environment, particularly the method of allocating the overhead costs. Oseifuah (2013) is critical of allocating overheads on a single basis such as the use of student numbers. The traditional costing system results from broad-based approaches, and is often misleading since it fails to capture the cause and effect relationships. This author also suggests that the ABC approach identifies activities which are associated with faculties and how those activities are linked to the generation of revenue and consumption of resources. The TCS employs one of three commonly allocation bases: direct

labour, machine hours and material dollars, whereas ABC typically utilises multiple allocation bases, such as set-up hours, number of times ordered, number of times handled and other transaction-related bases (Elagili 2015). Consequently, product costs based on ABC system are claimed to have more accuracy than those of the TCS (Elagili 2015)

2.14 Contingency theory in managerial accounting

Contingency theory is an approach to the study of organisational behaviour in which explanations are given as to how contingent factors such as technology, culture and the external environment, influence the design and function of an organisation (Islam and Hu, 2012:5159). The assumption underlying contingency theory is that no single type of organisational structure is equally applicable to all organisations (Aldukhil 2012 and Islam and Hu 2012). Rather, organisational effectiveness is dependent on the fit or match between the type of technology, environmental volatility, the size of the organisation, the features of the organisational structure and its information system. Contingency theory must identify specific aspects of an accounting systems which are associated with certain defined circumstances and demonstrate an appropriate matching (Otley 1980). In management accounting system (MAS) research, studies are concerned about how MAS is best designed and implemented to fit the contextual factors. These contextual factors are contingencies that may have an impact on the design of MAS and they are external such as environment culture and internal such as structure, size and technology (Aldukhil 2012). Contingency theory has been widely accepted and used in management and accounting literature (Ismail et al. 2015:22). It is based on the principle that the appropriateness of managerial techniques or systems is contingent upon the setting of that system that suit different organisations differently.

The ABC model and conceptual framework underlying the present study will be based on the contingency theory.

The contingency approach is a recent and important development in ABC research. Aldukhil (2012), states that the appropriateness of any system is dependent on the factors facing the firms. Abusalama (2008) argued that ABC system adoption and success would depend upon specific contingent factors such as product diversity, cost structure, firm size, competition, and business culture. In this study, Abusalama (2008)' contingency model of ABC adoption has been adopted in order to examine and investigate the reasons why the adoption of ABC system remains low. This study will also be based on the models of Fei and Isa (2010) and Elagili (2015) to examine the impact of behavioural and organisational and technical variables in ABC adoption in KwaZulu-Natal TVET colleges.

2.15 Factors that constitute barriers to ABC adoption

This section aims to review a series of factors that might constitute barriers in ABC adoption and implementation. These factors are divided into technical variables and behavioural and organisational variables together with development an ABC model applicable to TVET colleges which seeks to link behavioural and organisational variables with technical variables in the adoption of ABC. Behavioural and organisational variables consist of: size of an organisation, top management support, cost structure, product diversity, internal resistant, internal champion and innovation, internal resource availability and training, and technical variables which consist of: identifying activities, grouping and aggregating activities, assigning resources to activities, selecting cost drivers and assigning activities' costs to cost objects.

2.15.1 Behavioural and organisational variables

Behavioural and organizational variables are important to the cost management practices identified by Shield and Young (Fei and Isa 2010). Based on the literature reviewed in this chapter, it is possible to identify a behavioural and organisational variables which potentially impact on the adoption of ABC by TVET colleges:

2.15.1.1 Size of organisation

It has been argued (Innes and Mitchell 1995, 1998; Bjornenak 1997; Krumwiede 1998; Clarke et al. 1999 and Abusalama 2008) that the size of the company usually explains the rate of adoption of sophisticated cost accounting systems as, in general, larger size increases complexity and usually requires greater accounting resources. Abusalama (2008:139) justifies this argument by stating that large firms are more likely to have greater access to individuals with the knowledge to design and implement ABC systems. In addition, as ABC implementation is costly, larger firms are more likely to obtain economies of scale, with the cost spread across several products or services. The large firms have more discretionary resources, such as personnel, computing facilities and time, and are therefore more inclined to adopt ABC systems. Abusalama (2008:140) examines firm size in terms of number of employees. The results show that the firm's size does not significantly relate to ABC adoption.

In a survey of companies, it was observed by Naranjo-Gil (2009) that larger companies were more inclined to adopt the ABC system than smaller organizations. The size of an organization is related to the number of employees working in the company, the quantity of sales and the quantity of total assets. Larger companies have more resources, both for management and for the development of a complex cost system, such as the ABC system (Elagili 2015:50). Askarany and Smith (2008), for instance, explain that companies with more than 600

employees and more than 200 million USD working assets are considered large-sized companies. Based on above definition, there is evidence that there is a positive correlation between size of company and ABC adoption.

2.15.1.2 Top management support

Research shows that top management support is the most crucial factor in the success of ABC implementation (Aldukhil 2012:77). This finding is, consistent with the more general findings that almost all successful innovations require the support of top management (Aldukhil 2012:77). Top management should focus resources, goals, and strategies on the implementation of ABC. They must demonstrate a commitment to ABC by using it as the basis for decision-making. To encourage the use of ABC information, top management must use ABC information in communications and agreements with other employees.

Top management support consists of providing the necessary capital and commitment to solve potential problems and conflicts. Additionally, this support should be communicated effectively by selecting the appropriate team, deciding the type of hardware and software and making decisions on the time frame for implementing the ABC system. By requesting the progress reports on the ABC implementation process and eventually using ABC information, top managers represent the ideal example for ABC supporters. Managerial support is not exclusive to the preliminary stages of ABC implementation; rather, it is a continuous process to maintain the new system (Aldukhil 2012:77).

Top management support is positively associated with the adoption of ABC. Brown et al. (2004); Prescott and Conger (1995); Cohen et al. (2005) and Elagili 2015) identify that a lack of management interest/support is one of the reasons for the non-adoption of the ABC system. In the same vein, Majid and Sulaiman (2008) explain that the support of top management is crucial for the success of the ABC system.

There is a high percentage of success when top management support the adoption of the ABC system because of the freedom and support given to the system implementers by the top management whereby they have access to all necessary materials required for the implementation. This support also extends to assistance in the solutions of any problems and obstacles that might arise throughout the different phases of the system's adoption and implementation (Elagili 2015:51). Based on the above, the balance of research evidence appears to be supportive of the impact of top management on ABC adoption.

2.15.1.3 Cost structure (Level of overhead)

The earliest published literature on ABC (Cooper and Kaplan 1988; Cooper 1988; Drury 2012; Mitchell 1994; Abusalama 2008; Elagili 2015) argue that as overheads become an ever-larger component of product cost, it compounds the problematic distortion inherent in traditional based costing systems.

Kaplan and Cooper (1998) recommend that companies with high overhead costs should use much more sophisticated cost accounting systems, such as the ABC system, since it would help these companies in avoiding waste in costs and their ability to allocate overhead costs to products would be more accurate. Moreover, ABC is considered the best cost accounting system used in present-day companies. These studies also found a positive correlation between high overhead costs and the use of the ABC system in the companies under investigation. The same finding was also confirmed by Booth and Giacobbe's study (1998) and Elagili's study (2015) that companies with high overhead costs are likely to adopt the ABC system. Furthermore, Vieira and Hoskin (2005) and Majid and Sulaiman (2008) considered the overhead costs of an organization to be a factor that assisted in the adoption of ABC. Companies that have more overheads in the manufacturing of products tend to adapt ABC systems, rather than companies that have lower overheads. This is because the computation of more overhead costs is the main element of the ABC system, differentiating it from the traditional cost systems. As previously stated, the ABC system helps in the allocation of indirect costs or overheads to the final cost of the product; thus, it is more beneficial to companies that have higher overheads.

2.15.1.4 Product diversity

Kaplan (1988) argues that the traditional approach to fixed overhead manufacturing costing becomes increasingly dysfunctional when product diversity increases within the firm.

Abusalama (2008) states that increasing product diversity introduces the risk of significant inaccuracies in product cost assignment using traditional costing approaches. It is claimed that ABC avoids the deficiencies of the traditional costing systems. Brown et al. (2004) and Abusalama (2008) examine the influence of product diversity as factor on firms' interest in ABC and their decision to adopt it or not. Their study indicate that product diversity displays a significant and positive association with the implementation of ABC systems.

According to Schoute (2011), Abusalama (2008) and Elagili (2015:53), the diversity of products is also a major factor in the adoption of Activity-Based Costing. Companies that have many diverse product lines are known to use ABC systems, since allocating costs to a diverse

product range is more difficult than the allocation of costs to a lower number of products. The companies that have a wide product range have higher operational complexity. Greater product complexity and diversity increases the costing distortions arising from traditional cost systems. Other researchers, such as Bjornenak (1997) and Krumwiede (1998) also confirmed these findings.

2.15.1.5 Resistance to change (RTC)

Xu (2012:134) argues that a major reason for employees' resistance to implementation of ABC was lack of training and poor communication between relevant departments sharing the basic ABC.

Resistance is a phenomenon that affects the change process, delaying or slowing down its beginning, obstructing or hindering its implementation, and increasing its costs (UK Essays 2015). Effect of resistance to a new costing system in the organisation will cause distorted perception, interpretation barriers and vague strategic priorities, low motivation among the people and lack of creative response (UK Essays 2015). It is crucial for change initiators to deal with resistance for the successful implementation and adoption of Activity-Based Costing.

For as much as employees gets the job done, and possess the knowledge, skills, tools and experiences, it is clear that organizational changes cannot be achieved without employees' support and involvement. Employees' acceptance and commitment are the key factors for successful changes (UK Essays 2015). The TVET college's management should recognize the importance of its employees and minimize the resistance from employees in order to implement a new costing system effectively. Therefore, management must understand why employee resists to change, the forms of resistance and the factors determining employees' reactions to change (UK Essays 2015).

Bengat et al. (2015) also acknowledge that one attribute to employees' resistance is that past failures leave negative image for future changes.

During times of implementation of Activity-Based Costing in TVET colleges (change process), management of TVET colleges have a major role to play (Tribio and Hernandez 2011:65). The employees will expect well-timed communication, effective decision-making and adequate planning. Furthermore, employees will seek support from leaders to help them with the new costing system. In addition, the way of exerting leadership will have a significant impact on the level of resistance encountered during change (Toribio and Hernandez 2011:65). These authors believe that, if leaders choose a top-down approach and/or neglect to take into account the impact of the change on employees, the organisation will likely face resistance.

Communication is an ideal method to tackle resistance in terms of inadequate or inaccurate information analysis from the recipients of change.

Chris (2011:1) states that a new project (such as ABC) fails because of human nature-people tend to resist change. Therefore, as a new project initiator, understanding resistance is critical to creating change. According to Chris (2011), it is important to know how resistance manifests and how to overcome its various forms. The reasons why employees resist change and some tips to help overcome them and lead the new project successfully:

- Lack of knowledge of a new system

Chris (2011:1) states that those impacted by the change will rarely openly express their concerns. Nobody on the team is going to express doubt over their ability to succeed in the environment. Therefore, TVET college's management need to be aware of this pitfall in the process of implementing Activity-Based Costing and proactively take the following steps to build knowledge and comfort levels (Chris, 2011:1):

- Communicate openly about the Activity-Based Costing;
- Create an open forum for knowledge-sharing; and
- Empower employees by showing them how the new system or methodology will, in turn, empower them and enhance their effectiveness.

Fear of losing power

Fear of losing power is typically the result of poor communication. Where there is a lack of information, employees begin speculating, usually in very negative way, resulting in resistance to change.

Share knowledge: this simple step has a significant impact on overcoming resistance to change and driving Activity-Based Costing success in TVET colleges.

2.15.1.6 Internal champion support and innovation

The support of an individual who plays the role of 'Champion' inside an organization and the willingness of such insiders to accept and adopt new innovations such as the ABC system is a very important factor in the adoption and implementation of the system (Elagili 2015:51). The existence of such pro-innovation staff inside an organisation is significant since it would help in educating senior management and users about ABC. Moreover, such staff could bring other employees on board to accept the innovation and assist them in familiarizing themselves

with the new system, and in understanding the importance of the new system to the organisation and, thereby, overcoming any resistance to change within the organisation (Elagili 2015:51). Introducing a new system (ABC) is like a construction's company construct new project. Each project needs different people with different professionalism, knowledge, and experience, and requires them to work and coordinate with others from different departments (Azmy 2012:11). According to Azmy (2012), process and team integration are the key drivers of implementation of new projects to become successful. However, simply bringing people together does not necessary ensure they will function effectively as a team. Therefore, in the implementation of ABC, it is crucial for TVET colleges teams to find a solution to help their team members to integrate and work together effectively (Azmy 2012:2). The internal champion support goes hand in hand with innovation, if the employees of the organisation are very innovative, can easily accept the new system and help other employees to comprehend the new system.

An innovation can be a new technology or service and can be a change in existing technology or products. According to Askarany (2006:708) and Rogers (2003:11) provide a similar definition for innovation; they state that "it is an idea or practice, or object that is perceived as new by an individual or other unit of adoption". Innovations led by management generally require sufficient IT resources and the ability by an organisation to accept the experience of, and be adaptable to, change. This characteristic of being open to change/innovation is associated with and identified as, being one of the factors for the successful adoption of ABC (Elagili 2015:50). According to Elagili (2015), innovation is an idea that may relate to a programmer, system, policy, process and service or plan that is new to the organization, and that could be implemented. Organisations might expand their projects, manufacturing, or managerial innovation in order to respond to the current market needs for top quality products with affordable prices for consumers. So, when an organisation decides to introduce innovation/innovations to its projects to realise its set objectives, it would equally be in need of developing and innovating its accounting system too, to assist it in having access to more detailed and up-to-date financial information. Moreover, Askarany and Smith (2008) argue that the organisations that adopt innovation policies were more likely to adopt the ABC system instead of the traditional costing system since the ABC provides them with the more appropriate and detailed information required.

2.15.1.7 Internal resources' availability

The process of designing and implementing an ABC system requires companies to have adequate resources (Chiarini 2012). Chiarini (2012:682) also states that "It is not easy to operate compared to other systems and ABC system requires investment in IT throughout the

company." The resources include the time and commitment of accountants, top management, operating employees, computer facilities and external consultants (Chiarini 2012). Similarly, Lopez (2013) concludes that ABC is very accurate, but consumes a great deal of resources.

Garrison et al. (2011) also identify problems with the system. According to these authors, the ABC process of collecting information and identifying activities is rigorous and time consuming. They also state that limited resources are seen a major stumbling block in the adoption of the ABC system. Garrison et al. (2011) argue that ABC can be very expensive to implement. They confirm that implementing an ABC system is a project that requires a substantial investment of the company's resources. Similarly, Nassar et al. (2013) conclude that the greatest barrier to the adoption of the ABC system in Jordanian companies is its high cost of implementation and the high cost of ABC consultancy and computer staff time.

A significant drawback of ABC is that its benefit in the form of improved cost information may not outweigh its cost (Garrison et al. 2011).

2.15.1.8 Training

Training is important to help understand how ABC differs from traditional costing systems and why ABC provides a superior economic measurement and information system. ABC requires training from the senior management to the junior employees.

Elagili (2015) states that the third step in the implementation process for ABC is training. To make sure that the ABC system is carried out flawlessly, there needs to be effective application, performance, consumption and approval of the ABC system (Elagili 2015:41). For the ABC model to work there needs to be three sets of training programmes for the administration, implementers and the users respectively. For the ABC to be successfully implemented in an organisation, it needs to be understood by the administration, effectual training needs to take place (Elagili 2015:41). The implementers comprise the multifaceted team and even though they represent their own heads of department it is not probable that they will have complete knowledge about the ABC system prior to the team being assembled. Hence, they need to be taught about enterprise needs, software prototypes and project development. The entire workforce is associated with using the ABC system output information. To take efficient decisions they need to understand the system. Hence, training is a prerequisite for these people to make sure they understand the benefits of the system and comprehend them in their decision-making (Elagili 2015).

Despite behavioural and organizational issues overwhelming technical issues in relation to ABC implementation in developed countries, behavioural and organizational variables will not, in themselves explain ABC adoption rates. There are also technical issues which influence ABC adoption, as indicated by Cobb et al. (1992). According to a study conducted by Xu (2012:129), both these issues are major barriers to the implementers of ABC in Petro China as a developing country. Therefore, developing countries, including China, are experiencing difficulties in implementing ABC successfully from the perspectives of both technical and behavaioural and organisational variables. The next section examines the technical variables impacting on the adoption of ABC systems.

2.15.2 Technical variables

While significant consideration of behavioural and organizational issues relating to ABC implementation has been given in literature, it has been suggested that technical issues should be further investigated (Abusalama 2008:11). It has been stipulated (Cooper and Kaplan 1992, 1998; Drury 2012; Abusalama 2008) that the main components of an ABC system are: resources, activities and cost objects. Abusalama (2008:75) states that the main items, which he considers the "basic building blocks of the ABC system", are resources, activity, activity centre, resource driver, activity cost pool, cost element, activity driver and cost object.

The next section elaborates on the nature of these technical issues:

2.15.2.1 Identifying activities

Identifying and defining activities of an organisation are the heart of designing an ABC system, because the identification of the activities forces the accountant to determine what is actually happening in the relevant areas of the business and ensures that the costing system is built on reality (Abusalama 2008:98). Abusalama (2008:80) defines an activity as event, task, or unit of work with a specified purpose. Cooper and Kaplan (1998:210) state that "activities are described by verbs and associated objects: schedule production, move material, purchase materials, inspect items, respond to customers, and so on". The identification of activities of an organisation must examine the structure of the major work done by each functionalised organisation. On this basis, it will be easy to identify the activity and collect different activities into activity centres (Qinhua et al. 2009). Two approaches of identifying activities performed in an organisation are presented below:

Activity dictionary: this approach lists all the major activities performed in an organisation and provides work activity description for each activity. It also facilitates the activity analysis process by listing the typical activities by function or department. Furthermore, activity

dictionary helps companies in selecting activity drivers and provides a good guide to activity budgeting and performance measurement (Abusalama 2008:99). A standard activity dictionary (SAD), which lists and defines all the major activities performed by the organisation should be prepared. Such SAD provides a useful approach to identifying the activities suitable for use in the particular application of ABC (Abusalama 2008:81).

Functional decomposition: Turney (1996) mentions the term 'functional decomposition' as a process to identify activities. He states that "to identify activities with functional decomposition, start with an organisation chart for a company. Then divide each box in the chart into smaller units. This division of larger functions into smaller functions is continued until you meet the purpose of ABC system."

2.15.2.2 Grouping and aggregating activities

Abusalama (2008:83) argues that "The number of actions performed is typically so vast that it is economically unfeasible to use a different cost driver for each action". Therefore, he suggests that actions must be aggregated into activities, and then a single driver is used to allocate the cost of those activities to cost objects. This section presents the methods of aggregating activities to simplify the implementation of ABC systems as follows:

The activity centre

In figure 2.3, Turney (1996) argued that an activity centre is a collection of related activities, such as those in a particular department. Turney (1996) provides an example of activities in an inspection activity centre as follows:

Figure 2.3: Activity centre

Inspection Department
Inspecting incoming material
Inspecting incoming components
Inspecting the first piece of each batch
Inspecting customer complaints

Source: Turney (1996:103)

Based on figure 2.3, the activity centre directly parallels the inspection department in scope, but contains information about the activities that would not be found in any conventional departmental report. Turney (1996:103) argues that, this information includes the cost of each

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activity, the resources used by each activity, and operational information facilitate management of functions or processes. This information is used to help answer the following types of questions about the work of the centre. These are: what work is performed in the activity centre; which activities consume most of the resources of this department; which activities contain waste and are candidates for improvement; how does each activity meet the needs of its customer, and what is the overall performance of the department or the process.

Activity hierarchy

Horngren et al. (2002) state that an activity hierarchy categorises costs into different activities based on the different types of cost drivers, cost-allocation bases, and different degrees of difficulty in determining cause-and-effect relationships. Cooper and Kaplan (1998) argue that, when separating activities, a hierarchy occurs, and activities are classified into:

- Unit-level activities;
- Batch-level activities;
- Product-sustaining activities; and
- Facility-sustaining activities.

Based on the above information, unit- level activities consume resources in proportion to the number of unit s produced and sales volume. The batch- related activities, such as machine set up or material movements are performed each time a batch of goods is produced. Product level activities are performed to allow the production and sale of different products, e.g., product specification expenses. The last level is facility level; these costs include plant management expenses, building maintenance and heating and lighting expenses, etc. are incurred in support of the whole organisation.

Business process

Abusalama (2008) groups activities collectively into higher-level businesses. He aggregates many actions into each activity. He adds that such an aggregation would fail to identify differences in activities required for ordering different types of materials from different vendors and using different ordering relationships. There is also an opportunity for managers to compare the cost of performing the same business process at different plants or across different organisational units to identify efficient and inefficient practices. Therefore, during activity analysis, it is necessary to identify which activities are significant and which activities can be aggregated. Activities are made up of the amalgamation of tasks or units of work and can consist of many different tasks. The activities are usually identified by carrying out an analysis of the work in an organisation through interviews and/ or time in motion exercises.

Two major approaches have been reviewed to identify activities: these are activity dictionary and functional decomposition. Initially numerous tasks can be identified. These should be aggregated into a reasonable number of activities, otherwise there will be a proliferation of information which is costly to manage. Three approaches have been presented in relation to aggregating activities: these are the activity centre, activity hierarchy and business process. The final list of activities chosen is a matter of judgment but is likely to be based on the total cost of the activity centre and whether or not a single driver can provide a reasonable determinant of cost of the activity. If it is not reasonable, then it will be necessary to break the cost centre/pool down further (Drury 2012).

2.15.2.3 Assigning resources to activities

After the activities have been identified, the next step is to assign the overhead costs to each activity using first-stage cost drivers, which link spending and expenses, as captured in the organisation's financial, or general ledger system, to activities performed (Drury 2012). Figure 2.4 simplifies the general picture of two-stage allocation within ABC systems.

Figure 2.4: Two stage for ABC system
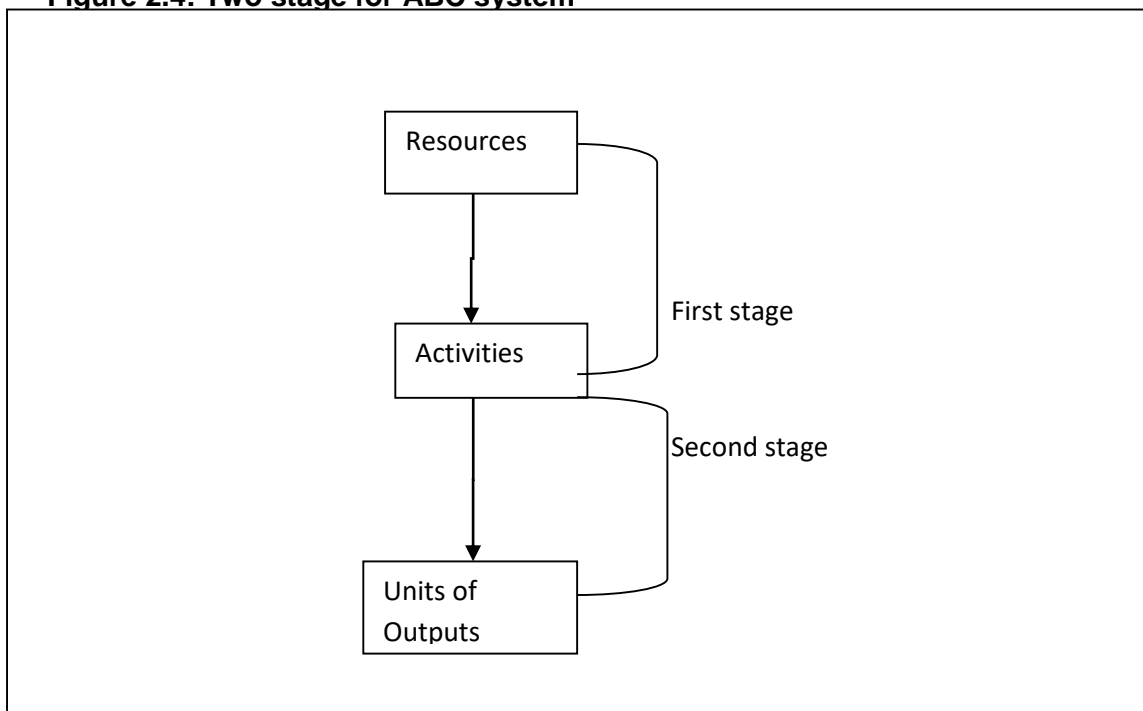
Source: Cooper et al. (1992)

The initial stage is referred to as a first-stage allocation, which assigns the costs of inputs cost pools within each activity centre. At this stage many of the resources may easily be directly attributable to specific activities, but some may be shared by a number of activities (such as lighting, heating, executive salaries, and depreciation). Traditionally, cost systems used simple

bases, such as direct labour hours, machine hours, unit produced, or materials processed to allocate production cost from cost centre to cost objects (Horngren et al. 2002; Abusalama 2008). Abusalama (2008:90) points out that an ABC system achieves improved accuracy in the estimation of costs by using multiple cost drivers to trace the cost of activities to the products associated with the resources consumed by those activities. The key to this accuracy is the determination of the correct drivers for the production process. The accuracy of a product cost depends on the appropriate selection of cost drivers, because cost of activity is an aggregation of primary drivers and product cost is an aggregation of the cost of activities (Abusalama 2008).The author believes that the most relevant drivers can be determined by questioning those employees who are most familiar with the activity to indicate which factor causes an increase or decrease in the time and effort they spend on activity.

2.15.2.4 Assigning the cost of activities to cost objects

Abusalama (2008:95) coined the term "first stage cost driver" as the method of assigning costs from a general ledger line item to an activity cost pool and "second stage cost driver" as the method of assigning the activity cost to the cost object. Lin et al. (2001) argue that a cost driver is usually articulated on a cost per unit basis by dividing the total cost of resources used on the activity by the number of cases performed.

Lin et al (2001) states that some costs will trace directly from the ledger to the activity, whereas others will require extensive interviews with employees and on-site observations to obtain the amount of resources consumed in the activity. For instance, cost tracing from the ledger is easy if one employee is spending all of his/her time on a specific activity, whereas another employee may spend a fraction of his/her time on a particular activity creating a more difficult task of tracing the cost of labour to the activity.

It is clear that ABC emphasises the need to obtain a better understanding of all activities performed in the organisation as the fundamental step of ABC systems. The above approaches, that is., identification of activities, grouping and aggregating activities, assigning resources to activities and assigning the cost of activities to cost objects are the heart of designing an ABC system (Abusalama 2008). According to many researchers (Cobb et al.1992; Innes and Mitchell 1998; Abusalam 2008), identifying, grouping and aggregating activities, assigning resources to activities and assigning the cost of activities to cost objects are the most common problems experienced during the design and implementation stages of ABC system. Thus, this must be first step to be addressed when designing an ABC system.

It is also apparent that activities and selecting their correct cost drivers play a crucial role in helping an organisation to create an understanding of ABC and to achieve the adoption of ABC.

2.16 Research hypotheses

The pivotal point of the adoption model developed in chapter 3 is that it is the combined effects of both behavioural and organisational and technical factors which result in adoption or non-adoption of the ABC system. Therefore, the model suggests that TVET colleges that are operating in different environments are closely aligned with the contingent factors associated with adoption of ABC. Therefore, to test the new model, the following hypotheses seek to establish whether or not behavioural and organisational and technical factors pose barriers to the adoption of ABC. The nine factors identified are individually tested to establish their relationship with ABC adoption. Should such relationship exist, it is then possible to identify adopting colleges. For example, adopting colleges may be larger with higher overheads, more product diversity, etc. On the other hand non-adopting colleges may be smaller with smaller overheads, no product diversity etc. Once that difference is established between TVET colleges, it is anticipated that there will be significant differences in adoption rates between these different colleges (colleges with larger overheads as opposed to ones with lower overheads).

The validity of the arguments in this chapter is tested by the hypotheses relating to the following variables:

- Size of an organization;
- Top management support;
- Cost structure/ Level of overheads;
- Product diversity;
- Resistance to change;
- Internal champion support and innovation;
- Internal resource availability;
- Training; and
- Technical variables.

Based on the information provided earlier in the literature part, and according to the research problem under study, and by referencing to related studies, the following hypotheses to be tested can be deduced:

- **Size of an organisation (H1)**

Abusalama (2008:139) believes that large firms are more likely to have greater access to individuals with the knowledge to design and implement ABC systems. In addition, as ABC implementation is costly. Larger firms are more likely to obtain economies of scale, with the cost spread across several products or services. This argument results in the following alternative hypothesis and null hypothesis (H0):

H1: Larger TVET colleges are more likely to adopt ABC than smaller colleges.

H0: There is no relationship between size of the college and ABC adoption.

- **Top management support (H2)**

Managerial support is not exclusive to the preliminary stages of ABC implementation; rather, it is a continuous process to maintain the new system (Aldukhil 2012:77).

The current study seeks to examine this issue via the following hypothesis:

H2: TVET colleges, which have top management support are more likely to adopt ABC than those colleges which face lack of top management support.

H0: There is no relationship between top management and ABC adoption.

- **Cost structure/Level of overheads (H3)**

Vieira and Hoskin (2004) and Majid and Sulaiman (2008) consider the overhead costs of an organisation to be a factor that assists in the adoption of ABC. Companies that have more overheads in the manufacturing of products tend to adapt ABC systems, rather than companies that have lower overheads. This study, therefore, seeks to test the impact of overheads on the implementation of ABC system by posing the following hypothesis:

H3: TVET colleges, which have a greater percentage of total cost as overheads are more likely to adopt ABC than colleges which have a smaller percentage of overhead costs.

H0: There is no relationship between cost structure/level of overhead and ABC adoption.

- **Product diversity (H4)**

According to Schoute (2011) and Abusalama (2008), a diversity of products is also a major factor in the adoption of ABC. Companies that have many diverse product lines are known to use ABC systems even though allocating costs to a diverse product range is more difficult than the allocation of costs to a lower number of products. This study adopts the position that product diversity is a significant factor in the adoption of ABC systems. This study tests this hypothesis as follows:

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H4: TVET colleges, which have more production diversity, are more likely to adopt ABC than colleges which have less production diversity.

H0: There is no relationship between production diversity and ABC adoption.

- **Resistance to change**

Askarany et al. (2008) argue that organisations that adopt innovation policies are more likely to adopt the ABC system instead of a traditional costing system since ABC provides them with the more appropriate and detailed information required. This study tests the following hypothesis:

H5: TVET colleges with employees, who are open to changed and innovative systems, will be more likely to adopt ABC than those colleges with employees who are resistant to change.

H0: There is no relationship between resistance to change and ABC adoption.

- **Internal champion support and innovation (H6)**

According to Egan (2002), process and team integration are the key drivers of implementation of new projects to become successful. The current study adopts the position that internal champion support is a significant factor in the adoption of ABC systems. This study, therefore, tests the following hypothesis:

H6: TVET colleges, which have high internal champion support and innovation, are more likely to adopt ABC than those colleges which have less internal champion support and innovation.

H0: There is no relationship between internal champion support and ABC adoption.

- **Internal resources availability (H7)**

Lopez (2013) concludes that the ABC is very accurate but consumes a great deal of resources. This study, therefore, tests the following hypothesis:

H7: TVET colleges, which have adequate resources, are more likely to adopt ABC.

H0: There is no relationship between internal resources' availability and ABC adoption.

- **Training (H8)**

Training is a prerequisite to make sure that employees understand the benefits of the system and comprehend them in their decision-making (Elagili 2015). This study adopts the position that training is a significant factor in the adoption of ABC systems. This study tests the following hypothesis:

H8: There is a positive relationship between ABC adoption and training.

H0: There is no relationship between training and ABC adoption.

According to Abusalama (2008:175), the above hypothesized factors (behavioural and organisational variables) alone may not be adequate to explain the full reasons for ABC adoption rates. Therefore, the current study tests the following hypothesis to establish whether or not technical difficulties pose barriers to the implementation of ABC:

H9: Technical issues are most common cause for rejecting ABC at TVET colleges **(H9)**.

H0: Technical issues are not most common cause for rejecting ABC at TVET colleges.

The above review has thus identified nine hypothesized variables based on the ABC model developed in figure 3.6.

2.17 Summary

In this chapter, the core terminologies of Activity-Based Costing (ABC) are defined. This chapter also illustrates traditional costing systems (TCS) and Activity-Based Costing (ABC) by explaining the two-stage allocation process for allocating overheads to cost objects. The deficiencies of conventional cost systems and development and evolution of ABC are discussed in this chapter. The factors that constitute barriers in adoption of ABC and the failure of the TCS to allocate costs to each activity using cost driver are illustrated. This chapter has also described the technical steps encountered during the design and adoption of ABC system. It is clear from the literature review that technical issues (identification, grouping activities, assigning resources to activities and assigning the cost of activities to cost objects) pose significant challenges in the implementation of ABC.

The next chapter will present an overview of TVET colleges and its education and training for individual and national development. The next chapter also overviews six KZN TVET colleges in order to create an understanding of the environment where the this study took place.

CHAPTER 3: EMPIRICAL FINDINGS OF PRIOR STUDIES, TVET COLLEGES CONTEXT AND ABC ADOPTION STRATEGIES

3.1 Introduction

Chapter 2 provided the background to this study by considering TCS and ABC to the treatment of overheads costs, the limitations of the traditional system, the claimed advantages and benefits of ABC, and the application of ABC to the public sector and ABC at TVET colleges.

This chapter presents an overview of TVET colleges and their education and training for individual and national development. It also discusses KZN TVET colleges in order to create an understanding of the environment where the research took place. All six TVET colleges, which are used as case, are overviewed. This chapter also provides an analysis of ABC methodologies to serve as subsequent formulation of a framework for the adoption of an ABC system in KZN TVET colleges and the development of ABC model applicable to TVET colleges. The empirical findings of previous studies are used to develop methodologies that are that applicable to TVET colleges.

Empirical studies relating to ABC implementation are also reviewed to establish the extent to which contingent variables and technical variables difficulties actually play a part. This chapter reviews these studies in chronological order (from 1987 to 2015) and reports on the adoption rates, benefits and difficulties of implementing the ABC system.

The next sections (3.2 to 3.4) present the context of TVET colleges to create an understanding of the environment where this study took place. Information is also provided on the location of each TVET college.

3.2 Technical and vocational education and training (TVET)

Technical and Vocational Education and Training (TVET), as a post-school provision form, represents an indispensable means to develop, at the individual level, skills which have indisputable impacts on national development in a developing context (Akoojee 2008:1). The public colleges in South Africa are associated exclusively with the training of a post-school, pre-employed youth component and has potential to respond to the lifelong learning needs of the population. As such, it has the capacity to serve as an important means for responding to the continuing education and training of both the employed and non-employed elements of society (Akoojee 2008). Individual skills are, thus, able to be translated into skills necessary to uplift communities. In this way, TVETs have important implications for poverty reduction in a developing context (Akoojee 2008:1).

TVET colleges, formerly known as further education and training (FET) colleges, provide education to two groups of people: learners pursuing vocation-focused schooling rather than traditional matric, and those who have completed schooling and seek a tertiary qualification but who do not qualify for university entrance (Technical and Vocational Education and Training 2016). The two main qualification streams offered at TVET colleges are (Technical and Vocational Education and Training 2016):

- National Accredited Technical Education Diploma (NATED or 'Report 191') programmes, which used to be the theoretical component of the artisanal training system for apprentices employed by private sector firms. More recently, students have been allowed to enrol in NATED without being employed or obtaining employer sponsorships. The courses are presented over six trimesters (for engineering studies) or three semesters (for business and services programmes); and
- National Certificate (Vocational) – or NC(V) – programmes were introduced in 2007 and emphasise practical and vocation-specific learning. They run over three years, and account for the majority of the students in the TVET sector.

The National Development Plan identified the potential of the TVET sector to play a critical role in South Africa's development and in reducing unemployment. It sets a target of 2.5 million enrolees at TVET colleges by 2 030, up from 640 000 in 2013. It is, however, unclear whether and to what extent the skills of TVET graduates meet employers' needs and are in demand in labour market (Technical and Vocational Education and Training 2016). It is also not clear whether the performance of South African secondary schools can be raised soon enough to produce the number of TVET- eligible school-leavers required to meet this demanding goal: In 2015, fewer than 350 000 matriculants passed their courses with grades high enough to qualify for entry into university and diploma-level studies (Technical and Vocational Education 2016).

3.3 Technical and vocational education and training context

In addition to the introduction of NC (V) programmes in 2007, the public TVET sector has undergone a number of significant changes in recent times (Technical and Vocational Education and Training 2016):

- In 2001/02, 152 Further Education and Training (FET) colleges were merged into 50 TVET colleges to consolidate college administration and reduce funding disparities;
- A large-scale recapitalisation of TVET colleges started in 2007, and included a 2014 commitment R2.5 billion for the refurbishment of existing campuses and the building of 12 new ones; and

- On 1 April 2015, the administrative function of TVET colleges was shifted from provincial governments to the national Department of Higher Education and Training (DHET), with TVET college staff being transferred to the DHET.

These important changes lead to rapid increase in the number of enrolees in the TVET colleges. Enrolment numbers increased from nearly 360 000 in 2010 to over 700 000 in 2014, a rate of growth nearly 20% a year. Over the same period, government spending on TVET colleges increased by only 16% a year (Technical and Vocational Education 2016).

Within the sector, funding was allocated among colleges largely based on historical norms, despite the funding formula being driven by enrolment numbers. The dominance of historical funding levels in actual allocations meant that TVET colleges received only 50% -80% of the amounts implied by the formula (Technical and Vocational Education 2016). In addition, the formula did not differentiate between colleges, although urban colleges, for example, would face higher staffing costs than rural colleges.

Although the current funding formula did not appear to drive actual allocations, its exclusive focus on enrolments rather than on college performance has the potential to create perverse incentives.

3.4 Overview of five KZN TVET colleges

There are nine public TVET colleges in KZN. KZN has the highest number of public colleges in South Africa with approximately 90 000 participants (DHET 2013). This study overviewed five TVET colleges (cases) in KZN.

Case A

The Umfolozi college is one of nine TVET colleges in the province of KwaZulu-Natal. Situated on the north coastal of KZN, the college boasts five fully-fledged campuses offering certificate and diploma courses in the fields of business and engineering studies. The college has five main campuses: Chief Albert Luthuli, Eshowe, Eskhawini, Mandeni and Richards Bay. In addition, seven skills centres are located at Sundumbili, Isithebe, Eshowe, Nseleni, Heatonville, Esikhawini and ZCBF Community Park.

Programmes offered include the National Certificate (Vocational) and N4-N6 Diploma programmes. An extensive selection of skills programmes ensures that the college is also meeting the need for skills training at a grassroots level. Learnerships and co-operative programmes are also very active at Umfolozi college.

The college has sector education and training authority (SETA) accredited trade test centres based at Mandeni and Richtech Campus. The trade test centres are accredited to offer the trade test for trades of electrician; fitter; fitter & tuner; and instrument mechanic. The Richtech and Mandeni campus are also accredited to offer International Computer Drivers Licence (ICDL) training and testing.

Case B

The Umgungundlovu TVET college is a public TVET college that offers both certificate and diploma programmes to learners. The college is situated in Pietermaritzburg (PMB) and draws students from the greater midlands area.

The college serves a large urban and rural geographical region that extends into Greytown in the east, Mooi River in the north, Camperdown in the south, and Bulwer in the west. This extension emphasises two critical aspects of the college: its vast rural geographical client base and the fact that all its campuses are located in the urban areas.

Umgungundlovu has five specialised campuses that offer affordable, lifelong education and training. These are:

- Edendale (Edendale);
- Midlands (Central PMB;)
- Northdale (Northdale);
- Plessislaer (Imbali); and
- Msunduzi (Central PMB).

The Umgungundlovu TVET central office is situated at 44 Burger Street, Pietermaritzburg. The senior management team as well as the portfolio manager's office are located at this campus. This campus also houses the finance and procurement staff.

The Edendale campus is situated in Edendale, Pietermaritzburg, 3217. This campus specialises in the training of civil engineering students. The campus offers NC (V), diploma and workshop courses in all engineering fields of study.

The Midlands campus is located in the centre of Pietermaritzburg. The key focus is on engineering theoretical programmes, information technology, programmable logic controller (PLC) training and electronics. The Midlands campus also has a new maths centre, offering Grade 12 mathematics and physical science.

The Msunduzi campus, situated in the centre of Pietermaritzburg, is a business studies campus offering NC(V) as well as diploma programmes in the business-related fields. The Msunduzi campus specialises in computer literacy classes which are offered part-time.

The Northdale Campus is situated in the Northdale suburb of Pietermaritzburg. The campus specialises in electrical engineering, offering both NC(V) and Workshops in this field of study. This campus is the home of NC(V) hospitality and finance, economics and accounting. This campus offers a financial management and business management diploma.

The Plessislaer Campus, located in Imbali, Pietermaritzburg, offers mechanical engineering programmes. These include fitting and turning, mechanical, fabrication, auto, tooling and electrical. NC(V), diploma and workshop courses are also offered in this campus. The business studies unit offers human resource diplomas as well as NC(V) education and development. The learnership unit is housed at Plessislaer campus.

Case C

The Thekwini TVET college has six campuses namely, Asherville campus (Sydenham in the heart of Durban), Cato Manor campus (Cato Manor is 5 km west of Durban city centre), Centec campus (Morningside in Durban), Melbourne campus (Dalbridge), Springfield campus (Springfield in Durban) and Umbilo campus (Umbilo Road in Durban).

The Thekwini TVET college has a strong commitment to nation building and leads the province in terms of their outreach programmes and partnerships. The Cato Manor Technical college, Durban Central Technical college and LC Johnson Technical college merged together to form the Thekwini college, an accredited public Further Education and Training institution as per KZN GG No. 1172002 published on 11 April 2002.

Case D

Elangeni TVET college is a public Technical and Vocational Education and Training institute, based in Durban, KZN. Elangeni TVET college strives to be a self-reliant TVET college that provides meaningful education and training to those students seeking to learn.

This college equips students with the qualifications and skills to start out on a chosen career path. Elangeni TVET college ensures that a support is given to lifelong learning and students are taught by trained assessors and moderators that quality delivery in assortment of subject fields.

The programmes that offered at Elangeni college are customised and responsive to the needs of learners and industry, these programmes are essential for the South African economy. The

Elangeni TVET college also offers vocational programmes that equip students for a successful career in an industry that has great needs for their practical skills, experience and knowledge. This TVET college plays a catalytic role in the economic empowerment of people by providing relevant education and training, this college also provides integrated theoretical and practical experience to the community.

The Elangeni TVET college has eight campuses, these are:

- Inanda;
- KwaDabeka;
- KwaMashu;
- Mpumalanga;
- Ndwedwe;
- Pinetown; and
- Qadi.

Case E

The Majuba TVET college has six campuses namely, Centre for People Development (CPD), Dundee campus, IT & business campus (IT &B), Majuba technology centre (MTC), Newcastle technology centre (NEWTECH), and Open learning unit (OLU). The Majuba TVET college is the one of the largest colleges in South Africa. This college has with an enrolment of approximately 30 000 students (Majuba TVET College 2017).

The Majuba technology centre (MTC) is a fully-integrated engineering studies campus situated on Inkosi Albert Luthuli Drive, Section 5, Madadeni. This campus boasts new high-tech workshops which are fully equipped with relevant, modern equipment and machinery. The campus is one of the few educational institutions in KZN that offers primary agriculture as a field of study (Majuba TVET College 2017). This campus has a 2-hectare farming area which is accessed by agriculture students to gain hands- on practical skills (Majuba TVET College 2017). The civil engineering division at this campus includes a fully-fitted plumbing workshop, carpentry workshop as well as a bricklaying workshop. Newcastle technology centre (Newtech), is a fully-integrated engineering studies campus situated on FW Beyers Road in Barry Hertzog Park. This campus offers a diverse range of exciting and innovative courses to enhance entry into the labour market, and improve career opportunities in the engineering field. The centre for people development (CPD), is a fully-integrated business studies campus situated on Dr. Nelson Mandela Road, Section 2 in Madadeni. This campus is ideally situated to give access to previously disadvantaged communities. It has always been instrumental in community development, focusing on providing people with appropriate skills, to enable them

to become employable or self-employed. The IT and B campus is a fully-integrated business studies campus situated on 4 Tommy Boydell Avenue in Barry Hertzog Park. This campus offers a diverse range of exciting and innovative courses to enhance entry into a labour market, and improve career opportunities in the business field. Dundee technology centre (DTC) is an engineering and business campus situated in Beaconsfield Street, Dundee. This campus is a key contributor towards social, cultural diversity and economic development and ensures that the demand for intermediate skills is met, not only in KZN, but also in South Africa (Majuba TVET College 2017).

3.5 ABC adoption strategies applicable to TVET colleges

In this section a new ABC model is developed. This model seeks to identify those factors which the literature suggests are likely to impact on the adoption of ABC. Several adoption strategies are reviewed as the basis of developing new model for this study. This section elaborates on the nature of technical variables by considering the various stages. Based on contingent variables and the difficulties encountered during implementation of ABC reviewed in chapter 2, a model is developed with the aim of addressing behavioural and organisational variables and technical variables as barriers to ABC adoption.

3.5.1 Allocation of overhead costs

Aldukhil (2012:51) states that the goal of the first generation of ABC was to improve the allocation of costs, which could be part of a business unit's strategic objectives. However, the system did not attempt to identify activities individually or provide real cost information about them; consequently, it was impossible to make a judgement on the performance of such activities. Nonetheless, the system was beneficial because it supported strategic decisions related to pricing and product mix. Figure 3.1 shows the assignment of costs the cost object using two stage allocation.

Figure 3.1: Allocation of overhead costs

Overhead

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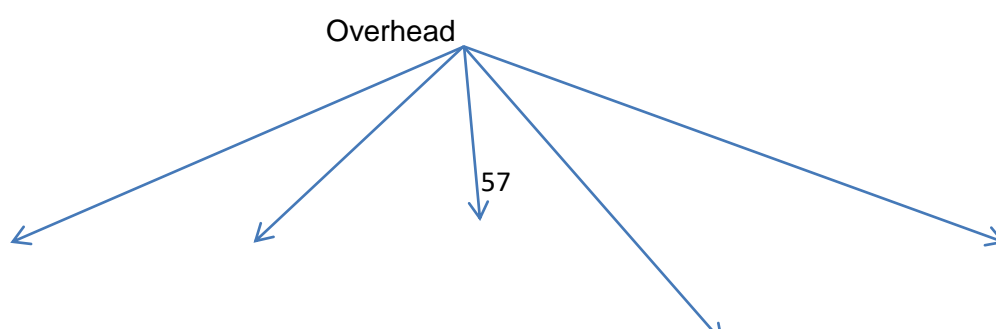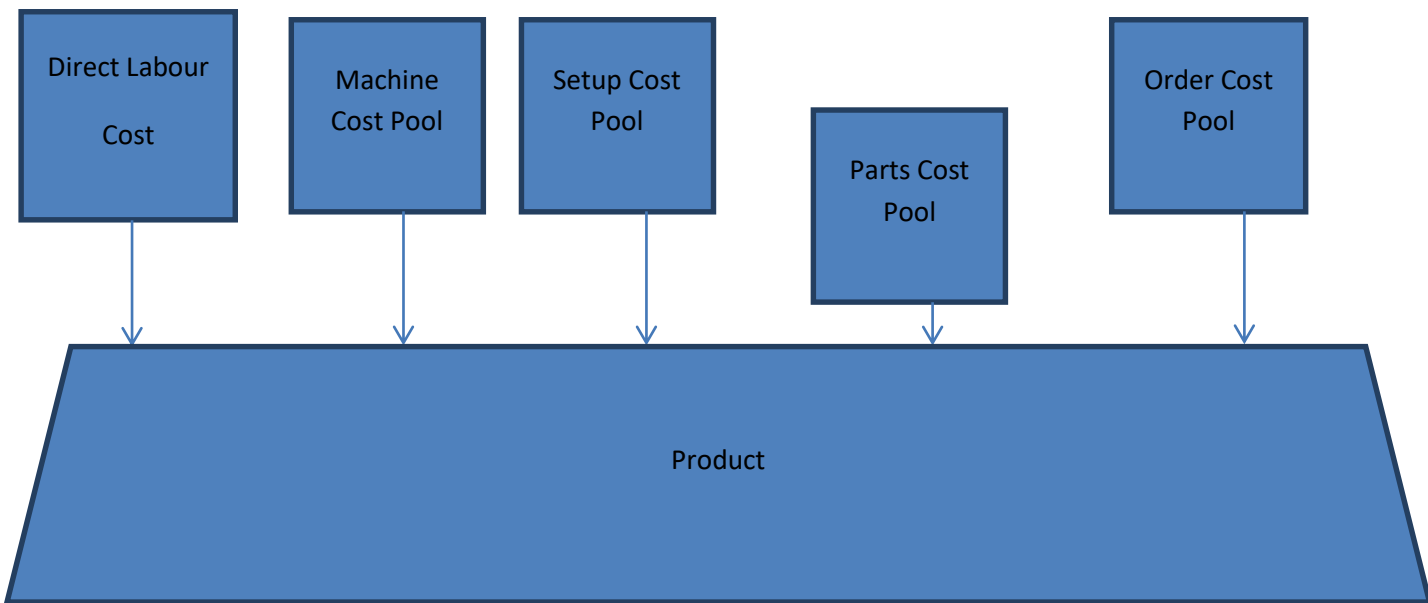
The second generation of ABC has a framework with two main views: the cost assignment view and the process view. Both views are shown in Figure 3.2.

The cost assignment view represents the vertical part of the model. Costs are assigned to the cost object in two stages (Aldukhil 2012). In the first stage, resource costs (for example, salaries, depreciation and utilities) are assigned to activity cost pools directly or through the use of resource drivers. Each type of resource represents a cost element of an activity cost pool. Thus, an activity cost pool is the total cost of all resources consumed by an activity. An activity centre represents a collection of related activities that underlie a specific process, function or department, for example, the purchasing order entry, payment process, receipt of incoming material and inspection, material handling and warehousing (Aldukhil 2012). In the second stage, each activity cost pool is assigned to cost objects with the help of activity drivers that reflect the activity consumption pattern of cost objects. If the cost object is a product, the product costs are the costs of the various activities assigned to that product. Figure 3.2 represents that detailed costs assignment view of ABC.

Figure 3.2: ABC Assignment Model

Activity Driver
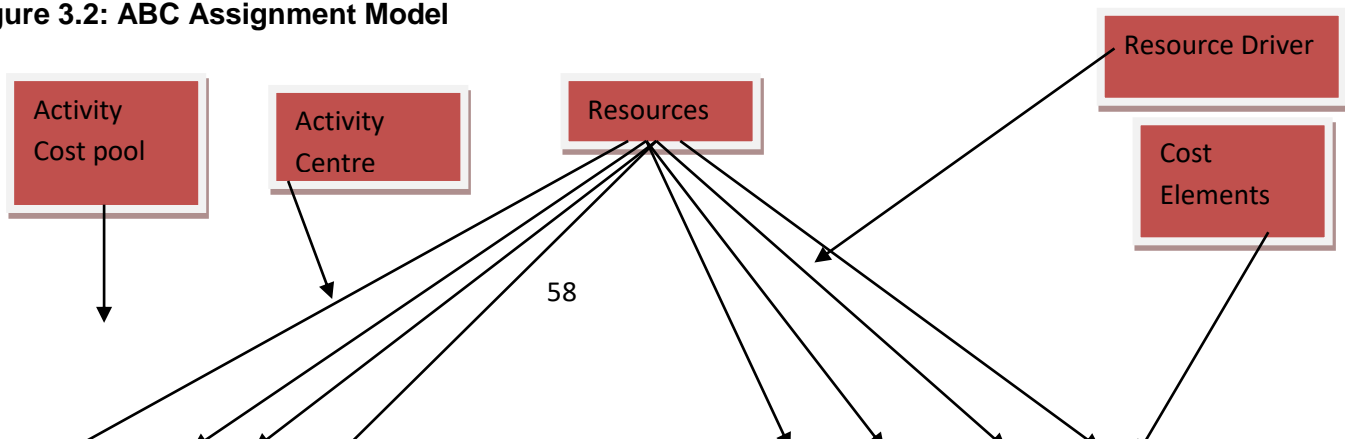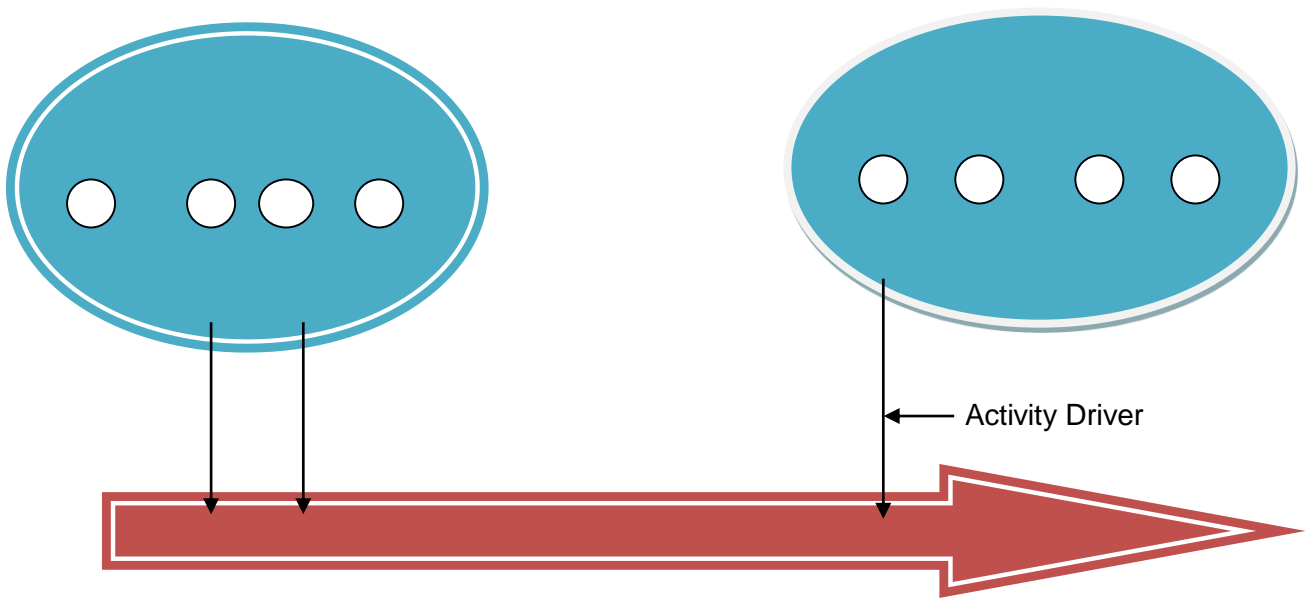
Source: Turney (1996:97)

From the above figure 3.2, it can be seen that costs flow from the resources to activities, and then flow through to the cost that triggers the activities. Therefore, this view indicates that activities consume resources, and cost objects consume activities.

Abusalama (2008:76) argues that the ABC system focuses on activities rather than products. Such focus helps to avoid the distribution in product costs that can arise from the use of the traditional costing systems, and provides more information that is accurate. Drury (2012) advises businesses to understand the factors that drive each major activity, the cost of activities and how activities can be related to products. The art of designing an ABC system can be viewed as making two separate interrelated decisions about the number of cost drivers to use (Abusalama 2008:77). According to Aldukhil (2012:54), activity information provided for the purpose of costing usually answers activity-related questions: what activities run in an organisation, what efforts are required to perform these activities and what are their costs? The nature of this information is primarily financial (Aldukhil 2012). Such information can form a basis for profit evaluation that drives important decisions.

The process view of ABC represents the horizontal part of the ABC model (refer to figure 3.2). It focuses on activity management, taking activity analysis (AA) further and supplying information as to why an activity occurs (i.e., its costs drivers) and how the work in an activity is accomplished (Aldukhil 2012:55)

An activity cost driver refers to the trigger for performing such activities. These drivers are related to the current activity or to the prior activity (Aldukhil 2012). There may be multiple cost drivers associated with an activity. A process can be seen as a chain of connected activities

performed together to serve the final customer. The linkage between activities offers a clear picture of activity triggers and enables activity as indicators of the limitations that cause variation in activity volume, resources consumed and run time. For example, product design specifications that do not fit perfectly into the current process setting are limitations that increase the effort required for set-up activities (Aldukhil 2012).

One of the major issues that affects the development of the new system is the measurement of costs (Aldukhil 2012). Firms considering the adoption of ABC may think about the cost of collecting data regarding activities and activity drivers. Data collection is usually done through conducting interviews and questionnaires with relevant employees (Aldukhil 2012). The data required depends on the degree of accuracy to be reached by the ABC system (Aldukhil 2012). Firms should keep ABC systems simple by reducing the number of activity drivers and, thus, reducing the costs of measurement.

Aldukhil (2012:55) states that firms should use transaction-based drivers instead of duration-based drivers in order to reduce the costs of measurement, such as number of inspections performed and number of inspection hours. Transaction drivers are easier to record than duration drivers. Moreover, the transaction drivers are already available in the existing system because a transaction is generated every time the activity is performed. For example, a purchase requisition is required every time a purchase order is processed (Aldukhil 2012).

The design process begins with a generally agreed definition of the objectives of an ABC system and ends with the assignment of the cost

This model can help TVET colleges to avoid the distortion in product costs that can arise from use of traditional costing systems (Abusalama 2008).

3.5.2 Two-stage allocation of overheads at TVET colleges

Higher education requires an alternative costing model that goes beyond the first-stage cost allocation to the second stage of cost allocation, whereby the costs are further allocated per activity that drives the cost. The present costing system used in tertiary education adopts the first-stage allocation and not the second. The two-stage allocation in terms of the ABC is a better costing system that meets the demand for higher education for continuous improvement and manages the business process, as suggested by Amir et al. (2010:5). For a better understanding of the conceptual framework for ABC adoption presented in this study, the adoption methodologies that are applicable to TVET colleges in implementation of ABC are discussed below.

3.5.2.1 The identification of the major activities

Based on a literature review of higher education institutions, many collections of activities are involved in the formation a final cost product (Aldukhil 2012). The core activities of TVET colleges mainly direct instruction and the administration department. Other academic support includes the libraries, computer labs, asset department, student support and general maintenance activities. Cooper and Kaplan (1998) believe that an activity dictionary provides a useful approach in identifying the activities suitable for use in the application of ABC. The activity dictionaries can be relatively brief, say 10-30 activities, especially where the prime focus of the ABC system is to estimate product and customer costs. Therefore, the activity dictionary simplifies the analysis process by listing activities by function or department (Cooper and Kaplan 1988).

To identify all major activities and define of each activity of each department of TVET college, the activity dictionary has been designed and is presented in appendix I. This standard activity dictionary helps TVET colleges in selecting measure 'drivers' and provides a guide to the adoption and implementation of ABC. The CFOs/their assistants were interviewed to identify activities and determine the work done in each campus. The next step in the study was to divide each department in smaller units (functional decomposition). To illustrate the functional decomposition of a TVET college to smaller units, figure 3.3 shows the costs flow from central office to campus (resource centre), then figure 3.4 shows costs flow from campus (resource centre) to department (activity centre). One department within the campus (administration department) is shown an as example of breaking down the activities of this department (refer to figure 3.4).

Figure 3.3: Proposed functional decomposition of TVET colleges into campuses
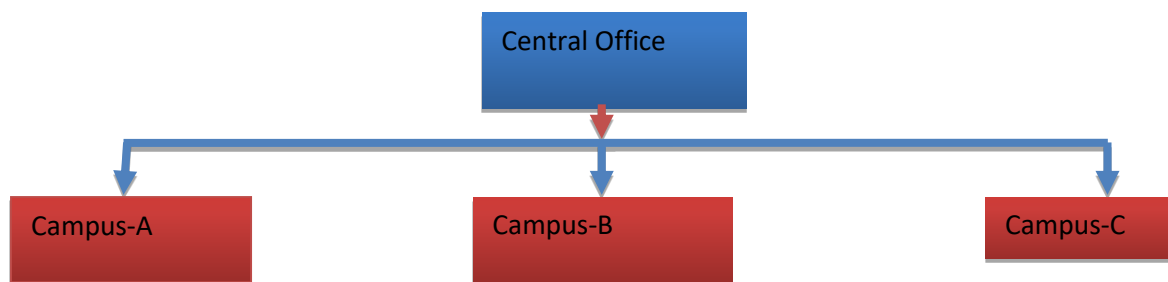
Figure 3.3 shows the decomposition of the TVET college into campuses, as the first step of dividing each department into smaller units. Figure 3.4 divides the administration department into smaller units, as an example of functional decomposition of the TVET college in order to identify the activities of each department as the first step in implementing ABC.

Figure 3.4: Proposed functional decomposition of administration department of a TVET college
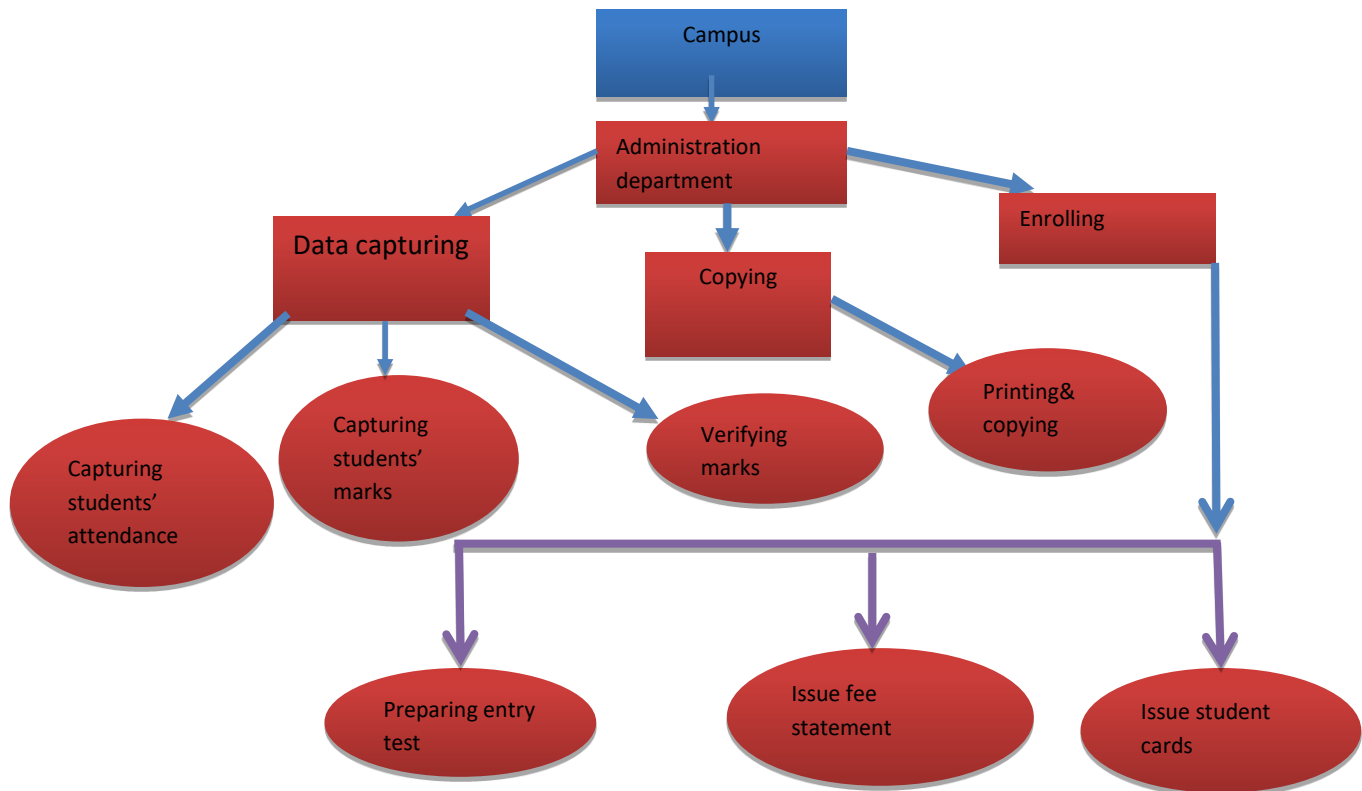
Figure 3.4 divides the administration department into major activities. The basic principle of ABC is to identify each activity of a department, As shown in figure 3.4, seven activities are performed in the administration department: capturing students' marks, capturing students' attendance, verifying marks, printing and copying, preparing the entry test, issuing student cards and issuing fee statements. This plan will enable TVET colleges to achieve suitable and economical activities. Turney 1996 (referring to figure 3.4) argues that it is important to identify each of these activities separately because the effort required to capture students' marks may differ from the effort needed to verify students' marks.

3.5.2.2 The grouping and aggregating activities

The number of actions performed in TVET colleges is so vast that it is not economically feasible to use a different cost driver for each action. This study uses an activity centre (administration department) to aggregate the actions into activities, and a single driver is used to allocate the costs to activities and to cost objects. For instance, the cost driver for capturing students' marks, verifying marks and capturing students' attendance, is the number of registered students. This is aggregated under data capturing. An activity centre is therefore a collection of related activities, such as those in the administration department. The activities

of TVET colleges in KZN are grouped into departments in order to help answer the following questions about the work of each department: what work is performed in the activity centre (department)? And which activities consume most of the resources of the department? This study used an activity centre to get information about the costs of each activity, and the resources used by each activity. This information can help TVET colleges to calculate the cost of these activities. For example, salaries of data capturers, computer software and computer hardware used by data capturers, printing papers, internet and cartridges are associated with activities performed in data capturing. The methodology will further enable TVET colleges to determine which activities contain waste and are candidates for improvement and what is the overall performance of the department as whole.

Activity hierarchy is employed in this study as one of the methods of classification of major activities. This approach recognises that not all the activities' resources are consumed in proportion of the number of outputs produced (Abu-Tapanjeh 2012:42).

Based on table 3.1, unit level activities consumes resources in proportion to the number of unit produced.

Table 3.1: Classification of Major Activities in ABC System		
Type of Activity	Definition	University Activities
Unit Level	Activities performed each time a product is delivered, for example a module	Teaching and Research
Batch Level	Activities performed each time or batch of product is delivered, for example a portfolio of module	Courses committees assessment and validation events
Product Level	Activities which are needed to support the provision of each type of output	Faculty administration
Facility Level	Activities which sustain an organisation's ability to function	General administration and provision of premises

Source: Cooper 1990

Labour for direct instruction was classified as unit level and data capturing was classified as product level. In summary, two approaches have been used in relation to aggregating activities in TVET colleges: these are the activity centre and activity hierarchy (refer to figure 2.1 and figure 2.2).

3.5.2.3 Assigning resources to activities

After the activities have identified and aggregated in TVET colleges, the next step is to assign the overhead costs to each activity using the first stage drivers, which link spending and expenses, as captured in the general ledger system, to the activities performed. Appendix J

was developed as a starting point of assigning the resources to activities performed at TVET colleges. In appendix J, the costs (resources) are assigned to each activity, using percentages as the activity driver. For example, the administration department uses (4.17/8.88) 50% of computers, data capturers, printing papers and cartridges (resources) in capturing students' marks. Therefore, 50% of the costs (resources) of data capturing section can be allocated/assigned to capturing students' marks in this way at TVET colleges.

Appendix J provides adequate information on allocating resources to activities performed within a TVET colleges. This appendix provides a good guide for a costing method by providing some cost allocation techniques for a wider range of TVET college specific activities that provide a valuable insight for management of a college. This information leads to the correct estimation of the cost of the programmes offered.

3.5.2.4 Assigning the cost of activities to cost object

The costs of activities are traced to cost objects by means of activity drivers. The second-stage cost driver will be used as the method of assigning the activity cost to cost objects in this study. The total costs of the teaching department were assigned to respective programmes (cost object) using the number of students that are enrolled in each programme as the driver. Moreover, the costs per student were calculated by dividing the total cost of the programme with number of student enrolled. However, different drivers were used to assign the costs for another department. The analysis of departmental activities is the first step of designing the system. In this study, the analysis of division activities focuses at campus level and the activity classification is shown in table 3.1.

A cost assignment model was also developed for TVET colleges using the ABC system. The new ABC model is shown in Figure 3.6. The new conceptual framework for the adoption of the ABC model in TVET colleges shown in figure 7.1 is modified to suit all campuses at TVET colleges. This new conceptual framework consists of the following elements as proposed by Krishnan (2006:8):

- Resources: Economic elements used to perform activities;
- Activity centre: A collection of related activities;
- Resource driver: Factor used to assign resources to activities;
- Cost driver: Factors used to allocate costs to activity;
- Activity cost pool: Total costs assigned to an activity;
- Cost elements: Amount paid for a resource and assigned to an activity; and
- Cost object: The ultimate goal of performing an activity. In ABC, this activity represents the final cost allocated to product or services.

The campus' accounting system, the chart of accounts (general ledger system) is a good starting point to convert to ABC cost model elements as shown in figure 3.4. In this model, resource drivers are the links between the resources and the activities; the resource driver allocates the total budget of the central office division to each resource centre, which is the campus. The resource driver is also used to disseminate the campus budget to other sub divisions of the campus. The resource driver (allocation base) is used for the selected general ledger items.

Over the last decade, although ABC has been widely applied to manufacturing, wholesale, retail and service sectors (Chongruksut 2002:57), the adoption of ABC by companies around the world has been at a fairly low rate (Innes and Mitchell 1995; Chongruksut 2002:57; Adukhil 2012). Armitage and Nicholson (1993) show that organisations in Canada and in US implementing ABC were 14% and 11% of respondents, respectively. Furthermore, a survey conducted by Aldukhil (2012:130) shows that only three higher education institutions are ABC users around the world and four have discontinued using ABC. According to Abusalama (2008), the main reason for this low rate, is that many researchers only perceive the behavioural and organisational variables as the only factors mitigating against the implementation of ABC, and technical variables are neglected. Based on this misconception, this study develops a model which will help TVET colleges to understand both technical variables and behavioural and organisational variables in order to implement ABC successfully. The original ABC model of ABC is shown in figure 3.5.

Figure 3.5: Original ABC Model of ABC Adoption
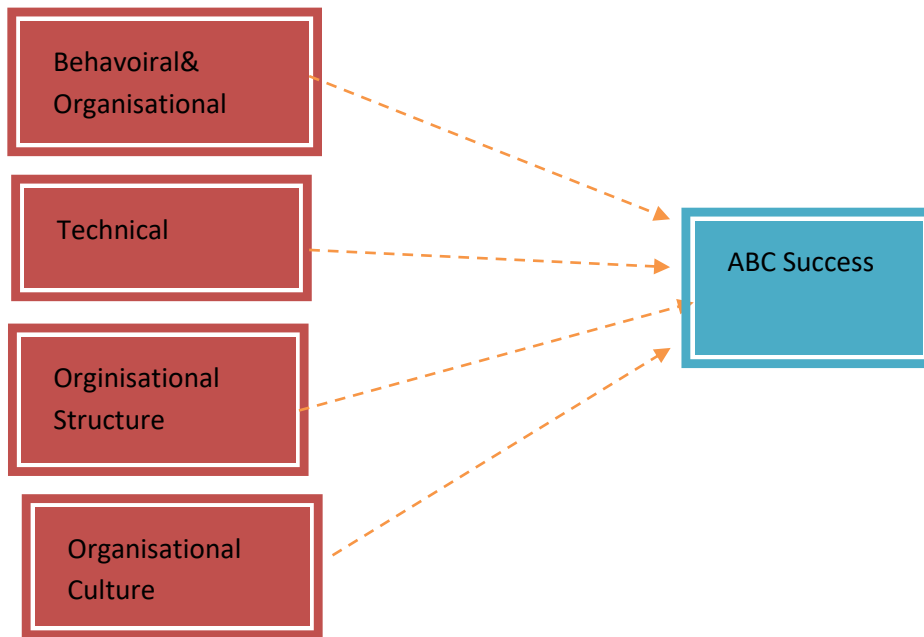
Source: Fei and Isa (2010:149)

Figure 3.5 (ABC model) suggests that for the company to adopt the ABC system, both technical and organisational and behavioural variables should be addressed. This model also suggests that the non-adoption of ABC may result from a failure to overcome these variables. This model seeks to incorporate both the impact of organisational and behavioural and technical variables on the implementation of ABC. This model, however, ignores the important step which requires an entity to have a better understanding of all the major activities that are performed within the entity, and it does not narrow down the scope of responsibility of each department or division which makes the calculation of costs easier and prepares the organisation to adopt ABC.

A new ABC model for ABC adoption is discussed in the next section.

3.6 New ABC model for ABC adoption

The literature review identified nine contingent factors, namely, product diversity, cost structure, firm size, training, internal champion and innovation, top management support, internal resource availability and resistance to change, and four technical variables, namely: identifying activities, grouping activities, assigning costs to activities and assigning costs of activities to cost object. These factors are identified as, impacting on the adoption of ABC. This study adopts Abusalama's (2008) general argument that seven contingent factors

potentially impact on ABC adoption. However, this study also incorporates technical variables and resistance to change as other factors that an impact on adoption of ABC in TVET colleges.

Based on the above factors, it is possible to develop an ABC model which is applicable to TVET colleges.

The new model designed in this study is the result of the selection of behavioural and organisational factors and technical factors presented in chapter 2 in order to investigate factors that constitute barriers to ABC adoption at TVET colleges. Even though there are many ABC models developed in literature very few studies have examined and addressed the association between technical, behavioural and organisational factors and ABC adoption within South African organisations. Furthermore, no study has investigated these variables at South African public TVET colleges. The selection of this model (figure 3.6) is based on the belief that, to adopt an ABC system successfully, the organizational and behavioural variables must be first identified and addressed, and thereafter, technical variables must be addressed.

Figure 3.6: Proposed New ABC model for ABC adoption
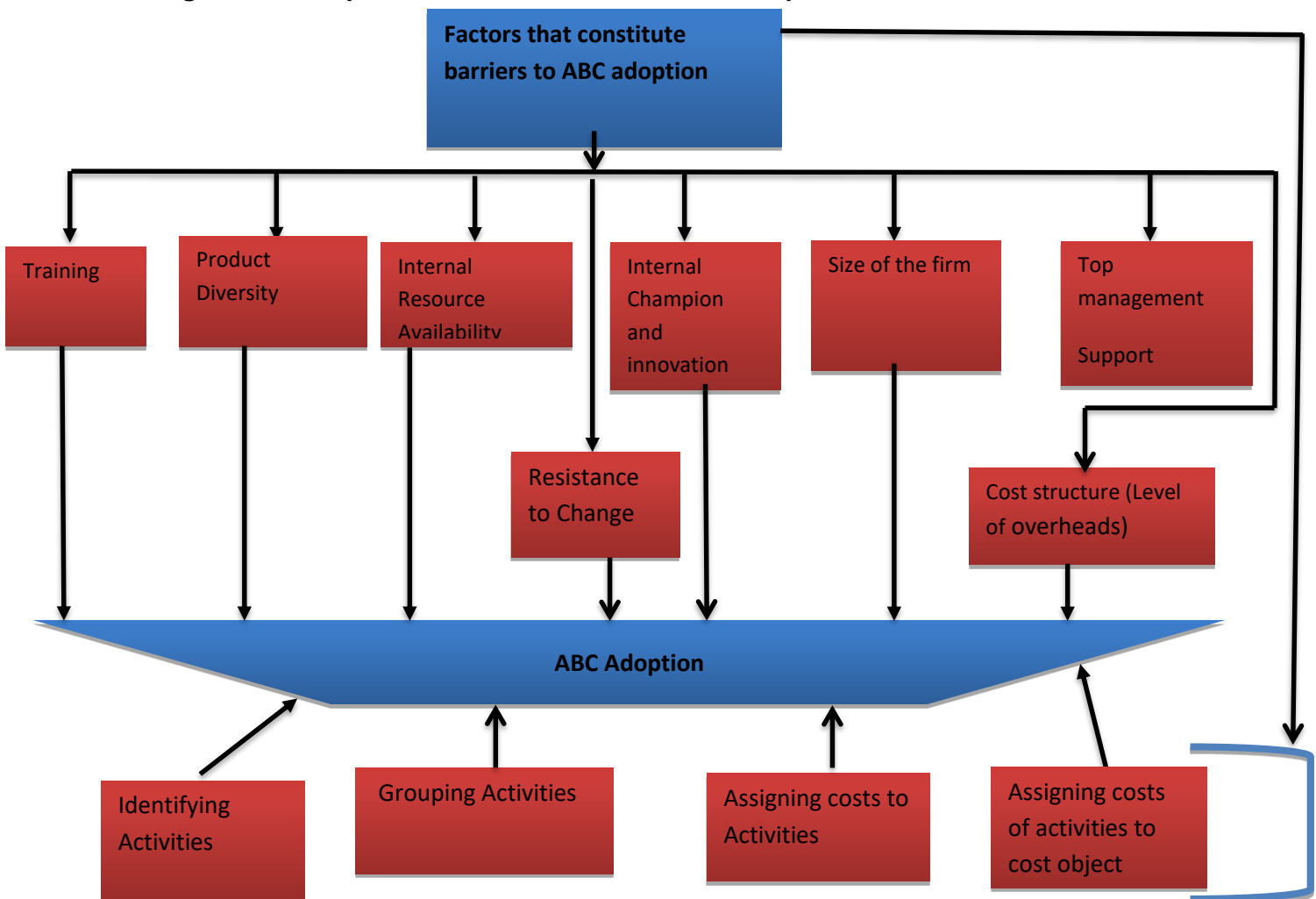
As the literature suggests, the new model seeks to identify those factors which, are likely to impact on the adoption of ABC. This model suggests that the organisations which identified and addressed only behavioural and organisational variables may fail to overcome implementation issues. The model identifies both behavioural and organisational and technical factors in order to overcome implementation issues. it also establishes the extent to which technical factors play a part in ABC adoption and implementation.

3.7 Empirical findings from prior studies

This section discusses research studies on ABC adoption in both developed and developing countries.

3.7.1 Activity-based costing in developed countries

It is well known that ABC has been successfully implemented as a refined costing system in developed countries since it was first introduced in the US in the late 1980s (Horngren et al. 2002; Andersons 1995; Carr 1993; Xu 2012:25). Despite the huge benefit and value derived from implementing ABC, a variety of problems and issues exist in the implementation of ABC.

Gietzmann (1991) conducted a case study into the initial implementation of ABC in Ransome Hoffmann Pollard Limited (RHP) in Britain. Gietzmann(1991) found that there was little evidence of either increased profits or the appearance of a true measurement of cost by adopting ABC in RHP. However, a major benefit of implementing ABC was a rise in the mutual understanding between the sales and accounting personnel and factory staff in how effective the costing system was in terms of managing trade-offs. This finding is supported by studies conducted during early 1990's (Armitage & Nicholson 1993; Clarke 1992; Innes and Mitchell 1991), which suggested that few firms had experimented with the new technique (ABC). Later in the same decade, studies suggested that many firms were still using traditional costing systems, and that an approximate 20% adoption of ABC was apparent (Innes et al. 2000; Sulaiman et al. 2004). Similarly, Xu (2012) argued that evidence showed either profits or performance measures had improved by adopting an ABC system in some western firms. Therefore, a challenging question is how to ensure that a shift of the costing system from conventional system to ABC is successful, especially when other organisational changes are made simultaneously. According to Xu (2012), organisational change and change of 'company culture had an impact on lower adoption rates.

On the other hand, Innes and Mitchell (1991), applying ideographic theory, conducted a case study of ABC implementation in a UK-based company. Innes and Mitchell (1991) identify some factors leading to successful ABC implementation, including support from top management;

constant supply of adequate resources; achievable objectives for ABC implementation; a participative manner between the different departments in data congregating; and complete involvement of all staff. Innes and Mitchell (1991) also indicate difficulties and obstacles encountered during ABC implementation. A critical difficulty was the increase of potential conflicts due to the fact that those responsible for implementing ABC did not realise the need for good communication and cooperation between different departments when introducing a new system (Innes and Mitchell 1991). As a result, conflicts among the relevant departments impaired the success of ABC implementation in the company. However, Innes and Mitchell (1991) were unable to explain in any depth what caused the conflicts.

Some of the answers may be found in Anderson's (1995) exploratory case study, where she identified behavioural and contextual factors as part of success factors to influence ABC implementation in General Motors Corporation from 1986 to 1993. Anderson (1995) searched for influential factors that had an impact on cost management system change, that could be well understood through empirically investigating those factors which influence ABC implementation. Anderson (1995) found that technological factors impact on the success of ABC. Her study developed a framework for evaluating ABC implementation.

In developing countries, there is evidence that suggests that most firms have experienced more problems in adoption of ABC than in developed countries, and that ABC is not successfully adopted (Innes et al. 2000; Sulaiman et al. 2004).

3.7.2 ABC in developing countries

Existing literature on ABC shows that the popularity of ABC as a tool for cost management in developing countries is very much below its popularity than in companies in the developed countries. The many studies to have examined the status of ABC implementation in developing countries include Brewer (1998), Mwita (2000), Wessels and Shotter (2000), Joshi (2001), Luther and Longden (2001), and their findings are briefly discussed in this section.

Brewer (1998) examined the relationship between national culture and ABC success by conducting a case study of Harris Semiconductor (HS)'s two plants located in Malaysia and the US. Brewer (1998) found that the top-down implementation approach which HS applied in its Malaysia plant played an important role in contributing to successful ABC implementation under its national culture, whereas it was not a case in its US plant. Therefore, the cross-culture difference did have an impact on successful ABC implementation. However, the question of whether this cross-culture difference would affect ABC failure remained unanswered.

Through a review of some of the concepts and literature of the performance management framework built up in developed countries, Mwita (2000) argues that a motivation for the performance management model should be promoted to modify the behaviour of job-holders, which can be done by employing an ABC model of behaviour change. Mwita (2000) urged developing countries to adopt this model as an efficient tool to overcome the drawback occurring in the over-centralised decision-making style typical of the public service. On the other hand, the model can be evaluated from an economic, managerial, social and behavioural perspective within its organisational context (Mwita 2000).

A study conducted by Wessels and Shotter (2000) examined the problems of implementation in companies located in South Africa. This study identified insufficient training for users and managers as a major impediment for implementing ABC in South Africa. However, in terms of organisational or cultural influences, the study found no association between organisational behaviour or culture and problems faced by these companies during the ABC implementation process.

Luther and Longden (2001) focused on the benefits of adopting management accounting techniques, including ABC, by the companies in South Africa. Their findings indicate that factors causing management accounting techniques, such as ABC changes in South Africa, differ from those in the UK for reasons of structural change and volatility in transitional economies like South Africa. Thus, this study showed that management accounting techniques and changes could only be understood within the political, cultural and economic contexts.

A case study conducted by Joshi (2001) indicated that there is a very low adoption rate for ABC in India. Most Indian companies relied heavily on traditional management accounting techniques due to cultural diversity and confusion in adapting contemporary management accounting practices, including ABC. Joshi (2001) concluded that some of the reasons could be attributable to Indian's long-term orientation and conservative management style.

The empirical studies relating to ABC in developed and developing countries established that the adoption rate of ABC is relatively low, particularly when one considers the benefits that have been claimed for the system. These following studies review the extent to which technical and other difficulties play a part in adoption of ABC.

3.7.3 Case studies on adoption of ABC

Over the past decade, there has been a growing awareness of ABC, but overall rates of adoption have been low. Abusalama (2008:69) states that an overview of how the ABC system

has been adopted should be provided by looking at a range of case studies conducted chronologically (from 1987 to 2015).

A number of researchers (Innes and Mitchell 1990; Cobb et al. 1992 O'Dea and Clark 1994; Anderson 1995; Shields 1995; Norris 1997; Krumwiede and Roth 1997; Krumwiede 1998; 2002; Briers and Chua 2001; Soin et al. 2002; Krumwiede and Suessmair 2007; Abdallah and Wei 2008; Xu 2012; Elagili 2015) have utilised case studies to examine the implementation of ABC and to identify the factors influencing the success of the systems.

In a case study, Innes and Mitchell (1990) highlight a number of problems with the implementation of ABC. They selected cases to give some diversity in terms of size, sector, stage of implementation, and focus of the application. The study found that a great deal of work was involved with the implementation of ABC. This included interviewing the managers in order to identify the activities, collecting the costs for activity cost pools, determining the cost drivers and, where appropriate, linking the cost drivers to the individual product lines.

Furthermore, Innes and Mitchell (1990) identify a number of similarities in the approach adopted by three companies in the implementation of ABC. These include the setting up of a small team to design and implement the system. In each case, a very senior accountant headed this team. There were on-going consultations with all the relevant managers in the organisations. This ensured that managers had the opportunity to make an input to the design of the system and ensure the proposals were acceptable and sensible. The system was kept as simple as possible by limiting the numbers of cost pools and cost drivers.

Cobb et al. (1992) found that the major difficulties perceived by UK companies considering the adoption of ABC were the amount of work involved in installing the system combined with a lack of suitable accounting staff resources, lack of computer resources, and difficulties in selecting suitable cost drivers. Regarding the companies which had rejected ABC, Cobb et al. (1992) identified the following issues: difficulties of collecting quantitative data on cost drivers; difficulties of linking cost drivers to individual product lines; amount of work required from the accountant; and other higher priorities (such as survival of the firm during a recession). Furthermore, Cobb et al. (1992) indicate that those companies which had adopted ABC faced some difficulties during an initial ABC implementation stage, such as the choice of activities, the selection of cost drivers, the uncertainty over using ABC for stock valuation for external financial reporting, as well as linking cost drivers with individual product lines.

In Ireland, O'Dea and Clark (1994) conducted semi-structured interviews with national firms in order to establish the factors associated with the implementation of ABC, and the difficulties that may be encountered. The results indicate that the reasons for not considering the

implementation of ABC included the following: the small percentage of overhead costs in the cost structure; low product diversity; the uncertainty as to whether ABC would have an impact on decision-making; and the belief that the existing cost system is satisfactory for product costs and measuring performance. In addition, the results show that the perceived difficulties of the implementation process were the cost of ABC implementation (time, software, and training), selecting activities and cost drivers.

Anderson (1995) conducted a case study of General Motors in the US and found that technological factors impact on the success of ABC. This study developed a framework for evaluating the ABC implementation and hypotheses about factors that influence the implementation of the system. The search for factors that influence ABC implementation success was guided by the IT and organisational change literature, as well as anecdotal evidence of factors that influence the success of ABC implementation.

Shields (1995) shows that variables influencing the success of implementing ABC involve behavioural and organisational variables, as opposed to technical variables, These variables comprise top management support, linkage of ABC system to competitive strategies, linkage of the ABC system to performance evaluation and compensation, sufficient internal resources, training in designing and implementing ABC and non-accounting ownership, which is the commitment of non-accountants to use ABC information.

The results of the study by Norris (1997) correlate with Shield's (1995) findings in that the successful implementation of ABC is associated more with behavioural and organisational factors than with technical factors. Shields and McEwen (1996) found that a significant cause of unsuccessful implementation on the part of several companies was due to an emphasis on the architectural and software design aspects of the ABC system, which served to overlook behavioural and organisational issues. Krumwiede and Roth (1997) also found that behavioural and organisational variables, as claimed by Shields (1995), can overcome the barriers of each stage in the implementation of ABC and can lead to the successful implementation of ABC.

The results of Norris's (1997) study confirm that internal commitment by individual managers to the change will influence its successful implementation. Implementation of ABC is unlikely to be successful without the commitment and sponsorship of users and senior management (Morrow 1992).

Krumwiede (1998) studied US manufacturing companies to examine how contextual factors, such as cost distortion, size of the firm, and organisational factors, such as top management support, training or non-accounting ownership, affect each stage of the implementation

process. Krumwiede 1998 found that each factor varies according to the stage of implementation. For example, a company's potential for cost distortion (a contextual factor) is a highly important factor in its decision to adopt and implement an ABC system, and top management, non-accounting ownership and implementation training (organisational factors) can lead to reaching the highest stage of implementation of ABC. Krumwiede (1998) concludes that firms considering or implementing an ABC system should take organisational and contextual factors into account.

Briers and Chua (2001) claim that the implementation of ABC is contingent not only on top management support, but also on external consultants, while several studies (Shields 1995; Shields and McEwen 1996; Roberts and Silvester 1996; McGowan and Klammer 1997; Krumwiede 1998) contend that the most essential factor influencing successful ABC implementation is top management support, to develop teams of ABC implementers.

Soin et al. (2002) used institutional theory to interpret the role of ABC in organisational change. The study reports on a longitudinal empirical case study of the implementation of ABC in the clearing department of a UK-based multinational bank. They identified tensions between the need to establish ABC as an organisational routine, thereby ensuring its reproduction, with the less routine but more revolutionary aspiration of ABC. Their research suggests that the ABC team succeeded in institutionalising a version of ABC that revealed new links between costs and products but did not transform the strategic thinking of the bank's senior management. Soin et al. (2002) argue that there is a need for future longitudinal case study research on ABC, with particular emphasis on a process interpretation of the ABC relationship that further explores the trade-off between strategic capability and the establishment of management accounting routines.

Krumwiede and Suessmair (2007) conducted an in-depth study of German and US companies to compare the cost accounting methods. The results show that German companies emphasize management accounting, and US companies place their accounting emphasis on financial reporting. In addition, the findings report that more German companies than US companies are satisfied with their costing systems. Regarding the adoption of ABC systems, the results show a small difference in the percentages of firms that implemented ABC between the two countries, which were 19% for German and 21% for US firms with the highest percentages coming from non-manufacturing firms; 38% in the US and 27% in Germany.

Abdallah and Wei (2008) investigated factors that led to the failure of an ABC implementation at a major Chinese financial institution-the Bank of China. The Bank of China decided to implement the ABC system in 2005 in order to achieve more efficient cost control and become a listed company. The implementation of ABC started very slow and then ceased in most

branches. Interviews with 18 employees at one branch revealed six factors that blocked the implementation of the ABC system. These factors were lack of a clear business purpose about the implementation of the ABC system, lack of knowledge regarding ABC, difficulties in designing the systems which included the identifying of activities and cost drivers, lack of participation and internal resistance to change.

Xu (2012) investigated the factors affecting the implementation of ABC in developing countries and the associated problems and measures taken by companies to address those factors using a case study of a Chinese multinational company, Petro China. His findings reveal that the main the reason for implementing ABC across eight branches of PetroChina was a top-down order emanating from and enforced by headquarters due to the incessant pressure of maintaining and sustaining a profitable and competitive position in the domestic and overseas markets.

Elagili (2015) investigated the following factors that encouraged the Libyan cement industry to adopt ABC: size of organisation, innovation, management support, internal champion support, level of overheads cost useful and important of cost information, product diversity, and intensity of competition. He conducted interviews with 27 employees who worked in different managerial levels (top management, middle management and shop floor management levels) in the headquarters and in the different manufacturing branches of the Libyan Cement Company (LCC) and Ahlia Cement Company (ACC). The study finds that all eight adoption factors have positive relationships to ABC adoption.

The purpose of this section is to describe the reasons and difficulties for not adopting ABC. This section presents the results of a number of studies relating to the implementation of the ABC system in different countries. This section indicates that technical variables, such as designing ABC system which included the identifying of activities and cost drivers,and the choice of activities, are common difficulties encountered during the implementation stage of the ABC among the studies (Cobb et al. 1992; Abdallah and Wei 2008). Given the frequency with which technical variables have been identified as constituting difficulties in ABC adoption, it is surprising that so little empirical research has been devoted in this area. A number of studies have considered behavioural and organisational variables (Elagili 2015; Briers and Chau 2001; O'Dea and Clark 1994; Krumwiede 1998; Norris 1997; Krumwiede and Roth 1997; Shields and McEwen 1996).

3.7.4 Surveys conducted on the adoption and implementation of ABC systems

This section presents the results of a number of survey studies regarding the implementation of the ABC system in different countries in chronological order (1987 to 2015). These studies

also report on the ABC adoption rates, its benefits and the difficulties of implementing the system.

Innes and Mitchell (1995) sent questionnaires to the top 1 000 non-financial companies listed in Times 1000 (1994) plus the top 60 financial and mutual companies (investment management firms were excluded). A 32% usable response rate was achieved. In relation to the ABC adoption rates, the findings reported that 21% of respondents were using ABC, 29.6% were considering ABC adoption, 13.3% had rejected ABC after assessment and 36.1% were not considering ABC adoption. Regarding the benefits and the applications of ABC, the results indicate that ABC had a positive impact which covered all of the cost management accounting areas of stock valuation, decision making, control and performance measurement and assessment. In addition, cost reduction and cost control application of ABC had proved to be particularly popular among UK adopters. The study did not examine or investigate reasons and difficulties for not adopting and implementing system.

Bjornenak (1997) conducted a questionnaire survey on the diffusion of ABC in Norway. The questionnaires were sent to 132 large Norwegian manufacturing companies. A response rate of 57% (75 companies) was achieved. In total, thirty companies (40%) had adopted the system, twenty-three companies (31%) were classified as non-adopters, and twenty-two companies (29%) were classified as being without ABC knowledge. The study also examined the variables that influence the adoption of the ABC systems, and the results indicate that a range of variables relating to cost structure, competition, and product diversity were associated with ABC adoption, whereas firm size did not significantly discriminate between adopters and non-adopters.

Nguyen and Brooks (1997) conducted a survey of 350 Australian manufacturing companies in the State of Victoria. This resulted in 20 useable responses which represented a response rate of 34%. The results showed that only 12.5% (15 companies) had adopted ABC, 2,5% (3 companies) rejected the implementation of the ABC, 8.3% (10 companies) indicated that they intended to adopt ABC in future, and the remaining 76.7% (92 companies) did not plan to implement ABC. The findings of the study show significant differences between companies adopting ABC and those not adopting ABC in relation to production complexity, firm size and level of competitive intensity, while no significant differences in relation to the proportion of overhead costs in total manufacturing costs and product diversity were found.

Clarke et al. (1999) reported the results of a 1995 survey which was based on a mailed questionnaire to the 511 manufacturing firms in the Business & Finance (1995) listing of Irelands' Top 1 000 companies. The questionnaire was addressed to the chief management

accountant in each company. A total of 204 (40%) usable responses were included in the analysis. In relation to the ABC implementation rate, 12% (24 companies) had rejected ABC, and 55% (112 companies) had not considered ABC. The study also reports the perceived benefits of ABC. In general, more accurate cost information for product costing and pricing, improved cost control and management, and improved insight into cost causation and behaviour were the main perceived benefits of ABC.

Furthermore, the findings indicated other benefits, such as better performance measures, more accurate customer profitability analysis, and a positive, behavioural impact on employees. Regarding the difficulties and problems with implementing ABC, the study reported that difficulties in assigning costs to activities, in identifying and selecting cost drivers, inadequate computer software, and in defining distinct activities were the most common perceived problems when adopting and implementing ABC among Irish manufacturing companies followed by lack of adequate resources, difficulties in selling the concept of ABC to managers, and the lack of internal expertise.

Groot (1999) reports the results of two similar surveys. The first survey was conducted in 1994 among 564 food manufacturers, retailers, distributors and brokers in the US. The survey was designed to identify the number of companies using ABC and to investigate the experiences they had in using ABC systems. Ninety-six (96) usable responses (17%) were obtained. A second survey was conducted in 1995 among 480 food manufacturers and retailers in the Netherlands. In this survey, 117 (24.4%) usable responses were obtained from companies representing all food sectors in the Netherlands. Since the US survey had already been designed and conducted, the Dutch survey was developed to address most of the questions in the US questionnaire. In relation to the percentage of ABC users, the results of both surveys indicate that the implementation rate in the Dutch and in the US sample was less than 20%.

Regarding the benefits derived from the use of ABC information by US and Dutch food companies, the findings indicate that the most important purposes for which ABC information is used lies in calculating the product profit margin, in improving production processes, and in evaluating the performance of production units. Less important benefits concerned decisions on sales price, product mix and client mix. US companies made similar use of ABC information as did Dutch firms. In relation to the reasons given by Dutch and American food producers for not using ABC, the results indicated that selecting cost drivers and identifying activities were the main issues encountered during the implementation of ABC, followed by unfamiliarity with ABC, lack of time and other high priorities.

Cinquini et al. (1999) conducted an empirical survey of cost accounting practices in a sample of large- and medium- size firms in Italy. The questionnaire was sent to 1 194 Italian

companies, which were selected from a company information database of the Italian National Association of Chambers of Commerce. The questionnaire was addressed to the controller in each company. A total of 132 (11.6%) usable responses were included in the analysis of the study. Regarding the adoption rate of ABC, the findings indicated that 10% of the companies in the sample had already implemented ABC, and 47% of the respondents claimed that they had never considered the adoption of ABC. The findings also revealed that 27% of the respondents had a favourable position toward ABC or asserted to having the intention to implement the system. The remaining respondents (16%) had decided not to introduce ABC. The study neither reviewed the benefits of implementing ABC, or examined the difficulties of adopting the system.

Innes and Mitchell (2000) reported the results of a 1999 survey which mirrored the design of the 1994 study reported in Innes and Mitchell (1995). The survey sought to determine and assess the nature and significance of changes during the 5-year period in ABC adoption rates and patterns of use in the UK. The questionnaire was sent to top 1 000 UK companies. A usable response rate of 22.9% was achieved. In relation to the adoption rate, the findings reveal that the proportion of ABC users and those currently considering its use had fallen to 17.5% and 20.3%, respectively from 21% and 29.5% in 1994. Moreover, the results report a slightly higher proportion claiming to have rejected ABC after assessment (15.3% as against 13.3% in the 1994 survey). In addition, there was an increase in the rate of those companies which had not considered the adoption of ABC in 1999 (46.9% compared with 36.1% in 1994). With respect to ABC benefits, the findings indicated that the major perceived benefits included improvement in product cost/profitability information, better cost control information, knowledge of customer profitability, superior decision-making information and improvement in performance measurements.

The results indicated that the need to address difficulties relating to technical issues, such as the identification of cost drivers, and the need to provide accurate cost apportionment, and behavioural problems, such as changing well-established practice and employee suspicion about the motives for using ABC, were the main problems of the system. The most common reasons given for not considering ABC were its lack of relevance to the respondents' business, the existence of a cost management system that operated satisfactorily, and the lack of top management support.

Chongruksut (2002) conducted a mail questionnaire survey among firms listed on the Stock Exchange of Thailand (SET) that operate in the Bangkok region. One of the aims of this study was to examine the adoption of ABC by firms based in Thailand, and to investigate the benefits, reasons and difficulties for not adopting the ABC system. A total of 292

questionnaires were sent to accounting/finance managers. One hundred and one (101) questionnaires were usable and represented a response rate of around 35%. The findings indicated that 11.9% (12 firms) had already adopted ABC, 2% had rejected adoption, and around 23% of the respondents were intending to adopt ABC. Most firms (63% or 64 firms) had no plans to adopt ABC and some of them had no knowledge of ABC. With respect to the reasons for not adopting ABC, the results indicated difficulties, which included time consumption, difficulties in selecting cost drivers and appropriate software, lack of expertise to implement ABC and that it was costly to switch to ABC. The results also indicated respondents were satisfied with the current system, they had no significant problems with the current system and the ABC benefits in literature were ambiguous. Therefore, firms were confident in current costing system.

Rundora and Selesho (2014) conducted a survey in manufacturing SMEs in South Africa to investigate the determinants of and barriers to the adoption of ABC, and the reasons and difficulties for not adopting ABC systems. A total of 48 questionnaires were sent to respondents. With respect to reasons for not adopting ABC, the results indicated barriers of implementing ABC, which included: a lack of knowledge of ABC; problems in defining cost drivers; problems in identifying activities; and that there was a higher priority of other changes or projects. Table 3.2 shows the adoption rate of ABC in a number of countries. It also shows that no country has an adoption rate of more than 50%.

Table 3.2: Overall rate of ABC adoption in different countries				
Country Surveys	Researcher	Year	Adoption Rate	Non-ABC Adopters rate
United Kingdom	Innes and Mitchell	1994	21%	79%
United Kingdom	Innes and Mitchell	2000	17.5	82.5%
Norway	Bjornenak	1997	40%	60%
Australia	Nguyen and Brook	1997	12.5%	87.5%
Ireland	Clarke, Hill and Stevens	1999	12%	88%
Ireland	Pierce and Brown	2004	28%	72
Netherland	Groot	1999	12%	88%
South Africa	Sartorius, Eitzen & Kamala	2007	11.6%	88.4%
United States	Groot	1999	17.7%	82.3%
United States	Kip and Augustin	2007	38%	62%
German	Kip and Augustin	2007	27%	73%
Italy	Cinquini et al.	1999	10%	90%
Thailand	Chongruksut	2002	11.9%	88.1%
New Zealand	Cotton et al.	2003	20.3%	79.7%
Philippine	Manalo	2004	17%	83%
Greek	Cohen et al.	2003	40.9%	50.1%
Irish	Abusalama	2008	26.3%	73.7%
South Africa	Selesho and Rundora	2014	33.3%	66.67%

Source: adapted from Abusalama (2008); Selesho and Rundora (2014)

Table 3.2 suggests that, over the past decade, there has been a growing awareness of ABC, but the overall rate of implementation has been low.

3.7.5 Gaps and limitations of previous studies

From the review of previous studies in developed and developing countries and case studies and surveys, and table 3.2, limitations of previous studies can be highlighted. Firstly, as highlighted by Lana and Fei (2007) and Fei and Isa (2010), the majority of ABC studies were conducted in developing countries with very little research carried out in developing countries, especially in South Africa, Thus it is necessary to identify whether the South African culture and way of doing business may have a different impact on the extent of ABC adoption. Second, the majority of the ABC research reviewed adopted the behavioural and organisational variables identified by Shields (1995) to investigate factors influencing ABC

success. Therefore, the technical variables should be further investigated in developing countries.

Studies were conducted in South Africa were by Sartorius et al. (2007) on organisational problems in respect of the implementation of ABC, Oseifuah (2013) on ABC approach to financial management in the public organisation sector (POS) and Wessels and Shotter (2000) on organisational problems in respect of the implementation of ABC. No study has investigated the factors influencing the adoption of ABC in South African institutions of higher education.

Finally, the review of the studies conducted in developed and developing countries show that most ABC implementation was conducted using either quantitative or qualitative methods. No study used the mixed method (qualitative and quantitative) in investigating factors that affect the adoption of Activity-Based Costing, particularly on the African continent. According to Cavana et al. (2001), using a questionnaire survey for data collection often encounters a low response rates and to counter this problem researchers are encouraged to use multiple methods to collect data. Thus, this study attempts to fill the gap in literature on ABC adoption issues through an in-depth analysis of ABC practices within TVET colleges in KZN.

3.8 Summary

In this chapter an overview of TVET colleges was discussed in order to create an understanding of the environment in which the study took place. Information was provided about the location of TVET colleges.

This chapter also developed a new ABC model. This model seeks to identify those factors which, as suggested by the literature, are likely impact on the adoption of ABC. Several adoption strategies were reviewed as the basis for developing a new model for this study. Based on a review of these factors and difficulties encountered during implementation of ABC (chapter 2), the model suggests the behavioural and organisational variables must be first addressed, followed by technical variables. This chapter then discussed and analysed the empirical finding from prior studies.This chapter also investigated ABC adoption in both developed and developing countries. The chapter shows that the majority of ABC studies were done in developed countries, and little research was conducted in developing countries (Sartorius et al. 2007; Oseifuah 2013; Rundora and Selesho 2014). This chapter shows that, over the past decade, there has been a growing awareness of ABC, but that overall rate of implementation has been low. No study has investigated the factors influencing the adoption of ABC in South African institutions of higher education using the mixed methods of research.

The next chapter presents the methodology used to address the research objectives of this study.

CHAPTER 4: RESEARCH DESIGN AND METHODS

4.1 Introduction

Previous chapters have described the literature on the adoption of the ABC system in developed and developing countries to ascertain the rate of adoption within developed and developing countries. The literature review indicated that ABC adoption rates are declining world-wide

The objective of this chapter is to describe the research methodology used in order to accomplish the objectives of the research. As indicated before, the overall aim of the study is to develop a conceptual framework for the adoption of an ABC model in TVET colleges in KZN. This chapter therefore describes the methodology used to achieve the following objectives:

- To determine the current practices of the costing model at TVET colleges in KZN;
- To investigate factors that constitute barriers to ABC adoption at TVET colleges in KZN; and
- To analyse adoption methodologies that might be applicable to TVET colleges in KZN.

In order to generate an appropriate alignment between objectives and the research methodology, a clear understanding of the constituent elements of the research methodology process, and their interaction, is essential (Missa 2013:16). Therefore, based on the clarity it offers, this study adopts the research 'onion' (Saunders et al. 2012). It encompasses the research philosophy on the outer ring through the research approach and strategies to the appropriate research techniques, which spell the end of the journey by achieving the aim.

This study focuses on the factors that constitute barriers to ABC adoption in KZN public TVET colleges. The purpose of undertaking this study is to bring about change in the costing systems in the TVET colleges.

No earlier study has been conducted on the adoption of ABC in South African public TVET colleges. Therefore, the present study is an exploratory, one of its objectives was to identify factors that constitutes barriers in ABC adoption and it aims to develop a conceptual framework for the adoption of ABC in TVET colleges.

4.2 Research design

In this section the main research models that influenced the decision to adopt a mixed methods design are covered Missa (2013).

This study adopts the 'onion' research, as suggested by Saunders et al. (2012), where the research process is considered as a journey to the centre by which the researcher goes through several stages as the layers mark important milestones for achieving the research aim ultimately.

Therefore, a researcher initially adopts a particular stance towards the nature of knowledge, which may be objectivism or subjectivism (Missa 2013:96). This stance, which underscores the epistemology, underlies the entire research process, and results determine the particular perspective adopted, be it positivism, post-positivism or interpretivism. The theoretical perspective, known to be implicit in the research questions, then prescribes the choice of methodology (e.g., survey, grounded theory, action research or ethnography). Finally, this methodology or plan of action, in turn, informed the choice of research methods applicable (Missa 2013).

Creswell (2014), who bases his research process framework on Crotty's (1998) four research design elements, implies that these four decision-making elements lead to a research design with examples through the research process (table 4.1).

Table 4.1: Research design framework with example based on Crotty (1998)			
Epistemology	Theoretical perspective	Methodology	Methods or Techniques
Objectivism	Positivism Post-positivism	Experimental research Survey research etc.	Sampling, Measurement and scaling, Statistical analysis, Questionnaire, Focus group interview etc.
Constructionism	Interpretivism -Symbolic Interactionism -Phenomenology -Hermeneutics Critical inquiry feminism	Ethnography, Grounded theory Phenomenological research Heuristic inquiry, Action research, Discourse analysis, Feminist standpoint research, etc.	Qualitative interview, Observation: participants and Nonparticipants, Case study, Life history, Narrative, Theme identification etc.
Subjectivism	Postmodernism Structuralism Post structuralism	Discourse theory, Archaeology Genealogy, Deconstruction, etc.	Auto-ethnography, Semiotics Literacy analysis Pastiche Intertextuality

From the foregoing, it is evident that Crotty (1998) omits a fifth dimension, i.e., 'ontology,' from the research process (Missa 2013). Crotty (1998:10), however, asserts that epistemology and

ontology are mutually dependent concepts and, therefore, should not be separated in the research process, and states "to talk about the construction of meaning (epistemology) is to talk of the construction of a meaningful reality (ontology)."

The next model, which is also hierarchical, is the research methodology 'nesting' (Kagioglou et al. 2000). Much like the research 'onion' (figure 4.1) but with fewer rings this 'nested approach' concept, has in its outer ring the research philosophy, which is said to guide and energize the inner researcher approaches and research techniques (Kagioglou et al. 2000). Again, the essence of a guided process from a wider knowledge base narrowing down to specific data collection methods characterizes the research process. This model is significantly helpful in understanding the research process (Missa 2013:97).

The final model, which technically prescribes a process that is also similar to the two preceding ones, is the research 'onion' (Saunders et al. 2012). This model presents the entire research process as an "onion" (figure 4.1), where the research process is considered as a journey to the centre by which the researcher goes through several stages as the layers mark important milestones for achieving the research aim ultimately (Missa 2013:97). This research process adopts the onion model as illustrated in figure 4.1.

Figure 4.1: The research 'Onion 'model (Source: Saunders et al. (2012)
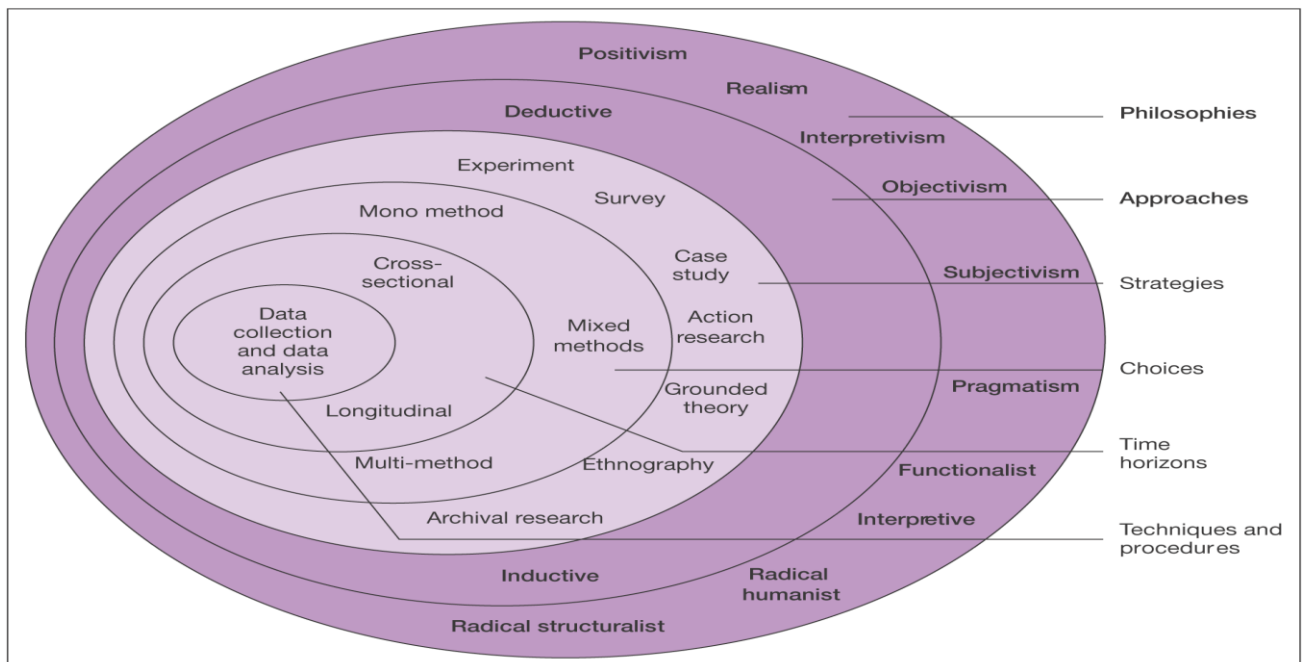
Missa (2013:97) states that the research onion shows how research is characterized by philosophy, which entails important assumptions about the views one holds of the world which assumptions underpin the research process from philosophies to techniques and procedures adopted for a study. Thus, it is important to evaluate such assumptions properly, as they

determine the course of the research. In order to generate an appropriate alignment between objectives and the research methodology, a clear understanding of the constituent elements of the research methodological process, and their interaction, is essential. Therefore, based on the clarity it offers, this study uses the research onion to realize this holistic and systemic approach. It encompasses the research philosophy on the outer ring through the research approach and strategies to appropriate research techniques, which spell the end of the journey by achieving the aim (as recommended by Saunders et al. 2012). The following sections describe the continuum of research paradigms following the layers of research philosophy, approach, strategy and techniques/ methods of the research onion (Saunders et al. 2012).

4.2.1 Research philosophical paradigms

This section defines the paradigms and the relationship of specific research methods to paradigms, especially for the two research techniques (interviews and questionnaires) used in this study. Research methodology is a philosophical stance of world view that underlies and informs the style of research (Sapsaford & Jupp 2006). Saunders et al. (2012) and Yin (2009) state that research philosophy is concerned with the way in which things are viewed in the world. It also helps to clarify the research design, to know which research design will work and which will not, and to identify and create a design that may be outside the researcher's knowledge supported by past experience (Easterby-Smith et al. 2008).

The research methods cannot be understood in isolation from the research philosophies (ontology, epistemology, axiology and pragmatic) (Saunders et al.2012).

The philosophical perspective adopted in this study, as in figure 4.1 is of a pragmatic approach which draws heavily on inductive and deductive reasoning. In order to fully analyse a phenomenon, it is necessary to support inductive approach with deductive thinking to enable it to tackle a real-world problem as is the case of this study. This philosophy (pragmatic) provides for the adoption of mixed methods as the data collection method which opens opportunities to be objective and subjective in analyzing the point of view of the participants (Saunders et al. 2012). This study used qualitative and quantitative data assembling instruments, including a questionnaire and interviews. The qualitative research model was chosen because of the basic philosophical assumption that people, their behaviour, and their experience play a significant factor in this study, whereas the quantitative research model was chosen because of the significant amount of feedback it provides and the greater access it allows to respondents.

4.2.1.1 Positivism

Babbie (2011:35) states that the roots of positivism can be traced to French philosopher Auguste Comte, who saw the human being as a phenomenon to be studied scientifically. Thus, positivism may be seen as an approach to social research that seeks to apply the natural science model of research as the point of departure for investigations of social phenomena and explanations of the social world (Denscombe 2010b:120).

Positivism holds the view that truth is represented by measurable, naturally occurring phenomena (Missa 2013). In fact, logical positivism asserts that for phenomena to exist, it must be measurable. Therefore, if the phenomenon cannot be measured, then it does not exist (Potts 1998).

Moreover, logical positivism argues that all naturally occurring phenomena can be broken down into measurable moments, which, when considered together form the basis of the existence of the whole phenomenon of interest in order to generate truth (Bertzner 2008).

A positivist researcher, therefore, uses deductive reasoning to generate theory from which specific hypotheses evolve and are tested. Inference from experiments is then used in constructing theory to generate laws governing nature (Yu 2006). The use of quantitative techniques is common, especially in the use of surveys in the field of diversity and equal opportunity employment.

The positivist researcher maintains that it is possible to adopt a distant, detached, neutral and no interactive position (Morris 2006: 3). Such a position would enable the researcher to assume the role of an objective analyst, making detached interpretations about those data that have been collected in an apparently value-free manner. For the same reason, positivists prefer an analytical interpretation of quantifiable data (Daymon & Holloway 2011:11).

Daniel (2016) states that positivists generally assume that reality is objectively given and can be described by measurable properties which are independent of the observer (researcher) and his or her instruments. Positivist studies generally attempt to test theory, to increase the predictive understanding of phenomena.

In conclusion, regarding scientific theories, the positivist is concerned with the creation of laws applicable to all people at all times (Welman et al. 2005:192). Collis and Hussey (2009:58) state that the purpose of positivism is to seek generalization (theories), which grounded in the natural science laws.

4.2.1.2 Post-positivism

Creswell (2014:6) sees post-positivism as an extension of positivism, since it represents the thinking after positivism, challenging the traditional notion of the absolute and objective truth of knowledge in the social sciences. Post-positivist approaches show a much greater openness to different methodological approaches, and often include qualitative, as well as quantitative methods. This allows for the development of alternative research strategies to find information in unlikely and creative ways (Glicken 2003:28). Additionally, researchers in this paradigm normally believe in multiple perspectives from participants rather than a single reality (Creswell 2014).

Positivism contends that there is an object reality to be studied, captured and understood, whereas post-positivists argue that reality can never be fully apprehended, but only approximated (De Vos et al. 2011b:7). According to Denzin and Lincoln (2011:8), post-positivism relies on multiple methods for capturing as much of reality as possible.

4.2.1.3 Interpretivism

The third and final research paradigm to be considered, i.e., interpretivism, is located on the opposite end of positivism. Interpretivism contends that reality is constructed and has no universal truth (Fellows & Liu 2009). This implies the assertion of the existence of multiple truths based on researchers' view of the world. Interpretive research, thus, illuminates the researcher's view and experiences through such processes. Truth is best understood by the closeness of participants in their natural settings and through critical subjective and inductive reasoning (Creswell 2014).

This paradigm is also known as social constructivism wherein people seek understanding of the world in which they live and work by developing subjective meanings of their experiences (Zongozzi 2015:17). Therefore, this study supports this paradigm because it relies on the views of the participants about their current situation (Creswell 2014:24).

The purpose of research in interpretivism is understanding and interpreting everyday happenings (events), experiences and social structures – as values people attach to these phenomena (Collis & Hussey 2009:56; Rubian & Babbie 2010:37).

Interpretivism is a phenomenon that is mainly focused on the specific way that people approach the world based on their previous experiences, using language as a medium of communication (Easterby-Smith et al. 2008). It is a subjective phenomenon that is based on factors such as awareness, depth of perception, an in-depth understanding of the phenomenon and interpretation based on personal experiences in order to answer what, why or how questions (Collis and Hussey 2009). According to this philosophy, the researcher is a part and a participant in the whole process of research and not an independent being, as thought by the positivistic philosophy. Therefore, this study adopted both the interpretivism

and the positivistic paradigms since the researcher values the significance of the subjective human creation of meaning and relies on numbers and statistics.

4. 3 Research philosophy and philosophical assumptions

According to Pathirage et al. (2008), research philosophy refers to epistemological, ontological and axiological assumptions and undertakings that guide an inquiry in a research study, implicitly or explicitly. Saunders et al. (2012) identify epistemology, ontology and axiology as the three main components embodying the philosophy of research. Epistemology also referred to as the 'theory of knowledge', deals with acceptable knowledge in the field of study (Saunders et al. 2012; Collis & Hussey 2009). It is about the nature of knowledge and how it is produced and underscores the relationship between the researcher and subject. Ontology refers to assumptions about the nature of things, the nature of reality and axiology deals with value judgments (Saunders et al. 2012).

The researcher's ontological beliefs are about the nature of reality, which is explored through the researcher's answers to problems such as what is the nature of the world, including social phenomena; if reality is orderly or lawful; the existence of the natural social order; if reality is fixed and stable or constantly changing, and whether it is unitary or multiple; and if reality can be constructed by the individuals involved in the research situation (Creswell 2014).

All research (whether quantitative or qualitative) is based on some underlying assumptions about what constitutes 'valid' research and which research methods are appropriate. In order to conduct and/ or evaluate qualitative research, it is therefore important to know what these (sometimes hidden) assumptions are (Daniel 2016:1). The most pertinent philosophical assumptions are those that relate to the underlying epistemology which guides the research. Epistemology refers to the assumptions about knowledge and how it can be obtained (Missa 2013:102).

Ontology, which deals with the nature of being, identifies a study as being socially constructed and only understood by examining the perceptions of the human actors, or external and objective to the researcher (Sexton 2007; Collis and Hussey 2009). As this study involves quantifying numbers with particular experiences and perceptions, both subjective and objective issues come into play. Therefore, this study takes a middle position of the two extremes on the ontology spectrum. Consequently, interview and surveys were used in this study.

4.4 Research approach

According to Saunders et al. (2012), there are two main research approaches, i.e., the deductive and inductive approaches. The deductive approach is a theory testing process which commences with an established theory or generalization and seeks to establish by observation whether it applies to specific instances. This approach is used more with a positivism research philosophy.

The inductive approach is a theory-building process, starting with direct observations of specific instances and seeking to establish generalisations about the phenomenon under investigation. It is more suited to a phenomenological research philosophy (Elagili 2015).

Table 4.2 illustrates the main differences between the deductive and inductive approaches.

Table 4.2: The major differences between deductive and inductive approaches	
Deductive approach	**Inductive approach**
Scientific principles	Gaining an understanding of meaning human attach to events
Moving from theory to data	A close understanding of the research context
The need to explain the causal relationships among variables	The collection of qualitative data
The collection of quantitative data	A more flexible structure to permit changes of research emphasis as the research process.
The application of controls to ensure the validity of data	A realization that the researcher is part of the research process
The operationalization of concepts to ensure clarity of definition	Less concern with the need to generalise
A highly structured approach	
Researcher's independence of what is sufficient size in order to generate a conclusion.	
Source: Saunders et al. (2012)	

Creswell (2014) states that one of the key differences between these two approaches lies in how existing literature and theory are used to guide the research. The deductive approach is designed to test a theory. Thus, the literature is used to identify questions, themes and interrelationships before data are collected. On the other hand, the inductive approach builds a theory as the research progresses; themes are identified throughout the research process and the literature is used to explore different topics. Hussey and Hussey (1997) argue that a discussion on the different types of research philosophies and approaches allows the researcher to understand the best way to conduct research, but they also suggest that an

individual should not feel too constrained when undertaking research; the researcher can move between an inductive and a deductive approach.

Sekaran (2009) and Saunders et al. (2012) suggest that a combination of deduction and induction is not only perfectly possible within the same piece of research, but is often an advantageous approach.

Accordingly, in this study, the deductive and inductive approaches were combined as follows:

1. Deductive approach
- A population (finance staff, CFOs and Assistant CFOs in KZN public TVETs) was chosen to provide their opinions on the reasons for ABC non-adoption; and
- A questionnaire was administered to a sample of staff (30 finance staff in TVET colleges) in order to establish the factors that constitute barriers in ABC adoption.
2. Inductive approach
- Ten staff members (5 CFOs and 5 Assistant CFOs) who have extensive experience about current costing systems and their limitations, were interviewed; and
- This sample was chosen to determine the problems they were experiencing using the current costing systems, how they were copying with any problems they were experiencing in the current costing system, and their views about ABC systems.

Both approaches yielded valuable data about the current costing systems and the reasons for ABC non-adoption.

The factors that constitute barriers in ABC adoption were derived from the literature and then investigated (deductive). Thereafter, the findings from the fieldwork (analytical framework for the adoption of ABC in TVET colleges in KZN) were incorporated into the existing theory (inductive).

4.5 Research strategy

Saunders et al. (2012) define research strategy as the plan that is aimed at providing the ways to answer the research questions in order to satisfy the research objectives. Five main types of research strategies, summarised in table 4.3, provide the three main conditions that allow for the selection of a certain strategy which is appropriate for a specific study. The conditions include:

- Type of research question;
- Researcher's control of behavioural events; and
- The focus being on present events as compared to past ones.

Table 4.3: Relevant situation for different research strategies			
Strategy	Form of Research Question	Required Control of Behavioural Events	Focus on Contemporary Events
Experiment	How, Why?	Yes	Yes
Survey	Who, What, Where, How many, How much?	No	Yes
Archival analysis	Who, What, Where, How many, How much?	No	Yes/No
History	How, Why?	No	No
Case study	How. Why?	No	Yes
Source: Yin (2009:8)			

The case study method, as identified by Yin (2009), is the most suitable strategy for answering "how" or "why" questions. It helps to understand what the problem is and how and why it occurred and how it is to be solved. If it is not possible for the researcher to control events and the study is to be mainly focused on contemporary events, then the case study is the best type of strategy (Missa 2013).

There are various strategies with distinctive characteristics available to a researcher (Missa 2013), such as case study, experiment, survey, action research, grounded theory, cross sectional studies, longitudinal studies, ethnography, archival research and participative enquiry (Collis and Hussey 2009; Saunders et al. 2012; Easterby-Smith et al. 2008). However, no single strategy can solve a particular research problem; hence a combination of these has been recommended in mixed methods application (Mertens 2003; Morse and Niehaus 2009; Teddlie and Tashakkori 2009; Bazeley 2009; Creswell 2014). However, outcomes derived from case study research have little base for generalisation.

4.6 Research methods

In social sciences, the positivist and interpretivist philosophies are represented by two main types of research method, quantitative and qualitative (Easterby-Smith et al. 2008). Table 4.4 shows the key features of qualitative and quantitative research.

Table 4.4: Key features of qualitative and quantitative research	
Qualitative	Quantitative
Uses small samples	Uses large samples
Concerned with generating theories	Concerned with hypothesis testing
Data are rich	Data are highly specific and precise
Reliability is low	Reliability is high
Validity is high	Validity is low

Generalises from one settings to another	Generalises from sample to population
Source: Hussey and Hussey (1997) and modified by Elagili (2015)	

Quantitative research is supported by the positivist school of thought and is all about measuring items in a quantitative way (Collis and Hussey 2009 and Easterby-Smith et al. 2008).

According to White and McBurney (2012:429), a quantitative research method has the following advantages:

- Quantitative data are statistics driven and can provide a lot of information;
- It is easy to compile the data onto a chart or graph because of the numbers that are made available;
- The research can be conducted on a large scale and gives a lot of information; and
- It saves time for the respondents.

Despite the strengths of quantitative research, it also has the following weaknesses:

- In order to gain a level of control, research is usually carried out away from a real world over which the researcher has little control, which probably results in unnatural outcomes (Xu 2012:31);
- Results are limited in terms of a larger amount of numerical images rather than detailed narrative analysis (Xu 2012:31);
- Failure to gain a deep understanding and conduct a thorough investigation into a contemporary phenomenon within its social and cultural context due to little participation in a real-life context (Xu 2012:31);and
- Time-consuming and can be difficult for non-statistical researchers (Xu 2012:31).

To avoid the above disadvantages, a qualitative approach is favoured by those researchers who wish to investigate a real problem in a real world where little control can be exercised (Xu 2012:31). As opposed to measuring objective facts in a controlled environment under quantitative research, a qualitative approach seeks to construct social meanings of human experiences within their social and cultural contexts under a natural environment where the researcher has little or no control over the situation (Xu 2012).

Qualitative research is believed to suit studies which require an in-depth exploration or investigation into a contemporary phenomenon involving human actions and beliefs within social and cultural contexts (Fossey et al. 2002).

Some of the strengths of conducting qualitative research are:

- Gaining a constructive and valid understanding of a contemporary phenomenon within its social and cultural context that cannot be explained by analyzing numerical data or conducting a hypothesis test (Xu 2012);
- Designed to achieve a holistic view of the phenomenon under exploration and investigation, and aimed at discovering knowledge rather than testing (Xu 2012);
- Little standardized or flexible ways in collecting and analyzing data, practical for studying a limited number of cases in-depth and conduct cross-case analysis (Xu 2012);
- Multiple interpretations available in analyzing data, for example, the researcher is allowed to interpret and analyse data in his or her own words into a rich and detailed phenomenon which is embedded within its social and cultural context (Xu 2012);and
- External validity will be greatly enhanced as the research is conducted in a natural setting (Xu 2012).

Carr (1993) argued that the debate over which approach is superior unnecessary as it is the research outcome which answers the research questions. Rather, depending on the nature and purpose of the study, one of them or both should be considered as methodology.

Table 4.5 shows a summary of the major differences between quantitative and qualitative approaches to research.

Table 4.5: Differences between quantitative and qualitative approaches		
Orientation	Quantitative	Qualitative
Assumption about the world	A single reality. i.e., can be measured by an instrument	Multiple realities
Research purpose	Establish relationship between measured variables	Understanding a social situation from participants' perspectives
Research methods and processes	-procedures are established before study begins; -a hypothesis is formulated before research can begin; -deductive in nature	-flexible, changing strategies; -design emerges as data are collected -a hypothesis is not needed to begin research; -inductive in nature
Researcher's role	The researcher is ideally an objective observer who neither participates in nor influences what is being studied	The researcher participates and become immersed in the research/ social setting.
Generalisability	Universal context-free generalisations	Detailed context-based generalisations
Source: Hemachandra (2016)		

The research philosophy of this study is both interpretivism and positivism as it focuses on meaning and numbers. Furthermore, a deep understanding of the current costing practices at KZN TVET colleges is needed in order to develop a conceptual framework for adoption of ABC, and, thus, both quantitative and qualitative approaches are adopted (i.e., a mixed methods approach).

4.7 Mixed methods

According to Saunders et al. (2012), a mixed methods approach is the general term indicating that both quantitative and qualitative data collection techniques and analysis procedures are used in a research design. In mixed methods research, the concept of data type, methods and paradigms are developed using either a quantitative or a qualitative research design (Missa 2013). For example, a closed-ended survey conducted under a post-positivism paradigm would be referred to as quantitative, while an interview conducted under an interpretivism paradigm would be referred to as qualitative (Missa 2013:100).

Teddlie and Tashakkori (2009) argue that multiple methods are useful if they provide better opportunities for the researcher to answer research questions and where they allow research to better evaluate the extent to which research findings can be used for a different purpose in a study. Myers (2009:8) states that one benefit of using mixed methods are that they enable the researcher to understand, interpret and view the context in which decisions and actions occur. Aldukhil (2012) supports the use of mixed methods in ABC implementation by saying

that "[f]irms considering the adoption of ABC may think about the cost of collecting data regarding activities and activity drivers." According to Aldukhil (2012), data collection for implementation of ABC is usually done through conducting interviews with relevant employees and distributing questionnaires to the relevant employees.

4.7.1 Mixed methods research

Onwuegbuzie and Johnson (2006) state that the goal of mixed methods research is not to replace either the quantitative or qualitative approaches of research, but rather to draw from the strengths of both these approaches and minimise possible weaknesses. The driving motivation behind mixed methods is the desire to get the whole story (picture), as much as possible (Vosloo 2014:322).

The purpose of the mixed method research design in this study is to (Mingers 2001:244; Rocco et al. 2003:22):

- Increase the validity of the research by the convergence of the different methods of research, because mixed methods research is regarded as a form of triangulation;
- Widen the scope of the research in that expansion calls for the use of mixed methods research to increase both the "breadth and range of a study"; and
- Complement different faces of the inquiry because of the "overlapping" that occurs between the different methods.

Creswell (2014:219) identifies three basic mixed methods designs with more advanced mixed methods strategies that can be incorporated within the three basic forms. The three basic designs include:

Convergent parallel mixed methods: The researcher collects both quantitative and qualitative data, analyses them separately and then compares the results to ascertain whether the findings confirm or disconfirm each other;

Explanatory sequential mixed methods: This involves a two-phase project in which the researcher collects quantitative data in the first phase, analyses the results, and then uses the results to plan the second qualitative phase of the research. The quantitative results inform the participants to be purposefully selected for the qualitative phase of the research and the types of questions to be asked of the participants; and

Exploratory sequential mixed methods: The researcher first begins by exploring with qualitative data and analysis and then uses the findings in a second quantitative phase. A three-phase procedure is employed, the first phase as exploratory, the second as research instrument development and the third as administering the research instrument to a sample of the population.

Therefore, this study adopted mixed methods that involve the use of both quantitative and qualitative data collection techniques. During the first phase, a questionnaire was administered to sample of thirty finance staff members of six public TVET colleges in KZN in order to get their views and experiences on factors that constitute barriers in ABC adoption. The semi-structured interviews were also conducted with five Assistant Directors (ADs) and five CFOs in finance from these five TVET colleges in order to delve deeper into ABC adoption issues and to confirm or disconfirm the findings of the quantitative method.

In response to the questionnaire and interviews, finance staff member had difficulties in identifying major activities performed at their respective TVET colleges. Based on these results, the standard activity dictionary (refer to appendix I) was developed as the method of identifying activities performed at these TVET colleges.

Therefore, this study adopted convergent parallel mixed methods, as both quantitative and qualitative data were collected, and analysed separately and then compared to ascertain whether or not the findings confirm each other.

4.8 Case studies

It is widely recognized that accounting methods and processes can neither be fully understood nor make sense without considering the organisational context in which they take place since they are shaped and affected by a number of organisational behavioural factors (Xu 2012:37). Xu (2012:37) also states that "We keep improving accounting methods and processes with the aim of better solving problems encountered by organisations and society. However, in order to fulfill this task, the knowledge about accounting actually gained from the employees inside an organisation." Questions need to be addressed such as: would the same accounting method which has been proven effective in terms of real life solving problems in developed countries work the same way in the developing world? (Xu 2012:37). Would the same accounting technique which is well developed in western countries be shaped or affected by the similar organisational and behavioural factors in organisations in eastern countries? (Xu 2012:37). To answer these questions, field studies or case study research is required (Xu 2012:37).

Case studies can be carried out in one organisation (single case study) or in more than one organisation (multiple case studies) (Elagili 2015:72). Yin (2009) stresses that the single case study is an appropriate strategy to use when the case represents an extreme or unique case. Yin (2009) argues that researchers who prefer to adopt a single case study as a research strategy needs to have a strong justification for this choice. Yin (2009) and Elagili (2015) observe that multiple case studies are more common and are generally used to replicate

findings or to support theoretical generalisations. Indeed, multiple case study research increases external validity and helps to protect against observer bias (Voss et al. 2002).

Since qualitative researchers are primarily interested in the meaning subjects give to their life experiences, they have to use some form of case study to immerse themselves in the activities of a single person or small number of people in order to obtain an intimate familiarity with their social worlds and to look for patterns in the research participants' lives, words and actions in the context of the case as a whole (De Vos et al 2011b:320). Creswell (2014) states that a case study involves an exploration of a "bounded system" (bounded by time, context and/or place), or a single or multiple case, over a period of time through detailed, in-depth data collection involving multiple sources of information.

Furthermore, there are two types of design for multiple case studies' strategy: multiple holistic and multiple-embedded case studies (Yin 2009). Multiple-holistic case studies involve a single unit of analysis. Multiple-embedded case studies include multiple units of analysis (Elagili 2015). In this study, multiple case studies are applied through visiting case organisations. They are used to carry out an in-depth investigation to get a better understanding of current costing practices in KZN public TVET colleges. Among the in-depth investigation results collected are CFOs and ADs finance's perspectives on what they consider as key allocation cost drivers within their college's costing model. The results from the initial theory need to solve the research problem by improving current costing practices (addressing non-adoption of ABC) in TVET colleges by developing a conceptual framework for adoption of ABC at TVET colleges.

This study seeks to test those factors which literature suggests are likely to impact on the adoption of ABC, by examining the interaction contingent variables through survey and statistical methods. One of the objective is to determine the relationship between behavioural and organisation variables and technical variable[factors that constitute barriers to ABC adoption] (independent variable) and the adoption of the ABC system (dependent variable) in order to propose a conceptual model for TVET colleges. This case study design provides an opportunity to influence or change the attitudes or procedures of the participants or environment and permits the researcher to explore the behavioural pattern of the participants (Yin 2009). A case study method, through the exploratory and explanatory strategy, offers in-depth details and an understanding of various impacts of the independent variable on the dependent variable. As a result, the case study offered a better opportunity to develop a conceptual framework for ABC adoption applicable to KZN TVET colleges. Therefore, this study adopted exploratory and explanatory case study, since it seeks to identify relationship

between contingent factors and ABC adoption [explanatory] and there is very little literature on reasons behind non-application of ABC in KZN TVET colleges [exploratory].

Creswell (2014) argues that a single or instrumental case study deals with one bound case, while multiple case studies investigate more than one case. This study examined the adoption of ABC at KZN TVET colleges. KZN public TVET colleges comprise nine TVET colleges, namely, Majuba TVET college, Mthashana TVET college, Mnambithi TVET college, Esayidi TVET college, Coastal TVET college, Elangeni TVET college, Umfolozi TVET college, Thekwini TVET college and Umgungundlovu TVET college. Therefore, multiple or collective case studies were the proper choice of method for this study since similarities and differences between these cases may be revealed in the research findings.

This study employed multiple-embedded case studies. Since they involve multiple realities derived from top management (CFOs) and middle management (AD finance) level which could provide data to enrich the findings. As a result, it was decided that the appropriate research design for this study would be multiple case studies (in six public TVET colleges in KZN province) replicating the same phenomena under different conditions.

4.9 Research questions

Riel (2016) states that the questions asked by researchers guide their process. Riel (2016) believes that a good question will inspire one to look closely and collect evidence that will help find possible answers. The best question is the one that will inspire researchers to look at their practice deeply and engage in cycles of continuous learning. These questions come from a desire to have practice aligned with values and beliefs. Good questions often arise from visions of improved practice and emerging theories about the change that will move the researcher closer to the ideal state of working practices. The main objective of conducting interviews was to develop standard activity dictionary (refer to appendix I) as the method of identifying activities performed at TVET college. This served as foundation for development of a conceptual framework for adoption of the ABC system in KZN TVET colleges. The main research question for this study is:

- Is the adoption of ABC by KZN TVET colleges associated with specific behavioural and organizational variables and technical variables?

The above question seeks to test those factors which literature suggests are likely to impact on the adoption of ABC. This question examines the interaction of a certain number of contingent variables and is composed of survey and statistical methods. Here the relationship amongst behavaioural and organisation variables and technical variable (independent

variable) and adoption of the ABC system (dependent variables) should be measured. Based on this research question, this study seeks to test and examine the hypotheses posed in chapter 2. Activity-Based Costing system was one of the solutions and its implementation and performance had many advantages for the users.

The previous research done in South African focused all its attention on emphasizing that the ABC system provided more useful and accurate data rather than the traditional costing system in South African companies. Therefore, this study adopted a different slant by focusing on the impact of different factors on the adoption of ABC among the public TVET colleges in KZN.

4.10 Data collection

There are certain sources of data which include primary as well as secondary data and both forms can be utilized by the case study method (Elagili 2015:74). Secondary data involve information that is already available in the form of documents, archives or any other form, including reports, publications, books, etc. Primary data are gathered directly with the help of interviews, observations, focus-group discussions and questionnaires (Collis and Hussey 2009).Yin (2009) suggests that the case study strategy must use a combination of methodologies which is known as triangulation. This strategy helps to understand the phenomenon in detail and unveils underlying deeper meanings.

The collected data are mainly dependent on the main research questions and the aims and objectives of the research. They are also dependent on the research philosophy, the research approach and the research strategy (Hussey and Hussey 1997; Easterby-Smith et al. 2008). Collis and Hussey (2009) agree that the multi-methods approach helps a researcher to overcome the possibility of bias associated with a single method. Multiple sources of evidence improve research validity and enhance the reliability of the study (Golafshani 2003).
Based on the above, both secondary and primary data were used. Secondary data were collected from books, journal articles and online data to achieve the objectives of this study, and to explain the research problem. Primary data were collected through interviews and questionnaires. The triangulation approach was used to make use of a variety of data sources (primary data and secondary data) in order to ensure that the study was reliable and authentic (Sanders et al. 2012).

To address the objectives of the study, a questionnaire was used. The following section explains the design and administration of the questionnaire.

4.11 Questionnaires

The researcher distributed questionnaires to finance staff of the respective finance departments of six public TVET colleges in KZN. Thirty (30) questionnaires were distributed, one for each finance staff member. The questionnaires were hand delivered and the researcher was available in case problems were experienced.

4.11.1 Questionnaire design

The research questionnaire (refer to appendix C) comprised three types of questions:

Dichotomous questions: This has only two response possibilities, for example, "Yes/No". (De Vos et al. 2011:198). This study had one dichotomous question.

Likert-type questions: This method is widely used in survey research (Sullivan and Artino 2013). This method indicates the strength of agreement or disagreement (Subedi 2016) and is used to measure attitudinal issues. In this study, a five-point Likert scale was used to measure variables in section 1.5.1 to 1.5.5, section 1.12.1 to 1.12.5, section 2.5.1 to 2.5.10, section 2. 6.1 to 2.6.5, section 2.7.1 to 2.7.4 and section 2.8.1 to 2.8.4 of the questionnaire. The five-point scale anchored at 1 'Strongly Agree and 5 'Strongly Disagree'. Respondents were asked to indicate their level of agreement with the statements provided.

Multiple-choice questions: Abusalama (2008:181) states that multiple-choice answers are those where the respondent is asked a closed question and selects his or her answer from a list of predetermined responses or categories. This type was chosen because the study required specific information in certain instances. However, some questions provided space for the respondent to add any answer not listed. In this study, most of the questions offered the respondent the opportunity of selecting (according to instructions) one or more response choices from a number provided. In general, most of questions were designed as closed questions.

The questionnaire (refer to appendix C) consisted of 27 questions and was divided into four sections, comprising 13 pages. The first section on personal information (questions A1 - A7) sought general information from the respondents. The next section (Section 1) was designed to examine the current costing model used by the TVET colleges and how the overheads costs allocated to their products, that is, the programmes. This section (questions 1 - 12) examined the size of an organisation, the cost driver used, how overhead costs were allocated and the current accounting and management techniques utilised at the TVET colleges. The third section (Section 2) (questions 1 – 8) was designed to examine the awareness of the respondents regarding ABC and to determine factors that constitute barriers in the adoption

of ABC. A final section (Section 3) focused on general questions (respondent's job title and experience).

To probe more deeply into the responses, the relationship of each question to the hypotheses, as developed in Chapter 2, was determined. This is shown in the table 4.6 (Abusalama 2008).

Table 4.6: The relationship between questions and hypotheses	
Hypothesis	**Questions and variables in the questionnaire relating to the hypotheses**
1	Q 3 in section 2 (The adoption of ABC) Q1, Q5.1 &Q5.2 in section 1 and Q8.1 in section 2 (The size of the organisation)
2	Q3 in section 2 (The adoption of ABC) Q6.3, Q6.4, Q6.5, Q8.3 & Q8.4 in section 2 (Top management support)
3	Q3 in section 2 (The Adoption of ABC) Q7a, Q7b & Q7c in section 1 (Cost structure/ level of overheads)
4	Q3 in section 2 (The adoption of ABC) Q2 in section 1 & Q8.2 in section 2 (Product diversity)
5	Q3 in section 2 (The adoption of ABC) Q6.1 in section 2 (Innovation)
6	Q3 in section 2 (The adoption of ABC) Q5.1 to Q5.10 in section 2
7	Q3 in section 2 (The adoption of ABC) Q6.1 in section 2 (Internal champion support)
8	Q3 in section 2 (The adoption of ABC) Q8.3, Q8.4 & Q4.5 in section 2 (Internal resource availability)
9	Q3 in section 2 (The adoption of ABC) Q6.2 & Q8.3 in section 2 (Training)
10	Q4 in section 2 (Reason for ABC rejection) Q6.1 to Q6.7, Q7a to Q7c, Q8 & Q9.1 to Q9.8 in section 1 (Technical variables)
11	Q7 in section 2 (Barriers to ABC adoption) Q10.1 to Q10.6, Q11.1 to Q11.10, Q12.1 to Q12.5 in section 1, Q4.6, Q4.7, Q4.8, Q4.11, Q7.1 to Q7.5 (Technical variables)

This study used a five-point Likert scale anchored at 1 'Strongly Agree and 5 'Strongly Disagree'. Respondents were asked to indicate their level of agreement with:

- statements relating to TVET colleges' current costing model;
- the allocation of costs under the current costing model at TVET colleges;
- the factors that constitute barrier to ABC adoption;
- critical success factors for ABC implementation;
- technical variables that constitute barriers to ABC adoption; and
- behavioural and organisational factors that constitute barriers to ABC adoption.

4.12 The study population

The target population for the survey consisted of finance staff members from all 50 TVET colleges in South Africa. This study, however, is limited to public TVET colleges in KZN as it was not feasible to complete coverage of the total population and all members of the population of interest.

As each TVET college has five finance staff members, the target population for the first phase of the research included all 45 finance staff members (a census) from TVET colleges in KZN. Numerous attempts to contact Esayidi TVET college, Mnambithi TVET college and Coastal TVET college, were unsuccessful. These three TVET colleges were therefore, excluded from the research study. Thus, the final population comprised of six TVET colleges in KZN.

Table 4.7 indicates that the final target population comprised of thirty finance employees from the finance departments of six public TVET colleges in the KZN Province. These thirty employees are situated in five units, i.e., Salary (Persal), Procurement, Accounts, Procurement, Norms & Standards (Budget) and Expenditure (Basic Accounting System).

Table 4.7: Target population of the finance departments of six public TVET colleges at KZN	
Unit (Finance section)	**Number of respondents**
Salary (Persal)	7
Procurement	1
Accounts	20
Expenditure (Basic Accounting System)	1
Norms & Standard (Budget)	1
Total	**30**

4.12.1 Sample of the study

Since the population for the study was not large, a census was conducted using the 30 finance staff members who consented to participate in the study.

Prior to the administration of the questionnaire and the interviews, pre-testing took place and pre-testing is discussed in next section.

4.13 Pretesting

Pretesting involves the use of a small number of respondents to test the appropriateness of the questions and their comprehension. Pre-testing helps to rectify any inadequacies before the instruments are administered. After the initial draft, the interview questions was discussed with the supervisor and their feedback was implemented.

Next, the researcher pre-tested the questionnaire using a sample of three administration staff members from Thekwini TVET college (Umbilo campus) and the semi-structured interview schedules with senior administration staff members from Thekwini TVET.

The pre-testing was conducted on 12 September 2016. The participants were asked to comment on whether the questions were clear, whether they were appropriate and if there were any other questions or issues that should be included. According to the participants who pretested the questionnaire and the interview schedule, no additional clarifications were required.

After the pre-testing, the survey was administered and hand delivered to respondents from 11 September 2016 to 4 December 2016. The completed questionnaires were collected by the researcher either on the day of the interviews or two weeks later.

The interviews were took place from 11 October 2016 to 30 November 2016. The next section describes the response rate.

4.14 Response rate

Table 4.8 shows the response rate for salary (Persal), procurement, expenditure (Basic Accounting System), Accounts and Norms & Standard (budget) in the finance department.

Table 4.8 Response rate			
Section of finance department	Targeted representative	Obtained representative	Obtained response rate
Salary (Persal)	7	7	100%
Procurement	1	1	100%
Expenditure (Basic Accounting System)	1	1	100%
Accounts	20	20	100%
Norms & Standard (budget)	1	1	100%
Overall responses	**30**	**30**	**100%**

Table 4.8 indicates that thirty questionnaires were submitted to the respondents and thirty questionnaires were returned, resulting in a 100% response rate.

4.15 Data preparation and processing

After the questionnaires were collected from the respondents, the questionnaires were scrutinised to ensure that the data recorded in the questionnaire were usable. Thereafter, the data were coded and captured in SPSS version 24.0. Variables were categorised according

to the "NOIR" classification or measure (Basak 2015 :72) for variables, namely, Nominal (N), Ordinal (O), Interval (I) or Ratio (R). N and O are non-parametric data, while I and R represent parametric data. This is important because the measure of the dependent variable determines the nature of statistical tests.

4.16 Census size

Since all 30 staff members in the finance departments of KZN TVET colleges were included, this study represents a census. This number (30) excludes those members who were selected for the pilot study.

4.17 Quantitative data analysis

Data collected in this survey were tested for reliability and validity using the Cronbach's alpha coefficient for critical success factors for ABC implementation in section 2.6.2- 2.6.5. Some descriptive and inferential tests were then performed on this data for Likert scale variables as well as demographic data of surveyed finance staff members mainly in terms of frequencies and means analysis. Inferential analysis was performed in the form of Pearson's correlation test between Likert scale variables, and linear regression equations were calculated for the variables with positive Pearson's correlation tests.

4.17.1 Statistical presentation

To summarise the data the following descriptive statistics were used:

- Bar graphs – to analyse the results on possible reasons for ABC rejection (refer to figure 5.1);
- Cross tabulations –Cross tabulations were used to analyse the results on size, product diversity categories by levels of ABC adoption (see table 5.36), on overheads categories by levels of ABC adoption (see table 5.31) and on internal resources availability by levels of ABC adoption (see table 5.49);
- Frequencies tables – Frequency tables were used to analyse the results on the biographic profiles of respondents, the factors that constitute barriers in ABC adoption and determining the current costing model used at TVET colleges;and
- Percentage tables – to analyse the results for current costing model and factors that constitute barriers in ABC adoption.

4.17.2 Statistical analysis of the data

To analyse the data, inferential statistics were used. The objective of inferential statistics is to enable the researcher to determine "whether or not a difference between two treatment conditions occurred by chance or is a true difference" (Sekaran and Bougie 2010:117).

The following inferential statistics were used:

- Chi-square tests were used for the hypotheses testing
- Pearson's correlation tests were performed to identify pairwise relationships between variable items such as the college allocates the budget to each campus as per number of students and student size is always used to allocate costs for the programme, the costing model currently in use at TVET colleges and resistance to change and in ABC adoption (refer to appendix K). For the purpose of this study, a two-tailed Pearson's correlation test was used. Appendix K display Pearson's correlation coefficients (p), significant values (p), and number of cases with non-missing value values (N) for each variable. When the significance value (p) is very small (less than or equal to 0.05), the correlation is significant. On the other hand, when the p is relatively large (greater than 0.05). the correlation is not significant.

Having discussed the quantitative methodology, the following section provides details on the qualitative methodology employed in this study.

4.18 Qualitative data collection

To yield data for qualitative investigation, interviews were used to collect the data. Hence, deputy principals finance (CFOs) and assistant directors (finance managers) from each of the six different TVET colleges in KZN were interviewed to contribute to the achievement of the stated research aim and objectives of this study.

For purposes of this study, interviews were conducted according to a semi-structured face-to-face interview schedule (a copy of which is provided in appendix F and on CD), as proposed by De Vos et al. (2011b:352) and Greeff (2011:151). The interview questions were clear, concise and phrased in such a way as to invite respondents to participate (Matambele 2014:97). The goal was to include all the questions necessary for collecting the desired information without making the interview so lengthy that it became inconvenient for participants, as suggested by (Gideon 2012:300).

4.18.1 Number of interviews

There are no rules governing identifying what is regarded as a sufficient number of interviews in qualitative research in recent literature. The choice of the number of interviews is based on the purpose of the study or on the available time or resources (Elagili 2015:76). Experienced methodologists recommend that the qualitative researcher should keep on interviewing participants until the researcher reaches 'replication' (that is, collecting repetitive data and hearing the same stories repeated again and again) or "saturation point" wherein no new information emerges during the interview process (Saunders et al. 2012; Yin 2009; Easterby-Smith et al. 2008; Creswell 2014). Table 4.9 indicates the numbers of interviews conducted in five public colleges in KZN province.

Table 4.9: Number of interviews			
College	Top Management	Middle Management	Total
Umfolozi TVET	1	1	2
Umgungundlovu TVET	1	1	2
Elangeni TVET	1	1	2
Thekwini TVET	1	1	2
Majuba TVET	1	1	2
TOTAL	*5*	*5*	*10*

Interviews were held at the offices of participants or in conveniently-located TVET colleges around KZN. Interviews were between 20 and 43 minutes in duration. Interviewing of participants took some time as many were concerned with meeting year-end deadlines. Two participants did not participate in the study due to personal commitments. Nevertheless, information obtained from 10 participants was sufficient to reach data saturation point. In this study, data saturation was reached during interview number eight. Sixty-eight percent (68%) of the information was collected by this point and only 32% of the information was collected from interview number nine to twelve. Therefore, the researcher felt confident that the sample size was adequate.

The responses from each respondent were recorded using a digital voice recorder. All the interviews took place in the offices of the deputy principal finance (CFO) and assistant director Finance (finance manager) respectively. A copy of the interview schedule and the contact details of the researcher were provided to each interviewee for possible enquiries.

4.19 Study population

The study population for the qualitative phase of the research comprised finance department officials in the position of deputy principal (CFO) and assistant director (finance manager) at five public TVET colleges in KZN. These officials were chosen as they are experts in the field of study and have specialised expertise and involvement in budget allocation and the costing systems of their colleges.

4.19.1 Sampling

The participants of this study were purposefully selected because of their involvement in decision making in budget allocation and in cost allocation in their respective TVET colleges. The number of participants was considered sufficient based on the saturation principle of diminishing returns (Thietart 2007). In this study, the saturation principle held true and the number of participants were sufficient and enough information was provided.

A list of the face-to face interviews with deputy principal finances and finance managers is shown in Table 4.10.

Table 4.10: Face-to-face interviews with Deputy Principals and Finance Managers				
Number	Date	Participants	Duration of interview	TVET College
1	11/10/2016	Deputy Principal Finance (CFO)	42.24 minutes	TVET college A
2	11/10/2016	Assistant Director Finance	28.34 minutes	TVET college A
3	19/10/2016	Deputy Principal Finance (CFO)	19.38 minutes	TVET college B
4	19/10/2016	Finance Manager	09.29 minutes	TVET college B
5	25/10/2016	Deputy Principal Finance(CFO)	30.20 minutes	TVET college C
6	28/11/2016	Finance Manager	23.59 minutes	TVET college C
7	28/11/2016	Deputy Principal Finance (CFO)	29.11 minutes	TVET college D
8	28/11/2016	Finance Manager	32.02	TVET college D
9	30/11/2016	Deputy Principal Finance (CFO)	20.05 minutes	TVET college E
10	30/11/2016	Assistant Director Finance	25.51 minutes	TVET college E

4.20 Qualitative data analysis

The data were analysed using the thematic analysis approach which includes general procedures for analysis (Elagili 2015:85). Collis and Hussey (2009) state that the thematic analysis offers an accessible and flexible approach to analysing qualitative data

In order to deal with the huge volume of qualitative data that was collected via the multiple case studies, the following general procedures for the thematic analysis were set up as follows as suggested by Elagili (2015:85):

- The research aim and questions were taken into consideration by the researcher at all stages of the analysis;

- All interviews were written into Microsoft Word. The interview transcripts were returned to the respondents for confirmation that they were a true record of what was said;

- Any material collected by interviews was carefully referenced; and

- The researcher started the analysis by reading and re-reading the transcripts of the interviews and notes of the direct data (this step in the process is supported by Saunders et al. 2012; Creswell 2014).

Next, the researcher coded the data. Coding refers to 'the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon' (Braun and Clarke 2014). After the data were coded, the researcher grouped the codes into small categories according to the themes of the research questions (such a strategy is supported by Saunders et al. 2012; Collis and Hussey 2009). In this process, 9 themes were identified (current costing model, size of organisation, training, cost structure/level of overheads, top management support, internal champion support and innovation, internal resource availability, resistance to change and technical variables). All case studies were analysed separately. Then, the findings from all case studies were combined and discussed as suggested by Elagili (2015).

4.21 Ethical clearance

Once the study had been approved by the Accounting and Informatics Faculty Research Committee (FRC) at the Durban University of Technology (DUT), the researcher approached the nine public Technical and Vocational Education and Training (TVET) colleges in KZN for permission to conduct research. The requirement for seeking permission for each college was difficult and proved challenging and a very time-consuming task (the researcher started to approach colleges for gatekeepers' letters from 01 April 2016 until 10 September 2016).

On 21 September 2016, the researcher received full approval from the Institutional Research Ethics Committee (IREC) to proceed with data collection (refer to in appendix H). On 11 October 2016, the researcher started to send survey questionnaires until 4 December 2016.

The qualitative data collection included semi-structured face-to-face interviews which were conducted from 11 October 2016 until 4 December 2016 with five deputy principals finance (CFOs) and five assistant director finance (finance manager). Each deputy principal and finance manager chosen for the semi-structured interview were contacted personally by telephone prior to data collection to introduce the researcher and negotiate the interview date that was most convenient for the participant. The participants were requested to sign a consent form (refer to appendix E). Before the commencement of each interview each deputy principal finance and finance manager was notified of his or her right to participate voluntarily without any physical or psychological coercion and that they had the right to withdraw from the study at any time. The permission to audio tape was also requested, and each participant was assured that all data would be secured or concealed and made public only with anonymity.

4.22 Validity and reliability

The questionnaires used in this study were designed to obtain both valid and reliable measurements. Asking the following questions about each question in the questionnaire improved the ability of the questionnaire to achieve valid and reliable measurements (Kashora 2006:56):

- Should the question be included at all?
- Is the question of proper scope?
- Can the participant answer the question adequately?
- Will the participant willingly answer the question?

All questions that did not meet the above criteria were excluded. The questions were also designed to cover only one aspect at a time and there were no double-barreled questions in the questionnaires. Table 4.11 summarises how the validity and reliability of the questionnaires were established.

Table 4.11: Validity and Reliability	
Characteristic	Method used

Validity	• Phrasing the questions concisely to avoid ambiguity
	• Checking appropriateness of responses to structured questions
	• Asking of each question: does it help to answer the objectives?
	• Including questions that covered generally agreed views about costing systems
	• Asking how well each question related to the findings in the literature
Reliability	• Making questions easy enough for respondents to comprehend them easily
	• Covers only one aspect in each question
	• Providing clear instructions in the questionnaire
	• Avoiding leading questions
Source: Mushonga (2015:59)	

All questionnaires and questions in the semi-structured face-to-face interviews were also pretested to eliminate any bias. The selection of the sample size for the semi-structured interviews was selected on recommendation of Guest et al. (2006:74). Thus, for the qualitative aspects of the study, purposive sampling of six deputy principals (CFOs) and six assistant directors finance (finance managers) was selected. However, it is useful to note that the term 'validity' does not carry the same connotations in qualitative research (Creswell 2014:201). It is suggested, rather, that terms such as trustworthiness, credibility, plausibility and dependability be used (Gorman and Clayton 2005:62; Onwuegbuzie and Johnson 2006: 55).

The use of multiple data sources of data collection, as done in this study, also enhanced the researcher's ability to assess the accuracy of the findings and to convince the reader of accuracy (Creswell 2014:201).

In this study, Cronbach's alpha was used to measure internal consistency of the survey response scale. According to Connelly (2011:45), a scale has internal consistency when all the items measure the same attribute or construct. The construct that was in the questionnaire was critical success factors for ABC adoption (refer to appendix C, sections 2.6.2 -2.6.5). Furthermore, this section was used as it consisted of the Likert-scale questions probing critical success factors for ABC implementation. A reliability coefficient of 0.70 to 0.80 is regarded as satisfactory, especially for comparing groups and a reliability coefficient of 0.60 or higher is considered as "acceptable" for a newly developed construct (Bland and Altman 1997:572; Connelly 2011:45; Groves et al. 2009:285).

The overall reliability score of 0.60 indicates a satisfactory degree of acceptability in consistent scoring for this category of this study since this is new. Table 4.12 reflects the Cronbach's alpha score for all the items that constituted the questionnaire.

Table 4.12: Cronbach's alpha

Questions on Likert-scale based on ABC adoption	Number of items	Cronbach's Alpha
S1.5: Determining the costing model at TVET colleges	5	0.679
S1.12: Determining the efficiency of current costing system	2	0.519
S2.5: Internal resistance to new system (ABC)	10	0.630
S2.6: Determining critical success factors for ABC implementation	4	0.715
S2.7: Determining technical variables that constitute barriers to ABC adoption	4	0.645
Overall	**22**	**0.60**

The reliability score for all but one section exceeded the recommended Cronbach's alpha of 0.600. This indicates a degree of acceptable, consistent scoring of these sections of the research. Section S1.12 had a score slightly below the acceptable value, mainly due to the number of the statements that constituted this question. Even though the sample size (30) was small, reliability testing was done as the respondents formed a specialised group.

Reliability and validity were also important for the qualitative approach of this study. According to Bashir et al. (2008), reliability is applicable to any research approach.

Prior to semi-structured interviews with participants, pre-testing was undertaken to make sure that interview questions were clear, unambiguous and understandable by participants. Two interviews were conducted to ensure that the semi-structured questions were clear and understandable and could be answered within an acceptable time. This pre-test helped the researcher to ensure that the interview questions were understandable and unambiguous. Hence, accuracy, consistency and validity of information were ensured.

4.23 Ethical considerations

This study adhered to all ethical principles, as prescribed by DUT in order to uphold the integrity of the research. The researcher also applied for permission to conduct research at six public TVET colleges in KZN (i.e., gatekeepers' letters as per appendix G). After obtaining permission from these TVET colleges, the approved research proposal by Faculty Research Committee, data instruments, consents forms, letters of permission, and covering letters were submitted to the Institutional Research Ethics Committee (IREC) for ethical clearance. Data collection instruments were pre-tested and no amendments were made. The outcome of the pretesting was also submitted to IREC for full clearance before data gathering for the study.

4.23.1 Letter of information and consent

Consent letters (refer to appendix B & appendix E) were sent to respondents before the pretesting and the study was conducted. Therefore, the participants were clearly informed of all the outcomes of the study before signing the consent form. They were also informed that their participation was voluntary and that they had the right to withdraw from the study at any time, and that this study did not expose them to risks, medical examinations, or any situation that could be harmful either mentally or physically.

To ensure anonymity, all participants were requested not to make any reference to their colleagues or to their personal identity. The participants were also assured that all information gathered would be treated confidentially and with anonymity.

The researcher was personally available for assistance and requested respondents not to discuss the contents of the questionnaire with each other.

4.24 Summary

This chapter has addressed a number of issues relating to the choice of research methodology adopted within this study. Based on the aim, objectives and research questions of this study, the philosophies of positivism and the interpretivism philosophy were chosen. The deductive and inductive approaches were selected and justified. A multi-case study, survey and interview approaches were adopted as the strategies for this research. The data collection tools chosen were face-to-face semi-structured interviews and hand-delivered questionnaires. Finally, the data were analysed by using thematic analysis and statistical analysis. The next chapter 5 presents and discusses the quantitative results from the questionnaires, and chapter 6 presents and discusses the qualitative results from the interviews.

CHAPTER 5: PRESENTATION AND DISCUSSION OF QUANTITATIVE RESULTS

5.1 Introduction

Chapter 4 focused on the research design and methods that were employed in this study. Quantitative data were collected using closed-ended and open questions in a hand-delivered survey. This chapter presents the findings from the questionnaire (refer to appendix C) administered to finance staff members of selected TVET colleges in KZN. The survey was administered to 30 finance staff members. Thirty (100%) members responded.

While the overall aim of the study is to develop a conceptual framework for the adoption of an ABC model in TVET colleges in KZN, the responses from the questionnaire were used to meet the following objectives of the study:

- To determine the current practices regarding the costing model at TVET colleges in KZN;
- To investigate factors that constitute barriers to ABC adoption at TVET colleges in KZN; and
- To analyse adoption methodologies that might be applicable to TVET colleges in KZN.

Based on the above three objectives it was possible to analyse methodologies applicable to TVET colleges. An ABC model was developed as a support of each of the nine factors that constitute barriers to ABC adoption. The fourth objective of this study is as follows:

- To develop a conceptual framework for the adoption on an ABC model in TVET colleges in KZN (this objective uses a synthesis of the results from objectives 1 to 3 and the interviews adopted in this study which are discussed in Chapter 6).

This chapter presents the findings from the data that were collected from finance staff members using a questionnaire survey (refer to appendix C). These results are presented, in the sequence in which the questions appeared in the questionnaire.

The questionnaire consisted of 98 items divided as follows:

SECTION A: Demographical data;

SECTION 1: Assessing current costing model practices at TVET colleges;

SECTION 2: Activity-Based Costing system (ABC); and

SECTION 3: General questions.

Data from the questionnaire were analysed and organised into the following headings:

1. Demographics;
2. Assessing current costing model at TVET colleges; and
3. ABC system.
- ABC knowledge;

- Resistance to change (behavioural and organisational variables);
- Critical success factors for ABC implementation (behavioural and organisational variables);
- Other behavioural and organisational variables; and
- Technical variables that constitutes barriers on ABC adoption.

5.2 Demographics information

This section presents the descriptive statistics of the respondents' demographics, namely, gender, race, age, highest qualification, department, occupation and finance experience.

Tables 5.1 and 5.2 indicate the results from these demographical questions.

Table 5.1: Background information - Age						
Age (years)	Female		Male		Total	
	no	%	no	%	no	%
20 - 29	5	29.4	5	38.5	10	33.3
30 – 39	8	47.1	6	46.2	14	46.7
40 – 49	2	11.8	1	7.7	3	10.0
50 – 59	2	11.8	0	0	2	6.7
60 – 65	0	0	1	7.7	1	3.3
Total	17	100	13	100	30	100

Table 5.1 shows that the majority of respondents (80%) are young and between 20-39 years. Millennials (born between 1981 - 2002) are entering the workforce expecting a different workplace to that of their parents (Twenge et al. 2010). Millennials have higher expectations regarding the salary they will be earning. Since millennials are narcissistic, they may not be satisfied by the salaries paid by these colleges and this unhappiness could result in them switching into the private sector for a higher salary.

The results in table 5.1 also show that these TVET colleges are experiencing a problem with retaining more experienced employees as only three (10%) respondents are between 50-65 years of age. This may mean that once public worker acquire experience, they switch to the private sectors to earn a greater salary.

Table 5.2: Background information - other					
Race	**African**	**Coloured**	**White**	**Indian**	**Total**
Male	10	-	-	1	11
Female	10	2	2	5	19
Total	20	2	2	6	30
Percentage	66.7	6.7	6.7	20	100
Highest level of qualification	**Std 9/Grade 11 or below**	**Senior certificate/ Grade 12/std 10**	**Certificate or diploma**	**Degree**	**PG degree**	Total
Male	-	-	8	3	2	13
Female	1	1	11	3	2	17
Total	1	1	19	6	3	30
Percentage	3.3	3.3	63.3	20.0	10.0	100
Section employed	**Salary**	**Procurement**	**Expenditure**	**Accounts**	**Budget**	**Total**
Male	4	-	-	9	-	13
female	4	-	1	12	-	17
Total	8	-	1	21	-	30
Percentage	26.7	-	3.3	70	-	100
Occupation		**Financial clerk**	**Debtors clerk**	**Other***	**Total**
Male		3	6	4	13
Female		6	3	8	17

Total	9	9	12	30
Percentage	30	30	30	100

* Four respondents were debtors clerks, 6 respondents were creditors
clerks, one was a finance manager and one was a finance officer.

Number of years of completed service	1-5	6 - 10	11 - 15	16 - 20	21 and above	Total
Male	10	1	1	1	-	13
Female	7	6	4	-	-	17
Total	17	7	5	1	-	30
Percentage	56.7	23.3	16.7	3.3	-	100
Job title of respondents	Finance clerk	Creditor clerk	Debtors clerk	Finance manager	Finance Officer	Total
Male	7	1	3	1	1	13
Female	10	5	2	-	-	17
Total	17	6	5	1	1	30
Percentage	30	20	16.7	3.3	3.3	100
Number of years in this position	1-5	6 - 10	11 - 15	16 - 20	21 and above	Total
Male	11	1	1	-	-	13
Female	8	5	4	-	-	17
Total	19	6	5	-	-	30
Percentage	63.3	20	16.7	-	-	100

The first part of table 5.2 shows the race groups of the respondents. Twenty (66.7%) respondents are African, two (6.7%) respondents are Coloured, two (6.7%) respondents are White and six (20%) respondents are Indian. This findings indicates that these TVET colleges have a demographic diversity (in terms of gender and race). Demographic diversity unleashes

creativity, innovation, and improved group problem solving which, in turn, enhances the competitiveness of organisations (Andrade 2010). Diversity in terms of gender and race is important in South Africa as race and gender issues of inequality need addressing.

This finding also shows that these colleges are complying with affirmative action, because previously disadvantaged women are well represented (56.7%).

The second part of table 5.2 shows the highest qualifications of the respondents. The qualifications were categorised as standard 9/ grade 11 or lower, senior certificate (grade 12/ standard 10), certificate or diploma, degree, post-graduate and any other qualifications had to be specified. Table 5.2 indicates, surprisingly, that there are only two (6.7%) finance staff members in these six TVET colleges who do not have a certificate or diploma. Nineteen (63.3%) respondents possess a certificate or diploma, six (20%) respondents possess degrees and three (10%) respondents possess post-graduate degrees.

It is concerning that only three (10%) respondents hold post-graduate degrees. This finding indicates that attracting and retaining highly-qualified staff members is a problem at these colleges. Table 5.2 also indicates that a fair proportion of the respondents have higher qualifications. Table 5.2 also supports the findings in table 5.1 that higher educated and experienced public employees may switch to the private sector, as only three (10%) respondents hold post-graduate degrees.

Table 5.2 also shows a breakdown of the designations of the finance staff members. Nine (30%) respondents are financial clerks, nine (30%) are debtors clerks and twelve (40%) respondents hold positions other than finance clerks and debtors clerks. This finding further indicates that respondents were the correct target audience and that the required information was gathered from respondents who are representative of the population.

The respondents were also asked to indicate the section in which they are employed. Table 5.2 indicates that twenty-one (70%) respondents, which are the majority of respondents, are from the accounts section, eight (26.7%) respondents are from the salary section and one (3.3%) respondent is from the expenditure section. This also indicates that the data waere collected from relevant respondents.

Respondents were also asked to indicate their job title. Table 5.2 shows that ten (33.3%) respondents were finance clerks, six (20%) respondents were administration clerks (finance), six (20%) respondents were creditors' clerks, five (16.7%) respondents were debtors' clerks, and one (3.3%) respondent was an accounts clerk. There was also one (3.3%) finance officer and one (3.3%) finance manager. This finding indicates that data were collected from relevant respondents who are representative of the population.

The researcher wanted to ascertain whether the number of years in the current position and the number of years with the finance department had an impact on the resistance to a new system such as ABC. Table 5.2 shows that nineteen (63.3%) respondents have 1-5 years' experience in their positions, six (20%) respondents have been in their positions for 6-10 years and five (16.7%) respondents have been in their positions for 11-15 years. No respondent who had 16 years' experience or 21 years and above experience. This result may also indicate that the public sector cannot retain experienced employees, and that, once public employees gain experience, they leave the public sector for the private sector.

In concluding this section on the background information, an interesting result is that only two (6.7%) respondents do not have tertiary–qualifications and there were only three (10%) respondents who are post-graduate holders. Furthermore, the majority of the respondents were young employees. A problem with young employees is that they enter the public sector with expectation that the workplace is different to that experienced by their parents and they expect higher salaries. This may result in higher employee turnover in the public sector and a switch to the private sector.

The next section presents and discusses the results of Pearson's correlation test.

5.3 Pearson's correlations test

This section presents Pearson's correlation test to identify pairwise relationship between variable items such as costing model currently in used at TVET colleges, resistance to change and ABC adoption.

According to Appendix K, the following correlations were found:

- The way of preparing income budget by central office (S1.5.4) correlate with the use of student size to allocate costs for the programme (S1.5.2).

This indicates that the student size is very important factor when preparing income budget at these colleges.

- The apportionment of overhead costs as per campus size (S1.5.5) correlate with the number of students is used to allocate costs for the programme (S1.5.2).

This indicates that the student size is always taken into consideration when allocating overhead costs to each campus.

- Under the costing system, the budget is always adequate and never runs before year-end (S1.12.1) correlate with the budget is allocated to each campus as per number of students (S1.5.1).

This indicates that the uses of students size when allocating budget to each campus is a reason for the running out of the budget before the year-end.

- Income from tuition fees is minimal and hardly covers the actual costs of teaching and learning (S1.12.2) correlate with uses of number of student to allocate budget to each campus (S1.5.1).

This indicates that using the number of students, results in inadequate tuition fees that hardly cover the actual costs of running the college.

- Being open to the new system (S2.5.3) correlated with the way of preparing an income budget in these TVET colleges (S1.5.4).

This show that respondents felt that the old way of preparing income budget in their colleges only taking into account number of student is not efficient and accurate and this cause them to be open to any new system such as ABC system.

- Being open to the new system (S2.5.3) correlated with the apportionment of overheads cost as per size of each campus (S1.5.5).

This indicates that the respondents are not happy with using size of the campus to allocate overhead costs to each campus.

- Being open to new system (S2.5.3) correlated with income from tuition fees is minimal and hardly to covers the actual costs of teaching and learning (S1.12.2).

This also shows that the respondents to a new system because the current costing system results in minimal tuition fees that are hardly to cover actual costs of running the college.

- Being open to new system (S2.5.3) correlated with up-to-date and very functional of the current costing system (S1.12.4).

This shows that respondents are not resistant to new system as the costing system currently in use in TVET colleges is out-dated and dysfunctional.

5.4 The costing model practices currently in use at TVET colleges (objective 1)

The first objective of the study was to determine the current practices regarding the costing model at TVET colleges in KZN. Questions were designed to gather information relating to the current costing model in use at the TVET colleges (The relevant sections of the questionnaire are S1.1, S1.3, S1.4, S1.5, S1.6, S1.8, S1.9, and S1.12 & S2.3). This section also follows analyses of the scoring patterns of the respondents per variable per section under the research objective 1 (To determine the current practices regarding the costing model at TVET colleges in KZN).

This section presents and discusses results relating to each variable using summarised percentages (univariate analysis).

This section also presents and discusses the results of the underlying relationship between the independent variable (behavioural and organisational and technical variables) and the dependent variable (ABC adoption) using bivariate analysis. This relationship is tested by means of a chi-square test.

5.4.1 The department in the TVET college with the most students

Respondents were provided with a list of options (refer to sections 1.1-1.1.5 of appendix C) and were asked to indicate the department with the most students at their TVET colleges. The researcher wanted to ascertain the impact of size on the allocation of the costs in each college. Table 5.3 shows that business studies had the most students as it was chosen by fifteen (50%) respondents, followed by engineering studies chosen by 12 respondents (40%) and 'other' departments chosen by three (10%) respondents.

Table 5.3: The department at the college with most students			
Note: data drawn from section 1.1	**Number**	**Percentage**	**Rank**
Business Studies	15	50%	1
Engineering Studies	12	40%	2
Other	3	10%	3

5.4.2 Department that has most students at your college

To determine whether the differences were significant, chi-square tests were conducted. The results are shown in table 5.4.

Table 5.4: Chi-square tests for department with most students			
Note: Data drawn from section 1.1	**Chi-Square**	**Df**	**Asymp.Sig (P-value)**
Please indicate the department that has most students in your college	7.800	2	0.020*
***P-value< 0.05**			

Since the p-value is less than 0.05 (the level of significance), it implies that the distributions were not even and this indicates that respondents chose two different programme with the most students at their colleges (electrical engineering and office administration). This indicates that the size of the programme offered at these TVET colleges are not equal.

5.4.3 Demographic data and department with most students

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and the department with most students. The results are shown in table 5.5.

Table 5.5: Chi-square test for department with most students and demographic variables							
Note: Data drawn from section 1.1	**Gender**	**Race**	**Age**	**Qualification**	**Section of employment**	**Occupation**	**Number of completed years with college**
1. Please indicate department with most students	.106	.154	.137	.731	.038*	.024*	.240
***P-value < 0.05**							

Table 5.5 shows that only 'section of employment' and 'occupation' had significant results (p-value <0.05). This findings indicates that there is significant relationship between 'section of employment' and occupation' and the department with most students.

5.4.4 The programme that has the most students and the programme which consumes a higher percentage of the college's budget

Respondents were provided with a list of programmes and were asked to indicate which one had the most students at their college. This was to ascertain the impact of the number of students (size) on the costing model currently in use at TVET colleges. Respondents had to choose one option. The respondents ranked office administration (which is under business

studies) and electrical engineering (which is under engineering studies) as the programmes which have most students at their colleges (in joint first place). Business management was ranked as the second programme that has the most students at their colleges, followed by financial management (third), management assistant (fourth) and tourism (last) (refer to table 5.6).

Respondents were also required to choose a programme that consumes the highest percentage of the TVET college's budget. Respondents could only choose one response, from the lists of programmes. This was to ascertain the relationship between the programme with most students and the programme that consumes highest percentage of the college's budget.

Table 5.6 shows that office administration was ranked as the programme that consumes the highest percentage of the college's budget, electrical engineering was second, business management was third, financial management was fourth and management assistant was last.

Table 5.6 also shows that electrical engineering and office administration are the programmes with the most students in these colleges. Office administration is ranked as the programme that consumes the highest percentage of the college's budget, followed by electrical engineering. This result indicates that the programme that has the most students consumes the highest percentage of the college's budget.

It is also noted that office administration is a component of the business studies which has the most students in these colleges and electrical engineering is a component of engineering studies which follows in second place in terms of student numbers in these colleges. Table 5.4 shows that the programme with the most students consumes the highest percentage of the college's budget. Therefore, there is a positive correlation between the number of students and the allocation of the budget under the current costing model in use at TVET colleges.

Table 5.6: The programme with most students and programme that consumes the higher percentage of the college's budget				
The programme with most students			The programme that consumes higher percentage of college' budget	
Note: data drawn from section 1.3 and section 1.4	**No of times chosen by respondent**	**Rank**	**No of times chosen by respondent**	**Rank**
Business Management	5	2	4	3
Electrical Engineering	10	1	8	2
Financial Management	3	3	2	4
Management Assistant	1	4	0	6
Office Administration	10	1	10	1
Tourism	1	5	1	5

5.4.5 Programme with most students

To determine whether the difference was significant, chi-square tests were conducted. The results are shown in table 5.7.

Table 5.7: Chi-square for the programme with most students			
Data: Data drawn from section 1.3	**Chi-Square**	**Df**	**Asymp.Sig (P-value)**
Please indicate the programme that has the most students	17.200	5	0.004*
*P-value < 0.05			

Since the p-value is less than 0.05 (the level of significance), it implies that the distributions were not even as the finance staff members chose two programmes (electrical engineering and office administration) as having the most students in their colleges, while ten (33.3%) respondents indicated that electrical engineering has the most students in their colleges and the other ten (33.3%) respondents selected the office administration as the department with the most students.

5.4.6 Demographic data and programme with most students

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and the programme with most students. The results are shown in table 5.8.

Table 5.8: Chi-square test for programme with most students and demographic variables							
Data: drawn from section 1.3	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years with college
1. Please indicate the programme that has most students	.539	.130	.498	.002*	.005*	.316	.494
*P-value < 0.05							

Only the p-values for 'qualification' and 'section of employment' to which respondents belong are less than 0.05. The respondents with different qualifications and from different sections, therefore, view this statement in a dissimilar manner. That is, there is a significant relationship between 'qualifications' of respondents and 'section' in which respondents belong and the programme with the most students.

5.4.7 Programme that consumes a higher percentage of the college's budget

To determine whether the difference was significant, chi-square tests were conducted. The results are shown in table 5.9.

Table 5.9: Chi-square test for the program which consumes a higher percentage of the college's budget			
Data: drawn from section 1.4	Chi-Square	Df	Asymp.Sig (P-value)
Please indicate the programme which consumes a higher percentage of the college's budget	12.000	5	0.035*
*P-value < 0.05			

Since the p-value is less than 0.05 (the level of significance), it implies that the distributions were not even. That is, the difference between agreement and disagreement about which programme consumes a higher percentage of the college's budget was significant. This indicates that, under the costing system currently in use the size of the programme plays a significant role in budget allocation among the programmes.

5.4.8 Programme that consumes the highest percentage of the budget

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and the programme that consumes the highest percentage of the college's budget. The results are shown in table 5.10.

Table 5.10: Chi-square test for the programme which consumes a higher percentage of the college's budget and demographic variables							
Note: data from section 1.3	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years with college
Please indicate the programme which consumes the highest percentage of college's budget	.309	.015*	.531	.217	.831	.073	0.614
*P-value < 0.05							

Table 5.10 shows that only 'race' that had a significant result (p-value <0.05). This indicates that there is relationship between the programme which consumes the highest percentage of college's budget and 'race'.

5.4.9 Accounting and management techniques

Respondents were asked to indicate the accounting and management techniques utilised at their colleges. The question provided a list of accounting and management techniques which might be used. Table 5.11 shows that 'budgeting' was reported as being used by over ninety percent (96.7%) of all respondents. One (3, 3%) respondent selected 'process costing' and one (3.3%) respondent selected 'job costing'. No respondents indicated that his or her college uses ABC or the balanced scorecard. This indicates that these public TVET colleges are still using traditional costing systems.

Table 5.11: Accounting and management techniques			
	Number	**Percentage**	**Rank**
Process Costing	1	3.3%	3
Job Costing	1	3.3%	3
Budgeting	29	96.7%	1
Other technique	16	53.3%	2
Note: Data drawn from section 1.6			

5.4.10 The funding of each campus under the current costing model

Respondents were asked to identify the method used to allocate the funding at each campus in their TVET colleges by ticking a range of possible methods to ascertain the cost drivers that are currently being used at TVET colleges. Table 5.12 shows that eighteen (60%) respondents reported 'latest enrolment and registration statistics' as most commonly used to allocate funding to each campus, and seventeen (56.7%) respondents reported 'the number of students enrolled' as the second common method used. Sixteen (53.3%) respondents reported the 'size of the campus' and the 'number of programmes' offered by the college as the third commonly used method. Fifteen (50%) respondents reported 'related costs of the programme' as the method used to allocate costs at each campus, four (13.3%) respondents reported 'certification rate' and other methods and two (6.7%) respondents reported the 'duration of the course'. This means that, under the costing systems currently used at TVET colleges, the number of students (latest enrolment and registration statistics) is reported as the first cost driver.

Table 5.12: Methods of allocation costs to each program		
Note: Data drawn from section 1.9	**Number**	**Percentage**
The reported number of students enrolled	17	56.7
Related costs of the programme	15	50%
Based on the number of programmes offered at each campus	16	53.3
Duration of the programme	2	6.7
Latest enrollment and registration statistics	18	60%
Based on certification rate	4	13.3
Based on the size of the campus	16	53.3
Other method	4	13.3

5.4.11 Whether accurate and adequate information is provided by the current accounting and management techniques in TVET colleges

To ascertain whether adequate and accurate of information provided by the current accounting and management techniques utilised at TVET colleges, respondents were asked to agree or disagree with the statement: The accounting and management techniques utilised in the college provide accurate and adequate information as the budget is always adequate and never runs out before year end.

Table 5.13: The adequate and accurate of accounting and management techniques at TVET colleges		
Note: data drawn from section 1.8	**Number**	**Percentage**
Yes	13	43.3
No	17	56.7

The table 5.13 shows that seventeen (56.7%) respondents indicated that the current accounting and management techniques utilised at their TVET colleges does not provide adequate and accurate information since the budget is not always adequate and runs out before the year-end.

5.4.12 The costing model currently in use at TVET colleges

To provide information on the current costing model in use at their respective TVET colleges, respondents were asked to indicate the level of their agreement with five statements. These statements and results are shown in table 5.14.

Table 5.14: Allocation method under current costing model				
Note: data drawn from section S1.5	**Agree**	**Neutral**	**Disagree**	**Total**
1 The college allocates the budget to each campus as per number of students.	80% 24	13.3% 4	6.7% 2	100% 30
2 The student size is always used to allocate costs for the programme.	83.3% 25	6.7% 2	10.0% 3	100% 30
3 The college has a tool used to identify all personnel costs and the tasks of each employee.	20.0% 6	26.7% 8	53.3% 16	100% 30
4 Central office prepares an income budget to determine fees for the following year, taking into account the expected number of students.	80.0% 24	13.3% 4	6.7% 2	100% 30
5 The college's overhead costs are apportioned according to the size of each campus.	76.7% 23	20.0% 6	3.3% 1	100% 30
Scoring 1= Strongly Agree, Scoring 2= Agree, Scoring 3= Neutral, Scoring 4 =Disagree and Scoring 5 =Strongly disagree. The levels of disagreement (negative statements) were collapsed to show a single category of "Disagree". A similar procedure was followed for the level of agreement (positive statements). This is allowed due to the acceptable level of reliability.				

Twenty-four (80%) respondents indicated that the colleges allocate their budget to each campus as per 'number of students', whereas four (13.3%) respondents were neutral in their response and two (6.67%) respondents disagreed with this statement. Thus most respondents felt that their colleges allocate the budget to each campus according to number of students.

When questioned regarding 'student size' as the method used to allocate costs for the programme, twenty-five (83.3%) respondents indicated that the student size is always used for cost allocation to the programme, whereas two (6.67%) respondents were neutral with this statement and three (10%) disagreed with this statement. Thus, most respondents felt that 'student size' is used when their colleges allocate costs to each programme.

When questioned if their colleges have a tool to identify all personnel costs and tasks performed at their colleges, sixteen (53.3%) respondents disagreed with this statement, whereas eight (26.7%) respondents were neutral and six (20%) respondents indicated that colleges do have a tool to identify all major activities performed at the college. It may be that these employees regard job descriptions as the method to identify activities/tasks of the college. Therefore, most respondents felt that there is no method to identify activities performed at their colleges.

When respondents were asked whether central office prepared an income budget taking into account the expected number of students, twenty-four (80%) respondents indicated that their colleges are taking into consideration the number of expected students when their central offices prepare an income budget, whereas four (13.3%) respondents were neutral with this statement and two (6.7%) respondents disagreed with this statement. Therefore, most

respondents indicated that the expected numbers of students are taken into consideration when their central offices prepare an income budget.

When the respondents were asked whether the college's overhead costs are apportioned according to the 'size of each campus', twenty-three (76.7%) respondents indicated that their college's overhead costs are apportioned as per 'size of each campus', whereas six (20%) respondents were neutral with this statement and one (3.3%) respondent disagreed with this statement. Therefore, most respondents indicated that the college's overhead costs are apportioned according to 'size of the campus'.

Amir et al. (2010) also found that higher learning institutions most commonly use the 'number of the students' as the cost driver and only teaching and learning costs are taken into consideration when calculating programme costs.

5.4.13 The costing model currently in use at TVET colleges

To determine whether the differences were significant, chi-square tests were conducted. The results are shown in table 5.15.

Table 5.15: Chi-square test for costing model at TVET college			
Note: Data drawn from section 1.5	**Chi-Square**	**Df**	**Asymp.Sig (P-value)**
1. The college allocates the budget to each campus as per number of students.	29.333	4	0.000*
2.The student size is always used to allocate costs for the programme.	27.667	4	0.000*
3. The college has a tool used to identify all personnel costs and tasks of each employee.	6.667	4	0.155
4. Central office prepares an income to determine fees for the following year, taking into .account the expected number of students	15.333	3	0.002*
5. The college's overheads costs are apportioned according to the size of each campus.	13.467	3	0.004*
*P-value < 0.05			

Since all the p-value except the third, are less than 0.05 (the level of significance), imply that the distributions were not even. That is, the difference between agreement and disagreement were significant

The implied relevance to this study is that, except for statement 3 in table 5.15, the finance staff members at six public TVET colleges in KZN felt that the under the current costing model, their colleges allocate the budget to each campus as per number of students, that students' size is always used to allocate costs for the programme, and when the central office prepares an income budget the expected number of students are taken into consideration under the current costing system, and the overhead costs are apportioned according the size of the campus under the current costing model.

5.4.14 Demographic data and costing model at TVET colleges

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and the current costing model (S1.5.1 to S1.5.5). The results are shown in table 5.16.

Table 5.16: Chi-square for allocation method under current costing model and demographic variables							
Note: Data drawn from section 1.5	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years with college
1. The college allocates the budget to each campus as per number of students.	.703	.853	.526	0.684	.875	.106	.939
2. The student size is always used to allocate costs for the programme.	.457	.083	.126	0.520	.928	.060	.869
3. The college has a tool used to identify all personnel costs and tasks of each employee.	.458	.704	.208	0.579	.216	.293	.010*
4. Central office prepares an income to determine fees for the following year, taking into .account the expected number of students.	.388	.139	.075	0.077	.024*	.188	.165
5. The college's overheads costs are apportioned according to the size of each campus.	.163	.017*	.000*	0.295	.802	.276	.752
*P-value < 0.05							

Table 5.16 shows that only p-values for 'experience', 'section of employment', 'age' and 'race' are significant (p-value < 0.05). That is, there is a significant relationship between these demographic data and the cost model currently in use at TVET colleges.

5.4.15 The efficiency of the current costing system

A number of questions were asked to determine respondents' perceptions of the efficiency of the current costing model at TVET colleges. These results are shown in table 5.17.

Table 5.17: The efficiency of the current costing model at TVET colleges				
Note: Data drawn from section 1.12	**Agree**	**Neutral**	**Disagree**	**Total**
1. Under the current costing system, the budget is always adequate and never runs out before year end.	33.3% 10	16.7% 5	50% 15	100% 30
2. In our college the income from tuition fees is minimal and hardly covers the actual teaching and learning.	86.7% 26	6.7% 2	6.7% 2	100% 30
3. The new costing system is needed as our college has limited grant funding from DHET.	89.7% 26	3.4% 1	6.9% 2	100% 29
4. The current costing system is up-to-date and very functional.	20% 6	50% 15	30% 9	100% 30
5. I fully understand and able to use the current accounting system.	86.2% 25	13.8% 4	0.0% 0	100% 29
Scoring 1= Strongly Agree, Scoring 2= Agree, Scoring 3= Neutral, Scoring 4 =Disagree and Scoring 5 =Strongly disagree. The levels of disagreement (negative statements) were collapsed to show a single category of "Disagree". A similar procedure was followed for the level of agreement (positive statements). This is allowed due to the acceptable level of reliability.				

Table 5.17 shows that fifteen (50%) respondents stated that the current costing model is not efficient and that the budget of the colleges runs out before the year end, ten (33.3%) respondents agreed with this statement and five (16.7%) respondents were neutral with this statement. These results support Kim and Ballard (2003) and Maria (2013) who found that there is concern in Institutions of higher education institution (HEIs) about their ineffectiveness in managing their financial resources as a result of using a uniform cost driver such as the number of students.

When respondents were questioned if the income from tuition fees under the current costing model is minimal and hardly covers the actual costs of teaching and learning, twenty-six (86.7%) respondents agreed with this statement, two (6.7%) respondents were neutral with this statement and two (6.7%) respondents disagreed with this statement. This finding indicates that the current costing systems which are currently in use at TVET colleges are not efficient as the income from tuition fees hardly covers actual costs of teaching and learning.

When respondents were questioned if a new costing system is needed as colleges are faced with limited grant funding from DHET, twenty-six (89.7%) respondents indicated that a new system is needed as a limited grant is received from DHET, two (6.9%) respondents disagreed with this statement and one (3.4%) respondent was neutral towards this statement. Only twenty-nine respondents answered this question.

Therefore, most respondents felt that a new costing system is needed as the colleges received limited funding from DHET.

When the respondents were questioned whether the current costing systems were up-to-date and very functional, fifteen (50%) respondents were neutral towards this statement, six (20%) respondents agreed with this statement and nine (30%) respondents disagreed with this statement. While only nine respondents disagreed with this statement, taking also the level of neutrality into account, the majority of the respondents indicated that the current system is not up-to-date and functional as the budget of the college runs out before year-end.

When the respondents questioned if they fully understand and are able to use the current accounting system, twenty-five (86.2%) respondents indicated that they fully understood, and are able to use the current accounting system, whereas four (13.8%) respondents were neutral in their responses.

5.4.16 The efficiency of the current costing model at TVET colleges

To determine whether the current costing model is efficient, chi-square tests were conducted. The results are indicated in table 5.18.

Table 5.18: Chi-square test: The efficiency of current costing model			
Note: Data drawn from section 1.12	**Chi-Square**	**Df**	**Asymp.Sig (P-value)**
1: Under the current costing system, the budget is always adequate and never runs out before year end	5.667	4	0.225
2: In our college the income from tuition is minimal and hardly covers the actual costs of teaching and learning	18.533	3	0.000*
3 The new costing system is needed as our college faced with limited grant funding from DHET	19.414	3	0.001*
4: The current costing system is up-to-date and very functional	11.241	2	0.004*
*P-value < 0.05			

Three of the four p-values in table 5.18 are less than 0.05, and only (one) of the statements showed a skewed pattern. This findings indicates that there is a significant relationship between the statements that scored less than 0.05 on the efficiency of the costing model currently in use at TVET colleges. This indicates that the current costing model is not efficient in allocating costs of the colleges (refer to table 5.11). This also means that respondents are not satisfied with the efficiency of the current costing model at TVET colleges.

5.4.17 Demographic data and the efficiency current costing model at TVET colleges

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and the current costing model at TVET colleges. The results are shown in table 5.19.

Table 5.19: The Chi-square Tests on current costing model and demographic variables							
Note: data drawn from section 1.12	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years with college
1. Under the current costing system, the budget is always adequate and never runs out before year end	.617	.026*	.181	.433	.140	.689	.456
2. In our college the income from tuition is minimal and hardly covers the actual costs of teaching and learning	.404	.913	.442	.854	.932	.069	.667
3. The new costing system is needed as our college faced with limited grant funding from DHET	.405	.990	.077	.130	.061	.346	.031*
4. The current costing system is up-to-date and very functional	.607	.844	.641	.708	.228	.263	.204
*P-value< 005							

Table 5.19 shows only the p-value for 'respondents' experience' and 'race' were significant (p-value < 0.05). Therefore, respondents with different 'experience' and from different 'races' view the statements in dissimilar manner. That is, there is a significant relationship between these demographic data and current costing used at TVET colleges.

5.4.18 The level of ABC adoption

In order to ascertain the level of ABC adoption within TVET colleges, respondents were asked to indicate the current level of ABC adoption in their particular TVET college.

Table 5.20 shows that eighteen (60%) respondents indicate that there is no consideration of ABC in their TVET colleges to date. Eight (26.7%) respondents indicated that ABC is already under consideration in their TVET colleges. Three (10%) respondents indicated that ABC has already been implemented in selected areas in their TVET colleges. No TVET college has

implemented ABC in full. The results of this study support the findings of Innes et al. (2000) and Sulaiman et al. (2004) that firms in developing countries are not adopting ABC as they are experiencing problems in ABC adoption.

Table 5.20: Level of ABC adoption			
Note: Data drawn from section 2.3	**Number**	**Percentage**	**Rank**
Implemented ABC in selected areas	3	10%	3
Currently under consideration	8	26.7%	2
Rejected ABC after assessment	1	3.3%	4
No consideration of ABC to date	18	60%	1

5.4.19 The level of ABC adoption

To determine whether the differences on the level of ABC adoption was significant, chi-square tests were conducted. The results are shown in table 5.21.

Table 5.21: Chi-square test: The level of ABC adoption			
Note: Data drawn from section 2.3	**Chi-Square**	**Df**	**Asymp.Sig (P-value)**
S2.3: What is a level of ABC adoption in your college	23.067	3	0.000*
*P-value < 0.05			

The p-value in table 5.21 is less than 0.05, this indicates that, the respondent responded in this question in dissimilar manner. Table 5.20 also indicates that respondents who chose 'no consideration of ABC to date' were higher than those who chose 'implemented ABC in selected areas'. This indicates that the no adoption of ABC at their TVET colleges.

5.4.20 Demographic data and level of ABC adoption

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and the level of ABC adoption at TVET colleges. The results are shown in table 5.22.

Table 5.22: Chi-square test: The level of ABC adoption and demographic variables

Note: Data drawn from section 2.3	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years with college
What is the level of ABC adoption?	.415	.444	.148	.031*	.000*	.754	.000*
*P-value < 0.05							

The p-values for 'qualification', 'section of employment' and 'number of years' (experience) are less than 0.05. The respondents with different qualifications view the statement on the level of ABC adoption in a dissimilar manner. That is, there is a significant relationship between respondents' 'qualification', 'section of employment' and 'experience' and level of ABC adoption. Table 5.16 indicates that most of respondents (18 respondents) state that there has been no consideration of ABC to date at their colleges.

5.4.21 Summary

This section reported the findings of research objective 1. It compared the demographic variables with the costing model currently used at TVET colleges by using chi-square tests. The findings of this study on objective 1 indicate that public TVET colleges in KZN spread their overhead costs according to the number of students. It is also noted that these colleges are still using a traditional costing system, as twenty-seven (90%) respondents indicated that their colleges are not ABC users. The findings of the study also indicate that latest enrolment statistics are mainly used to allocate the budget to the colleges' campuses.

The next section presents and discusses the results of the objective 2 relating to the factors that constituted barriers in the adoption of ABC.

5.5 Barriers to ABC adoption at TVET colleges (objective 2)

The second objective of the study was to investigate factors that constitute barriers to ABC adoption at TVET colleges in KZN. This section presents and discusses the results of the questions related to factors that constituted barriers in the adoption of ABC (both behavioural and organisational and technical variables) in the following sections of the questionnaire: S1.2, S1.7, S1.10, S1.11, S2.1, S2.2, S2.4, S2.5, S2.6, S2.7 and S2.8. In addition, this section analyses the scoring patterns of the respondents per variable for each section under the research objective 2 (To investigate factors that constitute barriers to ABC adoption at TVET colleges in KZN).

5.5.1 Behavioural and organisational and technical variables as barriers to ABC adoption

This section firstly presents and discusses results relating to each variable using summarised percentages (univariate analysis).

This section then presents and discusses the results of the underlying relationship between the independent variables (behavioural and organisational and technical variables) and the dependent variable (ABC adoption) using bivariate analysis. This relationship is tested by means of a chi-square test. This section first presents the findings relating to the following hypotheses:

H1: Larger TVET colleges are more likely to adopt ABC than smaller colleges,

H0: There is no relationship between the size of the college and ABC adoption;

H2: TVET colleges, which have top management support, are more likely to adopt ABC than those colleges which face lack of top management support,

H0: There is no relationship between the top management support and ABC adoption;

H3: TVET colleges, which have a greater percentage of total cost as overheads, are more likely to adopt ABC than colleges which have a small percentage of overhead costs,

H0: There is no relationship between cost structure/level of overhead costs and ABC adoption.

H4: TVET colleges, which have more production diversity/more programmes are more likely to adopt ABC than the colleges which have less production diversity,

H0: There is no relationship between product diversity and ABC adoption;

H5: TVET colleges, which have employees who are open to changes and innovative systems, are more likely to adopt ABC than those colleges with employees who are resistant to changes and innovative systems,

H0: There is no relationship between resistance to change and ABC adoption;

H6: TVET colleges, which have high internal champion support and innovation, are more likely to adopt ABC than those colleges which have less internal champion support and innovation,

H0: There is no relationship between internal champion support and innovation and ABC adoption;

H7: TVET colleges, which have adequate resources, are more likely to adopt ABC than those colleges with no resources,

H0: There is no relationship between internal resources' availability and ABC adoption;

H8: There is a positive relationship between ABC adoption and training,

H0: There is no relationship between training and ABC adoption; and

H9: Technical issues are the most common cause for rejecting ABC at TVET colleges,

H0: Technical issues are not the most common cause for rejecting ABC at TVET colleges.

5.5.1.1 ABC adoption and size of organisation: H1

This study adopts the position that size is a significant factor in the adoption of ABC systems. Therefore, this section addresses the following alternative hypothesis and null hypothesis:

H1: Larger TVET colleges are more likely to adopt ABC than smaller colleges.

H0: There is no relationship between the size of the college and ABC adoption

Respondents were asked to indicate the level of their agreement with statements shown in table 5.23. Table 5.23 shows that twenty-six (86.7%) respondents indicated that the large-sized TVET colleges are more likely to have a greater access to individuals with the knowledge to design a new system. This means that size plays a big role in ABC adoption. Based on this result, there is a positive correlation between size and ABC adoption. The size of the colleges was measured using the number of courses offered. Table 5.36 shows the cross tabulation of size on the categories of different courses. Table 5.36 indicates that there is relationship between size of the college and ABC adoption. This result contradicts Bjornenak's (1997) findings that firm size does not significantly discriminate between adopters and non-adopters of ABC.

Table 5.23: Size of organisation			
Note: data drawn from section 2.8	**Agree**	**Neutral**	**Disagree**
1. The large-sized colleges are more likely to have greater access to individuals with the knowledge to design a new system	86.7% 26	10.0% 3	3.3% 1
Scoring 1=strongly agree, scoring 2= Agree, scoring 3= Neutral, scoring 4= Disagree and scoring 5= strongly disagree The levels of disagreement (negative statement) were collapsed to show a single category of "Disagree". A similar procedure was followed for the level of agreement (positive statements). This is allowed due to the acceptable level of reliability.			

5.5.1.2 Size of organisation: H1

To determine whether the differences were significant, chi-square tests were conducted. The results are indicated in table 5.24.

Table 5.24: Chi-square test for size of organisation			
Note: Data drawn from section 2.8	**Chi-Square**	**Df**	**Asymp.Sig (P-value)**
1. The large-sized colleges are more likely to have greater access to individuals with the knowledge to design a new system	17.467	3	0.001*
*P-value < 0.05			

The p-value in table 5.24 tested at less than 0.05 (level of significance) implying that the size of the college plays a significant role in the adoption of ABC.

5.5.1.3 Demographic data and size of organisation: H1

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and size of organisation. The results are shown in table 5.25.

Table 5.25: Chi-square for size of the college and demographic variables							
Note: Data drawn from section 2.8	**Gender**	**Race**	**Age**	**Qualification**	**Section of employment**	**Occupation**	**Number of completed years with college**
1.The large-sized colleges are more likely to have access to individuals with the knowledge to design a new system	.342	.985	.747	.715	.317	.219	.763
*P-value < 0.05							

Since the p-values in table 5.25 are more than 0.05 (above level of significance), this statement showed a skewed pattern. There is no significant relationship between the statements that scored more than 0.05. However, table 5.23 shows that levels of agreements were higher than level of disagreements and table 5.24 indicates a significant relationship between size of the college and ABC adoption, based on this the null hypothesis (i.e., there is no relationship between the size of the college and ABC adoption) is rejected, and H1 is accepted: Larger TVET colleges are more likely to adopt ABC than smaller colleges.

5.5.2. ABC adoption and top management support: H2

This study adopts the position that top management support is a significant factor in the adoption of ABC systems. Therefore, this section addresses the following alternative hypothesis and null hypothesis:

H2: TVET colleges, which have top management support, are more likely to adopt ABC than those colleges which face lack of top management support.

H0: There is no relationship between top management support and ABC adoption.

Respondents were asked to indicate the level of their agreement with the three statements shown in table 5.26.

When the respondents were asked to indicate their level of agreement with the statement on top management support, fifteen (50%) respondents were neutral with statement one, whereas eight (26.67%) respondents were in agreement and seven (23.3 %) were not in agreement. This finding indicates that top management gives employees low support when a new system is introduced, possibly because the income from tuition fees is minimal and hardly covers the actual costs of teaching and learning (refer to table 5.17).

When the respondents were asked to indicate their level of agreement with statement two, twelve (40%) respondents were neutral towards this statement, whereas eleven (36.7%) were not in agreement and seven (23.3%) were in agreement. This finding indicates that the changes are not communicated to lower level employees and they are not consulted for their input. This means there is a lack of management support.

When the respondents were asked to indicate their levels of agreement with statement three, thirteen (43.3%) respondents were not in agreement with this statement, whereas 33.3% were neutral and seven (23.3%) respondents were in agreement. This finding indicates that top management may just introduce a new system without ensuring that employees are capacitated with new required skills. These results also indicate that top management support is lacking within TVET colleges when a new system is introduced. This may have a negative impact on the adoption of ABC and also leads to the non-adoption of ABC. This finding supports Krumwiede (1998) and Majid and Sulaiman (2008) who claimed that top management is a highly important factor in the decision to adopt the ABC system.

Table 5.26: Top management support				
Note: data drawn from section 2.6	**Agree**	**Neutral**	**Disagree**	**Total**

1. Top management always provides adequate support when a new system or programmers are introduced	26.7% 8	50.0% 15	23.3% 7	100% 30
2. Top management always consult affected staff for their input and opinion before they introduced the new system	23.3% 7	40.0% 6	36.7% 11	100% 30
3. Top management always conduct proper skills audits to ascertain the competency gap before they introduce the new system	23.3% 7	33.3% 10	43.3% 13	100% 30
Scoring 1=strongly agree, scoring 2= Agree, scoring 3= Neutral, scoring 4= Disagree and scoring 5= strongly disagree				
Levels of disagreements (negative statement) were collapsed to show a single category of "Disagree". A similar procedure was				
followed for the level of agreements (positive statements). This is allowed due to the acceptable level of reliability.				

5.5.2.1 Top management support: H2

To determine whether the differences were significant, chi-square tests were conducted. The results are shown in table 5.27.

Table 5.27: Chi-square test: Top management support

Note: Data drawn from section 2.6	Chi-Square	Df	Asymp.Sig (P-value)
1. Top management always provides adequate support when a new system or programmers are introduced	12.400	3	0.006*
2. Top management always consult affected staff for their input and opinion before they introduce the new system	9.200	3	0.027*
3. Top management always conducts proper skills audits to ascertain competency gap before they introduce the new system.	9.000	4	0.061
*P-value < 0.05			

Since all the p-values, except the last, are less than 0.05 (the level of significance), it implies that the distributions were not even. That is, the differences between agreement and disagreement were significant.

This finding indicates that there is statistically significant relationship between top management support and ABC adoption.

5.5.2.2 Demographic data and top management support: H2

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and top management support. The results are shown in table 5.28.

Table 5.28: Chi-square test: Top management support and demographic variables

Note: Data drawn from section 2.6	Gender	Race	Age	Qualification	Section of employmen	Occupation	Number of completed
1. Top management always provides adequate support when a new system or programmers are introduced.	.971	.081	.108	.206	.522	.525	.875
2. Top management always consult affected staff for their input and opinion before they introduce the new system.	.713	.190	.017	.263	0.369	.894	.123
3. Top management always conducts proper skills audits to ascertain competency gap before they introduce the new system.	.527	.481	.478	.165	.372	.441	.762
*P-value < 0.05							

The p-value for demographic variables by top management support is more than 0.05. The respondents with different demographic information responded in all statements in a similar manner. That is, relationship is not significant between demographic variables and top management support. However, table 5.27 shows significant relationship between top management support and ABC adoption. Based on the above discussion, H2 is accepted: TVET colleges which have top management support are more likely to adopt ABC than those colleges which face lack of top management support.

5.5.3. ABC adoption and cost structure/ level of overheads: H3

This study adopts the position that cost structure/ level of overheads is a significant factor in the adoption of ABC systems. Therefore, this section tests the following alternative hypothesis and null hypothesis:

H3: TVET colleges, which have a greater percentage of total cost as overheads, are more likely to adopt ABC than colleges which have a smaller percentage of overhead costs.

H0: There is no relationship between cost structure/level of overhead costs and ABC adoption.

Table 5.29 shows that twelve (40%) respondents indicated that service overheads are approximately 17% of the TVET colleges' cost structure. Table 5.30 shows that direct labour is the highest cost element, direct material is the second highest element and the lowest cost element was service overheads. This may have negative impact of the adoption of the ABC system since these colleges are labour intensive.

Table 5.29: Service Overheads		
% of cost structure	Number	Percentage

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17.00	12	40%
18.50	4	13.3%
20.00	9	30.0%
25.00	1	3.3%
40.00	2	6.7%
44	1	3.3%
Total	**30**	**100%**
Note: Data drawn from section 1.7		

Table 5.30 shows that the cost structure of TVET colleges varies between colleges. Direct labour is the highest cost element, with a mean value of 57.93% and a median value of 63%. It also recorded the highest range at 40% (Max 70% -Min 30%). This finding indicates that colleges are labour intensive which could have a negative impact on ABC adoption.

Table 5.30: Cost structure of the TVET college			
Statistics	Direct material	Direct labour	Overheads
	%	%	%
Mean	21.83	57.93	20.57
Median	20.00	63.00	18.50
Std. Deviation	7.78	11.16	7.45
Range	35.00	40.00	34.00
Minimum	5.00	30.00	10.00
Maximum	40.00	70.00	44.00
Note: data drawn from section 1.7			

Direct material was the second highest cost element, with a mean value of 21.83% and a median value of 20%. It also recorded a range of 35% (Max 40 – Min 5%). The lowest cost element was Service overheads with mean value of 20.57% and a median value of 18.5%. It recorded a range of 34% (Max 44% -Min 10%).

The low variation in the cost structure, as evidenced by the very low range of the responses of each of three categories of cost, may be attributed to the same sector characteristics, and the degree of labour intensity.

Respondents were divided into three categories; those with low overheads (10% to 20%), medium overheads (20% to 40%) and high overheads (40% to 45%). These three categories were based on a division of range of the overheads (10% to 44%). Table 5.31 reports the results of a cross tabulation of these three categories of overheads with ABC adoption status.

Table 5.31: Overheads and Level of ABC adoption						
			Please indicate the approximate percentage of total costs accounted for each of the following			Total
			Low Overheads 10% -20%	Medium Overheads 20%-40%	High Overheads 40% -44%	
What is the current level of ABC adoption in your college?	Implemented in selected areas	Number	1	0	2	3
		%within how many courses	33.3%%	0.0%	66.7%	10.0%
		% of Total	3.3%	0.0%	6.7%	10.0%
	Currently under consideration	Number	8	0	0	8
		% within how many courses does your college offer	100%	0.0%	0.0%	26.7%
		%of Total	26.7%	0.0%	0.0%	26.7%
	Rejected ABC after assessment	Number	0	0	1	1
		%within How many courses do the college offered	0.0%	0.0%	100%	3.3%
		% of Total	0.0%	0.0%	3.3%	3.3%
	No consideration of ABC to date	Number	17	1	0	18
		%within how many courses do your college offered	94.4%	5.6%	0.0%	60.0%
		% of Total	56.7%	3.3%	0.0%	60.0%
	Total	Number	26	1	3	30
		%within how many courses do your college offered	100%	100%	100%	100%
		Total	**86.7%**	**3.3%**	**10.0%**	**100%**

In table 5.31, if there was no relationship between the level of ABC adoption and cost structure, "Low overheads", "Medium overheads" and "High overheads" would be expected to be represented in the same proportion, or to put that in a different way, if the number of low overheads, medium and high overheads was unrelated to the level of ABC adoption, the distribution of the cost structure within each group would be expected to be about the same. The cells "Low overheads and currently under consideration", "Low overheads and no consideration of ABC to date" are the two cells where the number of respondents were greater. Therefore, the distribution of cost structure within each group was not the same. This means that low level of overhead costs at these TVET colleges are the main reason for non-adoption of ABC. There is, therefore, a positive relationship between cost structure and ABC adoption.

5.5.3.1 Cost structure / level of overheads: H3

To determine whether the differences were significant, chi-square tests were conducted. The results are shown in table 5.32.

Table 5.32: Chi-square tests for cost structure (H3)			
Note: Data drawn from section 1.7	**Chi-Square**	**Df**	**Asymp.Sig**
1. Direct material	40.933	7	0.000*
2. Direct labour	52.600	6	0.000*
3. Service overheads	27.867	6	0.000*
*P-value < 0.05			

Since the p-values are less than 0.05 (the level of significance), imply that the distributions were not even. That is, the differences between agreement and disagreement were significant.

This means that from the sig. value (p-values) from table 5.32, respondents were in agreement about percentage of each cost element.

5.5.3.2 Demographic data and cost structure: H3

A chi-square test was performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and cost structure/level of overheads. The results are shown in table 5.33.

Table 5.33: Chi-square test for cost structure and demographic variables							
Note: Data drawn from section 1.7	**Gender**	**Race**	**Age**	**Qualification**	**Section of employment**	**Occupation**	**Number of completed years with college**
1. Direct material	.395	.104	.008*	.066	.034*	.101	0.000*
2. Direct labour	.100	.054	.046	.020*	.001*	.164	0.001*
3. Service overheads	.170	.118	.551	.035*	.002*	.604	0.000*
*P-value < 0.05							

The p-values for respondents 'experience', 'section in which respondents belong by cost structure', 'age by direct material', 'qualification by direct labour and service overheads' are less than 0.05 (level of significance). Table 5.29 also shows that respondents' scoring patterns were not the same (but the big score is on 17% of service overheads as the cost structure of

these TVET colleges). Table 5.30 shows 'service overheads' with a lowest mean value, median, range and std. deviation. This means that respondents tended to choose service overheads as the lowest cost structure in their TVET colleges. Based on this finding, there is relationship between cost structure /level of overheads and ABC adoption. There is a significant relationship between cost structure and ABC adoption. Therefore, the null hypothesis (i.e., there is no relationship between the cost structure/level of overhead costs and ABC adoption) is rejected and H3 is accepted: TVET colleges, which have a greater percentage of total costs as overheads, are more likely to adopt ABC than colleges which have a smaller percentage of overhead costs. This finding concur with the findings of O'Dea and Clark (1994) and Elagili (2015).

5.5.4 ABC adoption and product diversity: H4

This study adopts the position that product diversity is a significant factor in the adoption of ABC systems. This study tests the following alternative hypothesis and null hypothesis:

H4: TVET colleges, which have more production diversity, are more likely to adopt ABC than colleges which have less production diversity.

H0: There is no relationship between production diversity and ABC adoption.

To determine product diversity, respondents were asked to indicate the number of courses the college offers. The question provided for three levels of numbers (1-10, 11-30 and more than 30 courses). As shown in table 5.34, all levels of product diversity were represented in the responses. Twenty-two (73.3%) respondents indicated that their colleges offered 11- 30 courses and four (13.3%) respondents indicated that their colleges offered more than 30 courses. Four (13.3%) respondents indicated that their college offered 1-10 courses. This means that twenty-six (86.6%) respondents indicated that their colleges have eleven or more courses (i.e., they have high product diversity).

Table 5.34: Number of courses (Product diversity)		
Note: data drawn from section 1.2	**Number**	**Percentage**
1-10	4	13.3%
11-30	22	73.3%
More than 30 courses	4	13.3%
Total	**30**	**100**

Table 5.35 indicates that there is a correlation between product diversity and ABC adoption. Twenty-one (70%) respondents were in agreement with this statement.

Table 5.35: Product diversity				
Note: Data drawn from section 2.8	**Agree**	**Neutral**	**Disagree**	**Total**
1.The TVET colleges that offer different programmes or courses are likely to accept a new system	70% 21	23.3% 7	6.7% 2	100% 30
Scoring 1= Strongly Agree, Scoring 2= Agree, Scoring 3= Neutral, Scoring 4 =Disagree and Scoring 5 =Strongly disagree. The levels of disagreement (negative statements) were collapsed to show a single category of "Disagree". A similar procedure was followed for the level of agreement (positive statements). This is allowed due to the acceptable level of reliability.				

Table 5.36 shows a cross tabulation of the five levels of ABC adoption and three levels for the number of courses, as used in the questionnaire. The size of a TVET college is also measured by the number of courses offered by each TVET college. A small TVET college in this context is one with 1-10 courses, a medium-sized college is one with 11- 30 courses, and a large college is one with more than 30 courses. Table 5.36 shows that the proportional distribution of the different product diversity categories is very different across the five categories of ABC adoption status. As shown in table 5.20, no TVET college fully implemented ABC. Table 5.36 shows that colleges that offer 1-10 courses are those that implemented ABC in selected areas at around 50%, as opposed to around 0% for those colleges that offer 11-30 or more than 30 courses. Seventy-five percent (75%) of higher diversified TVET colleges have a higher non-consideration of ABC adoption as opposed to higher adoption. This finding indicates that there is no relationship between product diversity and size of organisation and ABC adoption. In table 5.36 the cells "Large college and currently under consideration", and "Large college and no consideration of ABC to date" are two cells where the number of observations are greater. This means that the relationship between size of college and level of ABC adoption is significant (as the distribution of size of college within each group are different).

Table 5.36: Product diversity and size category and level of ABC adoption						
			How many courses does your college offered?			
			Small college 1-10	Large college 11-30	Very large >30	Total
What is the current level of ABC adoption in your college?	Implemented in selected areas	Number	2	1	0	3
		%within how many courses	50.0%	4.5%	0.0%	10.0%
		% of Total	6.7%	3.3%	0.0%	10.0%
	Currently under consideration	Number	0	7	1	8
		%within how many courses does your college offer	0.0%	31.8%	25.0%	26.7%
		%of Total	0.0%	23.3%	3.3%	26.7%
	Rejected ABC after assessment	Number	0	1	0	1
		%within How many courses does the college offer	0.0%	4.5%	0.0%	3.3%
		% of Total	0.0%	3.3%	0.0%	3.3%
	No consideration of ABC to date	Number	2	13	3	18
		%within how many courses does your college offer	50.0%	59.1%	75.0%	60.0%
		% of Total	6.7%	43.3%	10.0%	60.0%
	Total	Number	4	22	4	30
		%within How many courses does your college offer	100%	100%	100	100%
		Total	**13.3%**	**73.3%**	**13.3%**	**100%**

5.5.4.1 Product diversity: H4

To determine whether the differences in responses were significant, chi-square tests were conducted. The results are shown in table 5.37.

Table 5.37: Chi-square tests for product diversity			
Note: Data drawn from section 1.2	**Chi-Square**	**Df**	**Asymp.Sig (P-value)**
1. How many courses does your college offer?	21.600	2	0.000*
*P-value < 0.05			

Since the p-value is less than 0.05 (the level of significance), it implies that the distributions were not even. The implied relevance to this study is that for the sig. value (p-value) from table 5.34, most finance staff members (22) indicated that their colleges offered 11-30 courses,

whereas 4 respondents indicated that their colleges offered more than 30 courses and 4 respondents indicated that their colleges offered 1-10 courses. Therefore, this question was answered in a dissimilar manner. It is also noted respondents who chose the 11-30 courses were more than those who chose 1-10, this finding indicates that these colleges are offered diversified programmes.

5.5.4.2 Demographic data and product diversity: H4

A chi-square test was performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and the product diversity. The results are shown in table 5.38.

Table 5.38: Chi-square test for product diversity (H4) and demographic variables							
Note: Data drawn from section 1.2	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years with
1.How many courses do your colleges offer?	.035*	.288	.276	.159	.221	.452	.443
*P-value < 0.05							

The p-values for 'gender' and 'statement on product diversity' are less than 0.05. The respondents from different genders view the statement in a dissimilar manner. That is, there is a significant relationship between 'gender' and the 'statement on product diversity'. Table 5.33 indicates that twenty-two (73.3%) respondents indicated that their colleges offered 11-30 courses.

5.5.4.3 Product diversity: H4

To determine whether the differences in responses were significant, chi-square tests were conducted. The results are shown in table 5.39.

Table 5.39: Chi-square test for product diversity			
Note: Data drawn from section 2.8	Chi-Square	Df	Asymp.Sig (P-value0
1. The TVET colleges that offer different programmes are likely to accept the new system	34.000	4	0.000
*P-value < 0.05			

Since the p-value is less than 0.05 (the level of significance), it implies that the distributions were not even.

The relevance to this study implied from the sig. value (p-value) from table 5.39, is that respondents were in agreement with this statement. This finding indicates that there is relationship between product diversity and ABC adoption.

5.5.4.4 Demographic and product diversity: H4

A chi-square test was performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and the product diversity. The results are shown in table 5.40.

Table 5.40: Chi-square test for product diversity (H4) and demographic variables							
Note: Data drawn from section 2.8	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years
1.The TVET colleges that offer different programmes are likely to accept the new system	.296	.508	.290	.105	.988	.647	.414
*P-value < 0.05							

In table 5.40, the p-values for demographic variables by product diversity are more than 0.05. This indicates that there is no statistically significant relationship between product diversity and ABC adoption. The null hypothesis (i.e., there is no relationship between product diversity and ABC adoption) is accepted and H4 (TVET colleges which have more product diversity are more likely to adopt ABC than colleges which have less production diversity is rejected, i.e., there is no relationship between product diversity and ABC adoption. However, based on tables 5.35, 5.36, 5.37 and 5.38, the null hypothesis (i.e., there is no relationship between production diversity and ABC adoption) is rejected, and H4 is accepted: TVET colleges which have more production diversity are more likely to adopt ABC than those colleges which have less production diversity.

This study is, therefore, unable to conclusively accept or reject H4.

5.5.5 ABC adoption and resistance to change: H5

This section discusses the following alternative hypothesis and null hypothesis:

H5: TVET colleges, which have employees who are open to change and innovative systems, are more likely to adopt ABC than those colleges with employees who are resistant to changes and innovative systems.

H0: There is no relationship between resistance to change and ABC adoption.

Respondents were asked to indicate the level of their agreement or disagreement with the ten statements in table 5.41.

Table 5.41: Resistance to change				
Note: Data drawn from section 2.5	**Agree**	**Neutral**	**Disagree**	**Total**
1. I am open to new system which reduces errors.	90%	6.7%	3.3%	100%
	27	2	1	30
2. I accept a system which leads to better adherence to policies and procedures.	90%	3.3%	6.7	100%
	27	1	2	30
3. I am open to new system if it allocates costs, and is more efficient than the old way of doing things.	83.3%	16.7%	0%	100%
	25	5	0	30
4. I am open to the new system if adequate training is received.	80%	6.7%	13.3%	100%
	24	2	4	30
5. Often, I feel uncomfortable even about change that may potentially improve my life.	10.3%	27.6%	62.1%	100%
	3	8	18	29
6. When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me.	3.4%	20.7%	75.9%	100%
	1	6	22	29
7. I sometimes find myself avoiding changes that I know will be good for me.	0%	10.3%	89.7%	100%
	0	3	26	29
8. Once I've come to a conclusion, I'm not likely to change my mind.	6.9%	24.1%	68.9%	100%
	2	7	20	29
9. I like to do the same old things rather try new and different ones.	3.4%	13.8%	82.8%	100%
	1	4	24	29
10. If I were to be informed that there's going to be significant change regarding the way things are done at work, I would probably feel stressed.	6.9%	24.1%	68.9%	100%
	2	7	20	29
Scoring 1=strongly agree, scoring 2= Agree, scoring 3= Neutral, scoring 4= Disagree and scoring 5= strongly disagree				
Levels of disagreements (negative statement) were collapsed to show a single category of "Disagree". A similar procedure was followed for the level of agreements (positive statements). This is allowed due to the acceptable level of reliability.				

Twenty-seven (90%) respondents indicated that they were open to a new system which reduces errors, whereas two (6.7%) respondents were neutral in their response and one (3.3%) respondent disagreed. This finding indicates that finance staff members at these TVET colleges were not resistant to change.

When questioned if they can accept a new system which leads to better adherence to policies and procedures, twenty-seven (90%) respondents were in agreement with this statement, whereas one (3.3%) respondents was neutral and two (6.7%) disagreed. Therefore, respondents were open to change.

When questioned if they are open to a new system if it allocates costs more efficiently than the old way of doing things, twenty-five (83.3%) respondents were in agreement, whereas five

(16.7%) respondents were neutral. Thus, most finance staff members were not resistant to change.

When questioned if they are open to a new system if adequate training is received, twenty-four (80%) respondents were in agreement with this statement, whereas two (6.7%) respondents were neutral and four (13.3%) respondents disagreed. Most respondents indicated that, as long as training is provided, they were open to change.

When the respondents were asked if they feel uncomfortable about change that may improve their lives, eighteen (62.1%) respondents were in disagreement with this statement, whereas eight (27.6%) respondents were neutral and three (10.34%) respondents agreed. This finding indicates that most respondents were not resistant to change.

When questioned about their levels of agreement with statement number six (resisting being pressured to change), twenty-two (75.9%) respondents were in disagreement with this statement, whereas six (20.7%) respondents were neutral and one (3.4%) respondent was in agreement.

When questioned if they can avoid changes that will be good for them (statement number seven), twenty-six (89.7%) respondents were in disagreement with this statement, whereas three (10.3%) respondents were neutral.

When questioned if they can change their mind once they have come to a conclusion, twenty (68.9%) respondents were not in agreement with this statement, whereas seven (24.4%) respondents were neutral and two (6.9%) respondents agreed.

When questioned if they like to do same old things rather than try new and different ones, twenty-four (82.8%) respondents were not agreement with this statement, whereas four (13.3%) respondents were in neutral and one (3.4%) respondent was in agreement.

The final statement in this section questioned if they feel stressed if the way of doing things has changed. Twenty (68.9%) respondents were not in agreement with this statement, whereas seven (24.1%) respondents were neutral and two (6.9%) respondents were in agreement.

The overall results of these questions indicate that the respondents in six public TVET colleges in KZN did not resist any new changes and they were very open to new systems.

5.5.5.1 Resistance to a new system: H5

To determine whether the differences were significant, chi-square tests were conducted. The results are shown in table 5.42.

Table 5.42: Chi-square tests for internal resistance to a new system (ABC)			
Statements	Chi-Square	Df	Asymp.Sig
1. I am open to the new system which reduces errors.	19.867	3	0.000*
2. I accept a system which leads to better adherence of policies and procedures.	20.933	3	0.000*
3. I am open to the new system if it allocates costs, and is more efficient than the old way of doing things.	5.000	2	0.082
4. I am open to the new system if adequate training is received.	20.000	4	0.000*
5. Often, I feel uncomfortable even about change that may potentially improve my life.	5.897	3	0.117
6. When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me.	19.414	3	0.000*
7. I sometimes find myself avoiding changes that I know will be good for me.	10.207	2	0.006*
8. Once I've come to a conclusion, I'm not likely to change my mind.	22.897	4	0.000*
9. I like to do the same old things rather than try new and different ones.	17.483	3	0.001*
10. If were to be informed that there's going to be a significant change regarding the way things are done at work, I would probably feel stressed.	17.379	4	0.002*
*P-value < 0.05			

Eight of the ten p-values in table 5.42 tested less than 0.05, but two statements showed skewed patterns. In some instances, these were positive (higher levels of agreement) and in other cases they were negative (higher levels of disagreement) with regards to the chi-square test for internal resistance to a new system (ABC).

There is a significant relationship between the statements that scored less than 0.05. This implies that respondents are not resistant to change and they are open to new systems (refer to table 5.41).

5.5.5.2 Demographic data and resistance to change: H5

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and resistance to a new system. The results are shown in table 5.43.

Table 5.43: Chi-square tests for resistance to change and demographic variables							
Note: Data drawn from section 2.5	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years with college
1. I am open to the new system which reduces errors.	.025*	.936	.789	.659	.436	.145	.495
2. I accept a system which leads to better adherence to policies and procedures.	.414	.681	.747	.432	.724	.513	.908
3. I am open to the new system if it allocates costs, and is more efficient than the old way of doing things.	.712	.060	.231	.334	.236	.191	.217
4. I am open to the new system if adequate training is received.	.140	.638	.472	.818	.001*	.004*	.057
5. Often, I feel uncomfortable even about change that may potentially improve my life.	.010*	.250	.043*	.554	.391	.572	.405
6. When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me.	.601	.495	.582	.263	.568	.387	.393
7. I sometimes find myself avoiding changes that I know will be good for me.	.281	.061	.222	.506	.372	.328	.579
8. Once I've come to a conclusion, I'm not likely to change my mind.	.518	.513	.683	.429	.002*	.562	.369
9. I like to do the same old things rather than try new and different ones.	.698	.206	.197	.708	.776	.614	.381
10. If were to be informed that there's going to be a significant change regarding the way things are done at work, I would probably feel stressed.	.022*	.352	.838	.835	.829	.493	.569
*P-value < 0.05							

The p-values for 'gender', 'age', 'section of employment' and 'occupation by resistance to change' are less than 0.05. The respondents' different demographic data view these statements in a dissimilar manner. That is, there is a significant relationship between respondents' 'gender', 'age', 'section of employment', 'occupation' and 'resistance to change'.

Therefore, there is a significant relationship between resistance to change and ABC adoption. The null hypothesis is rejected and H5 is accepted: TVE colleges, which have employees who

are open to changes and innovative systems are more likely to adopt ABC than those colleges with employees who are resistant to changes and innovative systems.

5.5.6 ABC adoption and internal champion and innovation: H6

This study adopts the position that internal champion and innovation is a significant factor in the adoption of ABC systems. This study tests this alternative hypothesis and null hypothesis:

H6: TVET colleges, which have high internal champion support and innovation, are more likely to adopt ABC than those colleges which have less internal champion support and innovation.

H0: There is no relationship between internal champion support and innovation and ABC adoption.

The questionnaire probed critical factors in ABC implementation. The first statement in this section asked whether the respondents would encourage and support the implementation of a new system intended to improve efficiency.

Table 5.44 indicates that twenty-nine (96.7%) respondents were in agreement with this statement, whereas one (3.3%) respondent was neutral.

This indicates that finance staff members in these TVET colleges are pro-innovative and they have a willingness to accept and adopt innovations such as ABC system. The existence of such pro-innovation staff inside an organisation is significant since it would help in educating senior management and users about ABC.

Table 5.44: Internal champion and innovation				
Note: Data drawn from section 2.6	**Agree**	**Neutral**	**Disagree**	**Total**
1. If there is a new system intended to improve efficiency I will encourage and support its implementation	96.7% 29	3.3% 1	0.0% 0	100% 30
Scoring 1=strongly agree, scoring 2= Agree, scoring 3= Neutral, scoring 4= Disagree and scoring 5= strongly disagree. The levels of disagreements (negative statement) were collapsed to show a single category of "Disagree". A similar procedure was followed for the level of agreements (positive statements). This is allowed due to the acceptable level of reliability.				

5.5.6.1 Internal champion and innovation: H6

To determine whether the differences were significant, chi-square tests were conducted. The results are shown in table 5.45.

Table 5.45: Chi-square Test: Internal champion and innovation			
Note: Data drawn from section 2.6	**Chi-Square**	**Df**	**Asymp.Sig (P-value)**

If there is a new system intended to improve efficiency I will encourage and support its implementation	14.600	2	0.001*
*P-value < 0.05			

Since the p-value is less than 0.05 (the level of significance), it implies that the distributions were not even. That is, the differences between agreement and disagreement were significant.

This implies that there is a statistically significant relationship between internal champion and innovation and ABC adoption.

5.5.6.2 Demographic data and internal champion and innovation: H6

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and internal champion and innovation. The results are shown below in table 5.46

Table 5.46: Chi-square test for internal champion and innovation and demographic variables							
Note: Data drawn from section 2.6	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years with college
1. If there is a new system intended to improve efficiency I will encourage and support its implementation	.085	.622	.227	.059	.000*	.567	.000*
*P-value < 0.05							

The p-value for section of employment and experience and internal champion and innovation is 0.000. The respondents from different finance sections and with different experience view this statement in a dissimilar manner. That is, there is a significant relationship between the section in which respondents belong and internal champion and innovation. In other words, there is a significant relationship between the respondents' demographic variables and internal innovation. The null hypothesis is rejected.

Therefore, H6 is accepted as there is a significant relationship between the respondents' demographic variables and internal champion and innovation (i.e., TVET colleges which have high internal champion and innovation are more likely to adopt ABC than those colleges which have less internal champion support and innovation).

5.5.7 ABC adoption and internal resources' availability: H7

This study adopts the position that internal resources' availability is a significant factor in the adoption of ABC systems. This study tests the following alternative hypothesis and null hypothesis:

H7: TVET colleges, which have adequate resources, are more likely to adopt ABC.

H0: There is no relationship between internal resources' availability and ABC adoption.

Respondents were asked, in section 2 of the questionnaire, to indicate their level of knowledge relating to ABC. These results are shown in table 5.47. Twelve (40%) respondents indicated that they have no knowledge of ABC, followed by eleven (36.7%) respondents who have general knowledge of ABC, while six (20%) respondents claimed that they have an extensive knowledge of ABC and one (3.3%) respondent claimed that he/she has expert knowledge of ABC. This finding indicates that eighteen (60%) respondents have some knowledge of ABC, but, surprisingly, their colleges are still using traditional costing systems and no TVET colleges have adopted ABC. This means that there is no relationship between ABC knowledge (internal resources' availability) and ABC adoption.

Table 5.47: Knowledge of ABC system			
Note: Data from section 2.1	Number	Percentage	Rank
No knowledge	12	40	1
General knowledge	11	36.7	2
Extensive knowledge	6	20	3
Expert knowledge	1	3.3	4

Respondents were also asked, in section 2, to indicate where they first learnt of ABC. The purpose of this question was to ascertain if the respondents are familiar with ABC. This question was asked as the knowledge of ABC is very important in the implementation of ABC. Table 5.48 shows that thirteen (72.2%) respondents learnt of ABC at a university level, three (16.7%) respondents learnt ABC on their own and two (11.1%) respondents learnt ABC at in-house training.

Table 5.48: Knowledge of ABC system			
Note: Data drawn from section 2.1	**Number**	**Percentage**	**Rank**
University	13	72.2%	1
In-house training	2	11.1%	2

| On your own | | 3 | 16.7 | 3 |

Table 5.48 indicates that there is no relationship between the internal resources availability and ABC adoption, since thirteen (72.2%) respondents learnt ABC at university, but their colleges are not ABC users. This means there is no relationship between education and being innovative.

Table 5.48 shows that most respondents have ABC knowledge, but their colleges are not ABC users. Therefore, there is no relationship between ABC knowledge (internal resources' availability) and ABC adoption.

Table 5.49: Knowledge of ABC (internal resources' availability) * Level of ABC adoption						
			Please indicate how familiar you are with ABC			
			No knowledge	Knowledge	Expert knowledge	Total
What is the current level of ABC adoption in your college?	Implemented in selected areas	Number	0	3	0	3
		%within S2.1	0.0%	100%	0.0%	10.0%
		% of Total	0.0%	10.0%	0.0%	10.0%
	Currently under consideration	Number	1	7	0	8
		%within S2.1	12.5%	87.5%	0.0%	26.7%
		%of Total	3.3%	23.3%	0.0%	26.7%
	Rejected ABC after assessment	Number	0	1	0	1
		%within S2.1	0.0%	100%	0.0%	3.3%
		% of Total	0.0%	3.3%	0.0%	3.3%
	No consideration of ABC to date	Number	11	6	1	18
		%within S2.1	61.1%	33.3%	5.6%	60.0%
		% of Total	36.7	20.0%	3.3%	60.0%
	Total	Count	12	17	1	30
		%within S2.1	100%	100%	100%	100%
		Total	**40.0%**	**56.7%**	**3.3%**	**100%**

In table 5.49,in three   all cells, i.e., "No knowledge and full implementation of ABC", "Knowledge and Full implementation of ABC" and "Expert knowledge and full implementation of ABC", the number of observed respondents was equal to zero (excluded in the table since they are zero). This means that ABC adoption and ABC knowledge are independent. Although it is observed that the cell "no knowledge of ABC and no consideration of ABC" had a greater number of observed respondents, the difference was not so strong. Therefore, ABC adoption and ABC knowledge are independent.

In their responses to statement one shown in table 5.50, sixteen (53.3%) respondents reported that their finance department was adequately staffed and retain trained and experienced staff members. Six (20%) respondents were neutral with this statement one and eight (26.7%) respondents were not in agreement with this statement. This finding indicates that there is no relationship between experienced staff (internal resources availability) and ABC adoption.

Twenty (66.7%) respondents were in agreement with statement two as shown in table 5.50. This finding indicates that respondents felt that competent staff members are overloaded in their colleges. This also indicates that these TVET colleges have competent staff members, but these colleges are not ABC users, confirming that there is no relationship between internal resources' availability and ABC adoption.

Table 5.50: Availability of competent staff				
Note: Data from section 2.8	**Agree**	**Neutral**	**Disagree**	**Total**
1.The finance department is adequately staffed, often due to its ability to attract and retain sufficiently trained and experienced staff	53.3% 16	20% 6	26.7% 8	100% 30
2. The competent staff are overloaded and in demand in our college	66.7% 20	26.7% 8	6.7% 2	100% 30
Scoring 1=strongly agree, scoring 2= Agree, scoring 3= Neutral, scoring 4= Disagree and scoring 5= strongly disagree. The levels of disagreements (negative statement) were collapsed to show a single category of "Disagree". A similar procedure was followed for the level of agreements (positive statements). This is allowed due to the acceptable level of reliability.				

5.5.7.1 ABC knowledge (internal resources' availability): H7

To determine whether the differences were significant, chi-square tests were conducted. The results are shown in table 5.51.

Table 5.51: Chi-square tests for ABC knowledge			
Note: Data drawn from section 2.1	**Chi-Square**	**Df**	**Asymp.Sig (P-value)**
1. Please indicate how familiar you are with ABC.	10.267	3	0.016*
P-value < 0.05			

Since the p-value is less than 0.05 (the level of significance), it implies that the distributions were not even. That is, the differences between agreements and disagreements were significant.

The relevance to this study is that, for the sig. value (p-values) from table 5.51, most respondents indicated that they are familiar with the ABC system (refer to table 5.47).

5.5.7.2 Demographic data and ABC knowledge (internal resources' availability): H7

A chi-square test was performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and the ABC knowledge. These results are shown in table 5.52.

Table 5.52: Chi-square test for ABC knowledge and demographic variables							
Note: Data drawn from section 2.1	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years with college
Please indicate how familiar you are with ABC	.588	.287	.860	.254	.598	.181	0.854
*P-value < 0.05							

All the p-values are more than 0.05 (levels of significance), which imply that the distributions were even. Therefore, the statistical relationship between demographic variables and ABC knowledge (internal resources' availability) is not significant (i.e., there is no relationship between internal resources' availability and adoption of ABC).

5.5.7.3 Source of ABC knowledge (internal resources' availability): H7

To determine whether the differences were significant, chi-square tests were conducted. The results are shown in table 5.53.

Table 5.53: Chi-square tests for source of ABC knowledge			
Note: Data drawn from section 2.2	**Chi-Square**	**Df**	**Asymp.Sig (P-value)**
1.Where did you first learn of ABC ?	12.333	2	0.002*
*P-value < 0.05			

Since the p-value is less than 0.05 (the level of significance), it implies that the distributions were not even. Most of the respondents learnt ABC in university, a second group of respondents learnt ABC at professional training and the last group learnt ABC at in-house training. Therefore, most of the respondents have ABC knowledge.

5.5.7.4 Demographic data and source of knowledge (internal resources' availability): H7

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and the source of ABC knowledge. These results are shown in table 5.54.

The alternative hypothesis tested the claim that there were differences in the scoring options per statement and it also means that there is association between the demographic data and the source of ABC knowledge (internal resources' availability). The results are shown in table 5.54.

Table 5.54: Chi-square test for sources of ABC knowledge and demographic variables							
Note: Data drawn from section 2.2	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years with college
1.Where did you first learn of ABC?	.815	.636	.800	.016*	.019*	.522	.028*
*P-value <0.05							

The p-values for 'gender', 'race' 'age' and 'occupation' by 'source of knowledge' are more than 0.05. This indicates that there is no relationship between internal resources' availability and ABC adoption (null hypothesis is accepted). The p-values for 'qualification', 'section of employment' and 'experience' by 'source of knowledge' are less than 0.05. This indicates that there is a relationship between internal resources availability and ABC adoption (null hypothesis is rejected). However, table 5.52 shows no relationship between internal resources availability and ABC adoption.

5.5.7.5 Human resources' availability: H7

To determine whether the difference were significant, chi-square tests were conducted. The results are shown in table 5.55.

Table 5.55: Chi-square test for human resource availability			
Note: Data drawn from section 2.8	**Chi-Square**	**Df**	**Asymp.Sig (P-value)**
1.The finance department is adequately staffed, often due to its ability to attract and retain sufficiently trained and experienced staff.	9.333	4	0.053
The competent staff are overloaded and in demand in our college.	15.667	4	0.004*
*P-value < 0.05			

One of the two p-values in table 5.55 tested less than 0.05 (level of significance). There is a significant relationship between the statements that scored less than 0.05, implying that human resources' availability plays a significant role in the adoption of ABC. There is also a significant relationship between resource availability and ABC adoption.

5.5.7.6 Demographic data and human resources' availability: H7

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and human resources' availability (internal resources' availability). The results are shown in table 5.56.

Table 5.56: Chi-square test for internal resources ' availability and demographic variables							
Note: Data drawn from section 2.8	**Gender**	**Race**	**Age**	**Qualification**	**Section of employment**	**Occupation**	**Number of completed years with college**
1. The finance department is adequately staffed, often due to its ability to attract and retain sufficiently trained and experienced staff.	.182	.272	.146	.134	.796	.435	.409
2. The competent staff are overloaded and in demand in our college.	.115	.833	.812	.853	.003*	.554	.630
*P-value < 0.05							

Since all p-values in table 5.56 tested more than 0.05 (above level of significance), except the p-value for the 'section' in which the respondent belongs by human resources' availability, all other these statements showed skewed patterns. In some instances these are positive (higher levels of agreement) and, in other cases, they are negative (higher levels of disagreement)

with the chi-square test for human resources' availability (internal resources availability) in ABC adoption. There is no significant relationship between the statements that scored more than 0.05 (this corresponds with the findings in table 5.52).

Accordingly, the null hypothesis is accepted and H7 is rejected (there is no relationship between internal resources' availability and ABC adoption).

5.5.8 ABC adoption and training: H8

This study adopts the position that internal resources availability is a significant factor in the adoption of ABC systems. This study tests the following alternative hypothesis and null hypothesis:

H8: There is a positive relationship between ABC adoption and training.

H0: There is no relationship between training and ABC adoption.

Respondents were asked to indicate their level of agreement with a statement on training, as shown in table 5.57. Thirteen (43.3%) respondents were not in agreement with this statement, six (20%) respondents were neutral and eleven (36.7%) respondents were in agreement. This finding indicates that top management does not always support employees with training when a new system is introduced and training is one of the significant factors associated with successful ABC implementation (Aldukhil 2012). This could be a reason for ABC non-adoption within these TVET colleges. Therefore, there is significant relationship between training and ABC adoption.

Table 5.57: Training				
Note: Data drawn from section 2.6	**Agree**	**Neutral**	**Disagree**	**Total**
1: Adequate training is always provided when a new system or programmers are implemented	36.7%	20.0%	43.3%	100%
	11	6	13	30
Scoring 1=strongly agree, scoring 2= Agree, scoring 3= Neutral, scoring 4= Disagree and scoring 5= strongly disagree. The levels of disagreements (negative statement) were collapsed to show a single category of "Disagree". A similar procedure was followed for the level of agreements (positive statements). This is allowed due to the acceptable level of reliability.				

5.5.8.1 Training: H8

To determine whether the differences were significant, chi-square tests were conducted. The results are shown in table 5.58.

Table 5 .58: Chi-square Test: Training			
Note: Data drawn from section 2.6	**Chi-Square**	**Df**	**Asymp.Sig** **(P-value)**
1. Adequate training is always provided when a new system or programmers are implemented	11.000	4	0.027*
*P-value < 0.05			

Since the p-value is less than 0.05 (the level of significance), it implies that the distribution was not even. That is, the differences between agreement and disagreement were significant. This implies that there is statistically significant relationship between training and ABC adoption.

5.5.8.2 Demographic data and training: H8

Chi-square tests were performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and training. The results are shown in table 5.59.

Table 5.59: Chi-square test: Training and demographic variables							
Note: Data drawn from section 2.6	**Gender**	**Race**	**Age**	**Qualification**	**Section of employment**	**Occupation**	**Number of completed**
1.Adequate training is always provided when a new system or programmers are implemented	.361	.167	.103	.000*	.314	.573	0.284
*P-value < 0.05							

The p-value for respondents' qualifications and training is 0.000. This finding indicates that respondents with different qualifications view this statement in a dissimilar manner. That is, there is a significant relationship between respondents' demographic variable (qualification) and training. Table 5.57 also indicates that the level of disagreements was higher than level of agreements, indicating that training is a barrier to ABC adoption. Therefore, the null hypothesis (there is no relationship between training and ABC adoption) is rejected and H8 is accepted: There is a positive relationship between ABC adoption and training.

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5.5.9 Technical variables that constitute barriers to ABC adoption: H9

This study adopts the position that technical variables are significant factors in the adoption of the ABC system. This study will test the following alternative hypothesis and null hypothesis:

H9: Technical issues are the most common cause for rejecting ABC at TVET colleges.

H0: Technical issues are not the most common cause for rejecting ABC at TVET colleges.

In order to determine respondents' opinions on the technical variables that constitute barriers to ABC adoption, respondents were asked to indicate the level of their agreement with five statements shown in table 5.60.

Table 5.60 indicates that thirteen (43.3%) respondents were not in agreement with statement one (I can rank all the tasks of the college according to the college's divisions), whereas ten (33.3%) respondents were in agreement and seven (23.3%) respondents were neutral.

This finding indicates that finance staff members only know the tasks which are performed in their division (finance department) and they do not understand the tasks in other divisions. This finding is supported by the answers given in statement two in table 5.60.

When the respondents were asked to indicate their level of agreement with statement two (Given the opportunity I can enumerate all tasks and duties I performed in my job), twenty-two (73.3%) respondents were in agreement with this statement, whereas four (13.3%) respondents were neutral and four (13.3%) respondents disagreed. This findings indicates that finance staff members can enumerate all tasks they perform in their division (finance department).

When the respondents were asked to indicate their levels of agreement with statement three (The college identifies and analyses various activities involved with providing services or teaching students), thirteen (43.3%) respondents were not in agreement with this statement, whereas nine (30%) respondents were in agreement and eight (26.67%) respondents were neutral. This finding indicates that employees cannot categorize tasks as per division, their colleges do not identify and analyse various activities involved with providing services or teaching students and they cannot break down time spent on major activities performed at campus level. From this statement, it is clear that these colleges could have a problem in implementing ABC since respondents cannot categorise activities as per college division. This means that there is a relationship between the technical variables and ABC adoption.

The respondents were asked to indicate their level of agreement with statement number four (I can break down time spent on major activities at a campus level). Table 5.60 shows that

twelve (40%) respondents were neutral with this statement, eleven (36.7%) respondents were not in agreement and seven (23.3%) were in agreement. These results indicate that the technical variables are barriers to ABC adoption at these TVET colleges. Therefore, there is positive relationship between technical variables and ABC adoption.

Table 5.60: Technical variables that constitute barriers to ABC adoption				
Note: Data drawn from section 2.7	**Agree**	**Neutral**	**Disagree**	**Total**
1. I can rank all the tasks of the college according to the college's divisions	33.3% 10	23.3% 7	43.3% 13	100% 30
2. Given an opportunity I can enumerates all tasks and duties that I perform in my job (e.g. processing invoice, issuing invoice and balancing books)	73.3% 22	13.3% 4	13.3% 4	100% 30
3. The college identifies and analyses various activities involved with providing services or teaching students	30.0% 9	26.7% 8	43.3% 13	100% 30
4. I can break down time spent on major activities performed at the campus level	23.3% 7	40.0% 12	36.7% 11	100% 30
Scoring 1=strongly agree, scoring 2= Agree, scoring 3= Neutral, scoring 4= Disagree and scoring 5= strongly disagree. The levels of disagreements (negative statement) were collapsed to show a single category of "Disagree". A similar procedure was followed for the level of agreements (positive statements). This is allowed due to the acceptable level of reliability.				

Respondents were also asked to identify the divisions of their TVET colleges, This was to ascertain if the respondents were in a position to identify all the divisions of their TVET colleges, as this is a fundamental step of the ABC system. These results are shown in table 5.61. Table 5.61 shows that nineteen (63.3%) respondents reported the examination and curriculum divisions as most common and the housing division and 'other' as least common divisions in the TVET colleges. This finding indicates that, under the current costing system, colleges have difficulties in identifying divisions as the first step in identifying activities/tasks that are performed at the college. This finding also indicates that technical variables (identifying major activities) should be addressed for successful adoption of ABC in these colleges. From these results, it is clear that there is relationship between technical variables and ABC adoption.

Table 5.61: The divisions of TVET colleges		
Note: Data drawn from section 1.10	**Number**	**Percentage**
Housing Division	7	23.3
Administration and enrolment	16	53.3
Exanimation	19	63.3
Curriculum division	19	63.3
Other	5	16.7

Respondents were then asked to indicate the tasks of their TVET colleges. This question provided a list of tasks/activities that might be applicable to the TVET colleges. Respondents could choose more than one task. The purpose of this question was to ascertain if respondents could list all tasks/activities of their TVET colleges as the fundamental step of ABC implementation. These results are shown in table 5.62.

The setting up of an IT system was identified as the most common task of the TVET colleges by fifteen (50%) respondents. Issuing academic results and invigilating students were identified as the second most common activities of TVET colleges and career placement was identified as the least common task at TVET Colleges. Since identification of the major activity is not even, this finding indicates that respondents have difficulties in identifying the major activities of their colleges. This is one of the reasons for ABC non-adoption within these TVET colleges. Technical variables were the mainly reason for non-adoption of ABC system in these colleges.

Table 5.62: Tasks/activities of TVET colleges		
Note: Data drawn from section 2.8	**Number**	**Percentage**
Students personal counseling	11	36.7
Orientating students	7	23.3
Career placement	6	20
Allocating students to on campus residences/ off campus residences	9	30
Enrolling students	10	33.3
Issuing academic results	12	40
Updating students' academic records	11	36.7
Invigilating students	12	40
Setting up all IT systems	15	50
Curriculum design and development	10	33.3

5.5.9.1 Technical variables in ABC adoption: H9

To determine whether the differences were significant, chi-square tests conducted. The null hypothesis tested the claim that there were no differences in the scoring option per statement. The results are shown in table 5.63.

Table 5.63: Chi-square for technical variables in ABC adoption			
Note: Data drawn from section 2.7	Chi-Square	Df	Asymp.Sig (P-value)
1. I can rank all the tasks of the college according to the college's divisions.	10.000	4	0.040*
2. Given an opportunity I can enumerate all tasks and duties that I performed in my job (e.g. processing invoice, issuing invoice and balancing books).	17.667	4	0.001*
3. The college identifies and analyses various activities involved with providing services or teaching.	4.333	4	0.363
4: I can break down time spent on major activities performed at a campus.	10.333	4	0.035*
*P-value < 0.05			

Since all the p-values, except the third, are less than 0.05 (the level of significance), they imply that the distributions were not even. That is, the differences between agreement and disagreement were significant.

The implied relevance to this study, is that, except for the third p-value from table 5.62, finance staff members at six public TVET colleges in KZN felt that technical variables were the greatest hindrance in ABC adoption, as the respondents were not in a position to rank all major activities performed at their colleges as per each division of the college. These colleges were not analysing their activities involved in providing services or teaching students and respondents were not in a position to break down the time spent on major **activities performed at a campus level.**

5.5.9.2 Demographic data and technical variables

A chi-square test was performed to determine whether there was a statistically significant difference between the demographic data variables (gender, race group, age group, highest qualification, section of employment, occupation and number of completed years with the college) and technical variables in ABC adoption. The results are shown in table 5.64.

Table 5.64: Chi-square for technical variables and demographic variables							
Note: Data drawn from section 2.7	Gender	Race	Age	Qualification	Section of employment	Occupation	Number of completed years
1. I can rank all the tasks of the college according to the college's divisions	.665	.078	.688	.323	.482	.187	.159
2. Given an opportunity I can enumerate all tasks and duties that I performed in my job (e.g. processing invoice, issuing invoice and balancing books)	.558	.413	.146	.757	.972	.424	.304
3.The college identifies and analyses various activities involved with providing services or teaching	.830	.172	.832	.264	.063	.476	.186
4. I can break down time spent on major activities performed at a campus	.443	.453	.932	.385	.232	.573	.564
*P-value < 0.05							

Since all p-values in table 5.63 tested more than 0.05 (above level of significance), all of these statements showed skewed patterns. In some instance these are positive (higher levels of agreement) and in other cases, they are negative (higher levels of disagreement) for the chi-square test for technical variables in ABC adoption. There is no significant relationship between the statements that scored more than 0.05. However, table 5.59 indicates that over all levels of disagreement were much higher than levels of agreement. This finding shows a significant relationship between technical variables and ABC adoption. Based on this finding, the null hypothesis (i.e., technical issues are not most common cause for rejecting ABC) is rejected and H9 is accepted: Technical issues are the most common cause for rejecting of ABC in TVET colleges.

5.6 Summary for objective 2

This section presents and discusses the results of the questions related to factors that constituted barriers in adoption of ABC (both behavioural and organisational and technical variables) in the following sections of the questionnaire: S1.2, S1.7, S1.10, S1.11, S2.1, S2.2, S2.4, S2.5, S2.6, S2.7 and S2.8. In addition, the hypotheses, which were developed in the literature review, are also tested. The results indicate that all alternative hypotheses, except H4 and H7 were accepted (there is relationship between contingent factors and ABC adoption).

5.7 Possible reasons for rejecting ABC system at TVET colleges

To determine the reasons for rejecting ABC at their TVET colleges, respondents were given a list of options. The purpose was to ascertain the factors that are likely to influence the adoption of ABC. As shown in figure 5.1, the higher cost of implementing ABC was reported as the most common reason for the rejection of the ABC system, as this option was chosen by twenty (66.7%) respondents. In addition, the lack of an individual with knowledge (internal human resources) to design and implement ABC (eighteen respondents or 60%) and difficulty in identifying activities (technical variables) (seventeen respondents or 56.7%) were identified as the second and third most common reasons respectively, for the rejection of the ABC system at their TVET colleges.

A higher priority of other changes or projects (46.7%) and lack of commitment and cooperation among finance staff members (internal champion) (43.3%) were both chosen as reasons by respondents for the rejection of ABC at their TVET colleges. Another reason for its rejection by eleven (36,7%) respondents was that the new system involves a great deal of work (internal human resource). Ten (33.3%) respondents selected that the system takes up a lot of managers' time (internal human resources) and difficulty in defining cost drivers (technical variable) as reasons for rejection of ABC system. Lastly, nine (30%) respondents selected difficulty in designing ABC (technical variable) as the reason for the rejection of ABC and eight (26.7%) respondents selected difficulty in gathering data on cost drivers (technical variable) as a reason for rejection of ABC.

Figure 5.1: Possible reasons for rejecting ABC

Percent

Reason	Percent
Other	36,7
The difficulty in gathering data on cost drivers	26,7
Difficulty in designing the system	30,0
The difficulty in defining cost drivers	33,3
If the system takes up a lot of managers' time	33,3
If a new system involves a great deal of work	36,7
Lack of commitment and cooperation among finance staff members	43,3
A higher priority of other changes or projects	46,7
Difficulty in identifying activities	56,7
If the college does not have access to individual with knowledge to design and…	60,0
Higher cost of implementing a new system	66,7

Note: data drawn section 2.4

Despite the broad publicity for ABC systems over the world, the low adoption of ABC was why the study chose to investigate the reasons for rejecting ABC. This investigation has been done by comparing six KZN TVET colleges' characteristics as non-ABC adopters as suggested by Aldukhi (2012). Prior studies (Hieu 1996; Aldukhil 2012) also investigated this issue. Hieu (1996) collected data from 102 manufacturers who did not adopt ABC and Aldukhil (2012) collected data from 568 Australian manufacturing business units from both non-ABC adopters and ABC adopters. Table 5.65 shows a comparative analysis between studies of Hieu (1996), and Aldukhil (2012) and this study to see whether or not the reasons have changed over time as suggested by Aldukhil (2012). This study indicates that a higher rate of non-adoption has not changed and table 5.65 shows that the factors that hamper adoption of ABC have not changed either. However, additional variables have been discovered in this study (if the new ABC involves a great deal of work, if new system (ABC) takes up a lot of managers' time and difficulty in identifying activities).

Table 5.65: Reasons for non-adoption of ABC by business units			
Variables	This current study	Hieu's study(1996)	Aldukhil's study(2012)
A higher priority of other changes or projects	46.7%	-	22.6%
Higher cost of implementing new system (ABC)	66.7%	14.7%	13.2%
Lack of commitment and cooperation among finance staff members	43.3%	15%	1.9%
If the new system (ABC) involves a great deal of work	36.7%	-	-
If new system (ABC) takes up a lot of managers' time	33.3%	-	-
The difficulty in gathering data on cost drivers	26.7%	10%	11.3%
The difficulty in defining cost drivers	33.3%	5.8%	7.5%
Difficulty in identifying activities	56.7%	-	-
Other reasons	36.7	-	-
If the college does not have access to individual with knowledge to design and implement ABC	60%	33.3%	11.3%

5.8. Adoption strategies applicable to TVET colleges (objective 3)

The third objective of this study is to analyse adoption methodologies that might be applicable to TVET colleges in KZN. This research objective is answered by conducting an overview assessment of findings from objective one and objective two. The information from results of objective one and two was integrated in order to answer this objective. The methodologies applicable to TVET colleges were discussed and methodologies applicable to public TVET colleges were developed in chapter three.

5.8.1 An overview assessment of findings from objective one

The main goal of objective one was to obtain a picture of the costing models that are currently used at TVET colleges. The results showed that TVET colleges do not use ABC and they are still using traditional costing systems. The findings also revealed that TVET colleges spread their indirect costs among courses using the number of students and the size of their colleges as the cost drivers. Furthermore, the costing models currently used at TVET colleges do not provide accurate and adequate information because the tuition fees are minimal and hardly cover teaching costs and the budget runs out before the year end.

5.8.2 An overview assessment of findings from objective two

The main aim of this objective was to investigate factors that assist in ABC adoption. Nine factors were identified, and seven of nine were found statistically significant in ABC adoption. This study found that most important challenge in adoption of ABC were the technical variables. Furthermore, respondents also felt that is was not easy to identify all the major activities performed at TVET colleges.

5.8.3 Integration of objectives one and two

From findings of objective one and objective two, it is clear that the TVET colleges are still using traditional costing systems, but respondents felt that the costing model that currently used at their TVET colleges does not provide accurate and adequate information since the budget runs out before year end and income from tuition fees is minimal and hardly covers teaching costs. This suggests that a new costing model for TVET colleges is required. Therefore, a new ABC model was developed in chapter three for application at TVET (see figure 3.6).

From these results, it is also clear that the technical variables (identifying activities) were a major challenge that could hinder the adoption of ABC at TVET colleges. Therefore, new methods of identifying activities and solving technical issues were developed in chapter three (i.e., standard activity dictionary refer to appendix I) and conceptual framework that guides the adoption of ABC system at TVET colleges was also developed (see figure 7.1). Furthermore, appendix J was developed in this study to provide information on allocating resources to activity performed at TVET colleges.

5.9 Summary

The main goal of this chapter was to obtain a picture of the current costing model used at TVET colleges and how the behavioural and organisational and technical variables of this study are related to the adoption of ABC systems. Regarding objective one, the results indicate that under the costing systems currently in use at TVET colleges, the programme with the most students consumes highest percentage of the college's budget (refer to table 5.4). In relation to allocation of overhead cost to each campus, the results reveal that number of students was reported as common cost driver used at these TVET colleges (refer to table 5.8). This finding indicates that these TVET colleges use the volume related bases in the second allocation stage, to assign costs from cost centres to product (programme). This indicates that these colleges are still using traditional costing system. In relation to the level of ABC adoption within public TVET colleges, twenty-seven (90%) respondents revealed that their colleges are not ABC users (table 5.64).

In relation to objective two, the results indicate that all contingent factors were found strongly associated with ABC adoption, except the internal resources availability. Therefore, all the alternative hypotheses were accepted, excepts H7, as no support was found for these hypotheses. The next chapter presents and discusses qualitative results.

CHAPTER 6: PRESENTATION AND DISCUSSION OF QUALITATIVE RESULTS

6.1 Introduction

Chapter 5 presented and discussed the quantitative results of this study. This chapter presents the findings from semi-structured interviews with five CFOs and five finance managers (assistant directors in finance). The findings are presented using intra-case analysis and cross-case analysis, as recommended for multiple case studies (Yin 2009). This means that each case was analysed and discussed separately, illustrating the similarities and differences among findings of the cases, and then the findings from the separate cases were combined as suggested by Elagili (2015:87).

The aim of this study is to develop a conceptual framework for the adoption of an ABC model in TVET colleges in KZN, the responses from the interviews were also used to meet the following objectives of the study:

- To determine the current practices regarding the costing model at TVET colleges in KZN;
- To investigate factors that constitute barriers to ABC adoption at TVET colleges in KZN; and
- To analyse adoption methodologies that might be applicable to TVET colleges in KZN.

The results of inteviews are presented under the main headings as follows: characteristics of the interviewees, the research findings from the interviews and the research findings on the themes are analysed as: current cost model, size of the firm, top management support, cost structure, product diversity, resistance to change, internal champion support and innovation, internal resources availability, training and technical variables.

6.2 Characteristics of the interviewees

The data were obtained from interviewing 10 employees working at different managerial levels in each case, namely:

- Top management : deputy principal finance (CFOs); and
- Middle management: finance managers/assistant directors finance.

Two managerial levels were included in order to gain in-depth information and a clear perception on the factors that constitute barriers to the adoption of ABC in KZN TVET colleges.

6.3 Research findings on interviews

This section presents the findings from all five cases according to nine themes: current costing model, size of organisation, top management support, cost structure (level of overheads), resistance to change, internal champion support, internal resources availability, training and technical variables. Firstly, the statistics relating to biographical information obtained from respondents are presented.

6.4 Background of interviewees

6.4.1 Gender

In section A1 of interview schedule (refer to appendix F), respondents were asked to indicate their gender. Table 6.1 indicates the gender of the participants from six of nine KZN TVET colleges. As all the interviewees are in managerial positions, table 6.1 shows that, in these colleges, managerial positions are predominantly occupied by males and the majority of CFOs are men (although, it is not shown in table 6.1 four out of five CFOs are male). Therefore, there is no gender balance in top positions. A clear gender gap exists since more men than women occupy managerial positions at public TVET colleges.

Table 6.1: Gender of participants per TVET college				
Name of TVET College	**Gender**		**Percentage**	
	Male	Female	Male	Female
Majuba TVET College	0	2	0%	100%
Umfolozi TVET College	1	1	50%	50%
Thekwini TVET College	2	0	100%	0%
Elangeni TVET College	2	0	100%	0%
Umgungundlovu TVET College	1	1	50%	50%
Total participants (10)	**6**	**4**	**60%**	**40%**

6.4.2 Race group of respondents

Respondents were asked to indicate the race group to which they belong. Table 6.2 indicates that five (50%) respondents were White, three (30%) were African, one (10%) was an Indians and one (10%) was Coloured.

Table 6.2: Number of participants per race group		
Race group	Number of respondents	Percentage
African	3	30%
Coloured	1	10%
Indian	1	10%
White	5	50%
Total	**10**	**100%**

6.4.3 Participants' age group

To determine whether the age of the respondents has an impact on the acceptance of ABC respondents were asked to indicate their age group. These results are shown in Table 6.3. Five (50%) respondents were between 60-65 years, four (40%) respondents were between 35- 49 years and one (10%) respondent was between 50 – 59 years of age.

Table 6.3: Age group of the participants		Respondents' age group			
		35-49 years	50-59 years	60-65 years	Total
35-49 years	Number	4	0	0	4
	% of total	40%	0%	0%	40%
50-59 years	Number	0	1	0	1
	% of total	0%	10%	0%	10%
60-65 years	Number	0	0	5	5
	% of total	0%	0%	50%	50%
Total	**Number**	**4**	**1**	**5**	**10**
	% of total	**40%**	**10%**	**50%**	**100%**

6.4.4 Academic qualification of respondents

Respondents were asked to state their highest academic qualifications. The Table 6.4 indicates that five (50%) respondents possess post-graduate degrees at these six TVET colleges, three (30%) respondents possess degrees and two (20%) respondents possess diplomas. Despite this good level of knowledge, no TVET college is an ABC user. This finding may indicate that there is no relationship between level of knowledge and adoption of ABC system, although the decision to adopt ABC is taken not solely at managerial level at TVET colleges on ministerial programmes. The managerial level at TVET colleges may take a decision on skills programmes/ unfunded programmes as these programmes are costed at TVET college level.

Table 6.4: Highest qualification of participants		
Highest qualification	**Number of participants**	**Percentage**
Certificate or Diploma	2	20%
Degree	3	30%
Post-Graduate Degree	5	50%

Respondents were asked to indicate their familiarity with the ABC system. Table 6.5 shows that seven (70%) respondents have knowledge of ABC and only three (30%) respondents have no ABC knowledge. Even though seven out of ten participants are familiar with the ABC system within these TVET colleges, no TVET college has adopted the ABC system. These results may indicate that there is no significant relationship between ABC knowledge and ABC adoption.

Table 6.5: Knowledge of ABC system		
ABC knowledge	**Frequency**	**Percentage**
No knowledge	3	30%
General knowledge	5	50%
Expert knowledge	2	20%
Total	**10**	**100%**

6.4.5 The initial source of knowledge of ABC

Respondents were asked to indicate where they first learnt of ABC. This question was asked as the initial source knowledge of ABC is very important in the implementation of the ABC system. Table 6.6 shows that five (50%) respondents learnt the ABC system at a university level, and three (30%) respondents learnt the ABC system during in-house training.

It was also necessary to determine the source of ABC knowledge and the institution at which ABC was learnt, as it is possible that those participants who learnt the ABC system at tertiary institutions and those who learnt about it during in-house training would be more open to innovative solutions and might be keen to implement ABC, than those who do not have any idea about the ABC system. The result indicates that neither in-house training nor education (institution at which qualification was obtained) lead to the adoption of ABC. Although five (50%) participants learnt the ABC system at university and two (20%) participants learnt it during in-house training, not one TVET college had adopted the ABC system. TVET colleges are operating in a different environments, whereby the costing of funded programmes are done at DHET, but unfunded programmes are costed at college level. Therefore, this study contradicts Peansupap and Walker (2006:371) and Love et al. (2001:34) who consider training to be vital to the successful adoption of a new system.

Table 6.6: The initial source of knowledge of ABC		
Source of knowledge of ABC	**Number**	**Percentage**
University	5	50%
In-house training	2	20%
Other	3	30%
Total	**10**	**100%**

6.5 The current level of ABC adoption at TVET colleges

Respondents were asked to indicate the current level of ABC adoption within TVET colleges to ascertain the adoption rate of ABC at KZN public TVET colleges. Table 6.7 shows that ten (100%) respondents indicate that there is no consideration of ABC at their TVET colleges to date.

Table 6.7: ABC adoption rates at KZN TVET Colleges		
ABC adoption rates	**Number**	**Percentage**
No consideration of ABC to date	10	100%
Total	**10**	**100%**

6.6 Research findings on themes

The following section presents the findings from the interviews in all five cases. The data were analysed according the following nine themes: current costing model, size of the firm, top management support, cost structure, product diversity, resistance to change, internal champion support, internal resources' availability, training and technical variables.

6.6.1 Current costing model

Amir et al. (2010:4) state that the costs of programmes in the institution of higher learning are divided by the number of students in a particular faculty to calculate the student cost per faculty. In this case, only the number of students is considered as the cost driver. Therefore, higher education institutions are using traditional costing system/Student-Based Costing (SBC) in the calculation of the costs of each programme. To determine the current costing model at TVET colleges, the campus with the most students and its funding share was compared to the campus with the fewest students. To obtain the data on the current costing model at TVET colleges, participants from the five KZN TVET colleges were asked the following questions:

1. *Which campus has the most students at your college?*

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2. *Which campus has the highest funding allocation?*
3. *What type of costs does the college use in costing their programmes (direct, indirect, fixed or variable)?*
4. *Which traditional costing system does the college use currently (standard costing, direct costing, full costing)?*
5. *Which bases (cost drivers) are currently used to allocate overhead costs in your college?*

(Note that where the results of the interviews have been reported, words have been inserted in square brackets to improve the readability of the responses.)

Case A (Umfolozi TVET College)

From case A's participants' responses to the above question one, it turned out that Esikhawini campus has the most students among all the campuses of the college. Respondents also identified Esikhawini as the campus, which consumed the most budget of the college (question two). From questions 3, it turned out that the college is using direct costing systems (when costing unfunded programmes). All participants of case A indicated that the college spent a high part of its budget on direct labour costs. One respondent confirmed that they allocated costs per campus and not per programme.

In this respect one of the participants said (A1):

"The campuses aren't individually funded, we just get[a] grant in total, what we actually get [as] funding, is just spread across the campuses for the highest number of students numbers, as funs allocation. We spread our costs across campuses, not per programme, and we are budgeting based on number of students". "We budget based on what we estimate the programme will cost. We [It] will be great if we have a standardised system, and I am very concerned about the allocation problem. The budget is based on DHET costing model, I mean accounts model, expenditures are broken down into personnel cost and actual elements, but it doesn't allocate costs to programme, nothing is directly allocated to [a] particular programme".

A2 responded similarly and added:

"Esikhawini has [the] highest budget, because of high number of students and programmes, but it also depends on the expenses of the course or programme".

Case B (Umgungundlovu)

From case B's participants' responses to the above questions the campus with the most students consumed a high percentage of the college budget. They did not spread costs among all courses offered by the college. The college uses the direct costing system.

In this respect, one of the participants (B1) said:

"We don't do that level of costing, We keep records of all costs of the campus, we don't drill down to do by campus level, we don't report on [each] campus, unless there is [a] special need for that. We have information, but our problem that we have, is [a] severe budget constrain on our staff, so for the last years we haven't had an HR manager, for last year we haven't had a corporate service manager, I asked years ago for a management accountant, to put on a system and bring me costing because we have courses, and we have projects as well that we need to cost as well. That was declined by DHET. That's where we are at the moment, so the answers I am giving are based on [the] fact that we don't have capacity to do that system, although we have information, what I don't have, is capacity in people who can bring up [system] on board".

Case C (Thekwini)

The responses of all the participants in this college indicated that the bigger the size, the bigger the budget of that campus. Their cost drivers are number of students, size and infrastructure. The college does not allocate costs across the campuses and the college uses the direct costing system and incremental budgeting. Respondents also indicated that this college has the responsibility of costing skills courses/programmes and they are using direct costing system and incremental budgeting in costing these programmes.

A respondent (C1) stated:

"We don't work out an allocation per campus, the highest allocation goes to bigger campus, the bigger the size of that campus, more security will be and secondly the bigger the size the more the cost will be, and it also depends on the infrastructure, the more infrastructure is not good, so those that are needing more infrastructure we allocate [to]. We have the campus just on that hill is called CENTEC and this year the whole campus had to be replaced, it cost R3.3 million, those are the factors. The college just takes standard costing supplied by DHET, and then there are some skills courses, and we look at individual costing of those, but it's involves direct cost and incremental cost".

Another respondent (C2) stated:

"The funding works according the budget basically, we look at [the] previous year budget, the costing of the programmes are directly costed by state, the college only costs the skill programmes. The highest percentage of funding goes to bigger campus. Because we are [a] public institution, the state only gives us funding for NC(V) and NATED, so those programmes costing are done by them, whatever number of students we have in that campuses or courses that will actually determine how much funding in terms of personnel goes to that particular campus. We have actual costs at that campus, in other words, number of security is determined by the size of [a] population of that campus".

Case D (Elangeni)

From the responses of all respondents of case D, the college does not directly cost their programmes (funded programmes),which are costed by the DHET. The college only costed the skills programmes (unfunded programmes). The highest cost allocation goes to the bigger campus.

In this respect, one of the respondents of case D (D1) said:

"We don't allocate the funding to the campuses, it is done on consolidated bases, but greater [the] allocation will obviously go to Mpumalanga. We don't actually split indirect costs, if we follow budget and we spend on budget. We 've got income and we 've got debtors per campus, within the budget we 've got account line items: telephones, PPE (Property, Plant and Equipment), textbooks and protective clothing, and based on number of students and other criteria we allocate the costs across the programmes, so to me it is budget driven, if I can answer you in that way. We don't use salary cost to allocate indirect costs as I explained, if you look at the budget, and budget criteria and the way in which we allocate the budget, if we look at stationery costs it will depend on the number of students. Training costs they will depends on the number of staff, the different criteria makes better [a] budget".

Respondent D2 stated:

"The funding is based on the number of students, our costs of programmes are determined by the DHET". We don't change the amount that DHET stipulated".

Case E (Majuba)

The case E's participants responded that the MTC campus has the most students among all the campuses of the college and the MTC campus consumes a high percentage of the college budget. The college is using direct costing systems (when costing skills programmes), and

spent a high part of its budget on direct labour costs. One participant confirmed that the college allocated costs per campus, not per programme.

Respondent E1 stated:

"We don't do an activity-based costing, we don't spread indirect costs to the activities. Yeah… currently we use the pastel evolution to do our financial information. We have started a system, but is not really fully fledged at the moment where we allocated lecturers between NC(V) and NATED programmes. The centralised model is [an] excellent model, because then you have the same bases of costing for entirely college as opposed to each campus has their own bases, and the central function can see the bigger picture, the whole picture of the college as opposed to just one campus. In my opinion that is excellent model. Like I said it is very difficult to accurately allocate to an activity your indirect costs".

Respondent (E2) stated:

"*The central office, is not really cost centre, is a cost centre, but doesn't make income. There are quite a lot of things that we do that is not included in the costing model [or] funding model that's currently used, so the costs will be much higher than total programme costs at the end of the day, because you know we are being funded by programme costs, so I will suggest that it is revisited to see what are the real costs that going into offering the programme".*

Discussion:

From the responses of the participants at five TVET colleges, it is clear that these TVET colleges use incremental funding, where the institutions' allocations are based on those of the previous year, often augmented by a cross-the- board steady budgetary increases, or according to political influence, interest group pressure or the negotiation skills of the institutions (Sheppard and Ntenga 2014). Ziderman (2016) calls this mechanism "ad-hoc funding". An inherent shortcoming of ad-hoc funding is low internal efficiency of TVET colleges. Furthermore, ad-hoc funding is unrelated to the internal activities of TVET colleges. These TVET colleges are also allocating costs across their campuses based on estimated costs of input required for each campus based on the DHET funding model. This mechanism allocates funding to each campus on the itemised budgets for future years submitted by each campus, and the budget of each campus is based on the approval of individual expenditure. This mechanism also derives TVET colleges' allocation from formulae typically based on student enrolments or number of classes (Sheppard and Ntenga 2014). From the responses of the participants at these five public TVET colleges in KZN, it is clear that the campus with the most students consumes the higher percentage of college's budget. These TVET colleges

offer two types of programmes that is, funded/ministerial programmes and unfunded/skills programmes. The funded programmes are directly costed by the DHET, whereas skills programmes are costed at college level. These TVET colleges use direct costing system when costing their unfunded courses. They also use incremental budgeting system and their prominent cost driver is the number of students.

6.6.2 Size of organisation

According to many researchers (Naranjo-Gill 2009; Line et al. 2001; Abusalama 2008; Reynolds 2014), a number of factors can be used to measure the size of an organisation (Elagili 2015). Some of these factors are number of employees, the working capital and annual sales of the company. In the higher education institutions the size is measured according to the number of programmes offered and students' intake (Hashim 2015). Therefore, this study uses the number of courses to measure the size of the college. Hashim (2015) notes that a large-sized tertiary institution is one with a higher number of programmes offered and normally tends to apply the ABC system much more than small-sized companies. Since this study is based on TVET colleges and not on universities, considered colleges with 11- 30 and more than 30 programmes as large-sized. Khalid's (2005) study showed a positive correlation between the size of a company and the use of ABC system.

Companies with a wide product range have a higher operational complexity (Elagili 2015). Product diversity includes production volume diversity, size diversity and complexity diversity (Cooper and Kaplan 1988). This study also uses the number of courses to measure product diversity. According to Alsaeed (2003), there is a positive correlation between production diversity and the adoption of the ABC system.

To obtain data on the size of the colleges and product diversity, participants from the five KZN TVET colleges were asked, during interviews, the following questions:

 1. *How many courses/programmes does your college offer?*

Case A (Umfolozi TVET college)

From Umfolozi TVET college's participants' responses and from the college website (www.studentroom.co.za/umfolozi-tvet-college) this college has 40 programmes which are divided into NC(V), NATED and skills programmes. This study considers a college which offered more than 11 programmes, as a college offers diverse courses/programmes.

In this respect one of the participants said (A1):

"There are lot of skills programmes, the courses are divided into ministerial courses which are [in] in my head, I would probable say 40 programmes".

Case B (Umgungundlovu TVET college)

From Umgungundlovu TVET college's participants' responses and from the college website (www.studentroom.co.za/umgungundlovu-tvet-college-UFET), this college has 20 programmes which are divided into NC(V), NATED and skills programmes. This study considers a college which offered more than 11 programmes as large-sized college that offers diverse courses.

Case C (Thekwini TVET)

From responses of participants in this college and its website (www.studentroom.co.za/thekwini-tvet-college), the college has 20 courses, which are also divided into NC(V), NATED and skills programmes. This study considers the college which offered more than 11 courses/ programmes as a large-sized college that offers diverse courses.

Case D (Elangeni TVET)

From the responses of all participants and their website (www.studentroom.co.za/elangeni-tvet-college), the Elangeni TVET offers 22 courses/ programmes. This study considers the college which offered more than 11 programmes, as a large-sized college that offers diverse courses.

Case E (Majuba TVET)

From the responses of the participants in this college and the college website (www.studentroom.co.za/majuba-tvet-college) this college offers more than 11 courses, therefore this college is a candidate for ABC adoption. This study considers the college which offered more than 11 programmes, as college that is offering diversify courses and as large-sized college.

Discussion:

From responses of the participants at all five TVET colleges and documentation, it is clear that the Majuba TVET college, Umfolozi TVET college, Thekwini TVET college, Elangeni TVET college and Umgungundlovu TVET college are large-sized since they have more than 11 courses offered. Therefore, they are suitable candidates for adopting ABC based on the impact of size and product diversity on ABC adoption. These results confirmed the findings of

a number of previous studies (i.e., Chongruksut 2005; Brown et al. 2004; Alsaeed 2005; Cheuelal and Cooper 2001; Kaplan 1988; Elagili 2012).

6.6.3 Top management support

Previous studies report that key factor influencing the success of implementing and adopting ABC is top management support (Shields 1995; Shields and McEwen 1996; Roberts and Silvester 1996; McGowan and Klammer 1997; Krumwiede 1998; Aldukhil 2008).

There is a high percentage of success when top management support the adoption of the ABC system. Due to the freedom and support to the system implementers by the top management, implementers have access to all necessary materials required for the implementation. This support also extends to assistance in the solutions of many problems and obstacles that might arise throughout the different phases of the system's adoption and implementation (Elagili 2015:51).

To obtain the data for top management support impact on ABC adoption, participants from the five KZN TVET colleges were asked the following questions:

1. *What reasons can drive your college to reject the new accounting system?*
2. *If you have never considered ABC to date, what are your reasons for remaining with the current system?*
3. *In your opinion, the college will succeed in the implementation of ABC if:……………..*
4. *In your opinion, what problems will the college encounter or could encounter during the implementation of ABC?*
5. *If the new useful accounting system is introduced at your college, how could you give necessary support required for its implementation?*

Case A (Umfolozi TVET)

The participants from Umfolozi TVET college (case A) indicated that if the college wants to implement the new system, the new system must first be prescribed by the DHET (for costing of funded programmes). The DHET chart of accounts does not cater for ABC. The new accounting system must be in line with DHET and must be line with the costing system. If the college has DHET support, then the college can implement ABC. However, these colleges can implement the ABC system on skills programmes without obtaining permission from the DHET.

In this respect, one of the participants (A1) said:

"The system must be prescribed first of all by DHET that will be a problem, the DHET chart of accounts will be another problem, because that doesn't cater for vast of accounts and whether the Coltech will catered for that amount of accounts and staff members that will be required. If we have DHET support nothing can stop us to implement the new system and our biggest hindrance is the staff shortage [the adoption of ABC on funded programmes is not possible without DHET support]".

Case B (Umgungundlovu TVET)

From Umgungundlovu TVET participants' responses to the above questions, the college does not have the capacity to adopt ABC. Furthermore, the level of training and knowledge of the staff is the hindrance in the adoption of the ABC system. Support from DHET is also another challenge in the adoption of ABC.

In this respect one of the participants (B1) said:

"The problem the colleges could encounter, is the level of training and knowledge of the staff. Only reason which can cause the college to reject the ABC is the capacity. We do not have the management accountant to analyse the costing system of the college".

Case C (Thekwini TVET)

From Thekwini TVET college participants' responses to the above questions, skills level can be a hindrance in the implementation of the ABC system. The college is also required to follow department rules and the new system must be first prescribed by DHET in terms of the costing of funded programmes.

Case D (Elangeni TVET)

The participants from Elangeni TVET college indicated that if the college wants to implement they were willing to support the adoption of any the new costing system, such as ABC in their college, particulary if the new system allocates costs more efficient than costing system currently in use at their TVET college.

Case E (Majuba TVET)

The participants from Majuba TVET college were open to support any upgrade new system and if it allocates costs more efficiently. They also expressed their readiness to adopt the ABC system if it could reduce the costing allocation challenges facing their TVET colleges.

Discussion:

From the responses of the participants in these five public TVET colleges in KZN, it is noted that all participants were willing to support any new system, such as ABC system, especial if new system is in line with DHET costing model and if the system takes into account the current challenges of budget running out before the year-end. The participants have definitely stated that the lack of management's support (DHET support) was a reason to evade adopting the ABC system and they stated that they would not mind applying the ABC in their colleges if the DHET decide to do so, and establish a budgeted plan for its implementation.

This support is a significant factor in ABC adoption and this study is consistent with the findings of Majid and Sulaiman (2008), Abusalama (2008), Aldukhil (2012) and Elagili (2015).

6.6.4 Cost structure/Level of overheads

A number of researchers (e.g., Brown et al. 2004; Kaplan and Cooper 1998; Nguyen and Brooks 1997) have demonstrated that overhead costs have become an extra load on the cost of products which has led to distortion in traditional cost accounting systems which makes them ineffective and problematic for calculating the actual cost of the product. The studies, therefore, recommend that companies with high overhead costs should use much more sophisticated cost accounting systems such as the ABC system. These studies also found a positive correlation between high overhead costs and the use of the ABC system.

To investigate the level of overhead costs in these colleges, participants from five public TVET were asked the following question:

1. *What is the approximate overall percentage of overhead costs at your college?*

Case A (Umfolozi TVET)

All participants confirmed that their college is labour-intensive. They also stated that the percentage of overhead costs, constituted 10% to 20% of the total costs and with direct labour constituted approximately 63% of the total costs.

One of the participants (A1) stated:

"We are roughly sitting around 63% of salaries, which means overheads are less than 40%".

Case B (Umgungundlovu TVET)

These participants confirmed that their colleges is labour-intensive. They also stated that percentage of overhead costs constituted 35% of the total costs. These results show that this TVET college is labour-intensive and the percentage of overhead cost is low compared to total cost. These are possible reasons for non-adoption of ABC the system at this TVET college.

Case C (Thekwini TVET)

This college is also labour-intensive. Respondents stated that percentage of employees' costs constituted 70% of the total costs of the college.

One of the participants (C1) stated:

"*You see, the thing is that, in a manufacturing concern you 've got machines, those are all your direct costs , those are your assets. Our assets are the people, 75% of our costs is employees' costs".*

Case D (Elangeni TVET)

In this college, participants also stated that direct labour cost constituted 63% of total costs, confirming that this college is labour-intensive. They also stated that overhead costs are 20% of total costs, and there are variables, which can push these overhead costs up.

Below are some examples of participants' responses.

One of the participants (D1) stated:

"For example, salary costs of total costs are 63%. If we look at total expenses compared to income, last year we reported a surplus of R24 million. That just relationship between costs and income, and I don't know how to answer you in terms of percentage, but is any percentage need to be calculated from 63%".

Another participant (D2) stated:

"In terms of our budget, I can say 20% of our budget, but the're other variables which can push up this percentage".

Discussion:

From the responses of the participants at these colleges, it clear that these colleges are labour-intensive, since the direct labour cost is about 63% out of total costs of each college. The percentage of the overhead costs was very low compared to the total costs. Brown et al. (2004) state that semi-automated with the percentage of overhead cost high compared to total costs should adopt a more accurate and advanced cost accounting system such as ABC system than companies with the low percentage of overhead costs to total cost. The findings of this study indicate that these colleges has low percentage of overhead costs, as the cost structure at these TVET colleges total costs, that may impact negatively on adoption of ABC.

This finding is consistent with findings of Brown et al. (2004), Kaplan and Cooper (1998), Bjornenak (1997), Nguyen and Books (1997) and Elagili (2015).

6.6.5 Resistance to change (RTC)

Chris (2011:1) states that a new project (such as ABC) fails because of human nature-people tend to resist change. Therefore, as a new project initiator, understanding resistance is critical to creating lasting change. Chris (2011) advises that it is important to know how resistance manifests and how to overcome its various forms. .This characteristic of being open to change/innovation is associated with and identified as being one of the factors for the successful adoption of ABC (O'Reilly et al. 1991; Baird et al. 2004 and Elagili 2015:50). To investigate the resistance to change in these colleges, participants were asked the following question:

1. *When the college is introducing the new accounting system to assist in having access to more detailed and up-date financial information, do you think finance staff members will be opened to this change? If not, why?*

Case A (Umfolozi TVET)

All participants confirmed that their employees are very open to change and adaptable, provided the new system produces the goods results. Respondents indicated that they were comfortable when doing same thing, but can easily switch to a new system, when benefits of new system are known.

 Below are some examples of the participants' responses.

Participant (A1) stated that:

"I think most employees are resistant to change, when we had to do [a little) change as management. We know people like to do same thing because they feel comfortable about it. Once we see the results that the new system yields, they become open to the new systems. Another participant (A2) stated that:

"I think so because we are having a challenge at the present moment, our financial system is not conducive for our needs, it is not very goods system for students not financial side".

Case B (Umgungundlovu TVET)

In this college, the finance staff members are not be resistant to change since the current financial system has shortcomings and are looking for a very finance system which is user friendly.

One of the participants (B1) stated:

"I don't think they will be, because they recognise the shortcomings of current system, particularly finance system, and they are looking at the system which is very user friendly, they will be very positive".

Case C (Thekwini TVET)

From the responses, finance staff members are not resistant to change, but if the change means more work for them, then they would have a problem.

One of the participants (C1) stated that:

"Look, in principle, I don't think they will have a problem with it, but if it means more work for them, then they will have a problem".

Case D (Elangeni TVET)

From the responses all the participants confirmed that the finance staff members are open to new system, and are very adaptable. They are not comfortable about doing the same thing, and are willing to try the new things.

One of the participants (D1) stated that:

"I think finance staff members are really adaptable, they don't just follow the leader, they are quick, which I am very happy about".

Case E (Majuba TVET)

From the responses, all the participants confirmed that TVET colleges are operating in an environment, which is changing all the time. The participants confirmed that finance staff members are very open to change and new ways of doing things.

One of the participants (E2) stated that:

"You know, we are operating in an environment which is changing all time, even TVET colleges are in that environment, you can't stay fixed, you have to change. Even this year we have introduced… different and new way of capturing orders and payments, they are even coming back saying, it's working well for them".

Discussion

From the responses of the participants at all five TVET colleges, it became clear that all finance staff members are not resistant to the new system (ABC). Employees would resist the new

system (such as ABC) if it adds more work and responsibilities, and does not produce good results. Since employees get the job done, possess the knowledge, skills, tools and experience, the new change should be communicated to them before its implementation. From these findings, it is recommended that TVET colleges should recognise the importance of its employees and the ways to minimize any resistance from employees in order to implement a new costing system effectively. Therefore, they must understand why employees resist change as recommended (UK Essays 2015).

6.6.6 Internal champion support and innovation

The support of an individual who plays the role of a champion inside an organisation and the willingness of such insiders to accept and adopt new innovations such as the ABC system are important factors in the adoption and implementation of the system (Elagili 2015:51). The existence of pro-innovation staff inside an organization is very important since these staff members could bring other employees on board in accepting the innovation, in familiarizing them with it, and in helping them to understand the importance of a new system to the organisation, thereby overcoming any resistance to change within the organization.

To explore whether there were a pro-innovation individuals among the employees and whether these individual were knowledgeable about the ABC system, the participants were asked the following questions:

1. *How familiar are you with ABC?*
2. *What is your role when a new accounting system is introduced in the college?*

Case A (Umfolozi TVET)

From the responses of the participants at this college, it was apparent that participants had never worked with the ABC system and they have not tried to submit any proposal to the college to adopt ABC and upgrade the current cost accounting system. These participants also expressed their readiness to support ABC if the college should adopt it.

A participant (A1) stated:

"Not at all. I have never actually worked with ABC, my role is to oversee it and ensure it is correctly implemented"

Case B (Umgungundlovu TVET)

From the responses of all participants at this college, one of the participants had introduced ABC at the firm where he was working before joining this college. Furthermore, one of the

participants had tried to request the management accountant to assist in analyzing the costs at this college. This confirmed that the participants are innovative.

One of the participants (B1) stated that:

"Yes I am very familiar with ABC, Where I worked [before], I introduced it myself in large agricultural sugar Mill Company, I spent a lot of my years on that".

Case C (Thekwini TVET)

From the responses of the participants to above question, one of the participants was very familiar with ABC system, and he had introduced some innovations in the accounting system when he joined the college. The participants with no knowledge about ABC expressed their readiness to upgrade the existing cost accounting system if the college were to set up such a plan.

One of the participants (C1) stated:

"Yes, I am very familiar with ABC system, I introduced it where I worked [before]. I will have to driver it, When I got here I centralized finance and I centralized supply chain".

Case D (Elangeni TVET)

From all the responses of the participants at this college, it was noted that the participants were innovative, because they are currently assessing a new tool financial statement tool, which will assist in the preparation of financial statements at the college. Although they were not familiar with ABC, there has been innovation in accounting system at this college.

Below are examples of the participants' responses.

One of the participants (D1) stated:

"I did it years ago, I think 30 years ago, I am dynamically involved [with] it and I've got large Information Technology (IT) experience, for example, we are now assessing a new financial statement tool".

Another participant (D2) stated that:

"Last time I did, I was at school I can't say I am familiar with it, when a new system is introduced my role is to plan for it".

Case E (Majuba TVET)

From responses of all the participants at this college, it was noted that there has been innovation to the accounting system. Although they were not familiar with ABC system, they have introduced a new and different way of capturing orders and payments at their college, and they expressed their readiness to support an upgrade to the existing accounting system if the college were to set up such an upgrade.

One of the participants (E1) stated:

"I studied it in Management Accounting at university, my role is to provide recommendations to [the] principal of the college for any new accounting system".

Discussion

From the responses of the participants at these TVET colleges, it can be concluded that there are some employees at all these colleges who have knowledge of the ABC system and they agreed that the ABC system is useful for their colleges. They also expressed their readiness to support its use should their colleges decide to adopt it. This enthusiasm would help bring the rest of the employees on board and convince them about merits of the system. These findings support the findings of Elagili (2015).

6.6.7 Internal resources' availability

The process of designing and implementing an ABC system requires companies to have adequate resources (Chiarini 2012). It is not easy to operate in comparison with other system since the ABC system requires an investment in IT throughout the company. The necessary resources primarily include the time and commitment of accountants, top management, operating employees, computer facilities and external consultants (Chiarini 2012). Similarly, Lopez (2013) concluded that the ABC is very accurate but consumes a great deal of resources.

Accordingly, and to investigate the internal resources availability in these colleges participants from these colleges were asked the following questions:

1. *In your opinion, what problems will the college encounter the implementation of ABC?*
2. *What reasons can drive your college to reject the new accounting system?*
3. *If you have never considered ABC to date, what are your the reasons for remaining with current system?*

Case A (Umfolozi TVET)

From the responses of the participants at this college, it was found that all participants confirmed that the availability of staff with knowledge is a hindrance in ABC adoption.

One of the participants (A1) stated:

"Nothing would be hindrance except the need for additional staff to implement it. Our biggest hindrance are the staff costs".

Case B (Umgungundlovu TVET)

From the responses of participants at this college, capacity and level of knowledge were the reasons for the rejection of ABC, and they will need a management accountant to analyse the costs in ABC.

One of the participants (B1) stated:

"The only reason is capacity, if I could have the people to implement it there will be no problem, the only thing is level of knowledge, we need [a] management accountant someone who is going to pull and analyse that information".

Case D (Elangeni TVET)

From the responses of the participants at this college, the high cost of implementing new system such as ABC can be reason for rejection of the ABC system. They stated that employees should receive proper trained, which requires huge financial resources. Below are some examples of the participants' responses.

One of the participants (D1) stated:

"I think it's a huge amount of change, if we can change the system now, I don't think we can afford it".

Another participant (D2) stated:

"I don't think there will any problem, I won't call it a problem. For an adoption of any system, people should be trained properly".

Case E (Majuba TVET)

From the responses of the participants at this college, it was found that difficulty in allocating costs to activities can be a reason for ABC rejection and a management accountant will be

needed to help in allocating costs to activities. Below are examples of the participants' responses.

One of the participants (E1) stated:

"Difficulty in allocating costs and I believe that we will need a management accountant, and to me ABC system means more sense in manufacturing companies".

Another participant (E2) stated:

"We've got an IT challenge in this college, if you are not working in a stable that is a challenge, we even try to introduce EPR system but it is costing".

Discussion

From the responses of the participants at all these TVET colleges, it was noticed that internal resources' availability is a major reason for non-consideration of the ABC system. It also appeared that a lack of knowledge (there is no management accountant) of current employees could be a further reason for non-adoption. It also found that two colleges have the staff members who have expert knowledge in designing an ABC system, but these colleges have not yet adopted the ABC system. Such findings are inconsistent with the recommendations of the researchers (Chiarini 2012 and Lopez 2013). Therefore, this study finds no correlation between internal resources availability and ABC adoption.

6.6.8 Technical variables

While significant consideration of behavioural and organizational issues relating to ABC implementation has been given in literature, it has been suggested that technical issues should be further investigated (Abusalama,2008:11). It has been argued (Cooper 1989, 1990; Scapens 1991; Cooper and Kaplan 1991, 1998; Drury 2012; Kaplan and Atkinson 1998) that the main components of an ABC system are: resources, activities and cost objects. Abusalama (2008:75) states that the main items, which he considers the "basic building blocks of the ABC system", are resources, activity, activity centre, resource driver, activity cost pool, cost element, activity driver and cost object.

To investigate the technical variables in these colleges, the participants from these TVET colleges were asked the following questions:

1. *What does your college uses to identify all personnel costs and tasks associated with offering each programme?*

2. *Does the college have administrative tools available for each campus to examine instructional costs?*
3. *List all divisions/departments within one campus.*
4. *List major activities/tasks of each department mention above.*
5. *What do you understand about the standard activity dictionary? Do you have a standard activity dictionary at your college?*
6. *How would you break down the time spent on major activities performed at a campus level?*
7. *Rank activities mentioned above for their relative departments within each campus, how would you rank them?*

Case A (Umfolozi TVET)

From the responses of the participants at this college, it was found that the college does not have a standard activity dictionary to identify the major activities performed at college. The expenses are broken down in a conventional accounting grouping by employee categories which do not clearly depict the costs of the functions or activities by the employee groups.. Furthermore, there is no management tool that shows what it costs to produce different services by looking at how people use their time and resources, and what that time costs. One of participants (A1) stated:

"We don't actually allocate the costs to each programme, the funding is not allocate to each campus. I 've got no idea, what actually standard activity dictionary is".

Case B (Umgungundlovu TVET)

From the responses of the participants at this college, the spreadsheet is used to identify all personnel costs and tasks associated with offering each programme, and the college does not split the campus into divisions. Furthermore, it is very difficult for the current costing system to work in a backward manner from outputs to inputs, identifying the outputs or services the college produces and then tracing them to the input used to produce them.

One of participants (B1) stated:

"We use spreadsheets to identify all personnel costs and tasks associated with offering each programme. We don't split our campus into divisions. We never able to calculate these, I can ask the campus manager to calculate these, we don't have activity dictionary, but campus manager oversees these".

Case C (Thekwini TVET)

From the responses of the participants at this college, all the participants confirmed that their college does not have a standard activity dictionary. The college also does not have documents which define all the major activities performed by the college, it relies on job description to identify major activities performed at the college.

One of participants (C1) stated that:

"The college just takes the standard given by DHET, no we have not done activities analyse. What I am doing with finance staff now is workflow, asking people what they are doing how long it takes, these are the questions I am asking so that we can start optimize the workflow".

Another participant (C2) stated:

"Because we are public institution that costs determined by them in terms of much personnel cost goes into each programme".

Case D (Elangeni TVET)

From the responses of the participants at this college, it does not have a standard activity dictionary, which defines all the major activities to enable allocation of resources in pursuit of improved student outcomes.

One of participants (D1) stated:

"The duties of personnel are defined in their personal file which is maintained by [Human Resource] HR department, I don't understand terminology, standard activity dictionary, I don't think we have dictionary".

Case E (Majuba TVET)

From the responses of all participants at this college to above questions, it was found that the college does not have an administrative tool to identify personnel costs and tasks associated with offering each programme. The college also does not have a standard activity dictionary to assist in identifying major activities performed by the college.

Discussion

From the responses of the participants of all these colleges, it evident that these colleges do not have a standard activity dictionary, which defines and lists all major activities performed at these colleges, and there is no other tool which shows the connection between outputs and inputs or links activities to the specific college's outputs. The existing traditional costing system cannot provide enough detailed information and, therefore, it needs to be replaced by a new

system such as ABC, where there is a standard activity dictionary as a method of identification of major activities performed at the college, which can provide all necessary information that helps colleges to identify accurate and detailed teaching costs. These findings are consistent with the findings of other researchers (Cooper and Kaplan 1998; Drury 2012).

6.6.9 Training

ABC requires training from the senior management to the junior employees. Gurses (1999) states that the third step in the implementation process for ABC is training. To make sure that the ABC system is carried out flawlessly, there needs to be effective application, performance, consumption and approval of the ABC system (Elagili 2015:41). Aldukhil (2012:78) concurs with Elagili (2015) by stating that training is an important factor driving ABC success. Aldukhil (2012) also states that, without training, problems are expected during design, implementation and usage of the ABC system.

To investigate the impact of training in these colleges, the participants were asked the following questions:

1. *In your opinion, what problems will the college encounter during the implementation of ABC?*
2. *What reasons can drive your college to reject the new accounting system?*
3. *If you have never considered ABC to date, what are your reasons for remaining with the current system?*

Case A (Umfolozi TVET)

From the responses of the participants at this college to the above questions, it was noted that the ABC system requires a vast number of activities and the finance staff members need training and adopt ABC. Since training is needed to adopt ABC this college would need funding for training from DHET to train its employees.

One of the participants (A1) stated:

"The DHET chart of accounts, will be a problem because it does not cater for [a] vast of [number] of accounts. We have to give them capacitating training, the first thing is financial resources".

Case B (Umgungundlovu)

From responses of these participants, it was found that the level of knowledge and training of staff would be a hindrances in the adoption of the ABC system.

One of participants, B1, stated:

"The only reason is level of knowledge and training of staff, if we have people we love to put it".

Case C (Thekwini TVET)

From the responses the participants confirmed that training is a very important factor in the adoption of the ABC system. They also stated that training is associated with a successful the ABC system. Below are examples of participants' responses.

One of the participants (C1) stated:

"ABC will require high skill levels, because in ABC [there are] quite a lot of details need to be analysed and allocated to each activity".

Another participant, C2, stated:

"One needs to change the attitude of the people and people have to be trained".

Case D (Elangeni)

From the responses of the participants at this college, it became clear that since finance staff members have used pastel evolution for number of years, training will be required when the college decides to adopt the ABC system. The participants also confirmed that during the implementation of the ABC system, the consultants will be needed for training which is very costly. Below are some examples of participants' responses.

One of the participants, D1, stated:

"I think it will be a huge amount of change, we used pastel revolution for number of years now, since I joined the college, it will cost considerably and consultants are R500 per hour".

Another participant, D2, stated:

"For any adoption in the system, there will be challenges, people need to be trained properly".

Case E (Majuba TVET)

From the responses of the participants at this college, it was found that this college has challenges in IT. Therefore, for the adoption of the ABC system, IT technicians should be trained for the ABC system. Below is an example of participant's response.

One of the participants (E2) stated:

"*First challenge will be costing [high cost of implementing new system], secondly we have IT challenge in this college*".

Discussion

From the responses of the participants at all these TVET colleges, it became clear that training plays a crucial role in the adoption of the ABC system. As indicated previously, the third step in the implementation process for ABC is training. To make sure that the ABC system is carried out flawlessly, there needs to be effective application, performance, consumption and approval of the ABC system. For the ABC to be successfully implemented, it needs to be understood by the administration who require training. Training is also required for the implementers and the users.

The findings of this study confirmed the findings of a numbers of previous studies (Gurses, 1999; Elagili 2015; Shields 1995; Krumwiede 1998).

6.6.10 Product diversity

Colleges that offer different numbers of courses/programmes have a higher operational complexity. This diversity increases the costing distortions arising from traditional costing systems. Product diversity includes production volume diversity, size diversity, complexity, material diversity and set-up diversity (Elagili 2015). Cooper and Kaplan (1998), Chongruksut (2005), Brown et al. (2004) and Alsaeed (2003) concur that companies with diversity production are more likely to use the ABC system for the allocation of overhead costs to a large number of products and production lines. According to Alsaeed (2003), there is positive correlation between production diversity and the adoption of the ABC system. Therefore, this study used number of courses to measure the product diversity. The large-sized TVET colleges with a higher number of programmes would normally tend to apply the ABC system more easily than small-sized companies.

To investigate whether there is diversity in the types of product diversity (in terms of number of courses offered) at these TVET colleges under investigation, the participants were asked the following question:

1. *How many courses does the college offer?*

Case A (Umfolozi TVET College)

Umfolozi TVET college participants' reported this college offers 40 programmes which are divided into NC(V), NATED and skills programmes.

In this respect one of the participants (A1), said:

"There are lot of skills programmes, the courses are divided into ministerial courses which are probable say 40 programmes".

Case B (Umgungundlovu TVET College)

From Umgungundlovu TVET college participants' responses and their website (www.studentroom.co.za/umgungundlovu-tvet-college-UFET), it turned out that this college has 20 programmes/ courses which are divided into NCV, NATED and skills programmes.

Case C (Thekwini TVET)

From responses of participants at this college and their website (www.studentroom.co.za/thekwini-tvet-college), the college has 20 courses, which are also divided into NC(V), NATED and skills programmes. This study considers the college with more than 11 courses/ programmes as a college that offers diversified courses.

Case D (Elangeni TVET)

From the responses the participants and their website (www.studentroom.co.za/elangeni-tvet-college), it was found that Elangeni TVET offers 22 courses/ programmes. This finding confirmed that this college is highly diversified in respect of the number of courses, and is a candidate for ABC adoption.

Case E (Majuba TVET)

From the responses of the participants at this college and the college website (www.studentroom.co.za/majuba-tvet-college) this college offers more than 11 courses, and therefore, is a candidate for ABC adoption.

Discussion:

From the responses of the participants in all five TVET colleges and their respective documentation, it is clear that the Majuba TVET college, Umfolozi TVET college, Thekwini TVET college and Elangeni TVET college have more than 30 courses offered and the Umgungundlovu TVET college has more than 11 courses offered. These findings suggest that

all these six TVET colleges are suitable candidates for adopting more accurate and advanced costing systems such as the ABC system.

The results of this study support the findings of Hashim (2015), since all these TVET colleges are considered as large colleges, although no college is an ABC user. Therefore, there is no positive correlation between product diversity and ABC adoption.

6.6.11 The general discussion and validation of the quantitative findings

To conclude this section, face-to-face interviews were conducted with five CFOs and five finance managers who involved in financial decision-making and are experts in accounting and have a good knowledge about these TVET college environment. The use of supporting data (semi-structured interviews) helped to explain the attitude and behaviour of participants and to verify particular details that had been supplied by questionnaire. The findings from questionnaire were verified because this method did not allow for exploration of emergent themes, it only relied on concepts and questions defined in advance and interviewer or interviewee was unable to diverge in order to pursue an idea in more detail.

The objective of these interviews was to validate the quantitative findings and open-ended questions from interview schedule was used to obtain fundamental themes in order to find professional answer to question raised in this study. They were helpful in modifying and validating the model developed in chapter 3 and the factors of adoption of the ABC system at TVET colleges.

From the responses of these participants, it was clear that all their responses matched the findings from the quantitative survey. No additional factors were added by these participants (who participated in the interviews) when compared to those factors mentioned in the survey questionnaire. However, there was no correlation found between product diversity and ABC adoption from responses from interviews of participants which was the case in survey.

By comparing the theoretical adoption factors for the ABC system gathered from the literature review and those factors that emerged from survey and with those factors that emerged from the five case studies, a substantial amount of consistency was found, after analyzing and deliberating on the data collected during the fieldwork. All the adoption factors that emerged from the analysis and deliberation of the data collected from the qualitative methods are the same as those in the quantitative method (see chapter 5). Although the findings from survey unable to reject or accept H4, this study is now able to reject H4: TVET colleges which have more production diversity are more likely to adopt ABC system than colleges which have less

production diversity based on the results emerged from interviewing the participants from five case studies (six public TVET colleges in KZN).

6.6.12 Summary

This chapter has presented the findings that emerged from the data collected from five case studies through face- to- face semi-structured interviews. It also detailed the factors that should encourage TVET colleges to adopt the ABC system.

The next chapter tests model developed in chapter 3 by testing all hypotheses posed in chapter 2, and it also shows how the results from chapter 5 support each of the nine hypotheses that were posed in chapter 2. The next chapter also presents conceptual framework for adoption of ABC applicable to TVET colleges (refer to figure 7.1).

CHAPTER 7: TESTING OF THE RESEARCH MODEL AND CONCEPTUAL FRAMEWORK FOR ABC ADOPTION

7.1 Introduction

Chapter three presented the new model of ABC adoption (see figure 3.6).This model constructs a logical flow of relationships that culminate with ABC success. The top part of the model represents organisational and behavioural factors that link to the adoption of ABC and bottom part of the model represents the technical variables that end up with ABC adoption. Therefore, this chapter shows how these results support the theoretical model developed in chapter 3 and how they support each of the nine hypotheses that were posed in chapter 2. This chapter also presents the conceptual framework for the adoption of ABC applicable to TVET colleges (refer to figure 7.1). The model suggests that, for success in adoption of ABC, the top and bottom variables should be addressed for the successful adoption and implementation of the ABC system. Various statistical analyses were used to examine and evaluate research model and hypotheses.

The first section of this chapter is organised as follows: section 7.2 reviews the research model developed in this study; section 7.3 examines the relationship of behavioural and organisational variables and technical variables and ABC adoption by testing the nine hypotheses; and last section presents the conceptual framework for the adoption of ABC.

7.2 Behavioural and organisational and technical variables and ABC adoption

This section presents and discusses the results of univariate and bivariate analyses of the underling relationship between the behavioural and organisational and technical variables and ABC adoption. Two methods have been utilised (chi-square tests and graph and tables) to establish whether the nine hypothesised variables are individually associated with ABC adoption. The discussion of factors individually and their association with the adoption of ABC systems are presented in the following sub-section.

7.2.1 Product diversity

This study sought to establish if product diversity (measured by number of courses offered at each college) has any significance for the adoption of ABC systems. It was expected that colleges that are offering diversified courses (11-30 and above 30) are more likely to adopt ABC than colleges that are offering less diversified courses (1-10). Table 5.40 showed that the relationship between product diversity and ABC adoption is insignificant (p-values are more than 0.05).However, table 5.35, table 5.36, table 5.37 and table 538 show that the relationship between product diversity and ABC adoption is significant. This finding concurs

with the finding that " the organisations with greater percentage of highly diversified products have full implemented ABC have full implemented ABC) than lowly diversified organisation" (Brown et al 2004; Bjornenak 1997; Cooper 1998; Clarke et al 1999; Abernethy et al. 2001; Alsaeed 2005; Chongrust 2005; Abusalama 2008; Elagili 2015). This study finds no correlation between the different number of products (number of courses and ABC adoption (refer to table 5.40), on the other hand, this study finds correlation between product diversity and ABC adoption (refer to table 5.35 to table 5.39). Based on table 5.35 to table 5.39, product diversity is an important factor to ABC adoption.

Based on the findings from questionnaire,this study is, therefore, unable to conclusively accept or reject H4 (refer to chapter 5). However, results that emerged from face-to- face interviews verified that there is no correlation between different number of products (number of courses) and ABC adoption.

7.2.2 Size of an organisation

The size of an organisation was also measured by the number of courses offered at each TVET college. This study sought to establish if the size of an organisation has any significance for the adoption of ABC systems. Colleges that offer many courses are more likely to adopt the ABC system. Table 5.21 shows that levels of agreements were higher than levels of disagreements and table 5.22 indicates a significant relationship between size of the college and ABC adoption. Based on this finding the null hypothesis is rejected (refer to chapter 5).This finding of study supports the argument that 'the size of the organisation is usually a factor in the rate of adoption of sophisticated cost accounting systems' (Innes and Mitchell, 1995, 1999; Bjornenak 1997; Van Nguyen and Brooks, 1997; Krumwiede, 1998; Clarke et al. 1999; Khalid 2003; Line et al 2001; Naranjo-Grill 2009; Abusalama 2008; Elagili 2015).

7.2.3 Cost structure/Level of overheads

This study hypothesised that the colleges which have a greater percentage of total cost as overheads are more likely to adopt ABC. It was expected that colleges with greater percentage of total costs as overheads are more likely to implement ABC than colleges with smaller percentage of overheads. Table 5.32.shows that the relationship between cost structure/ level of overheads and ABC adoption is significant (p-values=0.000)

This finding supports the literature findings (Cooper and Kaplan 1988; Cooper 1989b; Drury 2012; Mitchell 1994; Brown et al. 2004; Bjornenak, 1997; Nguyen and Books 1997; Baker 1994; Abusalama 2008; Elagili 2015) that the growth of overheads compounds the problematic distortion inherent in traditional costing systems.

7.2.4 Top management support

This study sought to establish if top management support has any significance for ABC adoption. It was expected that colleges which have top management support are more likely to adopt ABC than colleges without top management support. The chi-square test in table 5.27 shows that the relationship between top management and ABC adoption is significant (p-values as discussed under S2.6.3 and S2.6.4 are less than 0.05). Table 5.26 also indicated that thirteen (43.3%) respondents reported that training is not provided when a new system is introduced and seven (23.3%) respondents were in agreement with this statement. Eleven (36.7%) respondents reported that top management does not always provides adequate support when a new system or programmers are introduced, whereas seven (23.3%) respondents reported that top management always provides adequate support when new system or programmers are introduced. Thirteen (43.3%) respondents reported that top management does not always conduct proper skills audits to ascertain competency gaps before they introduce the new system, whereas 23.3% (7) of respondents reported that top management always conduct proper skills audits to ascertain competency gap before they introduce the new system. This findings indicates that there is a lack of top management support.

The results of this study support previous ABC studies which indicated that top management support is one of the contributory factors to success of the ABC system (Conger 1995; Majid and Sulaiman 2008; Elagili 2015).

7.2.5 Resistance to change

This study sought to establish if resistance to change has any significance for ABC adoption. It was expected that colleges with employees that are open to change will be more likely to adopt ABC than those colleges with employees who are resistant to change. The chi-square test in table 5.42 and table 5.43 show that the relationship between resistance to change and ABC adoption is significant (most p-values are less than 0.05). The results of this study support previous ABC studies which indicated that being open to change/innovation is associated with and identified as, being one of the factors for the successful adoption of ABC (O'Reilly et al. 1991; Baird et al. 2004). This findings study also supports Askarany et al. (2008) who argued that the organisations that adopt innovation policies were more likely to adopt the ABC system instead of the traditional costing system since the ABC provides them with more appropriate and detailed information required.

7.2.6 Internal champion support and innovation

This study sought to establish if internal champion support and innovation have any significance for ABC adoption. It was expected that colleges which have high internal champion support and innovative employees are more likely to adopt ABC than those which face less internal champion support. The chi-square test in table 5.45 shows that the relationship between internal champion support and innovation and ABC adoption is significant (p-value =0.001). The null hypothesis on internal champion support is rejected. This result supports the finding of Askarany (2006) who indicated that innovation can be a new managerial technology or service and can also be a change in the existing technology.

7.2.7 Training

This study sought to establish if training has any significance for ABC adoption. It was expected that training is a significant factor in the adoption of ABC systems. The chi-square test in table 5.57 shows that the relationship between training and ABC adoption is significant (p-value =0.027). Therefore, the null hypothesis is rejected. The results of this study support previous studies which indicated that training is the most important step in the implementation of ABC. To ensure that ABC is carried out flawlessly, there needs to be three sets of training programmes carried out for the administration (Gurses 1999; Elagili 2015).

7.2.8 Internal resources' availability

This study hypothesised that the colleges, which have adequate resources are more likely to adopt ABC (internal resources were measured by knowledge of ABC). It was expected that those colleges which have adequate resources are more likely to adopt ABC than those without adequate resources. The chi-square tests in table 5.51 shows that the relationship between internal resources availability and ABC adoption is significant (p-value =0.016). This means that there is positive correlation between internal resources availability and ABC adoption. Referring to table 5.47, twelve (40%) respondents were not familiar with ABC and their colleges have not adopted ABC, and eighteen (60%) respondents are familiar with ABC and their colleges have not adopted ABC system. This means that the null hypothesis is accepted (there is no relationship between resources availability and ABC adoption). Table 5.53 also shows that the relationship between resources availability and ABC adoption is not significant (all p-values are more than 0.05). Therefore, the null hypothesis is accepted.

7.2.9 Technical variables

This study sought to establish if technical variables (identification of major activities, grouping activities, assigning costs to activities and assigning costs of activities to cost object) have any significance for ABC adoption. It was expected that technical variables are more likely to

influence ABC adoption. The chi-square test (table 5.62) shows that the relationship between technical variables and ABC adoption is significant (three out of four p-values are less than 0.05). The chi-square test (table 5.64) shows that the relationship between technical variables and ABC adoption is not significant (all p-values are more than 0.05). Table 5.60 shows that the overall levels of disagreements were much higher than levels of agreement. Statement S2.7.2 shows that levels of agreements were much higher that levels of disagreement (73.3% of respondents were in agreement with this statement). This findings means respondents can enumerate all their daily tasks. Table 5.62 shows that .respondents are not able to in identify all major activities performed at a college. Based on the results, the relationship between technical variables and ABC adoption is significant.

7.3 Conceptual framework for adoption of ABC model in KZN TVET colleges

This section presents the conceptual framework based on the review of the available body of knowledge and results of this study (chapter 2, chapter 3, chapter 5 and chapter 6). The conceptual framework in this study was developed on the key issues and concepts identified through the literature review and the knowledge of the researcher of the phenomenon. This framework served as a basis of understanding and was based on the new knowledge gained from the CFOs and ADs finance interviews and survey conducted with the finance staff members at six KZN public TVET colleges. The framework acts as a guideline for the adoption of ABC at TVET colleges.

7.3.1 Conceptual framework for adoption of ABC costing model in TVET colleges

The conceptual framework that guides the adoption of the Activity-Based Costing model at TVET colleges in KwaZulu-Natal is grounded in the vision of costing the programmes whereby TVET colleges seek to measure the costs associated with delivering a given academic programme. The conceptual framework was developed on key issues and concepts identified in the literature review and the research findings. Furthermore, this conceptual framework is developed to explain the methods by which TVET colleges track costs associated with their academic programmes. The conceptual underpinning of costing programmes at TVET colleges emphasises focusing on activities performed to deliver academic programmes. Costs of the programme are traced from the activities to products based on each product's consumption of activities. This conceptual framework acknowledges that products or services do not directly use up resources; they use up activities. In order to get the basics right, the identification of costs based on activities is considered a critical starting point in the implementation and adoption of ABC.

In keeping with the goal of effective and efficient costing of academic programmes, adoption of ABC in TVET is guided by four principles:

- Identifying activities
- Grouping and aggregating activities
- Assigning resources to activities
- Assigning the cost of activities to cost objects

Figure 7.1 provides a visual representation for the adoption of ABC and its relationship to central office, campus, departments, activities performed in each department, and programme, cost per programme/cost per student.

Figure 7.1: Proposed Conceptual Framework for Adoption of ABC Model in TVET Colleges
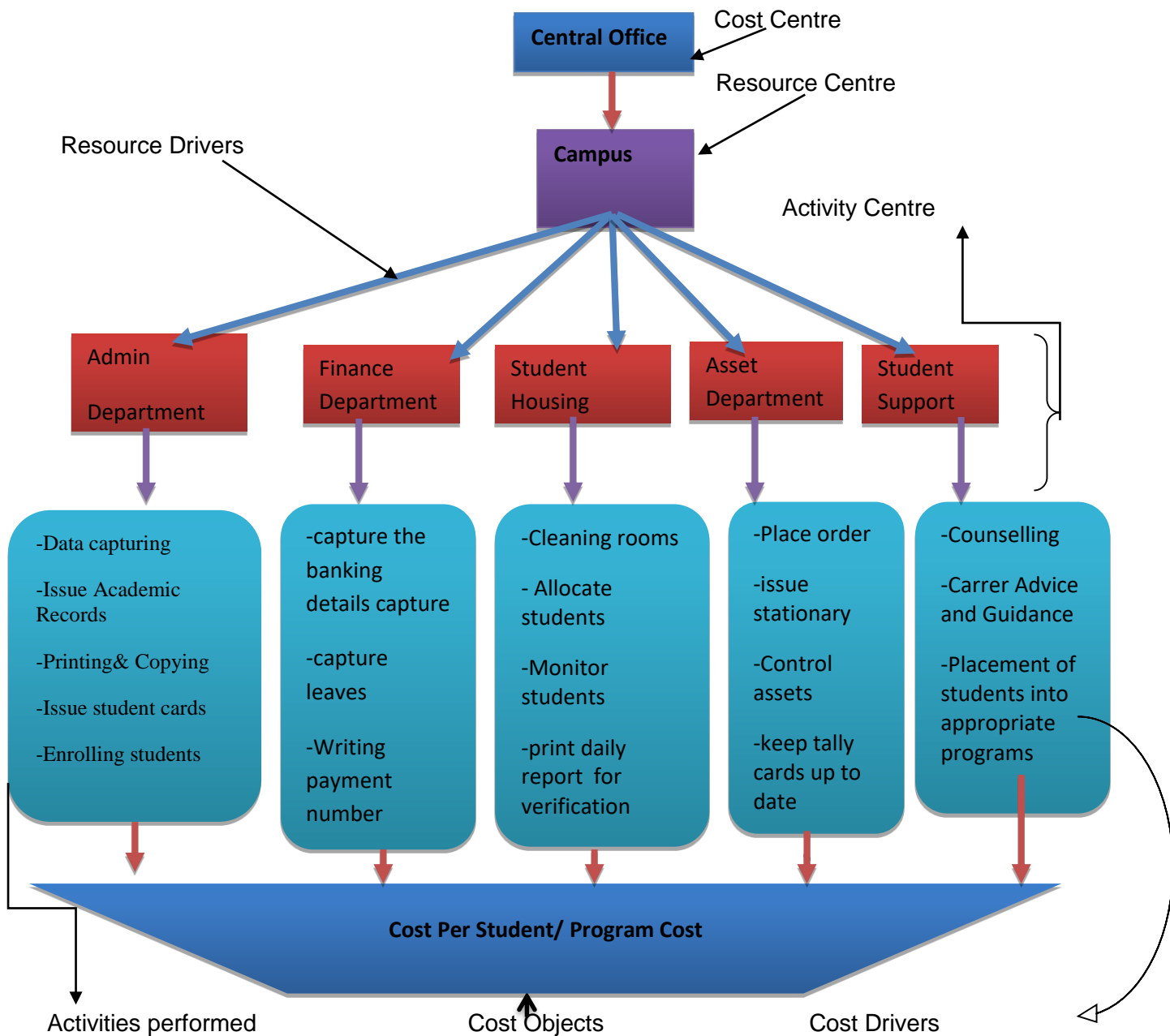
From the above conceptual model, it can be seen that the resource driver is also used to disseminate the campus budget to other sub divisions of the campus. The resource driver disseminates each cost element to other activity centers within a campus, such as the administration department, finance department, housing department, etc. The allocation of cost to each activity center depends on activities that are performed. In this model, is easy to eliminate activities that are not related to the specific cost elements, as those activities do not add value to the ultimate goal of the department. However, this was not the case under the current costing practices of TVET colleges whereby cost pools were not classified according

to the activity performed by each activity center. The TVET colleges' traditional costing systems do not eliminate non- value- added activities and, thus, this method does not give accurate or 'true' cost information to the department head to have better control over the costs.

7.3.2 Explanation of each of the four guiding principles:

Identifying activities: At TVET colleges, a collection of activities is involved in bringing out a final cost product/cost per programme. The core activities of TVET colleges constitute the overwhelming majority of the categories of direct instruction and administration departments. Other academic support includes the libraries, computer labs, asset department, student support and general maintenance activities. To identify all the major activities of TVET colleges, the activity dictionary in appendix I and functional decomposition in figure 3.4 are used. Functional decomposition starts with dividing college into campuses and then each campus into departments, In this way, it is easy to identify all major activities performed across the board. On the other hand, activity dictionary lists and defines all major activities performed in an organisation and provides a work activity description for each task.

Grouping and aggregating activities: The number of actions performed at TVET colleges is so vast that it is economically not feasible to use a different cost drivers for each action. This conceptual framework is based on the activity centre (department) to aggregate actions into activities, and the single driver is used to allocate the cost those activities to cost objects. For instance, for capturing students' marks, verifying marks and capturing students' attendance, the number of registered students is a cost driver, this cost driver is aggregated under data capturing. An activity centre (i.e. administration department) is a collection of related activities, such as those in the administration department. The activities at TVET colleges in KZN, are grouped into departments to answer the following questions about the work of each department. These are: what work is performed in the activity centre (department)?; and which activities consume most of the resources of the department?

Assigning resources to activities: This is the next step after the activities have identified and aggregated at TVET colleges. Overhead costs are assigned to each activity using the first-stage drivers, which link spending and expenses, as captured in the general ledger system, to the activities performed. In assigning the resources of TVET colleges to activities appendix J is used. This model assumes that the costs (resources) are assigned to each activity, using percentages as the activity driver. For example, the administration department uses (4.17/8.88) 50% of computers, data capturers, printing papers and cartridges (resources) in capturing students' marks. Therefore, 50% of the costs (resources) of the data capturing section can be allocated/ assigned to capturing student marks at TVET colleges.

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Assigning the cost of activities to cost objects: This conceptual framework assumes that the costs of activities are traced to cost objects by means of activity drivers. The second-stage cost driver will used as the method of assigning the activity cost to the cost object in this model. The total costs of the teaching department would be assigned to respective programmes (cost object) using the number of students that are enrolled in each programme as the driver. The costs per student would be calculated by dividing the total cost of the programme by the number of the students enrolled. However, different drivers would be used to assign the costs for another department. The analysis of departmental activities is the first step in designing the system. For this study, the analysis of the division of activities focuses at campus and the activity classification is shown in Appendix J.

7.4 Summary

The core activities of TVET colleges constitute mainly the categories of direct instruction and administration departments. Other academic support includes the libraries, computer labs, asset department, student support and general maintenance activities. The literature review helped to explore and analyse of current costing practices at TVET colleges and their limitations in the effective allocation of costs per programme. Chapter 2 and 3 helped in identifying the research gaps and developed the conceptual framework of this study.

This study has sought to answer one question in this section. This question is "which factors constitute barriers to ABC adoption at TVET colleges in KZN?" These factors are: product diversity, size of organisation, cost structure, top management support, resistance to change, internal champion support and innovation, training, internal resources availability and technical variables.

Based on the model developed in chapter 3, nine variables and their hypothesised relationships with ABC adoption have been examined in the first section of this chapter. Previous studies are not unanimous in their support of the impact of the individual variables upon ABC adoption. This study provides support for seven out of the nine identified variables that potentially impact on ABC adoption. The results of this study show a strong significant association among seven variables (cost structure/ level of overheads, resistance to change, internal champion support and innovation, training, top management support, size of organisation, product diversity and technical variables) and ABC adoption. Although, this study was unable to reject or accept H4 based on data gathered from questionnaire, there was no significant association found between product diversity and ABC adoption from the data emerged from face-to-face interviews. There was no significant association found between internal resources availability and ABC adoption in the current study.

The research model suggests that, in the adoption of ABC, likely behavioural and organisational variables and technical variables are at work. These are the variables which are appropriate or useful for the company to adopt ABC. This model suggests that the organisations which identified and addressed only behavioural and organisational variables may fail to overcome implementation issues. The model has identified both factors in order to overcome implementation issues; it established the extent to which technical factors play a part in ABC adoption and implementation. The objective of testing the ABC model in this chapter was to review the contingency theory as it has been applied to the design of management accounting systems.

The contingency theory has been applied in this study as a means of explaining organisational and behavioural and technical variables, and suggesting that ABC adoption is contingent upon factors, such as size of the college, top management support, cost structure, product diversity, resistance to change, internal champion and innovation, internal resource availability, training and technical variables. This study therefore found that the management accounting system (ABC system) is contingent upon size of the college, top management support, cost structure/ level of overheads, resistance to change, internal champion and innovation, training and technical variables. This study found that the management account system (ABC system) is not contingent upon internal resources availability and product diversity.

The next chapter provides the final conclusions relating to hypotheses, and considers the contribution of the study, limitations of the study and provides avenues for future research.

CHAPTER 8: CONCLUSIONS, CONTRIBUTIONS, AND FUTURE RESEARCH

8.1 Introduction

The new ABC model of this study based on the constructs that emerged from the existing literature (Chapter 2) was developed in chapter 3 (refer to figure 3.6). The research questions in chapter 4 , hypotheses were posed in chapter 2, and the model was tested with data from a survey of six public TVET colleges in KwaZulu-Natal in chapter 7. In order to achieve the objectives and to answer the research question of this study, the survey and multiple embedded case studies were chosen as the most appropriate research strategies. Thirty (30) questionnaires were delivered to finance staff members and these questionnaires were validated by interviewing five Chief Financial Officers (CFOs) and five Finance Managers/ Assistant Directors (AD) in finance departments from five public TVET colleges in the KwaZulu-Natal province. The appropriate methodology for this research was selected after a review of the literature on the research topic, setting of the aims and objectives, along with an examination of the literature on research methodology. The findings are based on the aim and objectives of the study, which are outlined below:

The main aim of this study was to develop a conceptual framework for the adoption of Activity-Based Costing model in KwaZulu-Natal TVET colleges. The following are the objectives of the study:

- To determine the current practices of the costing model at TVET colleges in KwaZulu-Natal;
- To investigate factors that constitute barriers to ABC adoption at TVET colleges in KwaZulu-Natal;
- To analyse adoption methodologies that might be applicable to TVET colleges in KwaZulu-Natal; and
- To develop a conceptual framework for the adoption of Activity-Based Costing model in TVET colleges in KwaZulu-Natal.

The research question was formulated and described. The research question addressed in this study is:

- Is the adoption of ABC by KZN TVET colleges associated with specific behavaioural and organizational variables and technical variables?

The quantitative data were examined using various statistical analyses (univariate and bivariate) deemed appropriate to the nature of the data and the research model.

The critical literature review is discussed in chapter 2 and chapter 3. The following aspects were examined in the literature review: deficiencies of conventional costing system; development and evolution of ABC; The two-stage of overheads allocation process in ABC; steps of ABC implementation; The application of ABC in public organisations; the application of TCS in the Higher Educations Institutions; comparing TCS and ABC systems; benefits of ABC at TVET colleges; the current practices of costing systems at TVET colleges in South Africa and factors that constitute barriers to ABC adoption. The review of adoption factors assist in identifying the factors that assist in adoption of the ABC system as identified in the literature published since 1987. These factors are size of organisation, product diversity, cost structure/level of overheads, top management support, internal resources availability, internal champion support and innovation, training, resistance to change and technical variables. These factors were used as a guide in collecting the relevant data for the study.

8.2 Theoretical and methodological contribution

The success of this study can be determined by the ability to contribute to the body of knowledge and practice (Missa 2013:252). This study has ultimately developed conceptual framework for the adoption of ABC to increase ABC adoption rate at TVET colleges. It is this aim that has informed the contribution of this study to the body of knowledge and practice in the field of management accounting.

Thereafter, this study developed a new ABC model, the new ABC model that seeks to incorporate behavioural and organisational factors to contingency theory was also developed. This study contributed to the existing management accounting literature by developing a conceptual framework for the adoption of ABC and incorporated technical variables, which may act as a barriers to ABC adoption into contingency theory. The conceptual framework developed in this study benefits various studies relating to ABC adoption to identify and solve technical variables such as difficulties in identifying activity centres, cost drivers and in assigning costs to activities. To the best of the researcher's knowledge, this study is the first to be carried out at public TVET colleges in KZN, and other public TVET colleges in South Africa. Subsequently, this study provides a basis for the development of scientific research in this area, and contributes theoretical and methodically to management accounting literature.

Moreover, little attention has been paid to ABC system in the higher education institutions in South Africa in general, and Africa, in particular. Therefore, this study will add to the body of knowledge in this sector (DHET) because it relates to the factors that assist in the adoption of the ABC system in the higher education sector in South Africa.

This is the first study with mixed methods (survey and multiple embedded case studies) study that addresses and develop the ABC model and conceptual framework for adoption of ABC in South African public TVET colleges, and all institutions of higher education in South Africa. This study has attempted to narrow the gap in knowledge within South African TVET colleges by providing an empirical understanding of factors that assist in the adoption of the ABC system within this environment.

8.3 The Main research outcomes

This section focuses on the findings presented in chapter five and chapter six and formulates conclusions of the study based on the objectives that were set out in chapter one. The questionnaire was structured to achieve the stated objectives and the interview schedule set out to achieve the stated objectives and validate the findings of this study..

8.3.1 Research findings on survey

This section focuses on the findings presented in chapter five and formulates conclusions of the study based on the objectives that were set in chapter one. The questionnaire was structured to achieve the stated objectives. The findings were based on the objectives, which are outlined below.

Objective 1: To determine the current practices of the costing model at TVET colleges in KwaZulu-Natal.

This objective was meant to determine how indirect costs are spread among the programmes within these public TVET colleges in KZN.

The literature review provided an understanding of the application of traditional costing system (TCS) at TVET colleges and the allocation of overheads within TCS and the results in chapter 5 revealed the following to answer objective 1:

- **Allocation of overheads under costing system currently in use at TVET colleges**

The findings of this study indicate that these TVET colleges use the number of students as a cost driver when spreading their overhead costs among the programmes offered at their colleges. The respondents indicated that the programme with most students consumes a higher percentage of the college's budget.

All respondents indicated that office administration (which is under business studies) and electrical engineering (which is under engineering studies) have the highest number of students at these TVET colleges and tourism has the lowest number of students. These

programmes (office administration and electrical engineering) are also consuming a higher percentage of the colleges' budget.

Respondents were also in agreement with the statement that 'the overhead costs are spread to each campus under current costing model based on size of the campus.

Based on these results, it is evident that these TVET colleges spread their overheads costs according to the number of students.

- **Accounting and management techniques utilised at TVET colleges**

The findings of this study indicate that TVET colleges are still using traditional costing systems, as the respondents indicated that their colleges are not using ABC systems. The literature review revealed that the use of volume-related OAR is inappropriate as resource consumption varies with activities and not volume (Charaf & Bescos 2013).

- **Methodology used to determine the funding of each campus at these TVET colleges**

The findings of this study indicate that the latest enrolment and registration statistics is mainly used to allocate funds to each campus. Hence, colleges rely on the number of students when determining the funds of each campus.

- **The accurate and adequate information provided by accounting and management techniques currently in use at TVET colleges**

The findings indicate that the accounting and management techniques used at TVET colleges do not provide adequate and accurate information.

More than fifty percent (56.7%) of respondents agreed that the current accounting and management utilised at their TVET colleges does not provide adequate and accurate information since the budget is not always adequate and runs out before the year-end. Respondents also indicated that the income from tuition fees is minimal and hardly covers the actual costs of teaching and learning.

From the above results, it is noticed that student numbers and size of the campus are the common drivers used at these colleges, and it can be concluded that, TVET colleges are still using the traditional costing system since volume-related bases (number of students and size of the campus) are used in the second- allocation stage, to assign costs from cost centres to products. The costing systems currently in use in these TVET colleges are not efficient. Therefore, a new costing system, such ABC is needed. This study established that traditional costing system produces inaccurate programme costs since they use a single overhead

absorption rate, as more than half of respondents (56.7%) agreed that the costing system currently in use at their TVET colleges produces misleading costs , which result in budget running out before the year end.

- **Level of Activity-Based Costing adoption at TVET colleges**

The findings indicated that ABC has not been adopted at the TVET colleges in South Africa, as 60% of respondents indicated that, there is no consideration of ABC to date at their TVET colleges. Tertiary institutions are still using traditional costing systems to allocate overheads costs to the programmes. This study found that TVET colleges were satisfied with the system of allocating overheads, despite the fact that this system were reported to produce distorted programme costs. Although the ABC system produces accurate programme costs, very few respondents (10%) implemented ABC in selected areas, with 90% indicating that their colleges are still using TCS (refer to table 5.10). This findings suggests that South African public TVET colleges are unaware of the benefits of using ABC.

- **Pearson's correlation tests**

The Pearson's correlation tests were found with the following:

> - The way of preparing income budget by central office (S1.5.4) correlate with the use of student size to allocate costs for the programme (S1.5.2).
> - The apportionment of overhead costs as per campus size (S1.5.5) correlate with the number of students is used to allocate costs for the programme (S1.5.2).
> - Under the costing system, the budget is always adequate and never runs before year-end (S1.12.1) correlate with the budget is allocated to each campus as per number of students (S1.5.1).
> - Income from tuition fees is minimal and hardly covers the actual costs of teaching and learning (S1.12.2) correlate with uses of number of student to allocate budget to each campus (S1.5.1).
> - Being open to the new system (S2.5.3) correlated with the way of preparing an income budget in these TVET colleges (S1.5.4).
> - Being open to the new system (S2.5.3) correlated with the apportionment of overheads cost as per size of each campus (S1.5.5).
> - Being open to new system (S2.5.3) correlated with income from tuition fees is minimal and hardly to covers the actual costs of teaching and learning (S1.12.2).

> ➢ Being open to new system (S2.5.3) correlated with up-to-date and very functional of the current costing system (S1.12.4).

Objective 2: To investigate factors that constitutes barriers to ABC adoption at TVET colleges in KwaZulu-Natal

The research findings show that eight out of nine factors assist in the adoption of the ABC system, and there is positive correlation between these seven factors and ABC adoption. There was no correlation between internal resources availability and ABC adoption. The ABC model developed in chapter 3 (see figure 3.6) revealed that the following factors exist at all these for the adoption of the ABC system, for the following reasons:

- **The lowest of overheads as the cost structure adoption factor**: It is observed Service overheads of these colleges are between 10% to 20% of total college's costs, Table 5.29 and table 5.32 shows that the relationship between cost structure/ level of overheads and ABC adoption is significant (p-value=0.013). Based on these results, the null hypothesis is rejected (there is a relationship between the cost structure and ABC adoption). This study confirms that the organisation with a higher percentage of overheads in their cost structure require an advanced costing system to avoid cost distortion.
- **Top management support adoption factor**: At these TVET colleges, a lack of top management support is a reason for non-adoption of ABC within these TVET colleges. This study confirms that top management support is important for using the ABC systemTherefore, ABC cannot be successful without commitment from senior management, as the adoption of ABC requires considerable resources which require managerial approval.
- **Resistance to change (RTC) adoption factor**: The results of this study support previous ABC studies which indicated that being open to change/innovation is associated with and identified as being one of the factors for the successful adoption of ABC.
- **Internal champion support and innovation adoption factor:** This study indicated that internal champion support and innovation are significant for ABC adoption.
- **Training adoption factor:** This study indicated there is a significant relationship between training and ABC adoption.
- **Technical variables (identification of major activities, grouping activities, assigning cost to activities and assigning costs of activities to cost object):** This study indicated that there is positive relationship between technical variables and ABC adoption.

- **Product diversity**: This study indicated that there is no significant relationship between product diversity and ABC adoption.
- **Size of the college**: The findings of this study support previous studies which indicated that the size of an organisation is associated with and identified as, being one of the factors for the successful adoption of ABC.
- **Internal resources' availability**: The findings of this study indicated that there is no significant relationship between internal resources availability and ABC adoption.

Objective 3: To analyse adoption methodologies that might be applicable to TVET colleges in KwaZulu-Natal

This objective was achieved by synthesising the results in objective One and objective Two. An extensive literature review was done (see chapter 3) and the findings of this study were presented in chapter 5 and chapter 6. The methodologies applicable to TVET colleges were analysed and developed in chapter 3.

The appendix I lists all major activities performed at TVET colleges and their definition. The activity dictionary helps TVET Colleges in selecting measures 'drivers' and provides a good guide to adoption and implementation of Activity-Based Costing.

- Figure 3.4 divides larger administration into major activities, in order to identify each activity of a department. This is the basic principle of ABC. Based on the above, seven activities are performed in administration department: capturing students' marks, capturing students' attendance, verifying marks, printing and copying, preparing the entry test, issuing student cards and issuing fee statements. These activities will enable TVET colleges to achieve suitable and economical activities. Turney (1996) argues that it is important to identify each of these activities separately because the effort required to capture student's marks may differ from effort needed to verify marks.
- Figure 7.1 that acts as the guide for adoption of ABC system at KZN TVET colleges
- Appendix J as the method of assigning overheads cost to each activity performed at TVET colleges using the first stage drivers, which link spending and expenses as captured in the general ledger system. This appendix J provides a guide for a costing method by providing some cost allocation techniques from a wider range of TVET college specific activities that provide a valuable insight for management of a college

8.4 Research findings on face-to face semi-structured interviews

This section focuses on the findings presented in chapter 6 and formulates conclusions of the study based on the objectives that were set in chapter one. The face-to-face semi-structured

interviews were structured to validate results derived from hand-delivery census survey. The qualitative data were analysed systematically by using thematic analysis (by coding the data, categorising codes into themes and summarising the findings at various stages).

In this study, qualitative data were used in order to enhance the validity of data gathered from the quantitative data. Moreover, the qualitative data were also used to validate the ABC model developed in chapter 3. All factors emerged in survey (quantitative data) exist in all five cases (qualitative data) and thus signify that the following adoption factors are also supported (confirmed) by qualitative method.

- **The cost structure/ level of overheads**:

The data gathered from face-to-face interviews found the cost structure is significant associated with the adoption of ABC system.

- **Top management support**

In the face-to-face interviews it was also found that the top management support is a very significant factor assists in ABC adoption.

- **Resistance to Change (RTC)**

The results of interviews indicated that resistance to change is significant associated with ABC adoption.

- **Internal champion support and innovation**

The data gathered from face-to-face interviews indicated that internal champion support and innovation has any significant for ABC adoption.

- **Training**

In the face-to-face interviews conducted it was found that training is significance for ABC adoption and there is significant relationship between training and ABC adoption.

- **Technical variables**

The results of face-to-face interviews indicated that technical variables are significance for ABC adoption. There is positive relationship between technical variables and ABC adoption.

- **Product Diversity**

Although, the results from survey questionnaire were unable to reject or accept H4, the results from face-to-face interviews found correlation between product diversity and ABC adoption.

- **Size of the college**

The data gathered from interviews indicated that the is positive relationship between training and ABC adoption.

There was no relationship found between internal resources availability and ABC adoption.

This findings validate findings from quantitative method and this section presented the findings that emerged from the data collected from five case studies. Face-to- face semi-structured interviews were to support census survey findings.

8.5 Research findings on objective 4

This section focuses on the findings presented in chapter 5 and chapter 6 to formulate conclusions of the study. The survey and interviews were conducted to achieve the last objective presented in chapter four. This study indicated that the use of functional decomposition (figure 3.4) and standard activity dictionary (appendix J) could help finance staff members to improve their competence. Therefore, finance staff members should guide other employees about the use of the standard activity dictionary and functional decomposition as methods of identifying activities performed at their TVET colleges. After the survey and interview were conducted the functional decomposition and standard activity dictionary were developed as the methods of identifying activities of these colleges (refer to figure 3.4 & appendix I). The impact and the contribution of functional decomposition and standard activity dictionary as methods of identifying major activities are shown in following the sub-sections. The model of ABC (see figure 3.6) and conceptual framework were developed to assist in the adoption of ABC at these TVET colleges.

8.5.1 The impact of functional decomposition on identifying activities

The functional decomposition (see figure 3.4) enables finance staff members to divide larger divisions into major activities. This is the basic principle of ABC. The identification of many activities in each department will enable TVET colleges to achieve suitable and economical activities.

8.5.2 The impact of standard activity dictionary on identifying activities

It was evident that standard activity dictionary (refer to appendix I) enables finance staff members to list all major activities performed in TVET colleges and their definition, this activity dictionary helps TVET colleges in selecting measures 'drivers' and provides a good guide to the adoption and implementation of Activity-Based Costing.

The finance staff members learn how to identify major activities at their colleges using functional decomposition and the standard activity dictionary. This is a significant contribution of this study in terms of the development of a new method of identifying activities performed at public TVET colleges. Based on the findings on survey and interview this study also develop a new method of allocating resources to activities performed at public TVET colleges (refer to Appendix J).

8.6 Further Contribution to Knowledge

This research study makes the following contribution of new knowledge to the existing knowledge in the area of costing programmes using ABC at TVET colleges in South Africa:

- One of the main contributions to knowledge is the development of a new ABC model applicable to TVET colleges on adoption factors of the ABC system that assist in the implementation of the ABC system. This model had not existed previously in the literature. Therefore, the researcher believes that many organisations can benefit from this new model developed in this study particularly, those wishing to adopt the ABC system;

- A unique conceptual framework for adoption of ABC has been developed as the new method of addressing technical variables that act as a barrier in ABC adoption;

- This study addresses the lack of empirical studies on the adoption of the ABC systems in South African public TVET colleges; and

- This study provides useful resource for both researchers and practitioners who have an interest in understanding the design of ABC and adoption factors for the ABC system.

8.7 Limitation of the Research

This section looks at the limitations of the study in respect of what could have been done different other conditions permitting.

Yin (2009) points out that every research is limited by the constraints placed upon the researcher. This research is no exception. However, in this research, every effort was made to ensure the gathering of highly reliable and valid data to achieve the research aim and

objectives. Even with such research effort, it was not possible to control all the influences that were likely to affect the quality of the research.

Although, if adopted, ABC implementation would take place in all TVET colleges, this study focused on the adoption of ABC within six public TVET colleges in KZN and this limited the scope of the study. The findings of this study can only be representative of ABC implementation by KZN TVET colleges and therefore, cannot be generalised to the other 50 public TVET colleges and other higher education institutions in South Africa.

There is a lack of literature on the ABC system's usage within the public TVET colleges in South Africa. This issue was considered as a limitation of the research. Moreover, there is also little literature on such studies conducted within African public TVET colleges and all other institution of higher education within South Africa TVET. The small sample of respondents was significant limitation in this study and from analytical perspective,small sample increases the likehood of type 2 error skewing the results, which decrease the power of the studyand also restricts the ability to confirm the findings of this study. However, the face-to-face interviews were used to compensate small sample limitation.This study also unable to conclusively establish the influence of DHET on the adoption of ABC system, the question of whether there is statistically relationship between DHET support and ABC adoption remained unanswered. These are deemed limitations and could have been addressed other conditions permitting. However, the research findings can be generalized from the TVET colleges in KZN to other TVET colleges that have a similar internal and external environment.

8.8. Suggestions for future research

The findings of this research have exposed to some loose ends that could not be answered conclusively by the data and considering the limitations of this study as outlined above, the following research areas are being put forward as suggestions for further research:

- Further empirical research should be conducted using case study and survey of all 50 public TVET colleges in South Africa (suitable sample size to avoid the likehood of a type 2 error) to detect the difficulties and barriers that prevent the adoption of the ABC system;
- The ABC model and conceptual framework developed in this study should be assessed in a specific user sector, particularly the government sector, or in specific country.

- An empirical study at South African public TVET colleges to compare the actual results according to both the traditional costing system and the activity-based costing system in order to verify the accuracy of determining the cost and benefits of the ABC system.
1. It is also recommended to conduct empirical study in South African public TVET colleges to determine the impact of DHET support in adoption of ABC system.
2. It is recommended to further test and validate a conceptual framework this study developed in order to be used a policy instrument to guide implementation of ABC system.

8.9 Conclusion

The study aimed at developing a conceptual framework for the adoption of an ABC in KwaZulu-Natal. This conceptual framework guides the adoption of ABC in KwaZulu-Natal and is grounded in the vision of costing the programmes whereby TVET colleges seek to measure the costs associated with delivering a given academic programme. The conceptual framework is developed in effort to explain the methods by which TVET colleges track costs associated with their academic programmes.

This study also developed ABC model, the assumption underlying the model is that other factors also contribute to success of ABC system. The model also includes hypothesised determinants of ABC adoption (i.e., size of organisation, top management support, cost structure, product diversity, resistance to change, internal champion support and innovation, internal resource availability, training and technical variables) have significant paths linked to ABC adoption. The eight out of nine factors were found related to ABC adoption and there was no relationship found between internal resources availability and ABC adoption.

This study also determined the current practices of costing model current in use at TVET colleges in KwaZulu-Natal. This study confirms that public TVET in KZN are still using traditional costing systems and they use uniform cost driver such as number of student when allocating overhead costs to each programme. In analysing adoption methodologies that might be applicable to TVET colleges in KZN TVET colleges, this study found that traditional costing systems that are currently in use at KZN public TVET colleges are not efficient since the budget runs out before the year-end. This ABC system was found applicable to these TVET colleges and conceptual framework was developed as the guide in adoption ABC in these colleges.

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APPENDIX A: COVERING LETTER: FINANCE STAFF MEMBERS
Dear Sir/ Madam

I am working towards a Masters of Accounting Degree through the faculty of Accounting and Informatics at Durban University of Technology (DUT). Despite the high profile of Activity – Based Costing (ABC), there is fairly low rate of implementation and only three education and training sectors in the world are ABC users. In an attempt to investigate these issues, I am currently conducting a census study in nine public Technical Vocational Education and Training (TVET) colleges in KwaZulu-Natal. This study is under the supervision of Dr Paul Green.

I would appreciate it if you give approximately 20 minutes to complete this questionnaire and submit it at your earliest convenience. Your response to the questionnaire will be invaluable and contribute to the overall success of the research. It is important to note that all sections of the questionnaire are relevant to you. This study will be conducted in accordance with ethical approval provided by DUT Institutional Research Ethics Committee.

Should you have any queries regarding Research questionnaire please contact the researcher, Mziwendoda Madwe on 0718406323, or my supervisor, Prof Paul Green on(033)8458804,or the Institutional Research Ethics Administrator on(031)3735599.

Thank you in advance for your cooperation.

Yours Sincerely

MC Madwe

LETTER OF INFORMATION

APPENDIX B: IREC – LETTER OF INFORMATION AND CONSENT: FINANCE STAFF

Title of the Research Study: Adoption of Activity-Based Costing at Technical and Vocational Education and Training in Kwazulu-Natal.

Principal Investigator/s/researcher: Mr Mziwendoda Cyprian Madwe

Co-Investigator/s/supervisor/s: Prof L J Stainbank (PhD)/Prof PG GREEN (PhD)

Brief Introduction and Purpose of the Study:

To establish why Activity-Based Costing (ABC) non-adoption rates are high in Technical and Vocational Education and Training (TVET) given the claimed benefit of the system with the aim of developing a conceptual framework for the adoption of the Activity-Based Costing in TVET colleges.

The research objectives of the study are to:

(1) To determine the current practices of costing model at TVET Colleges in KwaZulu-Natal.
(2) To investigate factors that constitutes barriers to ABC adoption at TVET colleges in KwaZulu-Natal.
(3) To analyse adoption methodologies that might be applicable to TVET colleges in KwaZulu-Natal.
(4) To develop a conceptual framework for the adoption of an Activity-Based Costing model in TVET colleges in KwaZulu-Natal.

Outline of the Procedures:

The research design will assist the researcher to achieve objectives as fully and accurately as possible. For the purpose of this research, mixed methods will be used which is both quantitative and qualitative method to collect data. The researcher will send a letter of consent to all respondents which will request them to partake in the study. Questionnaire will be distributed by emails and the researcher will follow up by phoning all respondents to ensure that all emails are received. Questionnaires to be designed in such a way that only close questions will be used. Questionnaires for end-users (Finance staff members) will have close-ended questions. Respondents will be given 5 days to complete and return questionnaires, after which time a reminder will be sent by email and telephonically. If there is a poor response after a week then the researcher will personally visits finance department to encourage them to return questionnaires. The researcher will emphasize to respondents that all comments will be treated as confidentially, all respondents will remain anonymous.

Risks or Discomforts to the Participant: Not applicable

Benefits: The benefits of this study, it will be made available through publication in accredited peer-reviewed journal; presentations at local and international conferences and also seminars and workshops given in workplace to assist all finance staff members.

Reason/s why the Participant May Be Withdrawn from the Study: There exist no adverse consequences for the participants if they chose to withdraw before or during the experiment as it is purely voluntary.

Remuneration: No remuneration will be paid to the participants.

Costs of the Study: The participants are not expected to cover any costs incurred.

Confidentiality: The data will remain under the ownership of DUT and TVET colleges. It will be kept for 5 years thereafter it will be disposed. Electronic data will be protected by passwords. The gather data will be treated as confidential and all respondents will remain anonymous.

Research-related Injury: Not applicable.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher (071 840 6323), my supervisor (033 84 58804.) or the Institutional Research Ethics administrator on 031 373 2900. Complaints can be reported to the DVC: TIP, Prof F. Otieno on 031 373 2382 or dvctip@dut.ac.za.

General:

Potential participants must be assured that participation is voluntary and the approximate number of participants to be included should be disclosed. A copy of the information letter should be issued to participants. The information letter and consent form must be translated and provided in the primary spoken language of the research population e.g. isiZulu.

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, _____ (Mziwendoda Madwe), about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: _REC 154/15_____,
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.

- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

_____   _____   _____   _____

Full Name of Participant   **Date**   **Time**   **Signature / Right**
Thumbprint

I, _____ (MC Madwe) herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Mziwendoda Madwe_____   _____
Full Name of Researcher   **Date**   **Signature**

_____   _____   _____

Full Name of Witness (If applicable)   **Date**   **Signature**

_____   _____   _____

Full Name of Legal Guardian (If applicable) Date   **Signature**

Please note the following:

Research details must be provided in a clear, simple and culturally appropriate manner and prospective participants should be helped to arrive at an informed decision by use of appropriate language (grade 10 level - use Flesch Reading Ease Scores on Microsoft Word), selecting of a non-threatening environment for interaction and the availability of peer counseling (Department of Health, 2004)

If the potential participant is unable to read/illiterate, then a right thumb print is required and an impartial witness, who is literate and knows the participant e.g. parent, sibling, friend, pastor, etc. should verify in writing, duly signed that informed verbal consent was obtained (Department of Health, 2004).

If anyone makes a mistake completing this document e.g. wrong date or spelling mistake a new document has to be completed. The incomplete original document has to be kept in the participant file and not thrown away and copies thereof must be issued to the participant.

References:

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APPENDIX C: SURVEY QUESTIONNAIRE: FINANCE STAFF

INTRODUCTION

Thank you for taking time to respond to this questionnaire.

The questionnaire is for a Masters study titled: **Adoption of Activity-Based Costing at Technical Vocational Education and Training Colleges in KwaZulu-Natal.** It will not take you longer than 15 - 20 minutes to complete.

Please mark the relevant box with a cross (X), and give brief responses where applicable.

Please be assured that your responses will be confidential and anonymous.

Personal information

1. Please indicate your gender		
Female	1	
Male	2	

2. Please indicate your Race Group		
African	1	
Coloured	2	
Indian	3	
White	4	

3. Please indicate your Age Group		
20-29 years	1	
30-39 years	2	

40-49 years	3	
50-59 years	4	
60-65 years	5	

4. Please indicate your highest qualification.		
Standard 9/ Grade 11 or Lower	1	
Senior Certificate (Grade 12/ Std 10)	2	
Certificate or Diploma	3	
Degree	4	
Post-Graduate Degree	5	
Other (specify):	6	

5. Please indicate in which section are you employed.		
Salary (Persal)	1	
Procurement	2	
Expenditure (Basic Accounting System)	3	
Accounts	4	
Norms & Standards (Budget)	5	

6. Please indicate your occupation.		
Financial Clerk	1	
Debtors' Clerk	2	
Other, Please specify:	3	

7. Indicate number of completed years of service with the college.

1-5 years	1	
6-10 years	2	
11-15 years	3	
16-20 years	4	
21 and above	5	

Census study on Activity –Based Costing System

Section 1: Assessing Current costing model at Technical Vocational Education and Training.

1. Please indicate the Department that has the most students at your college.		
Business Studies	1	
Open Learning/ Distance Learning	2	
Engineering Studies	3	
Human Resource Management	4	
Hospitality	5	

2. How many courses are offered at your college?		
1-10	1	
11-30	2	
More than 30 courses	3	

3. Please indicate the programme that has the most students at your college.		
Financial Management	1	
Tourism	2	
Business Management	3	
Management Assistant	4	
Electrical Engineering	5	
Office Administration	6	

4. Please indicate the programme, which consumes a higher percentage of the college's budget.		
Financial Management	1	
Tourism	2	
Business Management	3	
Management Assistant	4	
Electrical Engineering	5	
Office Administration	6	
Other, please specify:	7	

5. The costing model at Technical and Vocational Education and Training.					
1. Determining the costing model at TVET colleges	1Strongly Agree	2 Agree	3 Neutral	4Disagree	5Strongly Disagree
1. The college allocates the budget to each campus as per number of students.					
2. The student size is always used to allocate costs for the programme.					
3.The college has a tool used to identify all personnel costs and the tasks of each employee.					
4. Central office prepares an income budget, to determine fees for the following year, taking into account the expected number of students.					
5. The college's overhead costs are apportioned according to the size of each campus.					

6. Please indicate which of the following Accounting and Management techniques are utilised in your college?		
Standard Costing	1	
Process Costing	3	
Job Costing	3	
Activity-Based Costing	4	
Balance score card	5	
Budgeting	6	
Other Techniques (specify):	7	

7. Please indicate the approximate percentage of your total cost budgeted for each of the following.

(a) Direct material--------------%

(b) Direct material-------------%

(c) Service overhead---------%

Total   100%

8. The accounting and management techniques utilised in college provide accurate and adequate information as the budget is always adequate and never runs before year end.		
Yes	1	
No	2	

9. Please indicate which of the following is used to determine the funding of each campus in your college?		
Reported number of students enrolled.	1	
Related costs of the programme.	2	
Based on the number of programmes offered in each campus.	3	
Duration of the programme.	4	
Latest enrolment and registration statistics.	5	
Based on certification rate.	6	
Based on the size of the campus.	7	
Other, please specify:	8	

10. Please indicate, by ticking in appropriate box/es, which of the following are the divisions of your college.		
Student affairs	1	
Housing Division	2	

Administration and enrolment	3	
Examination	4	
Curriculum division	5	
Other, please specify:	6	

11. Please indicate which of the following are your college's tasks.		
Student personal counselling	1	
Orientating students	2	
Career Placement	3	
Allocating students to on campus residences/ off campus residences	4	
Enrolling students	5	
Issuing academic results	6	
Updating students' academic records	7	
Invigilating students	8	
Setting up of all IT system	9	
Curriculum design and development	10	

12. The allocation of costs under the current practices of costing model at TVET colleges					
2. Determining the efficiency of current costing system	1 Strongly Agree	2 Agree	3 Neutral	4 Disagree	5 Strongly Disagree
1. Under the current costing system, the budget is always adequate and never runs out before year end.					
2. In our college, the income from tuition fees is minimal and hardly covers the actual costs of teaching and learning.					
3. A new costing is needed as our college has limited grant funding from DHET.					
4. The current costing system is up-to-date and very functional.					
5. I fully understand and able to use the current accounting system.					

Section 2: Activity-Based Costing system (ABC)

1.Please indicate how familiar you are with Activity-Based Costing (ABC)? Please tick an appropriate box below.		
No knowledge	1	
General knowledge	2	
Extensive knowledge	3	
Expert knowledge	4	

2.Where did you first learn of ABC? Please tick an appropriate box below.		
University	1	
Professional Training	2	
Seminars or conferences	3	

In-house training	4	
On your own	5	
Other, please specify:	6	

3. What is the current level of ABC adoption in your college? Please tick an appropriate box below.

Full implementation of ABC	1	
Implemented ABC in selected areas	2	
Currently under consideration	3	
Rejected ABC after assessment	4	
No consideration of ABC to date	5	
Other, please specify:	6	

4. In your opinion, what problems will the college encounter during the implementation of ABC. Please indicate your response by ticking an appropriate box below.

A higher priority of other changes or projects	1	
Higher cost of implementing ABC	2	
Lack of commitment and cooperation among finance staff members	3	
Involves a great deal of work	4	
Takes up a lot of managers' time	5	
Difficulty in gathering data on cost drivers	6	
Difficulty in defining cost drivers	7	
Difficulty in designing system	8	
Difficulty in identifying activities	9	

If the college does not have a greater access to individual with knowledge to design and implement ABC.	10	
Other, please specify:	11	

5. The factors that constitute barriers to ABC adoption					
Internal resistance to a new system(ABC)	1 Strongly Agree	2 Agree	3 Neutral	4 Disagree	5 Strongly Disagree
1. I am open to a new system which reduces errors.					
2. I accept a system which leads to better adherence to policies and procedures.					
3. I am open to a new system if it allocates costs, and is more efficiently than the old way of doing things.					
4. I am open to a new system if adequate training is received.					
5. Often, I feel uncomfortable even about change that may potentially improve my life.					
6. When someone pressures me to change something, I tend to resist it, even if I think the change may ultimately benefit me.					
7. I sometimes find myself avoiding changes that I know will be good for me.					
8. Once I've come to a conclusion, I'm not likely to change my mind.					
9. I like to do the same old things rather than try new and different ones.					

10. If I were to be informed that there's going to be a significant change regarding the way things are done at work, I would probably feel stressed.					

6. Critical factors in Activity-Based Costing implementation					
4. Determining critical success factors for ABC implementation	1 Strongly Agree	2 Agree	3 Neutral	4 Disagree	5 Strong Disagree
1. If there is a new system intended to improve efficiency, I will encourage and support its implementation.					
2. Adequate training is always provided when a new system or programmers are implemented.					
3. Top management always provides adequate support when a new system or programmers are introduced.					
4. Top management always consult affected staff for their input and opinion before they introduce the new system.					
5. Top management always conducts proper skills audits to ascertain the competency gap before they introduce the new system.					

7. Technical variables that constitute barriers to ABC adoption					
5.Determining technical variables that constitute barriers to ABC adoption	1 Strongly Agree	2 Agree	3 Neutral	4 Disagree	5 Strongly Disagree

1. I can rank all the tasks of the college according to the college's divisions.					
2. Given an opportunity I can enumerate all tasks and duties I performed in my job (e.g. processing invoice, issuing invoice and balancing books).					
3. The college identifies and analyses various activities involved with providing services or teaching students.					
4. I can break down time spent on major activities at a campus level.					

8. The behavioural and organisational factors that constitute barriers to ABC adoption					
6.Determining behavioural and organisational variables that constitute barriers to ABC adoption	**1 Strongly Agree**	**2 Agree**	**3 Neutral**	**4 Disagree**	**5 Strongly Disagree**
1. The large-sized colleges are more likely to have access to individual with the knowledge to design a new system.					
2. The TVET colleges that offer different programmes are likely to accept the new system.					
3. The finance department is adequately staffed, due to its ability to attract and retain sufficiently trained and experienced staff members.					
4. The competent staff are overloaded and in demand in our college.					

Section 3: General Questions

1. Please provide the following information for the person completing the questionnaire

Job title ---

270

Number of years in this position ------------------------------

Number of years in this college ------------------------------

Thank you very much for taking the time to complete this questionnaire. Your help in providing this information is greatly appreciated.

APPENDIX D: COVERING LETTER: CFOs and ASSISTANT DIRECTORS

Dear Sir/ Madam

I am working towards a Masters of Accounting Degree through the faculty of Accounting and Informatics at Durban University of Technology (DUT). Despite the high profile of Activity – Based Costing (ABC), there is fairly low rate of implementation and only three education and training sectors in the world are ABC users. In an attempt to investigate these issues, I am currently conducting a census study in nine public Technical Vocational Education and Training (TVET) colleges in KwaZulu-Natal. This study is under the supervision of Prof Paul Green and Prof Lesley Stainbank.

I would appreciate it if you give approximately 30 minutes of your time to participate in this interview. Your response to this interview will be invaluable and contribute to the overall success of the research. It is important to note that all sections of this interview are relevant to you. This study will be conducted in accordance with ethical approval provided by the DUT Institutional Research Ethics Committee.

Should you have any queries regarding Research questionnaire please contact the researcher on 071 8406323, my supervisor, Dr Paul Green on 0338458804, or the Institutional Research Ethics Administrator on 0313735599.

Thank you in advance for your cooperation.

Yours Sincerely

MC Madwe

APPENDIX E: LETTER OF INFORMATION AND CONSENT: CFOs AND ASSISTANT CFOs

Title of the Research Study: Adoption of Activity-Based Costing at Technical and Vocational Education and Training in Kwazulu-Natal.

Principal Investigator/s/researcher: Mr Mziwendoda Cyprian Madwe

Co-Investigator/s/supervisor/s: Prof Paul Green (PhD) and Prof Lesley Stainbank

Brief Introduction and Purpose of the Study:

To establish why Activity-Based Costing (ABC) non-adoption rates are high in Technical and Vocational Education and Training (TVET) given the claimed benefit of the system with the aim of developing a conceptual framework for the adoption of the Activity-Based Costing in TVET colleges.

The research objectives of the study are to:

1. To determine the current practices of the costing model at TVET Colleges in KwaZulu-Natal;
2. To investigate factors that constitute barriers to ABC adoption at TVET colleges in KwaZulu-Natal;
3. To analyse adoption methodologies that might be applicable to TVET colleges in KwaZulu-Natal; and
4. To develop a conceptual framework for the adoption of an Activity-Based Costing model in TVET colleges in KwaZulu-Natal.

Outline of the Procedures:

The research design will assist the researcher to achieve objectives as fully and accurately as possible. For the purpose of this research, mixed methods will be used which is both quantitative and qualitative method to collect data. The researcher will send a letter of consent to all respondents which will request them to partake in the study. This interview schedules have a same standardised format which means the same questions are asked to each interviewee in the same order. The interviews will be recorded by researcher and the data written up as a transcript (a written account of interview questions and answers) which will be analysed at later stage. The interviewer will use language which is appropriate to the vocabulary of the group of people being studied. The researcher will emphasize to respondents that all comments will be treated confidentially, and all respondents will remain anonymous.

Risks or Discomforts to the Participant: Not applicable

Benefits: The benefits of this study, it will be made available through publication in accredited peer-reviewed journal; presentations at local and international conferences and also seminars and workshops given in workplace to assist all finance staff members.

Reason/s why the Participant May Be Withdrawn from the Study: There are no adverse consequences for the participant if they chose to withdraw before or during the experiment as it is purely voluntary.

Remuneration: No remuneration will be paid to the participants.

Costs of the Study: The participants are not expected to cover any costs incurred.

Confidentiality: The data will remain under the ownership of DUT and TVET colleges. It will be kept for 5 years and then disposed. Electronic data will be protected by passwords.

Research-related Injury: Not applicable.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher (071 840 6323), my supervisor (033 84 58808.) or the Institutional Research Ethics administrator on 031 373 2900. Complaints can be reported to the DVC: TIP, Prof F. Otieno on 031 373 2382 or dvctip@dut.ac.za.

General:

Potential participants must be assured that participation is voluntary and the approximate number of participants to be included should be disclosed. A copy of the information letter should be issued to participants. The information letter and consent form must be translated and provided in the primary spoken language of the research population e.g. isiZulu.

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, _____ (MC Madwe), about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number:_REC 154/15_____,

- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.

- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.

- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.

- I may, at any stage, without prejudice, withdraw my consent and participation in the study.

- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.

- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

_____   _____   _____ _____

Full Name of Participant   **Date**   **Time**   **Signature / Right Thumbprint**

I, _____ (MC Madwe) herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Mziwendoda Madwe_____   _____

Full Name of Researcher   **Date**   **Signature**

_____   _____   _____

Full Name of Witness (If applicable)   Date   **Signature**

_____   _____   _____

Full Name of Legal Guardian (If applicable) Date   **Signature**

Please note the following:

Research details must be provided in a clear, simple and culturally appropriate manner and prospective participants should be helped to arrive at an informed decision by use of appropriate language (grade 10 level - use Flesch Reading Ease Scores on Microsoft Word), selecting of a non-threatening environment for interaction and the availability of peer counseling (Department of Health, 2004)

If the potential participant is unable to read/illiterate, then a right thumb print is required and an impartial witness, who is literate and knows the participant e.g. parent, sibling, friend, pastor, etc. should verify in writing, duly signed that informed verbal consent was obtained (Department of Health, 2004).

If anyone makes a mistake completing this document e.g. wrong date or spelling mistake a new document has to be completed. The incomplete original document has to be kept in the participant file and not thrown away and copies thereof must be issued to the participant.

References:

Department of Health: 2004. *Ethics in Health Research: Principles, Structures and Processes* http://www.doh.gov.za/docs/factsheets/guidelines/ethnics/

Department of Health. 2006. *South African Good Clinical Practice Guidelines*. 2nd Ed. Available at: http://www.nhrec.org.za/?page_id=14

APPENDIX F: INTERVIEW SCHEDULE: CFOs AND ASSISTANT CFOs
INTRODUCTION

I want to thank you for taking your time to meet me today. My Name is Mziwendoda Madwe and through your experience I would like to establish why Activity-Based Costing (ABC) no-adoption rates are very high in TVET Colleges and why your college is still using the Traditional Costing System. This interview should take less than an hour. I will be taping the session because I don't want to miss any of your comments. Although I will be taking some notes during the session, I can't possibly write fast enough to get it all down. Since we are on tape, please be sure to speak up so that we don't miss your valuable comments. All responses will be kept confidential. This means that your interview responses will only be shared with research team members and we will ensure that any information we include in our report does not identify you as the respondent. Remember, you don't have to talk about anything you don't want to and you may end the interview at any time.

Are there any questions about what I have just explained?

Are you willing to participate?

Personal information

1. What is your gender?   _____

2. Your age group is between---------to---------------

3. What is your race group?   _____

4. What is your highest qualification?   _____

5. With which Accounting Professional Board are you registered?   _____

7. What is your occupation?   _____

5. What is your number of completed years of service with the college?   _____

Census study on Activity –Based Costing System

Section 1: Assessing Current costing model at Technical Vocational Education and Training.

1. Which campus has the most students at your college? ………………………

2. How many courses are offered at your college offer? …………………………………………

3. Which campus offers the most courses at your college? ……………………….

4. Which campus has the highest funding allocation? …………………………..

5. What does your college uses to identify all personnel costs and tasks associated with offering each programme? …………………………………………………………..

6. How do you spread indirect costs among all courses offered in this college? ....

7. Does the college have administrative tools available for each campus to examine instructional costs? ....

8. How is the college's payroll/ HR system utilised for the allocation of indirect costs? ....

9. What is the approximate overall percentage of overhead costs at your college?...

10. What types of costs does the college use in costing their programmes (direct, Indirect, fixed or variable)? ....

11. Which traditional costing system does the college use (standard costing, direct costing, full costing)? ....

12. Which bases (cost drivers) are currently used to allocate overhead costs to services within your college? ....

13. How many allocation methods are used in your college? ....

14. How do you measure the accuracy of costing the courses offered in your college?...

15. List all divisions/ departments within one campus ....

16. List major activities/ tasks of each department mentioned in no.15 above............................

17. What do you under standard about standard activity dictionary? Do you have a standard activity dictionary at your college? ....

18. Under the current college's costing model, a central officer, as the cost centre, prepares an income budget, where fees for all programmes for the next academic year are determined after taking into account the expected number of students registering. What is your opinion about this statement?

19. Do you think that the existing accounting system provides accurate and adequate information about the costs of programme? If so, why?……………………..

Section 2: Activity-Based Costing system (ABC)

1. How familiar are you with Activity-Based Costing (ABC)? ....
2. Where did you first learn of ABC? ……………………………
3. What is your current level of ABC adoption in your college? …………
4. What reasons can drive your college to reject the new accounting system?
5. In your opinion, what problems will the college encounter during the implementation of ABC? ....

6. If you have never considered ABC to date, what are your reasons you for remaining with your current system? ....

7. In your opinion, the college will succeed in the implementation of ABC ;

If ——

If ——

If ———

If ——

If ——

If ——

8. What is your role when a new accounting system is introduced in the college?...

9. Suppose the college introduces a new accounting system which provides more detailed and up-to-date financial information. Do you think finance staff members will welcome this change? If not, why? ....

10. Do you think the finance staff members with a knowledge of a new accounting system could bring other employees on board to accept the innovation and assist them in familiarising themselves with the new system? ....

11. If the new useful accounting system is introduced at your college, how could you give the necessary support required for its implementation? ....

12. Do you think the college could have necessary resources to implement ABC the system? ....

13. If the new accounting system is accepted by the college, what steps would you take to ensure that the entire workforce associated with the new system understand system and implement it in their decision-making?.....................................

14. Do you plan to implement ABC in the future? ....

15. How would you break down time spent on major activities performed at a campus level? Please try to approximate time usage on each the following major activities for a typical week.

Activities performed at a campus level

1. Marking students' assessments...hours
2. Preparing lesson plan...hours
3. Capturing students' marks...hours
4. Verifying students' marks...hours
5. Enrolling student..hours
6. Issuing academic records...hours
7. Counselling students..hours

8. Invigilating students...hours

9. Direct instructing (Lecturing)..hours

10. Setting an assessment..hours

11. Receiving and issuing stationary...hours

12. Placing an order for required material....................................hours

13. Issuing student cards...hours

16. Rank the above activities for their relative department within a campus.............................

16. Assign percentage of the day or quantity of hours for each activity? ....

Section 3: General Questions

1. Please provide the following information for the person completing the questionnaire

Job title --

Number of years in this position ------------------------------

2. Number of years in this college ------------------------------

Thank you very much for taking the time to complete this questionnaire. Your help in providing this information is greatly appreciated.

APPENDIX G: GATEKEEPERS LETTER/LETTER OF PERMISSION

higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

DHET 004: APPENDIX 1:

APPLICATION FORM FOR STUDENTS TO CONDUCT RESEARCH IN PUBLIC COLLEGES

1. APPLICANT INFORMATION

1.1.	Title (Dr /Mr /Mrs /Ms)	Mr	
1.2	Name and surname	Mziwendoda Madwe	
1.3	Postal address	56 Olifant Road Majuba Park Newcastle, 2940	
1.4	Contact details	Tel	0343181206
		Cell	0718406323
		Fax	
		Email	mcmadwe@gmail.com
1.5	Name of institution where enrolled	Durban University of Technology	
1.6	Field of study	Management Accounting	
1.7	Qualification registered for	*Please tick relevant option:*	
		Doctoral Degree (PhD)	
		Master's Degree	√
		Other (please specify)	

2. DETAILS OF THE STUDY

2.1	Title of the study
Adoption of Activity-Based costing in KwaZulu-Natal TVET Colleges	

2.2	Purpose of the study
The purpose of the study is to develop conceptual framework for adoption of any Activity-Based Costing model in KwaZulu-Natal TVET Colleges	

3. PARTCIPANTS AND TYPE/S OF ACTIVITIES TO BE UNDERTAKEN IN THE COLLEGE

Please indicate the types of research activities you are planning to undertake in the College, as well as the categories of persons who are expected to participate in your study (for example, lecturers, students, College Principals, Deputy Principals, Campus Heads, Support Staff, Heads of Departments), including the number of participants for each activity.

		Expected participants (e.g. students, lecturers, College Principal)	Number of participants
3.1	Complete questionnaires	a)Finance staff	05
		b)	
		c)	
		d)	
		e)	
3.2	Participate in individual interviews	Expected participants	Number of participants
		a)Chief Financial Officer	01
		b)Assistant Chief Financial Officer	01
		c)	
		d)	
		e)	
3.3	Participate in focus group discussions/ workshops	Expected participants	Number of participants
		a) Finance staff members	04
		b)	
		c)	
		d)	
		e)	
3.4	Complete standardised tests (e.g. Psychometric Tests)	Expected participants	Number of participants
		a)	
		b)	
		c)	
		d)	
		e)	
3.5	Undertake observations *Please specify*	We will observe finance staff doing their tasks and how long they take to complete each task	03
3.6	Other *Please specify*		

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6. DECLARATION BY THE APPLICANT

I undertake to use the information that I acquire through my research, in a balanced and a responsible manner. I furthermore take note of, and agree to adhere to the following conditions:

a) I will schedule my research activities in consultation with the said College/s and participants in order not to interrupt the programme of the said College/s.

b) I agree that involvement by participants in my research study is voluntary, and that participants have a right to decline to participate in my research study.

c) I will obtain signed consent forms from participants prior to any engagement with them.

d) I will obtain written parental consent of students under 18 years of age, if they are expected to participate in my research.

e) I will inform participants about the use of recording devices such as tape-recorders and cameras, and participants will be free to reject them if they wish.

f) I will honour the right of participants to privacy, anonymity, confidentiality and respect for human dignity at all times. Participants will not be identifiable in any way from the results of my research, unless written consent is obtained otherwise.

g) I will not include the names of the said College/s or research participants in my research report, without the written consent of each of the said individuals and/or College/s.

h) I will send the draft research report to research participants before finalisation, in order to validate the accuracy of the information in the report.

i) I will not use the resources of the said College/s in which I am conducting research (such as stationery, photocopies, faxes, and telephones), for my research study.

j) Should I require data for this study, I will first request data directly from the Department of Higher Education and Training. I will request data from the College/s only if the DHET does not have the required data.

k) I will include a disclaimer in any report, publication or presentation arising from my research, that the findings and recommendations of the study do not represent the views of the said College/s or the Department of Higher Education and Training.

l) I will provide a summary of my research report to the Head of the College/s in which I undertook my research, for information purposes.

I declare that all statements made in this application are true and accurate. I accept the conditions associated with the granting of approval to conduct research and undertake to abide by them.

SIGNATURE	MC MADWE
DATE	01 June 2016

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DHET 004: APPENDIX 1: APPLICATION FORM FOR STUDENTS TO CONDUCT RESEARCH IN PUBLIC COLLEGES

FOR OFFICIAL USE

DECISION BY HEAD OF COLLEGE

Please tick relevant decision and provide conditions/reasons where applicable		
Decision		*Please tick relevant option below*
1	Application approved	✓
2	Application approved subject to certain conditions. *Specify conditions below*	
3	Application not approved. *Provide reasons for non-approval below*	

NAME OF COLLEGE	MAJUBA TVET COLLEGE
NAME AND SURNAME OF HEAD OF COLLEGE	SJ Mbotshwa
SIGNATURE	▉
DATE	05-09-2016

MAJUBA TVET COLLEGE
. CENTRAL OFFICE

0 5 SEP 2016

TEL: 034 - 326 4888
PRIVATE BAG X6602
NEWCASTLE 2940

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APPENDIX H: ETHICAL CLEARANCE
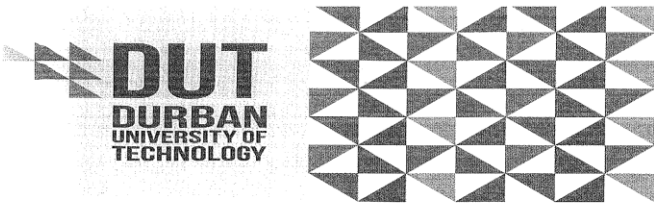
Institutional Research Ethics Committee
Faculty of Health Sciences
Room MS 49, Mansfield School Site
Gate 8, Ritson Campus
Durban University of Technology

P O Box 1334, Durban, South Africa, 4001

Tel: 031 373 2900
Fax: 031 373 2407
Email: lavishad@dut.ac.za
http://www.dut.ac.za/research/institutional_research_ethics

www.dut.ac.za

21 September 2016

IREC Reference Number: **REC 154/15**

Mr M C Madwe
56 Olifant Road
Majuba Park
Newcastle
2940

Dear Mr Madwe

Adoption of Activity-Based Costing at Technical Vocational Education and Training Colleges in KwaZulu-Natal

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tools.

Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letters.

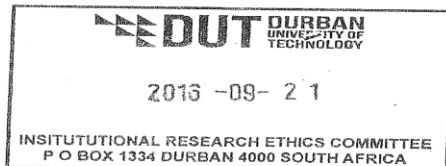Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Yours Sincerely,

Professor J K Adam
Chairperson: IREC

DUT DURBAN UNIVERSITY OF TECHNOLOGY

2016 -09- 2 1

INSITUTUTIONAL RESEARCH ETHICS COMMITTEE
P O BOX 1334 DURBAN 4000 SOUTH AFRICA

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APPENDIX I: STANDARD ACTIVITY DICTIONARY

Standard Activity Dictionary for TVET Colleges		
Department	*Major Activities*	*Definitions*
Teaching Department	Mark exams	Allocating marks on students' work
	Maintain class records	Recording marks, signing register to monitor attendance of students
	Define syllabus	Updating the subject, amending the tops in the subjects
	Lecturing	Teaching, guiding students on a particular topic
	Monitoring lecturer POE	Ensuring that lesson plans and facilitation plans
	Set assessments	Preparing a standardised test for students
	Invigilation	Monitoring students during examination
Administration Department	Print hand-outs	Making study material available for students
	Capture students' marks	Putting students marks on Coltech
	Print syllabus	Making syllabus available for teacher and students
	Issue academic records	Giving students results
	Print student cards	Giving students student cards
Assets department	Keeping assets register for	Maintaining assets register to control assets
	Placing an order	Ordering goods from suppliers
	Issuing stationary for academic staff	Giving lectures stationery
	Preparing invitations of quotations/tenders on College evaluation form	Issuing quotations for tenders
	Purchasing a new assets	Buying new assets
Finance	Issuing deposit slips for school fees	Giving deposit slips for depositing tuition fees
	Keeping records of payments	Maintaining payments records

	Keeping order books for all payments	Maintaining for audit purpose
	Sending order book to campus manager for approval	The campus manager giving a go ahead for purchases of new assets
Examination department	Counting answer exam booklets	Ensuring that are equal to number of students writing exam
	Reconciling the scripts	Tallying scripts to the signatures of students in exam register
	Sending daily report for each exam	Informing DHET about any irregularities
Student affairs	Issuing statements, certificates and diplomas	Responsible for making students results and diplomas available
	Helping students to fill application forms for diplomas	Assisting students when applying for diplomas
	Issuing exam permits for students	Making exam permission available before exam starts
	Filling of statements, certificates and diplomas	Keeping certificates and diplomas for students
Housing department	Catering for students	Cooking for students
	Maintain the records of resident students	Controlling students who enter at students residents
	Clean residences	Ensuring that the rooms for students are clean

Source: Researcher

APPENDIX J: METHOD OF ALLOCATION RESOURCES TO MAJOR ACTIVITIES AT TVET

Major Activities performed in TVET Colleges and cost drivers				
Activity Description	Activity Cost Driver Description	Activity Driver Volume Allowed Per Activity	Activity Driver	Activity Driver Volume per Activity
Mark Assessment	No. of students	15 minutes per student	Class of 25 students	6.25 Hours
Counselling	No. of students	30 minutes per student	Class of 25 students	12.5 Hours
Capturing student's mark	No. of students	10 minutes per class	Class of 25 students	4.17 Hours
Verifying marks	No. of students	5 minutes per class	Class of 25 students	2.08 Hours
Capturing student's attendance	No. of students	5 minutes per class	Class of 25 students	2.08 Hours
Invigilating	No. of hours	3 Hours per invigilator	2 invigilators for 90 students	6 Hours
Conducting lecture	No. of Hours	55 minutes per period	25 periods per week	23 hours
Developing curriculum	No. of preparations	48 hours per subject	4 subjects	192 hours

(Source: Researcher)

APPENDIX K: PERSON'S CORRELATION ANALYSIS OF THE LIKERT-SCALE RESEARCH VARIABLE

		S1.5.1	S1.5.2	S1.5.3	S1.5.4	S1.5.5	S1.12.1	S1.12.2	S1.12.3	S1.12.4	S1.12.5	S2.5.1	S2.5.2	S2.5.3	S2.5.4
S1.5.1	Correlation Coefficient	1,000													
	Sig. (2-tailed)														
	N	30													
S1.5.2	Correlation Coefficient	0,290	1,000												
	Sig. (2-tailed)	0,120													
	N	30	30												
S1.5.3	Correlation Coefficient	-0,052	0,274	1,000											
	Sig. (2-tailed)	0,783	0,143												
	N	30	30	30											
S1.5.4	Correlation Coefficient	0,284	.486**	0,034	1,000										
	Sig. (2-tailed)	0,128	0,006	0,857											
	N	30	30	30	30										
S1.5.5	Correlation Coefficient	.442*	.417*	0,090	.543**	1,000									
	Sig. (2-tailed)	0,014	0,022	0,635	0,002										
	N	30	30	30	30	30									
S1.12.1	Correlation Coefficient	0,182	.401*`	0,027	0,236	-0,079	1,000								
	Sig. (2-tailed)	0,335	0,028	0,888	0,209	0,677									
	N	30	30	30	30	30	30								
S1.12.2	Correlation Coefficient	.378*	0,052	-0,263	0,011	0,348	-0,354	1,000							
	Sig. (2-tailed)	0,039	0,785	0,161	0,955	0,060	0,055								
	N	30	30	30	30	30	30	30							
S1.12.3	Correlation Coefficient	0,323	0,064	-0,305	0,181	0,319	-0,126	.506**	1,000						
	Sig. (2-tailed)	0,087	0,742	0,108	0,349	0,092	0,514	0,005							
	N	29	29	29	29	29	29	29	29						
S1.12.4	Correlation Coefficient	0,226	0,263	0,054	0,311	-0,015	.372*	0,048	-0,129	1,000					

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	Sig. (2-tailed)	0,230	0,160	0,778	0,095	0,939	0,043	0,803	0,505						
	N	30	30	30	30	30	30	30	29	30					
S1.12.5	Correlation Coefficient	-0,010	-0,113	-0,085	.414*	-0,087	0,109	-0,124	0,030	0,142	1,000				
	Sig. (2-tailed)	0,958	0,561	0,660	0,026	0,654	0,574	0,522	0,877	0,462					
	N	29	29	29	29	29	29	29	29	29	29				
S2.5.1	Correlation Coefficient	0,260	-0,170	-0,179	0,179	0,289	0,205	0,214	0,334	-0,085	0,338	1.000			
	Sig. (2-tailed)	0,165	0,370	0,343	0,344	0,121	0,276	0,256	0,077	0,654	0,072				
	N	30	30	30	30	30	30	30	29	30	29				
S2.5.2	Correlation Coefficient	0,223	-0,191	-.379*	0,336	.381*	0,107	0,168	0,332	0,054	0,342	.850**	1.000		
	Sig. (2-tailed)	0,237	0,313	0,039	0,069	0,038	0,575	0,374	0,079	0,777	0,069	0.000			
	N	30	30	30	30	30	30	30	29	30	29				
S2.5.3	Correlation Coefficient	0,351	0,077	-0,268	.475**	.572**	0,018	.372*	.375*	0,279	0,248	.511**	.709**	1.000	
	Sig. (2-tailed)	0,057	0,688	0,152	0,008	0,001	0,926	0,043	0,045	0,135	0,194	0.004	0.000		
	N	30	30	30	30	30	30	30	29	30	29				
S2.5.4	Correlation Coefficient	0,281	-0,079	-0,129	.650**	.415**	0,040	0,233	.429**	0,218	.451**	.559**	.644**	.629**	1.000
	Sig. (2-tailed)	0,132	0,677	0,498	0,000	0,023	0,834	0,216	0,020	0,248	0,014	0.001	0.000		
	N	30	30	30	30	30	30	30	29	30	29				

S1.5.1= The colleges allocate the budget to each campus as per number of students, S1.5.2= The student size is always used to allocate costs for the programme, S1,5.3= The college has a tool used to identify all personnel costs and the tasks of each employee, S1.5.4 = Central office prepares an income budget, where fees for all courses for next year are determined taking into account the expected number of students, S1.5.5 = The college's overheads costs are apportioned according to the size of each campus.

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).