The Double Heuristic Method: Perspectives on how teachers deal with an alternative model for teaching in the VET sector.

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This thesis is submitted in total fulfillment of the requirements for the degree of Doctor of Philosophy

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The Double Heuristic Method: Perspectives on how teachers deal with an alternative model for teaching in the VET Sector.

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Declaration by Candidate

I certify that, except where due acknowledgement has been made, the work is that of the author alone.

This work has not been accepted, in whole or in part, to qualify for any other award in any university or other tertiary institution and to the best of my knowledge and belief, contains no material previously published or written by another person, except where reference has been made in the text; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; and any editorial work, paid or unpaid, carried out by a third party is acknowledged.

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Homayoon Azemikhah

31 March, 2013
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<th>Full Form</th>
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<tbody>
<tr>
<td>ACTU/TDC</td>
<td>Australian Council of Trade Unions and Trade Development Council</td>
</tr>
<tr>
<td>ANTA</td>
<td>Australian National Training Authority</td>
</tr>
<tr>
<td>APEC</td>
<td>Asia-Pacific Economic Cooperation</td>
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<td>AQF</td>
<td>Australian Qualification Framework</td>
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<td>AQFC</td>
<td>Australian Qualifications Framework Council</td>
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<td>Australian Quality Training Framework</td>
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<td>CBT</td>
<td>Competency Based Training</td>
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<td>CCM</td>
<td>Constant Comparative Method</td>
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<td>CEDEFOP</td>
<td>Centre Européen de Développement de Formation Professionnelle</td>
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<td>CI</td>
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<td>CLE</td>
<td>Competency Learning Event</td>
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<td>COAG</td>
<td>Council of Australian Governments</td>
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<td>CODE</td>
<td>Competency Development</td>
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<td>CP</td>
<td>Competent Position</td>
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<td>CTC</td>
<td>The Confusion to Clarity Theory</td>
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<td>CTE</td>
<td>The Career and Technical Education system representing VET In Texas</td>
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<td>CQ</td>
<td>Competency Quotient</td>
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<td>CVET</td>
<td>Continuous Vocational Education and Training</td>
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<td>DeSeCo</td>
<td>Definition and Selection of Competencies</td>
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<td>DEST</td>
<td>Department of Education, Science and Training</td>
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<td>DHM</td>
<td>Double Heuristic Method</td>
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<td>EQ</td>
<td>Emotional Quotient</td>
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<td>EU</td>
<td>European Union</td>
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<td>First heuristic</td>
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<td>Focus Question</td>
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<td>GIT</td>
<td>Graphical Interface Template of DHM</td>
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<td>Acronym</td>
<td>Description</td>
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<tr>
<td>GNVQ</td>
<td>General National Vocational Qualification (UK)</td>
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<td>HE</td>
<td>Higher Education</td>
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<tr>
<td>HLR</td>
<td>High Level Review</td>
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<td>HP</td>
<td>Horizontal Pedagogies</td>
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<tr>
<td>HRD</td>
<td>Human Resource Development</td>
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<tr>
<td>ICEQ</td>
<td>Intelligence, Competency &amp; Emotional Quotient combined</td>
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<td>ILO</td>
<td>International Labour Organisation</td>
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<tr>
<td>IQ</td>
<td>Intelligence Quotient</td>
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<td>IVET</td>
<td>Initial Vocational Education and Training</td>
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<tr>
<td>Kompetenz</td>
<td>“Competence” in German language</td>
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<tr>
<td>KSA</td>
<td>Knowledge, Skills, Attributes</td>
</tr>
<tr>
<td>Lernfelder</td>
<td>“Learning fields” in German language</td>
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<tr>
<td>LLL</td>
<td>Lifelong Learning</td>
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<td>LLUK</td>
<td>Lifelong Learning United Kingdom</td>
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<td>LSC</td>
<td>Learning and Skills Councils (UK)</td>
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<td>NCVER</td>
<td>National Centre for Vocational Education and Research</td>
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<td>NCVQ</td>
<td>National Council for Vocational Qualifications (UK)</td>
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<tr>
<td>NP</td>
<td>Not yet competent position</td>
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<td>NQF</td>
<td>National Qualification Framework (UK)</td>
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<td>NV</td>
<td>New Vocationalism</td>
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<td>NVQ</td>
<td>National Vocational Qualification framework in the United Kingdom</td>
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<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>O’NET</td>
<td>Occupational Network online database in United States</td>
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<td>OTM</td>
<td>Open Training Market</td>
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<tr>
<td>PBTE</td>
<td>Performance Based Teacher Education</td>
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<tr>
<td>PDP</td>
<td>Professional development Program</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>PISA</td>
<td>Programme for International Student Assessment and is used to evaluate students of OECD member countries</td>
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<tr>
<td>POT</td>
<td>Point of Transposition of competency</td>
</tr>
<tr>
<td>PR</td>
<td>Progressive Revelation</td>
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<tr>
<td>PROPE</td>
<td>Progressive Revelation of Pedagogical Engagement</td>
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<td>QCF</td>
<td>Qualification and Credit Framework (UK)</td>
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<td>Registered Training Organisation</td>
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<td>SH</td>
<td>Second Heuristic</td>
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<td>Sector skills Councils (SSCs) UK-wide</td>
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<td>Tertiary and Further Education</td>
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<td>Training Packages</td>
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<td>Trade Development Council</td>
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<td>Total Quality Management</td>
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<td>Technical Vocational Education Initiative (UK)</td>
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<td>United Kingdom</td>
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<td>United States of America</td>
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<td>Gowin’s Vee</td>
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<td>Vocational Education and Training</td>
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<td>Vertical Pedagogies</td>
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<td>Western Australia</td>
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ABSTRACT

The aim of this research has been to investigate how teachers in Vocational Education and Training (VET) in Australia deal with the Double Heuristic Method (DHM) as an alternative model for teaching in the VET Sector.

The context is set within a vocational educational landscape globally, highlighting approaches in the delivery of vocational education in the USA, European countries and Australia. In pursuit of these approaches, various typologies of competency-based training (CBT) are explored. The VET systems around the world have been undergoing a period of continuous reform, moving VET systems towards a more holistic approach of teaching and learning in higher education. In such a context, the Australian VET sector has been and continues to be faced with challenges in the implementation of the Australian Training Packages, the core curriculum for the VET sector.

This inquiry has been implemented within an interpretive paradigm in seeking to capture teachers’ perspectives of using the DHM and to investigate how VET teachers deal with the pedagogical challenges in their work. Central to the research question is investigating how teachers deal with an alternative model of pedagogy, the Double Heuristic Model, from their own frames of reference, and as they experience it. Qualitative methods have been used for data collection and analysis. The primary source of data was a series of semi-structured interviews. The data analysis was based on the principles of grounded theory method as outlined in the work of Strauss and Corbin (1990) whereby participants are placed in a position to consider a phenomenon and how they make meaning of that phenomena. In pursuing this approach to methodology in the two years of data collection and analysis, all three types of coding were utilised: open coding, axial coding and selective coding (Strauss and Corbin, 1990).

As the Double Heuristic Method is a relatively new approach in vocational education in Australia, there has not been any prior research on its use in this area. Hence, this research contributes to developing new insights into teachers’ perspectives and responses to one approach in teaching the Units of Competency in the Training Packages in Australia, using an alternative pedagogical framework.
CHAPTER 1: INTRODUCTION

The study reported in this thesis focuses on vocational education and training (VET) and teachers’ perspectives on the Double Heuristic Method (DHM), an alternative model for teaching in the Australian VET Sector. It seeks to examine the teachers’ perspectives of the application of the DHM in the context of the implementation of the Training Packages in Australia.

The aim of this study is to investigate how teachers in the Vocational Education and Training sector have dealt with the application of this alternative method in their delivery of the national Training Packages and to identify the pedagogical changes they underwent throughout the implementation of the DHM to their practice.

The Training Packages were introduced into the VET sector in response to the need for a national framework to implement competency-based training (CBT) in Australia with a view to training a more competent workforce that would be able to compete globally. The Australian Training Packages were composed of a number of components. The main components were competency standards (Units of Competency), qualification rules and assessment guidelines (Smith and Keating, 2003).

This chapter presents an overview of the research reported here by way of introduction, the researcher’s signature story, the aim of the study, and the justification for the research. It then provides the central research question and the guiding research questions, as well as an overview of the interpretivist orientation of the research methodology. Finally, the chapter presents an overview of the structure of this thesis.

1.1 The Researcher’s signature story

I started as a tutor in VET in 1993. It was before the time that National Training Packages were going to be introduced in Vocational Education and Training (VET). When I started to work in VET I learned that the curricula based on competency based training (CBT) had been subject to massive reform in Australia. Like any new starter, I was also trying to work out what was happening and who could explain the
new challenges in comparison to the supposedly traditional VET curricula. I was in the middle of my journey in understanding CBT which was new to teachers, when this research was initiated. It seemed to me that, to some greater extent, the teachers were lost regarding how to deliver in the new context. While we were struggling to understand the CBT, the leaders of VET were trying to convey to us that the curricula would be changing again in the near future. The changing of the format of curricula was so rapid that the teachers were not spending too much time on its structure and advised me: “Do not waste your time too much on these new curricula as it will change again at a blink of an eye. You need to learn the next one after this”. In such an environment I was trying to understand what was happening and why the curriculum was undergoing constant reform. In this environment of rapid change, the Training Packages (1997 to 2000) were introduced. When I studied the structure of the Training Packages and comprehended it, unlike my colleagues, I fell in love with the conceptual framework. I liked the new curricula, the Training Packages, so vehemently that I took it home and spent considerable time on analysing it. However, as was customary, the curricula was changing rapidly, everyone who realized how enthusiastic I was with the Training Packages told me that I was wasting my time, as this one will change and a new one would be substituted in its stead. Contrary to the VET teachers’ advice, I became more passionate about Training Packages and its structure. To me, it looked as if everyone was challenged in dealing with the new curricula. I found that everyone was attempting to examine the Training Packages in the light of the previous models of curricula.

My view was different. I believed that a re-thinking out of the box was essential. With such a state of mind, I sat and focused for several nights in order to understand it. For me, understanding the Training Packages was to comprehend the minds that had created it. Hence, I searched for any reports that threw some light behind the design and format of the Training Packages. Several days later I came up with a series of diagrams that fully and comprehensively illustrated how I understood the Training Packages. I thought I had gained insights into what Training Packages were trying to achieve. Most conversations in gatherings and meetings were focused around the Training Packages. It was in one of these conversations that I mentioned to the college director that I had resolved and simplified the complexity of the new curricula. I shared with him a series of diagrams that I thought the Training Packages were
designed to achieve. I had also designed a plan for the delivery of programs according to Training Packages. The College Director showed interest and asked me whether I would be willing to show my illustrations to him in his office. I did so, as requested.

During the illustrations, he rose up from his chair on several occasions and went to the white board on the wall and re-drew the diagrams. That day he confirmed my illustrations of the Training Packages system structure and the manner of delivery. He added that he thought in similar vein. At the end of the meeting, he asked for a copy of the illustrations to share with the Institute Director. I made a copy of my illustrations, diagrams and explanations for him. A few days later, as I was walking through the College’s corridors to go to my office, the College Director approached me and, while tapping on my shoulder, he told me, “I shared your illustrations with the Institute Director and he was very impressed with your explanations”. He also asked for a copy of your illustrations. I would like to thank you for your clarifying illustrations.

There were so many component parts of the Training Packages that teachers were trying to understand and deliver. In 1999, the teachers were examining the units of competency and found it to be different than previous curricula. It was not clear how to develop assessments that can measure all of the performance criteria. The units of competency were confusing, as was the need to assess all the component parts in the units of competency. Hence, the teachers asked whether it would be appropriate for the Australian National Training Authority (ANTA) to develop final assessments for the core units in the Diploma of Accounting. This project was then undertaken by ANTA. Few months later, ANTA developed six case study exemplars that covered the requirements of the units of competency for the Diploma of Accounting program.

When these exemplars were received by the Institute, management decided to undertake a project for the writing of six learning guides for the core units in the Diploma of Accounting. Then, the writers were invited to undertake the development of ‘Learning Guides’. I undertook to write a ‘Learning Guide’ for the Accounting Information Systems.

To write such a learning guide that could run into hundreds of pages was so difficult at the time. Teachers were still trying to understand the units of competency that replaced the traditional subjects. I decided to examine the structure of the units of
competency, once more, and this time I became very involved in the instructional design for a new approach to curriculum, in particular, the development of the new resource based on the units of competency.

After scrutinizing and analyzing the component parts of the unit of competency, as the relationship of the component parts were not clear, I created a diagram to help me understand these relationships. I took it to the Institute and presented it to one of the writers meetings.

At that time, the writing of the ‘learning guides’ was progressing and the regular meetings were held by participating writers for the discussion, revision, updating and reporting of the work in progress. At that meeting, where I presented the diagram and proposed that the diagram be incorporated in these learning guides for clarification, I argued that the diagram represented the component parts of the units of competency of the Training Packages.

The Institute Teachers who could not understand that the Training Packages were different to the previous model of curriculum were trying only to cover the content in the new learning guides that they were writing. They were misinterpreting the new conception of curriculum. Hence, they argued strongly against the new diagram that I had developed. The arguments gradually turned into a hot debate as to whether or not the diagram reflected the way the units of competency were meant to be delivered.

In the heat of this debate, the College Director who was making a cup of tea in the adjacent coffee room noticed and entered the room asking. “What is going on and why do you have such a debate? What is the matter?” The teachers said, “Homi has presented a diagram and is arguing that the diagram represents the units of competency, while we are arguing that it does not.”

The College Director asked me, “Homi, let me have a look at the diagram. Give it to me, let me have a look.” Then he took the diagram. Everyone was holding their breath while he was examining the diagram. Teachers were looking at each other in silence waiting for the College Director to utter something. After a few short moments he broke the silence by going to the white board to draw a horizontal version of the diagram on the board. The screeching sound of the chalk on the board filled the room as teachers fixed their gaze on his drawing.
Then he retorted, “What Homi has illustrated in this diagram is correct”. Although he has illustrated it in a vertical presentation, I have drawn the same diagram in a horizontal manner. This diagram indicates that a unit of competency is based on the foundation that is the underpinning knowledge upon which the elements of competency are constructed and each element is comprised of a number of columns that hold the competency. These columns are the performance criteria. So, what Homi is illustrating is a true meaning of a unit of competency”.

However, he determined that it was up to each individual’s discretion whether or not they would like to include this diagram in the resource. It was a matter of individual’s discretion to be resolved in the departmental meetings. At the completion of the writers meeting, one of the prominent teachers remarked, “Homi, your interest in Training Packages and competence to illustrate such complexity in a diagram is excellent. Why do you not undertake a PhD studies in the area?” This signature story gave me the impetus in undertaking PhD studies which led to solid determination to design a method for the teaching of competence in the Training Packages context.

**1.2 The aim of the study**

The aim of this study was to investigate how teachers in Vocational Education and Training (VET) deal with the application of the Double Heuristic Method (DHM), an alternative model for teaching in the VET Sector in the context of Training Packages in Australia.

This inquiry has been embedded within a qualitative, interpretivist paradigm to study VET teachers’ perspectives on the implementation of Double Heuristic Method. It seeks to investigate how the participative VET teachers deal with the challenges implicit in implementing this method. The study has explored how the VET teachers utilised the two heuristics of the DHM model and how they have applied these heuristics in the practice of planning and the delivery of training. In framing the aim of the study, in terms of how teachers deal with the DHM, the study adopts Herbert Blumer’s (1969:2) three premises within the Symbolic Interactionist tradition.
1.3 The central research question and the guiding research questions

1.3.1. Central Research Question:

The central research question that acted as the focus of the research was as follows:

What are VET teachers’ perspectives on the application of the Double Heuristic Method (DHM) as an alternative model adopted in the teaching of Units of Competency of the Training Packages?

The central research question seeks to examine the perspectives of teachers on the use of the DHM. Teacher perspectives (O'Donoghue, 2007) took into account considerations of how the teachers understood various components of the DHM, and how these components were interpreted in the context of competency development according to the teachers’ experiences, beliefs, assumptions, strategies and pedagogical practices. The VET teachers’ perspectives are the meanings that they have attributed to their experiences of implementing the DHM in the everyday delivery of training. The research, in exploring the participating teachers’ perspectives, sought their intentions, strategies and outcomes during the data gathering process. In other words, the data gathering process was guided by the following guiding research questions:

The questions guiding the research were:

‘How do the practitioners deal with the Double Heuristic Method (DHM) that provides teachers with an alternative pedagogical model of teaching for the competency-based Training Packages in the VET Sector?’

1. What are their intentions?
2. What are their strategies?
3. What are their outcomes?

These questions were pursued specifically within one state in Australia and served as a guide in the process of the data collection to developing propositions regarding the perspectives and understandings of the DHM by VET teachers, leading to a substantive theory as a central finding of the study. While the propositions are reported in the three analysis chapters, the resulting substantive theory: the theory of Progressive Revelation of Pedagogical Engagement, is discussed in the final chapter.
1.4 Research Design and Research Methods
This inquiry was designed within the interpretive paradigm to formulate a theory from the meanings that the participants attributed to the use of the DHM in delivery of courses to their students. The rich data collected from the participating teachers made clear their perspectives on how they dealt with the application of the Double Heuristic Method in the context of teaching in VET.

1.4.1. Study Population and Sample
Initially thirty VET teachers were approached by the Researcher to participate in the research project. The VET teachers who participated in this study were drawn from one state within Australia. Both new and experienced teachers, female and male, were intentionally selected to provide a diversity of experiences for this study.

1.5 Data Gathering and Data Analysis
A grounded theory methodology following the methods of semi-structured interviewing (O’Donoghue, 2007:85) were employed in this research for data analysis. A series of semi-structured interviews were conducted with each participant over a two year period. The first was undertaken after participants in their delivery had implemented the DHM, and the remaining interviews were conducted throughout the delivery of the unit, and after the completion of the sessions and assessments. In the process of data analysis, both code notes and theoretical memos were utilised for transcription of data using open coding, leading to the identification of the initial categories (Strauss & Corbin, 1990). This was followed by axial and selective coding. Axial coding was used to identify the relationships among the initial categories (Strauss, 1987) or concepts, while selective coding was used to identify the core category by integrating categories with a particular reference to a central category (O’Donoghue, 2007). This analysis led to the formulation of key theoretical propositions that are reported in the three chapters 7, 8 and 9. The resulting substantive theoretical model is reported in the final chapter.
1.6 Structure of the Thesis

Following the introductory chapter, Chapter 2 positions the study contextually by examining the increasing international interest in the integration of higher education and work, and further, how the concept of competence is found at the centre of the debate. Chapter 2 also outlines how this trend has led most countries around the world to adopt competency-based training (CBT) as the foundation for VET delivery. This chapter articulates how various typologies emerged globally and how these typologies have shaped the VET systems internationally. Integral to this discussion are the concept of competence and a portrayal of how this concept is interpreted according to a variety of typologies in various parts of the world.

Chapter 2, after examining the differences in these typologies, focuses on Europe and the ways in which European countries have been divided in their approaches to competence and vocational education. The chapter concludes that despite these differences, three typologies: the Behavioural approach (USA); the Functional approach (UK); and the Holistic approach (Germany and France), emerged globally and have been shaping the VET systems as well as competency models around the world. Given that the United Kingdom (UK) and Australia initially pursued a functional approach to competence and competency development, the chapter then explores the context of VET systems in both of these nations.

Chapter 3 reviews the relevant contextual literature underpinning the study in three parts by focusing on national and international policies as well as the empirical research that has been undertaken to date in this area.

Part One of this chapter focuses on global perspectives by exploring the model of vocational education launched in Europe by the European Union’s Lisbon Strategy in 2000. It explores how the Lisbon Strategy set the objective for Europe to become the most competitive knowledge-based economy globally. It explains how the realisation of such a goal required that both lifelong learning and competency development be included in VET delivery programs (EU 2003). It then scrutinizes the Definition and Selection of Competencies (DeSeCo 2002) project with its focus on Lifelong Learning and explores the Tuning project (2000) that focused on skills for university degrees. Both of these global projects were initiated to facilitate the confluence of lifelong learning and competency development. The Chapter then explores how learning
and competency development led to the emergence of curriculum reform in the VET sector and the significant finding that VET pedagogies are at their infancy. It also argues that facilitating pedagogical understanding requires a theory of applied vocational learning.

Part 2 focuses on the developments of vocational education in the UK and the unfolding episodes that brought to the surface the issues of significance in the first decade of the new millennium. It highlights how the UK Government has been wrestling continuously to exert control over these issues and how various research experts have been called upon to examine and investigate them at several unfolding stages to contribute some insights into the ongoing challenges of vocational education in the UK.

Part Three emphasizes that, in the absence of a theory of applied learning in the delivery of courses in Australian VET, some persistent issues continue to remain unresolved. These issues have ranged from misunderstandings and pedagogical confusion in the early years of Training Packages, to recent issues such as those documented by Skills Australia (2010). These include a diverse set of voices about the concept of competence all stemming from a central problem: lack of an applied learning theory. Part Three of the Literature Review then turns its focus on the origins of CBT and the unfolding events that gave taken place in Australia since the late 1980s.

Chapter 4 presents the theory of Competencivism, the conceptual framework of this study, and explains how this theory underpins the Double Heuristic Method (DHM) and the centrality of the concept of competence. It further discusses the four levels of facilitation that the theory encompasses. The Chapter then explains the various levels of facilitation of the theory and how the understanding, at each higher level, depends on a clear understanding of the previous levels of the framework. In brief, Competencivism provides an understanding of how to work skillfully with the Training Packages within a facilitative teaching framework, in order to build competence in a field as a learning outcome.

Chapter 5 explains the DHM construct and the components of the first and second heuristics, and how the two heuristics pedagogically work together in the development of competence. The chapter elaborates on how the DHM has evolved,
and grew out of the philosophical argument that before individuals are able to learn they must somehow grasp meaning (Gowin and Alvarez, 2005). The DHM theoretically explains how the abstract and the concrete sides of learning need to be developed in equilibrium, using skills as the interplaying medium between the two sides. Finally, Chapter 5 focuses on the pedagogical significance of the DHM.

Chapter 6 outlines the methodology that shaped this study. This thesis is centered on the perspectives of VET practitioners in dealing with the application of the DHM for the teaching of the Units of Competency of the Training Packages. Hence, a qualitative approach within the Interpretivist paradigm has been considered to be the most appropriate methodological framework for this thesis. The focus on how VET teachers deal with the DHM has necessitated the use of the principles of Grounded Theory (Strauss & Corbin, 1998) for data analysis that is shaped by the conceptual framework of Symbolic Interactionism (Blumer, 1969).

The central research question is consistent with this perspective, through which the data was sought to yield verifiable knowledge (Blumer, 1969:21). The methodological framework has been based on an interpretivist perspective (Crotty, 1996), i.e., the grounding of theory in data about the perspectives on how VET teachers, in this instance, have been dealing with the Double Heuristic Method (DHM). This approach was consistent with Cohen and Mannion’s (1989:39) arguments that ‘sociological theories should be grounded in data that are generated by the act of research.’

1.7 Data analysis chapters

The methodological chapter is followed by three data analysis chapters, which present analytical findings that address the guiding questions. These findings were based on a number of concepts that emerged from the analysis of teachers’ responses. These concepts were classified into three main categories, resulting in the emergence of the three propositions listed below.

The first proposition focuses on the finding that in the context of Training Packages teachers see the Double Heuristic Method (DHM) as a clarifying approach for VET delivery in Australia. The Double Heuristic Method is seen to clarify the multi-faceted
relationships among the many and varied components in the delivery of Training Packages.

The second proposition looks at the strong conviction amongst participating teachers that, by using the DHM, they are able to confirm the practices in which they engage. In such a context, they see the DHM approach playing a confirmatory role in strengthening and maintaining their confidence by confirming that what they are doing is right and that they are on the right track to ensuring that the requirements of Training Packages and AQTF are met.

The third proposition examines the ways that the participating VET teachers see the Double Heuristic Method (DHM) as a meaning-making apparatus, with a synthesising role for VET delivery in Australia. This gives competency a structure, an approach, and a clear construct, in order to make meaning of the integration.

Each of the above propositions is dealt with, in turn, in Chapters Seven, Eight and Nine.

Chapter 10 is the final chapter and concludes the study by describing the substantive theory of Progressive Revelation of Pedagogical Engagement (PROPE). This theory has been developed through this research project as a response to central and guiding questions applied in the research process within one Institute in Australia. The Theory of Progressive Revelation of Pedagogical Engagement (PROPE) illustrates how the synthesising, clarifying and confirmatory roles of the DHM contribute to the meaning making process, facilitating the grasping of the meaning of VET delivery by teachers and learners.

Conclusion

Chapter 1 provided the researcher’s signature story, the aim of the study and the justification for the inquiry. The chapter, then, presented a brief description of the conceptual framework of the research, the central research question and the guiding research questions followed by a summary of research design and methods adopted in the study. And, lastly, the chapter provided an overview of the structure of the thesis.
In the next chapter the competency models are examined globally in positioning the study within the international context of VET to explore the underlying reasons behind the urgent need for the theory of applied learning around the world.
CHAPTER 2: BACKGROUND AND CONTEXT

Chapter 1 provided an overview of the conceptual framework of the study as well as an overview of the structure of the thesis by presenting a summary of each chapter.

This chapter positions the study contextually by examining the competency models and diversity of approaches to the delivery of competency-based training globally. In this attempt, the chapter explores competency models pursued in the United States and Europe. The chapter then explores in more detail the context of VET in the United Kingdom. Finally, the chapter focuses on the Australian VET context by exploring the evolution of competency-based training and the competence approach that shaped vocational education in Australia. The contextual background in this chapter sets the scene for an analysis of the empirical studies and policy documents that will be pursued in chapter 3 to pave the way for a conceptual focus of this research in chapter 4.

2.1 International context

Internationally, the term “competence” remains elusive in spite of the fact that there has been global consensus on the importance of competence-based learning in the policy documents of international organisations such as the International Labour Organization (ILO), the Organization for Economic Co-operation and Development (OECD), the European Union (EU) and the Asia-Pacific Economic Cooperation (APEC) for more than a decade (Winterton, 2009). In 1997, the ILO published a report on the diversity of approaches to competency-based training across the world (ILO, 1997). The variations of competency models reflect two tensions that are apparent among the countries: tension between formal education and workplace learning, tension between national approaches and global constructs of competence (Winterton, 2009). As Winterton (2009) highlighted:

Despite initiatives like the European Qualifications Framework there is still no consensus for adopting a common competence model and policy discussions continue to reveal confusion (Winterton, 2009:681).

It is argued that moving towards a global consensus on the concept of competence requires an analysis of the different models around the world. On this basis, in 2004, CEDEFOP (Centre Européen de Développement de Formation Professionnelle)
commissioned three pieces of research: reference levels for qualifications (the vertical dimension); a typology of knowledge, skills and competence (the horizontal dimension); and a system for credit transfer (Winterton, 2009:682). In addition, there has been increasing interest in the integration of education and work internationally, in the context of competency-based training (Gonczi and Hager, 2010). Meeting labour market requirements in such a context has required the global development of an appropriate typology of competence (Le Deist and Winterton, 2005). Given that the term ‘competence’ is central to the integration of education and work, arriving at a particular typology depends on how its meaning is interpreted (Le Deist and Winterton, 2005). Le Deist and Winterton (2005) have found a lack of clarity surrounding its meaning across different global contexts:

Despite the central role of competence, there is considerable confusion surrounding the term, which reflects conflation of distinct concepts and inconsistent usage as much as differences in systems, structures and cultures of HRD and VET (Le Deist and Winterton, 2005:28).

In spite of such global confusion surrounding the terminology, three typologies have been identified in the literature throughout the years that VET systems have been shaped in various countries (Le Deist and Winterton, 2005). These typologies are: in the USA, the behavioural approach, based on attributes; in the UK the functional approach; and, in Germany and France, the holistic approach. All VET systems in various countries have been based on one of these typologies. For example Australia has adopted the functional typology.

In addition, there are numerous countries adopting hybrid approaches, combining some features of these typologies, resulting in various types of VET systems being created in countries around the world. In this context, the VET systems in various countries may have both similarities as well as some differences, depending on which combination of features they have adopted from these typologies. It was confirmed in 2008 by Cedefop (Centre Européen de Development de Formation Professionelle) that VET systems seem to have some similarities in their structure, content and output; in particular, between groups of countries sharing a common typology (approach) to VET, while at the same time, they also demonstrate substantial variations.

As Winterton (2009) has stated:
This diversity embodies not only language issues but also fundamental cultural differences in approaches to skill formation (Winterton, 2009:681).

In addition, each of these countries has been going through continuous improvements and reforming of their VET systems up to the present time and it seems this will continue for an unforeseeable time into the future. This is confirmed by Gonczi and Hager (2010), who state that countries in almost every part of the world, including Scotland, England, and Wales, Canada, the United States, Mexico, many South American countries, Australia, New Zealand, Sweden, France, Kuwait, Indonesia, Korea, and Thailand, have undertaken substantial reforms of their VET systems. Gonczi and Hager (2010) have further regarded these changes as the most significant reforms in current decades. These reforms of education systems, thus far, have led to substantial changes to higher education and school systems in some of these countries. The changes have not been implemented easily; rather they have generated difficulties, misunderstandings and confusion in VET delivery in various parts of the world. The feelings of uncertainty over curriculum reform of this type are global, including in Australia, and are a large part of the context of this study.

In such a context, this Chapter attempts to report firstly on these emerging typologies that have shaped the VET systems, and the diversity in approaches to vocational education globally. The Chapter then explores the context of VET systems in United Kingdom (UK) and Australia and outlines the challenges that they have been facing in recent decades.

2.2 The three emerging typologies

Initially, there have been two broad emerging competency-based approaches to education and training. The American competence-based approach, with focus on behavioural attributes resulting in attributes typology, as well as the European approach based on occupations, resulting in functional and holistic typologies.

In the United States, the use of traditional tests of cognitive intelligence based on IQ proved to be an ineffective indicator of job performance when applied for recruitment purposes (Winterton, 2009). Therefore, over time, alternative indicators of job performance have been demanded, and the measures of competence were initially developed in the US to deal with this need (White, 1959). The conclusion was that it was important to identify individuals with the right psycho-social attributes that are
associated with superior performance. On this basis, the competence-based selection approach that combines psycho-social attributes with performance was found to be effective and replaced tests of cognitive intelligence (IQ) (McClelland, 1973). The differentiation of psycho-social attributes of individual workers from job-related activities (skills) and tasks resulted in two sets of descriptors: job-oriented descriptors and worker-oriented descriptors, as specified by the O’NET database (the most widely-used source of occupational information in the US). These two aspects of competence are recognised in the US competency-based approach (the US model) and are elaborated by Winterton (2009) as follows:

While the job-oriented descriptors (job characteristics, activities and tasks), define the requisite mix of knowledge, skills, and abilities (in other words competences), the worker-oriented descriptors are concerned with “enduring characteristics that may influence both work performance and the capacity to acquire knowledge and skills required for effective work performance” (in other words, psycho-social characteristics) (Winterton, 2009:684).

According to Winterton (2009), the O’NET approach continues to exert a major influence on approaches to competence around the world. The American approach is called the Attributes Typology.

The European approaches, which were distinct and independent of American approaches to education and training, were developed during the 1980s. The distinction was that the focus of European approaches was on occupations rather than on the attributes of individuals and workers. In Europe, the United Kingdom was the first country to adopt CBT on this basis, and later, both Germany and France followed. However, as Winterton (2009) has highlighted, the approaches adopted by these three countries led to two broad dominant European models that have strongly influenced how competence is perceived in other member states of the EU. In other words, given that there was a single focus on occupations in Europe, the UK pursued a functional approach (typology) to CBT, while Germany and France followed a holistic approach (typology). Each of these will be described in turn below.

In the 1980s, the United Kingdom was the first country in Europe to adopt a competence-based training system centred on a unified national framework of vocational qualifications which was based on occupational standards of Competence (Winterton, 2009). Mansfield and Mitchell (1996) pointed out that the UK approach
was grounded in functional analysis of occupations in a variety of contexts. Competence was viewed as the ability to perform activities in the tasks within an occupation. Winterton (2009) has further elaborated that, while the UK approach influenced Commonwealth countries such as Finland, Ireland, Australia and New Zealand, both France and Germany pursued quite different competence models, which in turn influenced other European countries.

In Germany, competence (Kompetenz) has always been implicit in their dual system of VET that integrates work-based and school-based learning with a high degree of employers’ engagement, where the occupational competence has always been rooted in the concept of Beruf (occupational identity) (Winterton, 2009:686). The German education system adopted an “action competence” approach that moved the focus of the German VET system from subject content (inputs), to competence (outcomes).

Vocational training curricula are now described in terms of vocational action competence (Handlungskompetenz), specifying domain competence (Fachkompetenz), personal competence (Personalkompetenz) and social competence (Sozialekompetenz) (Winterton, 2009:686).

This move, in 1996, led to the German VET curricula being specified in terms of learning fields (Lernfelder) rather than occupational knowledge and skills that led to new vocational training curricula (Straka, 2005). According to Burchert (2011):

Learning fields are general descriptions of vocational tasks and competences which are translated into more concrete learning situations. While learning fields are the same on national level, learning situations were prepared by single schools or regions (Burchert, 2011:1).

For example, the first learning field from the twelve learning fields required to gain competency as painters and varnishers is, ‘to handle metallic surfaces (timeframe 60 hours)’. Teachers need to define the content required for this learning field, as well as translate it into learning situations. In this instance, as reported by Burchert (2011), the learning situation adopted for this learning field was ‘Restoration of a monkey bar in a kindergarten’.

In the 1990s, the French State Employment Agency adopted a competence-based approach for its catalogue of occupations. The French competence model is comprehensive, comprised of knowledge competences (savoir), functional
competences (savoir-faire) and behavioural competences (savoir-être) (Winterton, 2009). Both French and German approaches suggest a more holistic approach to competence development.

From the evidence provided here, it can be concluded that there are three typologies: the American approach based on behavioural attributes, the UK functional approach, and the holistic approach like that of France and Germany.

Despite the historical recognition that there are three typologies that were used by countries more recently, the trend internationally is moving towards a holistic typology of competence comprised of knowledge, skills and attributes. For example, countries around the world such as Australia are moving towards a more holistic approach to competence that is labelled by Gonczi and Hager (2010) as an integrated approach. This is confirmed by Le Deist and Winterton (2005) who have pointed out that a world view is emerging that links knowledge, skills and attributes (KSA) to competence, which is consistent with the French approach and derived from Bloom’s Taxonomy of Learning (Winterton, Le Deist and Stringfellow, 2005). Winterton suggests that these three competences are inseparable; rather they work together to produce what he has labelled the Meta competence.

Le Deist and Winterton (2005) have pointed out that:

The holistic competence model is perhaps better represented as a tetrahedron, reflecting the unity of competence and the difficulty of separating cognitive, functional and social dimensions in practice. The holistic competence model is represented as a tetrahedron in plan view. Meta-competence is presented as an over-arching input that facilitates the acquisition of output competences at the base of the tetrahedron. Practical competences may be thought of as situated on the faces of the tetrahedron, combining elements of the dimensions of competence in varying proportions (Le Deist and Winterton, 2005:40).
Le Deist and Winterton (2005) have further elaborated that in holistic typology of competence the learner needs to coordinate the three competences in unison. This gives recognition to meta competence that facilitates the acquisition and coordination of these competences by the learners. Hence, in addition to the three competences of cognitive, functional and social (behavioural and attitudinal), there is a need for a fourth type of competence as elaborated by Winterton et al (2005):

The first three dimensions, cognitive, functional and social competences, are fairly universal and are clearly consistent with the French approach (savoir, savoir faire, savoir être) as well as the longstanding KSA (knowledge, skills and attitudes) of the training profession. Thus, knowledge (and understanding) is captured by cognitive competence, skills are captured by functional competence and ‘competencies’ (behavioural and attitudinal) are captured by social competence. Meta-competence is rather different from the first three dimensions since it is concerned with facilitating the acquisition of the other substantive competences (Winterton et al, 2005:39).

Le Deist and Winterton et al (2005) have listed meta competence and social competences as personal in the model illustrated in Figure 2.2.
Thus, it can be argued that the VET systems that have been constructed around the planet have been shaped by one of the three emerging typologies, explained above. The United Kingdom has followed a functional typology approach to vocational education. At this juncture it is important to gain insights into this approach, which has been followed by Australia. Hence, the VET context in the United Kingdom is explored in more detail in the next section.

**2.3 United Kingdom VET context**

As was discussed earlier, the UK pursued a functional approach to CBT as their competence model. According to the ILO (2009:18), functional analysis is a technique to identify the purpose of employee activities and break them down until they are described in sufficient detail to be used as ‘standards’. Functional analysis involves:

- Identifying or defining the key purpose (or functions) of an occupation;
- Subdividing the key purpose of an occupation in order to establish the outcomes which must be met for the key purpose to be achieved;
- Re-aggregating or clustering different groups of outcomes to form vocational qualifications (ILO, 2009: 18).

Given that the UK government identified endemic deficiencies of skill formation in the 1980s, there has been a renewed interest in Vocationalism since that time. Hence,
in the 1980s a competence-based approach to VET, based on functional typology, was adopted through the establishment of a competence-based qualifications framework (Le Deist & Winterton, 2005). According to Yeomans (2002), this renewed interest actually dates back to James Callaghan’s 1976 Ruskin College speech. However, Yeomans (2002) elaborated that the debates around the content of vocational education in the UK, and its character and purpose, go back much further.

Yeomans (2002) highlighted that in the late 1970s and early 1980s, the UK was faced with economic difficulty such as rapidly rising unemployment, affecting sectors of the economy that led subsequently to the ‘Great Debate’ and the election of a Conservative government. According to Yeomans (2002), a broader analysis of English culture by Martin Wiener (1981) and Correlli Barnett (1986) at that time revealed an anti-industrial bias in English education. The Wiener and Barnett theses became more popular among politicians and commentators, who supported the attempted Thatcherite cultural and economic revolution. One of the by-products of Thatcherite revolution was the great plethora of white papers that were generated during that time, resulting in the reform and transformation of vocational education in the United Kingdom that became known as New Vocationalism (NV). NV was constituted by a group of projects including the Technical Vocational Education Initiative (TVEI), National Vocational Qualifications (NVQs) and the General National Vocational Qualification (GNVQ).

In the 1980s, UK governments had two important priorities (ILO, 2009:12):

- Achieving greater control over public expenditure by colleges and Awarding Bodies
- Shifting power over the provision of vocational education and training (VET) towards employers

NVQs were introduced in 1986 to achieve these ends, offering basic entry-level qualifications in most trades and skills, providing high standard of competence, and enabled millions of people of all ages in almost all imaginable trades and professions to achieve formal qualifications (Businessballs, 2012). GNVQs were vocational qualifications based on NVQ principles available via schools and colleges.

Yeomans (2002) emphasised that the low quality of vocational education and training (VET) in the UK was claimed to be handicapping commerce and industry in the
competitive 1980s and 1990s, and both the TVEI and the GNVQ were designed to align education more closely to the ‘needs’ of industry and commerce, and rectify some of the knowledge, skill and attitude deficits of school leavers. This suggests that the school leavers with such deficits who were becoming the learners in vocational education contexts of NVQ and GNVQ needed to be instructed by teachers in two ways: To compensate for those deficits, as well as to successfully build upon their knowledge, skills and attitudes that were required for the new qualifications.

Yeomans (2002) has concluded that whatever the theoretical justifications for the GNVQ, the architects of the GNVQ should know that teachers would find this approach indigestible, on the ground that it did not adequately take into account how teachers teach, how students learn, how colleges and schools are recognised, and how curricula are changed. The approach was founded on work-based standards and referred to by the Government as ‘standards of a new kind’:

The proposals in the mid-1980s for a reformed work-based VET route were based on what the Government at the time referred to as ‘standards of a new kind’. Later these standards became known as ‘occupational standards’ and were similar to the New Zealand and South African examples of ‘unit standards’ (ILO, 2009:12).

In 2008, the UK government introduced the Qualification and Credit Framework (QCF) that came into operation for vocational qualifications in England, Wales and Northern Ireland and replaced NVQs. There is no evidence to indicate whether NVQs led to significant improvements in skill development or not. Despite this, NVQs have continued to be used as a model across the world for competence-based approaches to training (ILO, 2009).

Whether, in this context, the new Qualifications and Credit Framework (QCF), that has replaced NVQs in the UK, will fulfil the original hopes for NVQs as a national framework remains to be seen. However, the QCF is still at an early stage of implementation in the United Kingdom, attempting to accredit learning ‘bits’ on the assumption that accrediting learning, however small the individual ‘bits’ are, will promote lifelong learning (ILO, 2009:20). Lester (2011:4) has pointed out that, by mid-2011, the National Qualification Framework (NQF) should have been substantially replaced by the Qualification and Credit Framework (QCF) in the United Kingdom, resulting in re-specifications of most of the vocational and prevocational
qualifications in the new format. In the QCF, there were two significant departures that needed to be clearly understood:

The capturing and crediting achievements irrespective of size, level, how and where the learning occurred, as indicated by (Lester, 2011):

QCF allows achievements to be captured, expressed and certificated regardless of their size or level or of how or where the learning took place, effectively enabling adults to gain credit for any learning achievement or area of skill that they could demonstrate and that learning would need to match to an output-based unit specification (Lester, 2011:3).

As Lester has further delineated, in QCF the units rather than qualifications are envisaged as being of primary importance in the Framework, and combining units into qualifications comes after their completion as indicated below (Lester, 2011):

In QCF, the significant departure from NQF was that units rather than qualifications were envisaged as the primary currency, and all units would carry a credit-rating based (as in higher education) on one credit equalling ten notional hours of learning. The Open College Network approach of designing units first and (where appropriate) combining them into qualifications afterwards was carried over into the QCF (Wilson 2010:3).

The UK approach to competence-based qualifications has been described by Australian authors such as Gonczi and Hager (2010) as the Task Approach, in which NVQs and GNVQs have been set up for general national qualifications covering many occupations and work roles. However, according to Winterton (2009), the UK functional approach has been influential among countries such as Australia, New Zealand, Finland and Ireland. Winterton (2009) emphasised that:

The UK approach to competence-based qualifications influenced Commonwealth countries like Australia and New Zealand (Young, 2003) as well as other European countries, including Finland and Ireland, but France and Germany independently adopted quite different competence models, which in turn influenced other European member states (Winterton, 2009:686).

Hence, the chapter now focuses on the context of VET in Australia.

2.4 Australian VET context

As Winterton (2009) has highlighted above, the UK functional approach (typology) influenced countries like Australia. Although it seems that Australia followed a
functional approach (typology), Gonczi and Hager (2010) emphasised that in Australia a more integrated approach to competence development has been pursued. However, to understand how vocational education in Australia evolved, it is better to explore the origins of vocational education that led to the evolution of Tertiary and Further Education (TAFE) as an independent sector in its own right within the context of the broader Australian education system.

The origins of Vocational Education and Training (VET) in Australia dates back to the mid to late nineteenth century, when the mechanics’ institutes were established to provide working people with some grounding in science and technology (Smith and Keating, 2003). Schools of mines and working men’s colleges were also established to provide training for Australia’s working population. The institutions focused on training in limited trade areas, which was mainly available to Australian males (Smith and Keating, 2003). This situation continued well into the twentieth century until the 1960s and 1970s. According to Smith and Keating (2003), it was in the 1970s that Australian Commonwealth Government turned its attention to technical education and training. During this period, the Kangan Report (1974) was released and defined the roles of Technical and Further Education (TAFE).

The TAFE system in Australia has undergone a period of growth and gradually its status has changed to become a sector with increased funding and expansion, although in the federal budget of 2012, this measured funding may have been compromised. The new sector was called the VET sector, and TAFE became a major player in the VET sector.

During the 1980s, the Australian economy was under the steady influence of the global economy in the areas of the changing nature of work and the growth of technology. Australian industries and manufacturing were seen as non-competitive, and Australia was in danger of becoming redundant and overlooked in the global economy. The first calls for radical reform in Australia’s VET sector were made by the Australian Treasurer in 1987. Australia was required to produce a skilled workforce. The Labour Government responded and argued for a world class training reform and introduced the Training Reform Agenda, comprised of the following components:

- Competency-based training (CBT) – a new model of curriculum.
Australian Qualification Framework (AQF) – a policy for the quality of qualifications.

Registered Training Organisations (RTOs) – professionalization of the sector.

Open Training Market (OTM) – a competitive open market for training providers.

Training Packages (TP) – up to date retraining for workers.

Australian Quality Training Framework (AQTF) – a policy to ensure quality retraining of Australian workers.

From its inception until 1988, the TAFE system had been offering courses on time-served basis. In that year a major shift occurred that reformed education and training in Australia permanently. A paper titled “Industry Training in Australia: The Need for Change” that was released by John Dawkins, the Labor Minister for Employment Education and Training in the latter part of 1988, set a major shift in the delivery of vocational courses from a time-served orientation to a competency-based curriculum with a focus on industry-based training (ILO, 2009). This major change reformed education and training in Australia until the current time.

According to Harris, Guthrie, Hobart and Lundberg (1995), this shift of emphasis in the delivery of vocational education created a turbulent time for two decades in the training environment in Australia. In 1995, Harris et al wrote (1995) that education in the world and in Australia is facing two paths before it. They described the duality as:

It is a safe path of traditional education and training, and less-used way of competency-based education and training that is being almost forced upon some educational travellers, such as Technical and Further Education (TAFE) colleges/institutes and industrial organisations (Harris et al, 1995:7).

As a result of these changes introduced into the training sector, many educators have become apprehensive because they are required to make radical changes in their training role as practitioners, as well as the way in which they interface with learners (Harris et al, 1995).

The move to competency-based training (CBT) in the late 1980s, which was followed by the advent of Training Packages in the 1990s, brought about massive changes in vocational education and a shift in the thinking and practice of teaching. This argument is confirmed by the Australian Government High Level Review that:
Competence (and therefore competency-based training and assessment) appears on the surface to be a deceptively simple concept but, theoretically and in practice, that simplicity melts away to reveal conceptual complexity (Schofield & McDonald & ANTA, 2004a:16).

Further, Harris et al (1995) recorded that, while some educators saw competency-based education and training as a panacea of all educational ills, others saw it as an economic rationalist approach to boost workforce productivity, based on international competitive standards.

The extraordinary changes demanded by the move to CBT have affected practitioners to the extent that some research has referred to these changes as significant, foundational or fundamental, requiring rethinking of teaching, learning and assessment in the VET sector (Schofield & McDonald & ANTA, 2004a; Down, 2003a; Kell 2006a, 2006b).

The need for rethinking of teaching and learning in VET has always been echoed by Kell (2006a:48), who reflects that:

Teaching and learning in TAFE and VET generally require significant change. Some of the national directions concerning training packages and the application of aspects of competency-based training require significant rethinking (Kell, 2006a:48).

On this basis, Australia adopted CBT as the basis of training reform in 1987. CBT requires practitioners to facilitate the learners’ development of competence, including the teaching of performance in addition to the teaching the content. As a result of a mandated move to CBT, VET sector practitioners faced a great deal of difficulty and misunderstanding, particularly in relation to curriculum design and implementation. Practitioners continued to struggle with the concept of CBT and were faced with further challenges by the advent of Training Packages that replaced vocational education and training curricula in 1996. The main components were competency standards (Units of Competency), qualification rules and assessment guidelines (Smith and Keating, 2003). The structure of competency standards that was comprised of various components was quite new to the VET teachers. The first wave of confusions and misunderstandings that emerged from CBT (Smith, 1999) was compounded by this second wave of challenges created by the advent of Training Packages (Down, 2003). Anomalies such as ‘the concept of competence’, and the
inter-relationships of these component parts, including the constituents of ‘competence’, were central to this misunderstanding (Azemikhah, 2011).

The impact of the double jeopardy with these two massive waves of changes in the Vocational Education arena in Australia has fundamentally transformed the educational ethos and systems within TAFE (Down, 2003a). The effect of these changes has not only transformed Vocational Education but has also affected other educational sectors, such as schools and universities. In 2003, Down undertook research in which perspectives of participants such as VET managers, VET practitioners and staff on the impact of changes in VET were documented. The following extract is reproduced from Down’s research (2003a):

While the “success stories” documented proved that the Training Packages have the potential to provide gains in the effectiveness of vocational education, the research depicted a picture of a system that is struggling against real impediments to implement a change which is only partially understood by most of its practitioners. The shift in educational thinking and approach required by Training Packages is a substantial one, and one which takes time to become integrated into practice (Down, 2003a:4).

Down (2003a) suggested a requirement for strong leadership to aim at converting the hearts and minds of the practitioners. On reflection, this reference to the hearts of VET practitioners is a significant one in a context that downplays the place of the intellect and highlights the significance of skill development.

Down (2003a) gathered the views of over 200 vocational training practitioners, bureaucrats, industry personnel and students from all Australian states and territories. The research provided a snapshot of conflicting views about the Training Packages and indicated that there were key contextual issues that acted against the adoption of Training Packages and their innovative uses by VET practitioners. The conclusion was that her research portrayed a great array of misunderstandings and confusion within the VET sector, as a result of incorrect perspectives reported by the practitioners of the new change agenda. She reported that *misunderstandings and wrong impressions have influenced the behaviors and beliefs as powerfully as do the facts* (Down, 2003a:2). Thus, from its inception, it can be argued that the introduction of CBT and Training Packages has unfolded in an ethos of misunderstanding.
Down’s research (Down, 2003a) indicated that the Training Packages were only partially understood by most of its practitioners (Down, 2003a:3), and that with a change of such magnitude, such misunderstanding may not be unusual. It was clear from this report that practitioners must come to find new ways to fully understand the changes if the new policies were to be effective.

Down (2003a) has also emphasised that for the Training Packages to reach its potential, there exists a need for effective professional development of VET staff (including sessional staff) to ensure that VET teachers and trainers have the necessary competence to deliver Training Packages effectively (Down, 2003a:3).

Given the data gathered by Down (2003a), it is argued here that the VET system continues to struggle. The outcome of the implementation has been superficial compliance rather than re-conceptualised change, and nothing substantial has been done over six years to convert the hearts and minds of VET practitioners. Down (2003a) concluded that practitioners have only developed partial understanding of the Training Packages implementation.

These perplexities have been emerging since Australian VET shifted its focus in 1988 from a content-based system of delivery (Content Paradigm) to a competency-based method of delivery (Competency Paradigm) (for example, Schofield & McDonald & ANTA, 2004a; Smith and Keating, 2006). The advent of the Training Packages has generated further demand for CBT (Chappell, Hawke, Rhodes, Solomon & ANTA, 2003). In the competency paradigm, an emphasis on content has been extended to include all the constituents of competence comprised of knowledge, skills and attributes, and not merely the knowledge component (Schofield & McDonald & ANTA, 2004a; Smith and Keating, 2003). In addition, the Training Packages require the application of the content knowledge and skills in a simulated work environment or on the job, to a list of procedural steps called ‘Performance Criteria (Schofield & McDonald & ANTA, 2004a). The introduction of these changes and the extension of content and inclusion of constituents of competence, (i.e. knowledge, skills and attributes in teaching practices) require maintaining the right balance between theory and practice, and the pedagogy of how these component parts are inter-related. While the teaching of subjects’ modules and their relevant content in a content-based system
may appear to be simple, the teaching of the Units of Competency in a competency-based system has created new challenges for teachers.

In a competency-based system, teachers are not only required to teach and assess content, but they also have to ensure that the learners have achieved ‘competency’. Students should not only know and understand the content but, they should also master a range of skills and attitudes, and apply these to performance in an integrated approach as specified by the competency standards. Based on these requirements, it is evident that the Training Packages model has introduced enormous pedagogical complexities for teaching in the TAFE sector. It is argued that, without a supporting theoretical framework of applied learning that defines the inter-relationships of these component parts in practice, it is not viable to expect all VET practitioners to understand the complexities introduced for implementation. Down’s (2003a) research has confirmed that this is the case.

These contextual changes require establishing a balance between theory and practice. This has proved to be crucial in professional vocational education. From a historical point of view, it is well established that Vocational Education evolved from an historic tradition of a conception of curriculum that focuses on ‘knowing how’. The advent of competency-based Training Packages has drastically changed this conception. VET teachers are now required to achieve the theoretical dimension of “knowing why” as well as the practical dimension of “knowing how”. While teaching practices in other sectors may have been generally theory-driven, competency-based vocational education and training has always lacked this required theoretical dimension.

The works of Tyler warned some time ago that:

> Without Theory, practice becomes chaotic, merely a collection of isolated, individual cases. Theory gives meaning and unity to what would otherwise be specific and isolated cases. Hence, these efforts to connect theory to practice more closely are important contributions to professional education (Tyler 1949:55).

Thus, it is evident that a sound and comprehensive theoretical framework is vital to give meaning to a change of such magnitude in VET. In other words, in order to give meaning and unity to VET pedagogical needs, a comprehensive theoretical framework is inevitable.
Given the data gathered by Downs (2003a), it can be stated that VET in Australia has been in a state of struggle. Superficial compliance rather than the desired change has been the outcome of the implementation, as practitioners only partially understood the requirements of the Training Packages. The Training Packages model has introduced enormous pedagogical complexities for teaching in the VET sector without a supporting theoretical framework. Erica Smith confirms this in her submission in 2011 to Skills Australia by stating that VET educators, i.e., teachers and trainers are not able to work skillfully with the Training Packages (Skills Australia, 2011).

The Smith Submission referred to the point that Schofield and MacDonald made in 2004 in the High Level Review of Training Packages that VET teachers do not know how the Training Packages work or how to work with them (Schofield & McDonald & ANTA, 2004a:5).

The Skills Australia report (2011) draws on the experience and expertise of a broad range of stakeholders such as Trade Unions, Registered Training Organisations (RTOs), Higher Education, Group Training Agencies, Governments etc, who generously contributed their views through more than 140 submissions and through consultations attended by nearly 500 people.

Skills Australia (2011) report also indicates that while the Australian Quality Training Framework (AQTF) is a good starting point in terms of a set of standards, there has been a failure to invest adequately in effective implementation of these standards as VET quality regulation is considerably underfunded in comparison to higher education sector. This failure has been exacerbated in 2012 by massive budget cuts by states to TAFE across Australia in particular to Victoria, NSW and Queensland. These cuts have threatened the closure of 38 campuses in Queensland and have been worsened in Victoria to the point that TAFE system is struggling for its survival (Forward, 2012) which will impact on professional development of TAFE teachers to develop necessary skills in an environment of continuous change.
The Skills Australia (2011) report’s finding that the VET teachers have not developed the necessary skills to work with the Training Packages skilfully indicates a foundational problem in the delivery of Training Packages. This reflects the work of Down (2003), who further stated with volition that,

The shift in educational thinking and approach required by Training Packages, is a substantial one, and one which takes time to become integrated into practice (Down 2003a:4).

Smith’s finding in 2011 also confirms Down’s view point that the integration of such a profound change in educational thinking requires a theoretical framework to facilitate understanding of the change.

Training Packages in Australia require the teaching of a number of Units of Competency (courses) that replaced subject modules. Each Unit of Competency consists of a number of knowledge items, a suite of skills to be developed, as well as performance criteria. No theoretical framework has been advocated as to how the range of knowledge and skills are to be integrated and inter-related into reconceptualised teaching practices underpinned by performance criteria. The Training Packages lack a theoretical and conceptual framework that supports the necessary pedagogies for competency development.

2.5 Content era, competency era and paradigm shift

It is argued here that the shift in educational thinking that accompanied the introduction of competency-based training (CBT) in 1987 and the Training Packages in 1996, led to the advent of a new educational paradigm for the VET sector. The new paradigm requires the VET sector to do “more than re-affirm the existing assumptions about competence” (Schofield & McDonald & ANTA, 2004a:16). Training Packages are underpinned “by a range of explicit and implicit assumptions about work performance knowledge and skill, teaching, learning and assessment and qualifications. These assumptions are in dire need of a pedagogical re-think” (Schofield & McDonald & ANTA, 2004a:16).

The Training Packages demand the rethinking of the new pedagogical work by VET teachers. Some concepts may need to be redefined, some broadened. This is endorsed by (Schofield & McDonald & ANTA, 2004a), who affirm the need to reshape pedagogical engagement in Vocational Education.
The High Level Review (Chappell et al & ANTA, 2003) has identified a range of perplexities, complexities and dissonances that are implicit in the reform. Such complexities are reflected in the transition from a traditional paradigm to a new competency-based paradigm. Azemikhah (2006) has described the confusion in VET that has emerged as a result of this shift from a content-based (time-served) to a competency-based paradigm. Clearly the question emerges as to what is implicit in the paradigm shift, and what are the implications for the VET sector.

According to Kuhn (1970), in every profession there is a ruling paradigm that governs the activities of that profession. This ruling paradigm determines the way in which experiments need to be designed and results interpreted. Kuhn (1970) argued that the ruling paradigm dominates the field until a scientific revolution occurs. During the revolution, the ruling paradigm is overthrown in favour of a new paradigm (Kuhn 1970). In the case of VET sector in Australia, the traditional paradigm was the content-based paradigm, which focused on the delivery of content to learners on a time-served basis.

Kuhn (1970) hypothesizes that revolutions of this type result from break-downs in intellectual systems which happen whenever practitioners facing new problems try to resolve them with old methods. The rules of the dominant or ruling paradigm are adopted to (unsuccesfully) solve these problems.

Given that Kuhn’s scientific revolution is valid, this dominant content paradigm has accumulated a common body of beliefs, assumptions and approaches to solve problems that are congruent with TAFE teachers’ beliefs and values, such as approaches used by teachers in regard to assessment, pedagogy, teaching practices according to the relevant principles and codes of practice. The proponents of the paradigm have adhered to the content-based rules, which have governed the activities within that paradigm. The practitioners have developed standards of performance over the years as practitioners within the paradigm. Hence, they have developed and share a conceptual model that governs their activities under the content regime in Vocational Education.

The High Level Review (Schofield & McDonald & ANTA, 2004a) of the Training Packages in Australia has pointed out that Vocational Education is facing a revolution or paradigm shift of this type. This is exacerbated by the introduction of two new
learning environments, i.e. on-the-job and off-the-job, which are central to VET Training Packages. These are not clearly defined, may overlap and their links to Training Packages and subsequently VET pedagogy are tenuous (Chappell et al & ANTA, 2003). As a result of this ambiguity “the transformation to Training Packages has increased the organisational complexity of the system” (Chappell et al & ANTA, 2003:13) (ANTA 2003a:13). As stated, such a transformation in VET education has been a revolution (Schofield & McDonald & ANTA, 2004a:4).

This revolution in VET education has created a paradigm shift and with it a host of confusions and misunderstandings that have been referred to as pedagogical perplexities that continue to challenge teachers in the VET sector.

Confusions about competency and competency-based training have been identified as either conceptual (Rychen, 2002; Reeff, 2003), pedagogical (Chappell et al & ANTA, 2003; Schofield & McDonald & ANTA & 2004a; Smith and Keating, 2003) or methodological (Vieyra-King and Caiteaux, 1996; Hinzen, 2001) Some international authors around the world have gone further and argue that the very term ‘competent’ creates confusion (Mansfield, 2004).

As stated, Kuhn (1970) argues that scientific revolution starts when a number of practitioners in the discipline who are faced with new anomalies are unable to explain the anomalies in the context of the ruling paradigm. The practitioners who subscribe to the ruling paradigm tend to ignore the contradictions and inconsistencies by improvising and making ad hoc changes to handle the crisis (Kuhn 1970).

Clearly, this is indicative of what has been happening in the VET sector based on the study of literature in vocational education in the recent past, and in the light of Kuhn’s (1970) thesis. For example, Harris wrote in 1995 that, “as educational innovation is introduced, there are always pitfalls, traps, short-circuits, hasty and superficial implementations, and political machinations. CBT is no different” (Harris et al, 1995:2).

The superficial implementation of CBT was referred to by Smith (1999) from the data collected from participants, who stated, “what we are doing here is a pseudo-CBT, that’s all you can call it” (Smith, 1999:113). Smith in her submission to Skills Commission – Skills Australia (2011) has painted the picture differently, thus:
While there were serious problems with the early stages of CBT and Training Packages, the current system is set up as well as can be expected when there are so many conflicting interests to accommodate, and the high-level review of Training Packages confirmed this. The issue, though, is that teachers and trainers are not educated to the level at which they can work skilfully with Training Packages, therefore underpinning knowledge is quite frequently not delivered to learners (Skills Australia – Skills for Prosperity, 2011:117).

This suggests that, after 15 years, VET teachers and trainers are not working skilfully with Training Packages (Skills Australia, 2011). These anomalies continue to persist in the implementation of Training Packages in a competency-based paradigm.

2.5.1. Anomalies (Kuhn 1970)

The anomalies (Kuhn 1970) that have emerged as a result from the recent Skills Australia (2011), such as requirement to work skilfully with the Training Packages (Skills Australia, 2011:117), are implicit in the paradigm shift that has put the implementation of Training Packages in question. Some of these anomalies include:

- Anomalies about the concept of competence and the inter-relationships of its component parts, such as knowledge and skills
- Anomalies about underpinning knowledge that has been overlooked (Skills Australia, 2011:117)
- Anomalies as to how much knowledge is required in delivery (Skills Australia, 2011:117)
- Anomalies about the quality of training delivery and assessment (Skills Australia, 2011:147)
- Importance of underpinning knowledge or theory in the development of competence (Skills Australia, 2011:234)
- Anomalies about deep seated issues of consistency in quality of training (Skills Australia 2011:147)
- Anomalies about the pedagogy of CBT and competence
- Anomalies about the low quality of teaching and assessment of competence (Skills Australia, 2011:5)

The above anomalies reported by Skills Australia (2011) impinge on VET delivery of Training Packages. Chapter 3 reports on literature that articulates the underlying causes that gave rise to these anomalies. In addition, the analysis will reveal how these anomalies might be addressed.
2.6 The revolution in VET education

The High Level Review of Training Packages was instigated by the Federal Government in 2003 and 2004 to provide further insights into particular confusion and, in particular, confusion of a pedagogical nature. It is now nine years since the report “Moving On”, i.e., the Phase Three Report of the High Level Review in which Schofield & McDonald & ANTA (2004a) pointed out the need for the rethinking of all the assumptions underpinning Training Packages.

As discussed earlier, the complexities in the last two decades, and particularly from the advent of Training Packages in 1996, have resulted in commissioning of the High Level Review and a number of reports designed to address what has been problematic with the paradigm shift. In order to cope with the crisis, VET teachers have been making an ad hoc decision that Down (2003a) has referred to it as “superficial compliance”. In the following quotation, she has pointed out that:

Much of the data collected and analysed reflects a VET system struggling to give the appearance of compliance rather than embracing the whole-hearted acceptance of the change (Down 2003a:3).

Down (2003a) has clarified that the shift in educational thinking and approach required by Training Packages has been a substantial one, and one which takes time to become integrated into practice. Her view is confirmed by Smith’s submission to Skills Australia (2011) asserting that:

Teachers and trainers are not educated to the level at which they can work skilfully with Training Packages (Skills Australia 2011:117).

The anomalies reported above suggest that the integration of Training Packages into practice is far from complete and according to Skills Australia (2011) varies considerably from individual to individual submissions. Whilst not unexpected, this variability means that understanding of Training Packages and the change in practice they represent is often incomplete and results in practices which leave a lot of room for improvement. Even when Smith (Skills Australia, 2011) admits that there were serious problems at the early stages of CBT and Training Packages, the above list of anomalies indicates that problems still persist. The mere fact revealed by Skills Australia (2011:117) that teachers and trainers are not educated to the level at which they can work skilfully with Training Packages, indicates the dire need for a framework that is instrumental in educating a skillful taskforce by shaping a new
pedagogical approach, otherwise the anomalies will remain and continue to abort the full implementation of the new system.

2.7 Conclusion

While there is still no consensus to adopt a common competence model (Winterton, 2009), moving towards a global consensus on competence requires documenting the existing models around the world. Le Deist and Winterton (2005) have pointed out that responding to the demands of the labour market globally requires an appropriate typology of competence. Arriving at a typology of competence depends on how competence is interpreted. Despite the confusion surrounding the meaning of competence and how it is interpreted, three typologies have emerged globally, which are: the behavioural approach in USA, the functional approach in the UK and the holistic approach in Germany and France. While these typologies were followed and shared by some countries, others have followed a hybrid approach, combining some features of these typologies and resulting in various types of VET systems with similarities and differences among them. These countries have also been continuously improving and reforming their VET systems, leading to substantial changes to their higher education and school systems.

However, these global trends indicate that countries around the world are moving towards a more holistic approach to typology of competence, despite the fact that initially they followed one of the three typologies. For example, the US model of typology emerged when the tests of cognitive intelligence proved ineffective as an indicator of job performance (Winterton, 2009) and to deal with this problem the measures of competence were initially developed (White, 1959). The employees’ superior performance was found to have association with their psycho-social attributes. In their approach, the psycho-social attributes of individual workers were differentiated from job-related activities, resulting in two sets of descriptors: job-oriented descriptors and worker-oriented descriptors.

The European approaches were developed in the 1980s, and were independent of American approaches. Although the focus in Europe was on occupations rather than individuals’ attributes, European countries differed in their approaches. For example, the UK pursued a functional approach (Typology) while Germany and France followed a holistic approach (Typology).
Despite the fact that different approaches have been followed by various countries, Gonczi and Hager (2010) have pointed out that countries around the world including Australia are moving towards a more holistic approach to competence. The Australian approach is called by Gonczi and Hager (2010) an integrated approach. This is confirmed by others such as Le Deist and Winterton (2005), who referred to an emerging world view supporting knowledge, skills and attributes (KSA) in relation to competence. This view has been compared with the French approach and referred to by Le Deist and Winterton (2005) as:

The first three dimensions, cognitive, functional and social competences, are fairly universal and are clearly consistent with the French approach (savoir, savoir faire, savoir être) as well as the longstanding KSA (knowledge, skills and attitudes) of the training profession (Le Deist and Winterton, 2005:39).

Schofield & McDonald & ANTA (2004a) have confirmed this view by referring to the knowledge, skills and attributes as the constituents of competence.

Australia moved to CBT in 1987, but did not have a framework for its implementation until the late 1990s. In 1996, the Training Packages (TPs) were introduced as the framework for implementation of CBT, comprised of the Units of Competency. Units of Competency in the Training Packages are comprised of knowledge, skills and attributes that are regarded as the constituents of competence (Schofield & McDonald & ANTA, 2004a).

The chapter set the context of the study and established that the shift in educational thinking that accompanied the introduction of competency-based training (CBT) in 1987 and the Training Packages in 1996 led to the advent of a new educational paradigm for the VET sector. According to Kuhn (1970), in every profession there is a ruling paradigm that determines the way in which experiments need to be designed and results interpreted, which dominates the field until a scientific revolution occurs. During the revolution, the ruling paradigm is overthrown in favour of a new paradigm (Kuhn 1970). In the case of the VET sector in Australia, the traditional paradigm was the content-based and focused on the delivery of content in a time-served basis, referred to here as the ‘Content Era’ (Azemikhah 2006), that was overthrown by CBT. The chapter covered the Australian VET context, indicating that the VET system in Australia has gone through a paradigm shift (Kuhn, 1970). Clearly, this is indicative
of what has been happening in the VET sector, based on the study of literature in vocational education in the recent past and in light of Kuhn’s (1970) thesis.

However, as Smith (Skills Australia, 2011) has indicated, it is not the knowledge component that is problematic but it is whether or not the teachers are adept in using the Training Packages. In Chapter 3 the empirical literature in this area are analysed to shape the study.
CHAPTER 3: LITERATURE REVIEW

3.1 Introduction
In the previous chapter the contextual literature was examined. Chapter 3 provides an exposition and analysis of the empirical literature and policy documents that advised the shaping of the study. Part One of this chapter explores the concepts of lifelong learning (LLL) and competency development (CBT) at the global level. It examines to what extent the research has impacted the European policies that led to changes shaping the VET systems throughout Europe in the first decade of the new millennium in response to challenges of globalisation. Secondly, this section also examines to what extent the elements of lifelong learning and competency development have been integrated globally by further policy development in both the global and in the Australian context.

3.2 Lifelong learning
An overview of the international trends in Lifelong Learning by Dr George Papadopoulos, former OECD Deputy Director, has revealed that major international agencies have given top priority to LLL. As Bradley (2008:10) has hinted, in order to take into account the training invested in those who are already in the workplace, it is necessary to turn the rhetoric of lifelong learning into a reality.

To recognise such reality, as Bradley (2008:10) emphasised, as well as the parallel trend of LLL and competency development, it is important to understand what is meant by LLL at the outset.

The following definition emerged from consultations that were undertaken across Australia in 1996:

Lifelong learning is a continuously supportive process which stimulates and empowers individuals to acquire all the knowledge, values, skills and understanding they will require throughout their lifetimes and to applying them with confidence, creativity and enjoyment in all roles, circumstances and environments (Kearns, McDonald, Candy, Knights and Papadopoulos, 1999a:viii).
Given that LLL and competency development should be integrated (EU, 2003) the question to be answered is: which competencies do individuals need to develop for their lifelong success?

The answer can be found in the DeSeCo (Definition and Selection of Competencies) Project (1997 – 2002) that was launched in December 1997 by the OECD in search of an answer to such questions as: in the context of LLL, what competencies do we need for an overall successful life and a well-functioning society?

The Tuning Project (Gonzalez and Wagenaar, 2003), which was the second global project associated with LLL, focused on the area of higher education and placed importance on developing subject-specific knowledge and skills as the basis for university degree programs. It also emphasised the development of generic competencies or transferable skills that are important for life and for LLL. The typical academic competencies such as problem solving, capacity for analysis and synthesis, as well as the capacity to learn were identified as being the most important ones in all fields of study.

This project was integral to the Bologna Process that was planned for the ten year period between 1999-2010, signed by European Ministers and launched in 2000. The Bologna Process was initiated by the Bologna Declaration and signed in the Italian city of Bologna on 19 June, 1999, by the Ministers of Higher Education from 29 European countries (Gonzalez and Wagenaar, 2003).

The main objective of the Bologna Process was to establish a European Higher Education Area by 2010, and the member countries focused their attempts to achieve this objective during 1999-2010. The process was necessary for strengthening the competitiveness and attractiveness of higher education in Europe, as well as fostering the mobility of students in both undergraduate and postgraduate studies and their employability across Europe (Gonzalez and Wagenaar, 2003).

The first phase of the Tuning Project focused on the designing and delivering of the degree programs on the basis of well defined profiles which translated into learning outcomes and were expressed as competences.

Other generic competencies, for example, capacity to adapt to new situations, concern for quality, information management skills, ability to work autonomously, team work,
capacity for recognising and planning, oral and written communication in native language as well as interpersonal skills, were regarded to be important for employability.

The most relevant subject-specific competences were also identified by the seven pilot subject area groups (Business Administration, Chemistry, Education Sciences, History, Geology/Earth Sciences, Mathematics and Physics). In the field of education, the Tuning Project highlighted that teacher training is regarded by the European Commission as important and ‘vital’ to the achievement of the Lisbon objectives in education and training, and is comprised of subject-specific competences in the Higher Education Sector. Thirty subject-specific competences in Education Sciences were developed by the Education Sciences working group and evaluated by students, academic and employers. Each academic was encouraged to identify ideas for best practice in developing the competences in a degree program such as learning activities, teaching and assessment and to find answers to the following five questions:

1. What does this competence mean for my students?
2. How do you help students to achieve this competence in your teaching methods?
3. What learning activities do your students engage with in order to develop this competence?
4. How do you assess whether, or to what degree, they have achieved this competence?
5. How do your students know whether or to what degree they have achieved this competence, and if not, why they have not achieved it?

As a result, two approaches for the teaching of generic competences for lifelong learning at degree level have been identified across Europe. The first approach is the provision of separate course units as part of degree programs, enabling students to master generic competences. In the second approach, generic competences are integrated into subject programs and modules. In this way, field-based studies assist students to develop key and generic skills that are of value to employers and to LLL (Gonzalez and Wagenaar, 2005).

The realisation of including competencies at Higher Education (HE) as well as the Vocational Education and Training (VET) area in study programs globally required strategies to address the issue of globalisation of VET internationally. Hence, there is
a recognised need for retraining in the context of LLL, to replace potentially obsolete skills with the new skills. Without such a process, professional obsolescence can occur, which leads to the erosion of competence (Clayton, Harding, Toze and Harris, 2011). Clayton et al (2011) has elaborated that professional obsolescence occurs when individuals do not have the ability to undertake continuous learning to sustain their current knowledge.

To avoid professional obsolescence, new strategies that emphasise LLL were required at the global level. Hence, parallel to DeSeCo and the Tuning Project, the question emerged as to how to place more emphasis on LLL in the context of global VET for the 21st century, which was also the theme of the Lisbon Strategy.

### 3.2.1. Lisbon Strategy 2000: Searching for a global 21st Century approach to VET

At the turn of the century, the European Council was determined to ensure that Europe would be able to achieve sustainable economic growth as well as higher levels of social cohesion and respect for the environment. On this basis, the European Union launched the Lisbon Strategy (2000) as a response to the challenges of globalisation and ageing.

Globally, a dynamic knowledge-based society has been founded over the years on the basis of the interdependence of social and economic policies directed at the modernisation of society and the economy. As a result, more integrated and holistic strategies have been formulated to give recognition to such interdependence. Positioning VET in such global context forced the leading countries to search for a 21st century approach. This search led to the conclusion that lifelong development of skills needs to be placed at the centre of global VET in the international reform model (Kearns 2004).

The important goal argued within the Lisbon Strategy (2000) was that the level of skills in all Europe should increase and that the following objective should be achieved by the year 2010:

> “Europe to become, the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion” (European Commission, 2010:2).
To achieve such an outcome, the EU countries set the required benchmarks for performance on the basis of Lisbon Strategy to be achieved by 2010 (Lisbon European Council, 2000). On these grounds, the European Commission emphasised that lifelong learning should become the overall objective of all national educational communities in Europe and around the world.

In 1995, in the white paper Teaching and Learning: Towards the Learning Society, the European Commission (1995) associated lifelong learning with the personal skill card. The White paper set out the action to be taken in Member States. This card was aimed for Europeans, with which new knowledge and skills acquired during a lifetime in various formal and informal learning environments could be documented for individuals (European Commission, 1995). The aim was not to devise a uniform card and impose it on Europe, rather to contribute to the development of such tools for LLL, so as to progressively arrive at joint standards, including standards that cut across a number of occupations (European Commission, 1995).

Kearns (2004) has pointed out that:

> There is a general recognition that lifelong learning strategies should underpin all education and training policies as, for example, in the policies of the European Union (EU) and its member countries, and in other countries such as Canada and Japan (Kearns, 2004:i).

Internationally, the concept of lifelong learning has been the most remarkable phenomenon over the decade of the nineties (Kearns, McDonald, Candy, Knight and Papadopoulos, 1999). Teaching and learning in 21st century are going through transformation by integrating lifelong learning and competency development as the integral elements of the holistic approach for VET, resulting in the concept of competence for life.

Similarly, lifelong learning has gained impetus in the context of the European Commission’s Leonardo da Vinci programme (part of the Lifelong Learning Programme 2007-2013). Leonardo da Vinci focuses on raising the quality and relevance of VET, and provides an opportunity for organisations to build European partnerships, exchange best practice, increase the expertise of their staff and develop the skills of learners (Cedefop-Germany, 2010:29). The European Union (EU) through the Leonardo da Vinci programme provides grants to organisations that offer
VET opportunities in the workplace or training institutions and provides funding for cooperation between organisations. The Leonardo da Vinci programme is administered by European commission. The EU also provides grants to individuals to assist in their professional and personal development.

In 2010, the UK government appointed a Minister for Further Education, Skills and Lifelong Learning. UK has also set up a system and has called for all individuals to open a lifelong learning (LLL) account. These accounts are intended to provide access to new FE student loans and other forms of financial support for learning such as an enhanced discretionary learner support fund, allowing adults to signal where they have demands which the market is not meeting. All LLL accounts will also provide incentives for learning, including a means of recognizing the social contribution made through volunteering. Lifelong Learning (LLL) accounts provide access to personalized information on training already achieved by individuals, as well as information on the wage and employment benefits of different courses (Department of Business, Innovation and Skills (UK), 2010).

Thus, the widening of the concept of competence needs a 21st century approach to learning, skills and workforce development (Kearns 2005). In response to the needs of the 21st century in the global context, a comprehensive theoretical framework incorporating LLL around these themes based on the concept of competence is required.

3.3 Competency development

In order to understand the analysis of empirical literature in this important area of the research study, it is necessary to grasp an understanding of competency-based training (CBT) and its origins in the United States before analysing the research literature.

In the United States of the 1950s, -60s and -70s, the societal origins of CBT were shaped by a chain of events that started with the launch of Sputnik by the Soviet Union into orbit around the earth (Harris et al, 1995; Hodge, 2007). Towards the late 1950s, the United States of America and the Soviet Union engaged in a “space race” competition. Each country in this space race intended to be ahead in launching the first satellite into the Earth’s orbit. In this race, it was the Soviet Union that successfully launched the first satellite, Sputnik, on October 4, 1957 ahead of the
Americans. The success of the Soviet Union in launching the first satellite had a significant impact on American psyche (Hodge, 2007). This lost opportunity, to be the first in space, forced Americans to engage in a soul-searching endeavor for the causes of this failure, which led them to scrutinize their education and training system (Harris et al., 1995), as well as the quality of teacher preparation (Harris et al., 1995). They identified that the root cause of this national failure was linked to accountability issues and that National Defense must be related to the nation’s education system.

Further events led to the introduction and endorsement of the National Defence Education Act 1958 by the US Senate. This resulted in changes in teacher training and the advent of Performance Based Teacher Education (PBTE), that later evolved into CBT (Hodge, 2007). Burns and Klingsledt (1973) pointed out that it was the public cry for accountability and demand for the specification of performance criteria on the part of many funding agencies that resulted in the emergence of competency-based training (CBT). Houston (1974) emphasized accountability, which is a common expectation that professionals are knowledgeable in their fields and employ that knowledge in their practice (Hodge, 2007).

These comments suggest that the accountability movement has been an important factor in the evolution of CBT. This is confirmed by Bates (1996) who pointed out that most writers have traced CBT to models of teacher education that were popular in the USA in the 1960s when there were calls for greater accountability in education. Thus, as a response to the public cry for accountability, in 1967, the Office of Education called for proposals for a model of teacher education that led to performance-based teacher education (PBTE). Harris et al (1995) pointed out that the model was aimed at primary and vocational teacher education.

Elam (1971: 6-7) stated the characteristics of a PBTE program, inter alia, were that competencies (knowledge, skills, behaviours) that are going to be demonstrated by the students should be derived from explicit conceptions of teacher roles. Further, it was argued, competencies need to be made public beforehand, as well as the criteria that are employed in assessing competencies. In addition, the student’s progress through the programs should be determined by demonstrated competency rather than by time or course completion. Further, that the instructional program is intended to facilitate the development and evaluation of the student’s achievement of competencies
specified, and performance is to be used as the primary source of evidence, taking into account evidence of the student’s knowledge. Hodge, (2007) has elucidated that Elam’s (1971) list of essential criteria for PBTE programs is significant in the development of CBT and its origins. Thus, the assessment in PBTE was based on performance criteria.

Subsequently, competency-based teacher education substituted the systematic study of disciplines such as psychology and mathematics (Harris et al, 1995). By 1977, about 23 American states had put in place the required legislation for performance-based vocational education to be applied in the training of vocational teachers.

In the UK, the City and Guild of London Institute was one of the organisations that showed interest in CBT. In the early 1980s, the Thatcher Government started to renew the UK education system. This was the beginning of the Thatcherite cultural and economic revolution as referred to in Chapter 2. A white paper titled *Employment for the 1990s* was published in 1988 by the Government. It argued that recognised standards of competence, relevant to employment, should be drawn by organisations that are industry-led and covering all occupations (Harris et al, 1995). The National Council for Vocational Qualifications (NCVQ) was established to design and implement the competency-based national qualifications (Harris et al, 1995:43). It was pointed out that:

> A particular issue we need to address in the UK, if we are to achieve the targets, is that of raising the status of vocational education in the society which is still dominated by academic elitism (Jessup 1992:173).

To address this, the Government published a white paper in 1991 titled, *Education and Training for 21st century* in which it declared its intention to establish a ‘parity of esteem’ between academic and vocational education (Jessup, 1992). Jessup (1992:173) has highlighted that the intention was to align academic and vocational education at all levels and move towards a more coherent and comprehensive system by creating the National Vocational Qualifications (NVQ) framework on the basis of NCVQ’s work. The NVQ Statement of Competence was covered by Units of Competence. Each unit followed a format of Elements, Performance Criteria and Range. While Elements described the activities the student had to carry out, they were divided into Performance Criteria that described smaller steps that effective workers should take to achieve the standards of quality. Performance Criteria referred to some concepts that
represented a range of circumstances or situations applicable to that activity, which were called Range (Boutall, 2011).

As countries around the world, particularly in Europe, were responding to the competency-based movement and engaged in the process of adopting CBT and competency development in their vocational education, two major models for VET emerged.

The European models were distinct from the American approaches, as referred to earlier in Chapter 2, as they were based on occupations rather than individuals. With such distinction, European competency models either focused on a functional approach such as the case in the United Kingdom, or a more holistic occupational approach as in the cases of Germany and France. The functional approach was referred to by some European authors such as Deissinger (2004) as the Anglo-Saxon model of VET. Deissinger (2004) has referred to the holistic approach in Germany as the Dual System. Winterton (2009) has pointed out that these approaches led to the dominant European models and to the way competence has been perceived in other Member States.

Deissinger (2004:77) has further asserted that:

Obviously, there seems to exist a number of major discrepancies between what may be called the Anglo-Saxon model of VET as established in the UK or Australia and the Dual System in Germany, with its longstanding apprenticeship tradition.

Deissinger (2004) has clarified that the German Model is the most copied model in the world. The essence of the German Dual System lies in a combination of learning and work within the bounds of the dualism of learning sites (part-time vocational school and training company).

The philosophy of this system is based on vocationalism, which means the training is workplace-led and predominantly practical (Deissinger, 2004). This German system is comprised of a holistic set of competences, defined around the workplaces, that are based on national qualification standards according to the 1969 Vocational Training Act or Berufsbildungsgesetz (Deissinger, 2004). Harris et al (1995) has pointed out that in 1969, the Federal Parliament of Germany passed the Vocational Training Act
1969 that made in-company initial and further training and schooling the basis of Germany’s dual system of vocational education and training.

The dual system operates within the jurisdiction of Federal and State Acts. Under these Acts, it is mandatory for school leavers who are below the age of eighteen and are not in higher or further education to attend local part time vocational schools (Deissinger, 2004). The Vocational Training Act places vocational training in the hands of firms and chambers. Chambers both monitor training and support training companies, and hold exams for journeymen, skilled industrial workers, commercial clerks and masters (Deissinger, 2004).

Cedefop-Germany (2010:14) has differentiated initial vocational education and training (IVET) from continuing vocational education and training (CVET). CEDEFOP has defined IVET as training undertaken typically after full-time compulsory education to promote the acquisition of the necessary knowledge, skills and competences for entry to an occupation or group of occupations. To remain competent for life or to maintain their competence throughout life, individuals are required to also engage in continuing vocational education and training (CVET). Continuing vocational education and training (CVET) can be broadly defined as professional or vocational development through education and training, undertaken typically after one has completed initial vocational education and training (IVET) (Cedefop-Germany, 2010:14).

During 2008, Cedefop developed a comparative analysis and study of IVET in Europe. This work was carried out on the basis of twenty five country reports by ReferNet. ReferNet is a network created by Cedefop in 2002 that is specialised in the preparation of country reports on vocational education and training (VET) systems for member states, as well as Iceland and Norway.

Cedefop (2008) has pointed out that one way to improve competitiveness at the global level is to increase participation in vocational education and training. For this reason, vocational education and training (VET) is the focus of several European policies. Cedefop (2008) has further emphasised that given the current global socioeconomic circumstances, countries around the world need to achieve the following goals:

- Firstly, a better qualified labour force for the restructuring, innovation, as well as transition to a knowledge-based economy.
Secondly, to achieve such a qualified labour force, they need an initial vocational education and training system (IVET) which is a supplier of a new professional which has an important role to play in achieving such outcome (Cedefop, 2008).

In addition, it is necessary to improve the quality of IVET in order to increase its attractiveness at the global level (Cedefop, 2008). To develop an understanding of the main characteristics of initial vocational education (IVET) in Europe, Cedefop undertook a comparative analysis of the VET systems of the following countries in 2008:

<table>
<thead>
<tr>
<th>Belgium</th>
<th>Greece</th>
<th>Lithuania</th>
<th>Slovakia</th>
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<tr>
<td>Ireland</td>
<td>Latvia</td>
<td>Portugal</td>
<td>Iceland</td>
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<tr>
<td>Cyprus</td>
<td>Poland</td>
<td>United Kingdom</td>
<td>Estonia</td>
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<tr>
<td>Austria</td>
<td>Sweden</td>
<td>Germany</td>
<td>Netherlands</td>
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<tr>
<td>Finland</td>
<td>Denmark</td>
<td>France</td>
<td>Slovenia</td>
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<tr>
<td>Czech Republic</td>
<td>Spain</td>
<td>Hungary</td>
<td>Norway</td>
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Among the 25 countries that were reviewed for this study, three have already adopted national qualifications frameworks (Ireland, France and the UK), and the rest, except Cyprus, which remains sceptical, intend to introduce such a system in the near future (Cedefop, 2008).

The role of IVET in meeting these goals were set out by the Lisbon Strategy (2000) and can be seen in the targets laid down by the European Union (EU) as follows:

- a) Countries should reduce the share of early school-leavers (aged 18 to 24) by 10%;
- b) A minimum of 85% of young people (aged 20-24) should have completed at least upper-secondary education;
- c) At least 12.5% of adults (aged 25-64) should participate in lifelong learning.

Given that the above objectives are important, the question is: What are the challenges that the VET systems are facing globally in achieving them? In Zooming in on 2010, Cedefop (2007) outlined that the type of challenges VET systems will be facing globally in the next twenty years are demographic and occupational. The demographic challenge is dealing with decreasing participation of young people in upper, post-
secondary, and tertiary education. The occupational challenges involve training large numbers of people with low skills to meet current skill shortages.

There have been three important policy statements in response to the above challenges that have shaped education at the EU level on the basis of the Lisbon Strategy. The Copenhagen Declaration, 2002 (European Commission, 2002) established the European dimension to vocational education and training (VET), including recognition of qualifications and competences. The Maastricht Communiqué, 2004 (European Commission, 2004) built upon Copenhagen Declaration to establish a number of action plans at the national level by increasing investment to boost flexibility in VET systems in meeting the needs of employers and assisting those most vulnerable to changes in the labour market. The Helsinki Communiqué, (European Commission, 2006) confirmed the aims of Maastricht and drew attention to the fact that IVET must be an attractive option for young people.

The crucial points emphasised by the Helsinki Communiqué, (European Commission, 2006) were to increase the attractiveness of IVET to young people across Europe and to establish VET as a major part of lifelong learning. Therefore, combining competency development through IVET and lifelong learning through CVET are the necessary ingredients of lifelong success in developing competence and remaining competent for life. The question is how these objectives need to be achieved globally.

The Helsinki Communiqué (European Commission, 2006) provides a solution by stating that European VET policies should promote high quality initial VET and create conditions to improve the skills of those in the labour force through continuing VET (CVET). Given that policies should engage all young people to acquire skills and competences relevant to labour market needs and to their future lives (European Commission, 2006:3), the question is whether European policies can address the needs of IVET systems in various European countries and to what extent they are similar or not. Cedefop (2008) has reported that IVET systems seem to have some similarities in their structure, content and output; in particular, between groups of countries sharing a common approach to IVET, while at the same time, they also demonstrate substantial variations.

In such a context, Cedefop (2008) pointed out that European and national policies should ensure quality outcomes by facilitating comparability of the structures of IVET
systems. Both the structure and the content of IVET have gone through major reforms in all countries in recent times. These reforms have been substantial in former Eastern bloc countries that are adapting to the conditions of market economies, while other European countries are reforming their IVET systems to be more responsive to the demands of the current and future labour-market (Cedefop, 2008). These trends require a brief look at the structure of IVET systems of these countries.

3.3.1. The structure of IVET systems

Until relatively recently, the structure of IVET systems included only the upper secondary level of schooling, but it is increasingly changing to include the lower secondary level. At this level, both general and academic studies, as well as general vocational preparation, are provided.

Hence, IVET is comprised of academic, vocational, apprenticeship and special programs pathways. According to Cedefop (2008), countries such as Belgium, the Czech Republic, Denmark, Germany, Ireland, France, Hungary, Austria, Poland, Portugal, Slovenia and the UK, in addition to vocational studies or apprenticeship, provide special programmes that aim at young people at risk of dropping out of the IVET systems.

In Europe, at present, IVET is considered as an alternative pathway to the academic route that contains many elements of an academic education which can, ultimately, lead to a tertiary level. In the countries such as Germany, where the dual system is well established, IVET has always combined practical experience in the workplace with academic study provided in the classroom (Cedefop, 2008).

The IVET systems in various countries are different with respect to structure, curricula, qualification/accreditation, transfer, progression and the starting point in the larger education system. In addition, VET systems are not the same, in every country, in terms of transfer which is to allow people to move between academic and vocational streams, or between the various modes of vocational provision. Allowing individuals to attain higher levels of achievement through either of the academic or vocational streams is called progression and is achieved through various possible routes through the education system as the following diagram illustrates.
It is argued that facilitating learners to develop competencies for employability in both IVET and CVET systems require pedagogical strategies. Cedefop (2009) has elaborated that the general challenge for VET pedagogy is to adapt to the increased international competition in providing people with skills and competencies to maintain their employability in the labour market. Globally, this requires a workforce for VET that is equipped with pedagogical knowledge, in addition to the knowledge of the specific fields of delivery in which they specialise.

### 3.3.2. IVET, CVET and VET pedagogy

Cedefop (2008) has pointed out that pedagogical knowledge is a very important component of VET teacher training. Pedagogical knowledge enables teachers to convey the knowledge that is pertinent to their fields of expertise. This means that both IVET and CVET systems are constructed in various countries on the assumption that these systems are capable of such a task, leading to sustainable employment.
Despite this, Cedefop (2008) has elaborated that VET systems, globally, are still at the moot point and is not clear as to whether or not they have delivered sustainable employment to their participants, even if they have undergone a period of continuous reform. The question is why, after continuous reforming of the VET systems, around the world, for the last decade or so, are VET systems still unable to deliver competencies that lead to sustainable employment for their learners?

This is addressed in the Tomlinson Inquiry (2010) that was undertaken in the UK. One of the most significant findings that emerged from the Tomlinson Inquiry (2010) was the importance of pedagogy in VET, and that to simply deliver vocational education and training, knowledge, per se, is not sufficient. Rather, the teacher must be adept in how they communicate that knowledge. Tomlinson (2010) also emphasised that extended research into vocational pedagogy should become a priority for the VET sector. One of Tomlinson’s (2010) findings was that VET pedagogies remain at their infancy, and relatively little research has been undertaken into these pedagogies. Further, the report highlighted that developing pedagogical understanding is more complex than developing subject knowledge, and concluded that a theory of applied learning is needed to facilitate such pedagogical understanding (Tomlinson, 2010). This research argues that the pedagogical understanding and the knowhow in communicating pedagogic knowledge in VET delivery of expert knowledge is made possible by application of the Double Heuristic Method (DHM), discussed in Chapter 5. The DHM is framed by four premises of the applied learning theory of Competencivism (Azemikhah, 2008) outlined in Chapter 4.

The pedagogical understanding of communicating that knowledge, in competency development, according to OECD (2009), should aim at closing the large gulf between learning and work (OECD, 2009). This means that the communication of that knowledge should be implied and facilitated in the closing of such a gap. However, the difficulty of closing the gap between learning and work, as OECD (2009) has pointed out, is that while learning is often seen as abstract, classroom-based and academic, the world of work is seen as concrete, with bosses and customers, profits and machinery (OECD, 2009:10). On this basis, it is argued that these are two different ethoses: there is the world of work, as distinct from the world of learning, as the following diagram illustrates.
This is further confirmed by Bates (1996), who has described competency-based pedagogy as epiphenomenal, indicating deeper changes in social structures that require the synchronization of the two historically separate spheres of work and education.

The OECD (2009) has pointed out that the task of VET is to provide learning for jobs, despite the fact that institutions providing VET have quite a different style from the world of work, (OECD, 2009:10). This suggests two distinctive and broad ethoses (the world of work and the world of learning), and it is necessary for the VET pedagogy to function within these two ethoses in order to connect the abstract, which deals with the mind, to the concrete, that deals with the hands, in the context of competency development (IVET) and lifelong learning (CVET). The National Quality Council (NQC) (2011:6) asserts:

… work based learning caters for all those whose natural learning style is to learn from the concrete to the abstract (and to the theory), rather than the reverse. Such people are a significant proportion of learners, who are not well catered for in traditional teaching settings: schools and higher education tend to teach from the abstract to the concrete (NQC, 2011:6).

Hence, it is clear that the starting point for VET pedagogy is distinct from pedagogy applicable to schools and universities suggesting two distinctive pedagogical approaches as follows:

- Those in schools and universities whose starting point for learning is the abstract and working their way to the concrete, and
Those mainly in VET whose starting point for learning is the concrete (the Hands) and working their way to the abstract (the Mind).

Although learners may fall into either of the above categories, classifying them into the correct categories that they may belong to may not be an easy task. However, irrespective of whichever category a learner may belong to, Azemikhah (2005) argues that he/she is required to make connection across or inter-connect the hands and mind in order to learn and develop competencies. In such a context, the following issues need to be addressed:

- How to connect concrete (hands) to abstract (Mind) and theorizing the interplay of the two.
- How these pedagogies can be framed by a theory to facilitate learning in the context of these two ethoses.

It is argued that the answers to these questions lead to the theory of applied learning. Thus, the global literature is explored in search of answers.

### 3.4 In search of a theory of applied learning

It was concluded earlier that the two trends of IVET and CVET emerged from the notions of competency development and lifelong learning (LLL). Pursuing these trends led to the realisation that VET pedagogies are at their infancy. Given the above emerging trends, it is clearly evident that IVET and CVET are interconnected yielding competence for life. It is argued, here, that for the understanding of how to develop and maintain competence for life through IVET and CVET a theoretical framework utilising the concrete (Hands) and abstract (Mind) notions in VET pedagogies is required as the special theory of applied vocational learning. Such a theoretical framework is necessary to facilitate pedagogical understanding that can be used in the vocational context. The application and implementation of these pedagogies will transform VET delivery across the globe into a workable, teachable and learnable format via a theory that facilitates the practice of teaching and learning in all the trades and professions and activities of life. This is confirmed by Dr Mary Bousted, General Secretary of the Association of Teachers and Lecturers in the UK, who has stated:
“There is a clear need to develop a theory of applied learning…we do not yet have one…Pedagogy is the most important thing for a teacher to understand; it is much easier to develop subject knowledge than it is to develop pedagogical understanding” (Bousted in Tomlinson, 2010:42).

The chapter now turns its focus to empirical research in VET in the United Kingdom.

3.5 Empirical research in vocational education in the UK

Barber (2011), Assistant Principal, Westminster College, London, in an address to AUSTAFE in Brisbane stated that, many policies that are implemented in Australia are similar to the policies in the UK. She further added that:

Ministry to Ministry are actually sharing these policies, perhaps learning from one another at the top level and that we on the ground also are not re-inventing the wheel as well (Barber 2011).

Barber (2011) pointed out that the UK is a member of the European Union (EU) and the policies that emerge in the UK are driven by those of the EU. She added that:

We can learn (both countries Australia and UK) from each other in the course of the following 7 or 8 years. But before achieving that, it is better to look back a decade or so and learn from what happened in the UK Vocational education (Barber 2011).

The Thatcher government in the early years of 1980s started to shake the UK education system that became known as ‘Thatcherite revolution’, as discussed in Chapter 2, and by mid 1980’s government moved towards a complete overhaul of VET strategy. The term ‘competence’ became decidedly dominant in the most influential publications of this period, The Review of Vocational Qualifications and the ensuing white paper titled, Working together, Education and Training (Bates, 1996). The plethora of white papers that became known as ‘New Vocationalism’ resulted in transformation of VET in the UK (refer to Chapter 2). These papers laid the foundations for developing a new system of vocational qualifications in Britain related more directly and clearly to competence required and acquired at work (Bates. 1996).

In relation to the decade 1986 to 1996 in Britain, Bates (1996) has highlighted that in this decade, the competence movement advanced to all spheres and levels of post-16 education and training, and its penetration is deepest in technical and vocational
fields, and lesser in scientific fields. She pointed out that Britain, the ‘Trojan Horse’ of the competence movement, has developed a system of National Vocational Qualifications (NVQ) and their sister qualification, General National Vocational Qualifications (GNVQ) framework. These frameworks are intended to span across the entire range of qualifications including degree level, and require the development of competence-based pedagogy. She identified parallel trends in New Zealand, Australia and the United States in 1996. However, she stated that “it is in Britain where competence has become wedded to national system of qualifications, that the movement has become most sharply defined, uniform in its manifestations and most deeply entrenched” (Bates, 1996:1). She has further elaborated that central to the understanding of the competence movement in Britain is the appreciation of the fact that competence is a central concept in the emerging system of NVQs and GNVQs, which came to prominence in both US and Britain in the context of calls for accountability in education (Bates, 1996). The version that has become dominant in Britain is broadly similar to American models and, according to Bates (1996), the approach adopted in Britain by the National Council for Vocational Qualifications (NCVQ) resonates closely with the following definition of competency-based education:

Competency-based education tends to be a form of education that derives curriculum from an analysis of prospective or actual role in modern society and that attempts to certify students progress on the basis of demonstrated performance in some or all aspects of that role. Theoretically, such demonstrations of competence are independent of time-served in formal educational settings (Grant, 1979).

In 1988, a white paper titled Employment for the 1990s was published by the government delineating that recognised standards of competence, relevant to employment, should be drawn by organisations that are industry-led, covering all occupations (Harris, 1995). The National Council for Vocational Qualifications (NCVQ) was formally established in 1996 to implement the recommendations as set out in the White paper for the design of competency-based national qualifications (Bates, 1996:4). Jessup (1992) pointed out that,

A particular issue we need to address in the UK if we are to achieve the targets is that of raising the status of vocational education in the society which is still dominated by academic elitism (Jessup, 1992:173).
In response, the NCVQ proceeded to establish a framework for all vocational qualifications based on five levels, with an essential criterion that qualifications must be based on statements of competence (Bates, 1996). The derivation of competencies, as Bates (1996) has elaborated, is the responsibility of the Industry Lead Bodies and is done by analysing jobs on the basis of a process described as ‘functional analysis’. The UK approach, discussed in Chapter 2 and presented as the functional typology, used a process of functional analysis of the jobs called ‘progressive disaggregation’. The process of ‘progressive disaggregation’ has been used to break down the job’s purpose into smaller components and finally to performance criteria. These performance criteria are grouped into elements of competency which, in turn, are grouped into modules.

Bates (1996) asserted that,

If we define the competence movement more broadly to include performance criteria to manage organizational and individual performance, it is more starkly evident that we are dealing with a highly pervasive and seemingly relentless social trend (Bates, 1996:6).

Bates (1996) elaborated further that this social trend circles around competence epiphenomenally, as she put forward in her own words:

we may need to view the arrival of competency-based pedagogy as epiphenomenal, as surfacing in education of deeper changes in structures and processes of social control over work, education and training, and as a means of synchronizing these historically separate spheres (Bates, 1996:6).

This suggests that the changes penetrating into various spheres of social structures, resulting from the epiphenomenal effects of competency-based pedagogy, are becoming so deeply rooted that nothing short of a profound theoretical platform upon which such pedagogies need to be erected can establish the synchronization of these two historically separate spheres. Bates (1996:6) predicted that the pivotal position of competence formation in technical and vocational education will grow stronger rather than decline. She has highlighted that:

In essence, the entire gamut of post-16 provision for technical and vocational education throughout work-based, further and higher education is in the process of reconstruction on the basis of competence-based approaches (Bates, 1996:6).
The success of such profound reconstruction depends on successful offering of NVQs by colleges as well as the proposed parity of esteem between vocational and higher education that the White Paper titled, ‘Education and Training for the 21st century’ (1991) has addressed.

3.5.1. Education and training for the 21st century (1991)

Enforcing vocational training requires colleges and schools to offer only NVQs (CBET courses) to students. To achieve this objective, the UK Government published a white paper in 1991 titled, Education and Training for the 21st century (Bates, 1996). In this white paper the Government also declared its intention to establish ‘parity of esteem’ between academic and vocational education (Jessup, 1992). Jessup (1992:173) highlighted that the intention was to align academic and vocational education at all levels and move towards a more coherent and comprehensive system, by creating the National Vocational Qualifications (NVQ) framework on the basis of NCVQ’s work. In Bates’ view, Government’s intention was to enforce all vocational training to be linked with NVQs and GNVQs. In such a context, the Secretary of State, as Bates (1996) explained, was able to use reserve powers under the 1988 Education Reform Act as a means of requiring colleges to offer only NVQs (only CBT courses) to students pursuing vocational options.


As it had been evident that the key themes of Lifelong Learning (LLL) and competency development were emerging throughout the global VET literature, the Moser report (1999) emphasised that the teaching of these skills is part of LLL strategy. The Moser report (1999) highlighted the fact that one in five adults in the country is not functionally literate, and far more people have problems with numeracy. This shocking situation reflects past decades of schooling. Moser (1999) emphasised this finding as one of the reasons for relatively low productivity in the UK economy. He further pointed out that the teaching of basic skills to adults needs to become a key part in the strategy for Lifelong Learning and for national renewal generally. He proposed a wide-ranging National Strategy, which could halve the levels of functional illiteracy and innumeracy in about a decade, and make major progress by 2005, a key target year (Moser, 1999).
3.5.3. Learning and Skills Act (2000)
Post-compulsory education and training in England and Wales was reformed by the Learning and Skills Act (2000) in the areas of funding and planning by establishing the learning and skills councils (LSCs) in 2001, as well as the network of sector skills Councils (SSCs) UK-wide, underpinned by the Sector Skills Development Agency (Cedefop, 2005 – VET in UK).

The national qualifications framework (NQF) for England, Wales and Northern Ireland was introduced in 2000, which made all VET qualifications subject to quality control for admission. In 2004, the NQF and vocational qualifications were reviewed in line with the government’s skills agenda to create an employer-led qualification system (Cedefop, 2005).

3.5.4. Success for all (2002)
This report highlighted that an incredibly broad range of learning is delivered by a diverse range of providers of further education and training, including around 400 further education (FE) sector colleges, which formed the largest element and attracted around 60% of the Learning and Skills Council (LSC) funding.

In 1993, the Government took these colleges out of local authority control and delegated substantial autonomy. It did not, however, establish a sufficiently clear framework for accountability or standards, but introduced a harsh national funding regime which forced colleges to expand while cutting unit costs. As a consequence of such arrangements, too much management time was spent chasing and accounting for funding, and not enough on raising the standards and relevance of teaching and learning.

For these reasons the report indicated that it is now time to develop and implement a comprehensive reform strategy for further education and training.

Success for All was launched in November 2002 as the government’s agenda for reform in the learning and skills sector. The strategy was to raise standards and transform local provision so that providers are clear about, and focus on, their strengths, and develop their education and training missions accordingly. The goal was to establish a stronger and clearer accountability framework for the learning and
skills sector on the basis of provider responsibilities. Further, the primary responsibility for improving the quality of provision rests with the provider. Hence, the providers are expected to establish and sustain a culture of continuous improvement, based on self-assessment and development planning.

Achieving the goals of *Success for All* (2002) required that teachers acquire skills to be able to assist learners as business owners to succeed in their business, as well as assisting learners who are job seekers to develop relevant competencies for employment. Hence, the *Success for All* (2002) report was followed by the White Paper, *21st Century Skills: Realising our Potential* (2003) and the report, *Equipping our Teachers for the Future* (2004).


This White Paper, as well as its sequel of 2005, *Skills: Getting on in Business, Getting on at Work* aimed to develop the Government’s strategy of ensuring the right skills for employers to succeed in their businesses. These White Papers envisaged some measures to assist individuals in gaining the skills they needed to become employable and personally fulfilled (Cedefop, 2005 – VET in the UK: 17).

### 3.5.6. Equipping our teachers for the future (2004)

The focus of this report was on planning to reform the initial teacher training within the learning and skills sector in the UK. The reform was needed to equip teachers with all the skills they need to teach in the future and was built on *Success for All*, the Government’s agenda for reform in the learning and skills sector that was launched in November 2002.

The aim of this reform was to improve the quality of teacher training in the UK, in order for the learners to be taught by qualified and skilled teachers. Improving the quality of training a teacher receives affects their teaching throughout their career, as well as the achievements and life chances of their students – some six million annually in the learning and skills sector. One of the intentions of the reform was that the teachers in the learning and skills sector become role models for lifelong learning. It is necessary that teachers are continuously updating their subject and teaching skills and knowledge, as the context in which they work changes. Another emphasis of this
report was the parity of esteem with school teachers that the VET teachers were demanding.


The introduction of *Curriculum 2000*, which introduced, inter alia, new vocational A-level qualifications, was followed by the government’s announcement of its vision for 14-19 education and training in England. The reform envisaged for VET the introduction of new lines of learning that will lead to diplomas in 14 broad sectors. These specialised diplomas will replace the current system of around 3 500 separate qualifications and providing a vocational route to higher education and skills employment (Cedefop, 2005 – VET in the UK).

3.5.8. Foster Review (2005) and VET as neglected middle child

In 2005, the government realised that the Vocational Education sector needs to be reinvigorated with a new vision and purpose. Hence the government commissioned Sir Andrew Foster to undertake the review of Further Education (FE) in that year. Sir Andrew’s finding was that Further Education (FE) College(s) in the UK are regarded as the neglected ‘middle child’ between universities and schools.

The Foster Review (2005) suggested that as FE colleges offered major opportunities for the economy and individual citizens, it was important that the central government brought together the policies and operations of several departments of state to ensure coherence and synergy. The staff that worked in these colleges perceived that the government considered them as being in second place to universities.

Hence, he recommended a review of the way the corporate leadership for skills was organised to enhance the importance of the FE role. The report sets out a much-needed vision and a clear set of values for FE colleges to maximise and fulfil the potential of young people and adults in contributing to knowledge and skills of world-class quality in competitive proportion to the size of the population.

It is argued here that maximizing and fulfilling the potential of young people requires an appropriate and professional delivery of courses by VET teachers. Such delivery by VET teachers requires a theoretical framework, such as a theory of applied learning. The Foster report elucidated that for the UK to achieve a place in the world
economy, an education and skills system that creates a pool of skilled and mobile employees is needed. This is to provide development routes for individuals and retrain workers to keep pace with changing technology, and to meet the needs of individuals and communities for personal and social development. Again, this research argues that to maintain a skilled workforce of people who are trained and retrained in FE colleges, there is a need for a theory of applied learning to be used by VET teachers. While the Foster Review’s focus was on Further Education colleges, the Leitch Review (2006) placed the emphasis on skills of the workforce in the UK, as discussed in the following section.


This report (Leitch, 2006) focused on the Skills of the workforce in the UK and referred to the point that in the 19th Century the UK had natural resources, the labour force and the inspiration to lead the world into the Industrial Revolution. Today, UK is facing a different type of revolution. In other words, success for those developed countries that cannot compete on the basis of natural resources and low labour costs demands a more service-led economy, and depends on high value-added industries. The natural resource for the UK in the 21st century is skilled individuals whose potential is both untapped and vast. Unlocking their potential is only possible through skilling that results in higher productivity, the creation of wealth and improved social justice.

Leitch (2006) pointed out “the case for action is compelling and urgent” (Leitch, 2006) and by becoming a world leader in skills, the UK will prosper into the future as it becomes more able to compete. The alternative is that without increased skills, the UK would condemn itself to a lingering decline in competitiveness, diminishing economic growth and a bleaker future for all. The Leitch Review’s recommendations start with an ambitious vision: the UK must become a world leader in skills by 2020. Skills are the most important lever within the government’s control to create wealth and to reduce social deprivation.

At present, the low level of skills in the UK has created increasing inequality, deprivation and child poverty. There is a risk of a permanent generational cut-off from labour market opportunity. Leitch emphasised that skills that were once considered as a key lever for prosperity are now increasingly considered the key lever. He
concluded that a radical step-change is necessary. The Review recommended that the UK commit to becoming a world leader in skills by 2020, benchmarked against the upper quartile of the OECD.

Leitch (2006) highlighted that the global economy, with emerging economies such as India and China, is changing rapidly and altering UK competitiveness. The population is ageing globally, the world is facing rapid technological change, and migration flows are increasing internationally. In such a global environment, the correlation between skills, productivity and employment is direct. Hence, UK businesses will find that it is increasingly difficult to compete globally unless the UK can make its skills base one of its strengths by building on reforms to schools, colleges and universities.

The main recommendations were to increase adults’ skills across all levels by directing all funding through ‘Train to Gain’ and learner accounts by 2010. ‘Train to Gain’ was initiated by UK Government based on this recommendation to ameliorate the skills deficiency in the UK. The Leitch Review also recommended an increase in employer engagement and investment in skills, launching a new skills pledge for business owners to train all eligible employees (to Level 2) of National Qualification Framework (NQF) and to increase employer investment in NQF Level 3 and 4 qualifications in the workplace, increasing people aspirations and awareness of the value of skills, and creating a new employment and skills service.

Leitch (2006) alleged that the policy framework set in his report would deliver world class skills and recommended that the UK Government and Devolved Administrations in Northern Ireland, Scotland and Wales must now act to decide detailed next steps. In response to Leitch and Foster reviews, the FE Reform White paper was released in 2006 by the Blair Labour Government.

3.5.10. **FE Reform White Paper - Raising skills, improving life chances (2006)**

The FE reform white paper set a number of goals to be achieved as the mission for FE in the UK. These included the following:

- Define the central purpose to equip young people and adults with the skills, competences and qualifications that employers want,
- Create more areas of specialist excellence.
Create specialist networks among colleges.

Promote a stronger Sixth Form college sector.

To achieve the mission set by the FE reform White Paper (2006) required a sound scrutiny of initial teacher training in the UK. This is explored next.

3.5.11. Initial teacher training – Making the reform happen (DfES), 2007

According to this report from September 2007, the Government expects that all new staff employed as teachers and trainers in the learning and skills sector (VET) will be trained to a standard that allows them to achieve Qualified Teacher Learning and Skills status (QTLS) and be licensed to practise by the Institute for Learning (Learning and Skills Sector, 2007). This expectation supersedes the targets for qualified teachers in the Success for All (2002) agenda.

In addition, the existing teachers and trainers in the learning and skills sector are required to practise the following (Department for Education and Skills, 2007):

- Read the new standards for teacher training when published by Lifelong Learning UK (LLUK).
- Discuss with line managers opportunities for continuing professional development leading to Qualified Teacher Learning and Skills status (QTLS) status.
- Contact the Institute for Learning to discuss the advantages of registration and initiating a professional development record.
- Participate in an initial assessment, including accreditation of prior learning and leading to an individual learning plan.
- Undertake an appropriate programme of Continuing Professional Development that will lead to the award of QTLS.
- LLUK has been given the responsibility of establishing a professional development framework for teacher trainers that will cover both the qualifications they should hold and the experience they should have.

3.5.12. Teacher training in vocational education (Skills Commission – Tomlinson, 2010)

This report was the result of a six-month inquiry into teacher training in vocational education chaired by Sir Mike Tomlinson. The fundamental issue that drove the
inquiry was the “inequities between teachers of academic and vocational education and the pernicious effects of this division on the learning experience” (Tomlinson, 2010). This led the UK inquiry into findings that revealed two major areas of neglect in the VET sector outlined forthwith.

3.5.12.1. The first area of neglect

Teachers of vocational education have been a neglected group within the teaching profession, even considered to be second best (Tomlinson, 2010:7).

While the VET sector and its teachers were referred to as the neglected middle child by the Foster Review (2005), Tomlinson (2010) confirmed that VET teachers were the most neglected group. It is argued here that the neglect of the VET sector as the “middle child” is broader and has a theoretical dimension to it. In other words, as a consequence of such neglect, theory-making in the area of VET pedagogy has suffered greatly, to the point that Tomlinson (2010) asserted that VET pedagogy is still at its infancy. He then brings this to the attention of policymakers and attempts to redress such neglect by stating that “teachers of vocational education have often been a second thought for policymakers and relegated to the second division of teaching. The purpose of this inquiry has been to redress this neglect and give them the long overdue attention they deserve” (Tomlinson, 2010: 6).

The underlying reason for this neglect and the inequities has been that: the system as it stands is biased towards academic education and its teachers, and fails to recognise the crucial role that vocational education and its teachers play in 14-19 education (Tomlinson, 2010:9). On the basis of the evidence gathered throughout the inquiry by Sheerman and Silver as the co-chairs they concluded as follows:

Throughout the inquiry the Commission has taken evidence from organizations and individuals across the sector. We have found that the historic professional inequalities between teachers of academic subjects and teachers of vocational subjects persist and that we are still some distance from achieving professional equality between these two groups. It is our firm belief, however, that teachers, as front line staff, and as a workforce that will be central to reconstructing our knowledge economy, should be afforded special consideration (Tomlinson, 2010: 6).

To address this issue, a key recommendation of the inquiry was to replace the two separate spheres of teacher training regimes with a unified learning system.
3.5.12.2. The second area of neglect

Evidence submitted to the inquiry has highlighted the continued neglect of vocational and applied pedagogies and has recommended that it should become a priority for research and curriculum development (Tomlinson, 2010:42)

As was apparent from quotations and Tomlinson’s (2010) discussion, one of the most significant findings that emerged from this inquiry (Tomlinson, 2010) was the importance of pedagogy in VET and that to deliver vocational education and training, knowledge, per se, is not sufficient. Rather, the teacher must be expert in how they communicate that knowledge. Tomlinson’s (2010) finding was that the VET pedagogies remain at their infancy and relatively little research has been undertaken into these pedagogies. Further, that developing pedagogical understanding is more complex than developing subject knowledge. Hence, a theory of applied knowledge is needed to facilitate pedagogical understanding.

After examining two areas of neglect, the Inquiry proposed a number of recommendations to bridge the fault line between the two sections of the profession. The report recommended that academic and vocational teacher training converge into a unified teacher training system, that there be a universal teaching status, and that employers provide teacher work placements. It also emphasised that extended research into Vocational Pedagogy should become a priority for the VET sector.

3.5.13. Wolf Report (UK) 2011 – labour market shift away from 14-19 cohorts

In UK, Professor Alison Wolf was commissioned to scrutinize issues such as the change in the labour market, which in recent time has seen employment shift away the from 14-19 cohort, by considering a number of factors other than academic achievements, including experience, for recruiting. She was asked by the Secretary of State to investigate, inter alia, how it can be ensured that vocational education provides for progression to higher learning and higher employment.

The trend in recruitment places more emphasis on experience than academic achievement. This indicates that the 14-19 cohort, who have been trained as competent, are not in fact competent. Employers cannot be fooled. This research argues that the reason for this outcome is that the 14-19 cohort has been trained by
VET teachers without a theory of applied learning in place and this evidence is sufficient that there is a need for such a theory.

John Hayes, Minister for Further Education, Skills and Lifelong Learning, in the Foreword to the Wolf Report (Wolf, 2011) pointed out that:

> While there have been many calls over the years for greater parity of esteem between academic and vocational qualifications, in practice this has meant making what is practical more academic, to the detriment of both. It is time, as the Secretary of State has said, that we recognise the ‘inherent value of craftsmanship’ – the intrinsic richness of manual work, practical and technical competences. Recognising the value of practical skills matters for individuals and our society, and it matters for our economy too (Wolf, 2011:6).

### 3.6 Exploring empirical research and policies in the Australian VET

So far, based on empirical research and policy analysis globally and in the UK, it has been established that a theoretical framework or a theory of applied learning is needed. In the light of the discussion in previous parts, it is argued that VET in Australia, similarly, has been dealing with persistent issues in the absence of a theory of applied learning in recent decades. Hence, it is argued that the misunderstandings that followed the introduction of CBT and of Training Packages in Australia have been the direct consequence of such a theoretical vacuum. This part of the Literature Review will further explore the empirical research and policies, and subsequent relevant events that have taken place in Australia since the late 1980s.

During the late 1980s, the Australian Government identified that for Australia to achieve its goals of macroeconomic reforms, its workforce would need to become much more competitive by improving its flexibility and adaptability at the global level (Dawkins, 1988:107). Competency-based training (CBT), as Billett, McKavanagh, Beven, Angus, Seddon, Gough, Hayes & Robertson, (1999:1) assert, was selected by the Commonwealth Government to secure these goals and became linked with the economic reform movement. CBT became the foundation stone of training reform in Australia (Smith and Keating, 2003:120). Hence, in Australia, similar to other parts of the world, CBT did not originate from a theoretical foundation; rather, it originated from a political foundation to secure the goals of macroeconomic reforms.

During the period 1982 to 1989, the conceptual foundation that underpinned the national training reforms evolved, and was given firmer shape in Australia
Reconstructed, a report by the ACTU/TDC Mission to Western Europe, published in 1987. By April 1989, proposed reforms were sufficiently developed to underpin the report titled Improving Australia’s Training System (Dawkins, 1989). The reform became the agenda for the Special Ministerial Conference on training in the same year (ANTA, 1994:3). In the year prior to this publication, the Australian Council of Trade Unions and the Trade Development Council had set out on a mission to Western Europe “to examine how governments, unions and business could co-operate through better arrangements of the Australian economy” (Smith and Keating 2003:31). One of the main findings of Australia Reconstructed (ACTU/TDC, 1987), was the realisation of the deficiency in Australia’s skills base. To address this deficiency, it was argued that increased attention was needed to be paid to employment policies and training; in particular, the training of young people (Smith and Keating, 2003:31).

In 1989, in a special ministerial meeting of Commonwealth, State and Territory Ministers responsible for vocational education and training, it was decided to introduce and implement a uniform national CBT approach to VET by adopting and implementing the competency-based training system in Australia and establishing the National Training Board (NTB) for the development of competency standards (Harris et al, 1995:51). This was the basis upon which Australia was to produce a skilled workforce. The then Labor Government argued for world-class training and introduced the Training Reform Agenda.

Consequently, the VET sector adopted competency-based training (CBT) in the period from the late 1980s to the early 1990s. One of the major consequences of this move was the repositioning of practitioners. VET teachers were no longer curriculum designers; rather, they were regarded as implementers of CBT. VET teachers were faced with new challenges which arose from the variance in the definitions of CBT. As Smith and Keating (2003:120) pointed out, “there is much confusion about what CBT really is, and much debate about whether it is a good thing” (Smith and Keating 2003:122). Given that “it is difficult to get a definition of CBT on which everyone agrees” (Smith and Keating 2003:122), there was constant debate about CBT among VET practitioners. In other words, the way CBT was viewed ‘in the field’ left behind any written definitions (Smith and Keating 2003). These challenges were compounded by the advent of Training Packages.
3.6.1. Training Packages

In 1996, Australia introduced Competency-based Training Packages that replaced VET curricula (Smith and Keating, 2003). As Training Packages are regarded as the basis of VET curriculum, they were designed to ‘make training more flexible, accessible and relevant to industry’ (ANTA, 1996). Training Packages are comprised of Units of Competency (competency standards) that are grouped or ‘packaged’ according to specific guidelines into qualifications of various levels. Training Packages also include details on assessment, support materials (formerly called ‘non-endorsed components’), learner guides and resources for teachers, and are considered as “tools of practice” (Schofield & McDonald & ANTA 2004a:27).

While Training Packages are underpinned by a number of assumptions (such as performance, knowledge, skills), these assumptions, whether explicit or implicit, require re-thinking particularly at the level of design and implementation. Schofield & MacDonald & ANTA (2004a) pointed out that competency is a broader concept than merely the ability to perform workplace tasks. It was argued (Schofield and MacDonald, 2004a) that in re-conceptualising a definition, competency must include more specific criteria, such as the demonstration of:

- Effective performance in employment;
- Application of skills and knowledge within and across a number of work contexts and contingencies;
- Ability to transfer skills and knowledge across and within work contexts, and within a changing context over time;
- A combination of higher order skills (where relevant).

Schofield & MacDonald & ANTA (2004a) argued that the above criteria have practical implications for the definition of competence, for the design and structure of Training Packages, and for the processes through which they are developed. In order to develop a clear pedagogical understanding of these implications and to turn them around in a meaningful way, an applied theory of learning is required. Before developing a clear pedagogical understanding of VET delivery, it is important to understand how the VET system, that was provider-led in Australia for years, was replaced by new thinking that was based on an industry-led system. This shift, which brought about further implications for teaching and learning of competency, is a
further reason that a theory of applied learning is required. Changing such a foundation that governs the activities of teaching and learning in VET delivery by a mere political decision without consolidating such a shift with the support of a theory of applied learning will further aggravate misunderstandings.

3.6.2. Industry-led replaced provider-led vocational education

The concept of an industry-led system of vocational education and training (VET), initiated by Australian Government, dates back to the turn of the century and eventuated as a result of intense industry lobbying (Chappell, Hawke & Schofield, 2002). Understanding this is important for pedagogical understanding in VET delivery. Hence, “for the past 15 years, one of the major planks of VET reforms has been to create a national industry-led vocational education and training system” (Schofield & MacDonald & ANTA, 2004b:2) that has been agreed upon by Federal, State and territory governments. To establish and maintain an industry-led system, a comprehensive strategy was vital and Training Packages were designed to fulfil this role. On this basis, the “Training Packages are a strategy for ensuring that the needs of industry, as mediated by industry training bodies and specified in the competencies to be found in the Training Packages, are the basis of most VET delivery” (Schofield & MacDonald & ANTA, 2004b:2).

The Training Packages are regarded, as Gonczi (2001) has noted, as:

...a culmination of a way of thinking that has been evident within these reforms – that of ensuring that what a VET system delivers is what industry actually demands (Gonczi, 2001:2).

Thus, the Training Packages are such a culmination and the competencies contained in them are entirely industry developed, and because of the agreement at Ministerial level, VET delivery was to be based on the competencies contained in the packages. Prior to Training Packages there was agreement that “all VET delivery would be competency-based and that there would be an industry-led system, but no mechanism for ensuring its implementation” was evident (Gonczi, 2001:2).

This suggests that the competencies were the result of political decision making and based on industry consultation rather than on a specific learning theory. Thus, according to the above assertions, Training Packages are regarded as the mechanism for the implementation of an industry-led system rather than a theory-based system.
Hence, VET delivery has been in accordance with the dictates of competency standards contained in the Training Packages. As Smith predicted in her research (Smith, 1999:115), “the findings concerning confusion about, and dissatisfaction with, competency standards were significant and need to be considered during the development of packages”. Smith (1999) predicted that, if the competency standards in the Training Packages were not adequately prepared, the VET teachers would resist the new system, and she further predicted that the implementation of the Training Packages was likely to repeat many of the mistakes of early CBT implementation. She has concluded that there “appears to be little consideration, at a policy level, of the teaching and learning implications of the packages” (Smith, 1999:115).

This suggests clearly that the theoretical implications of teaching and learning were not taken into consideration, leaving these to the domain of educational theorists. This is confirmed by Karmel (2004), who asserted that the implications regarding competency development have not been addressed by and in the Training Packages. Karmel (2004) elaborated further that the essence of Training Packages is the specification of competence, without providing how the competence is to be developed, because Training Packages are not curriculum documents (Karmel, 2004).

Based on Karmel’s (2004) assertions, it is argued here that shifting the educational ethos should be based on strong theoretical reasoning of the human mind rather than by mere political decisions to achieve economic ends. The former causes understandings, while the latter produces misunderstandings. The former will, per se, establish itself; the latter needs be coerced by enforcement. Competency-based Training Packages fall into the latter category of a shift in thinking, rather than the former. It falls into the ambit of theoretical argument by Tyler (1949) who elaborated that, without theory, practice would become chaotic and merely a collection of isolated cases. For this reason, practice in the Training Packages context has been reinforced by various means. Hence, now that Training Packages are in operation without having originated from the theoretical reasoning of the human mind in the first place, the only alternative way to make it meaningful is to bring about the theoretical backing that was absent in the first place. There is a need for a theory of applied learning to ensure that the practice of teaching falls into the ways that the human mind develops and operates.
According to Karmel (2004), and despite the above arguments, how competency is to be facilitated was ignored in Training Packages and was left out completely. The omission of such an important factor was exacerbated by further pedagogical, learning and teaching implications due to the emerging New Vocationalism of 21st Century, as referred to in Chapter 2. New Vocationalism was one of the by-products of the Thatcherite revolution in the 1980s in the UK which reformed and transformed vocational education in the United Kingdom and has had implications in Australian VET. This is discussed in the next section.

3.6.3. New order in education and the new vocationalism of the 21st Century

The Australian VET system has undergone unprecedented change in recent times since the Kangan report in 1974 (Chappell et al & ANTA, 2003). These changes have been immense and reflect an international focus on education and training to bring VET to the readiness stage, in order to maintain the continuous formation of workers with appropriate knowledge, skills and capabilities in these new economic times (Papadopolous 1996; Gee, Hull & Lankshear 1996; Waterhouse, Wilson & Ewer 1999; Marginson 2000). The label ‘New Vocationalism’ that emerged in the UK was applied to these changes in education and training by (Ball 1994; Grubb 1996; Symes & McIntyre 2000). The new order in education and the New Vocationalism has had a profound and immense effect on all sectors of education in Australia, to the extent that traditional curricula has come under scrutiny and has been influencing contemporary Higher Education in the universities Sector (Chappell et al & ANTA, 2003:32). Chappell et al & ANTA (2003) has further pointed out that “in Australia, New Vocationalism has also been marked by the establishment of a vocational education and training market with schools, TAFE colleges, universities, ACE providers, industries and private providers all competing with each other to supply vocational education and training services” Chappell et al & ANTA (2003:32).

The goals of the New Vocationalism, in this new order in education, are beyond learning the knowledge and developing the skills to perform competently in occupations. Rather, they go beyond, to the realm of capabilities for high performance workplaces. Further, New Vocationalism advocates the adoption of attributes of learning as a “vital feature of human activity throughout life based on the lifelong learning” (Chappell et al & ANTA, 2003:33) which has now become the integrating
policy goal of most OECD countries. This suggests that the new order is not only based on acquisition of knowledge, but it also involves the development of skills and the acquisition of attributes. These complexities need a theory of applied learning that, while clarifying the development of competence, will simplify learning. It is argued here that nothing short of a theory of applied learning is able to achieve this end.

In addition, the learner-centered pedagogies, with their focus on individual responsibility that shifts away from teaching to learning, from the teacher to the learner, from the content to the process, are emphasised in the Training Packages context. This shift in emphasis clearly places the focus of the proposed theory of applied learning on the learning experience. As Chappell et al & ANTA (2003) argue, “work experience, either real or simulated, is almost an obligatory feature” (Chappell et al & ANTA (2003:36).

Thus, as this kind of knowledge “overrides conventional binaries around theory and practice, as well as liberal and vocational educational goals” (Chappell et al & ANTA (2003:36), these immense pedagogical challenges in VET delivery place severe demands on VET teaching. What is required is a new vocational education practitioner as the new breed of teacher who has the capability to facilitate learning in the context of CBT.

3.6.4. Emergence of new vocational education practitioner

Industry lobbying was a significant influence in the shift to New Vocationalism. One of the consequences of this shift is the emergence of a new VET practitioner who satisfies the increasing expectations of industry clients and individual students (Mitchell, Chappell, Bateman, & Roy, 2006).

Traditionally, the VET practitioner was supply-driven, and believed that the best or only learning environment was the classroom, a site for learning far superior to the student’s workplace (Mitchell et al, 2006:23). This was in contrast to the new practitioner in VET, who is demand-driven, and only provides those services required by enterprises and individuals (Mitchell et al, 2006:23). This shift also requires a theory of applied learning in which new vocational education practitioners are able to facilitate learning rather than focus on merely teaching, as before, as the teacher’s role has been invited into a new paradigm of education.
As Reigeluth (1999) emphasised, the new vocational education practitioner is operating in the new paradigm of education and learning which is changing from provider-driven to demand-driven. In the new paradigm, Reigeluth (1999:19) asserts that the teacher’s role is changing to “a guide on the side rather than a sage on the stage” (Reigeluth, 1999:19). This shift is necessary for the teacher’s role as facilitator. Without a facilitation framework, it is difficult for teachers to understand how crucial their facilitative efforts are. Reigeluth (1999) asks that if the role of the teacher who was once the agent of learning has been changed to a facilitator, then who would be the agent of learning? He then provides the answer as follows: “well-designed resources are one, and instructional design theory and instructional technology can play particularly large roles in developing these resources (Reigeluth, 1999:19).

This suggests that the new VET practitioner as facilitation agent needs to use his/her pedagogical expertise to develop these resources that, in most part, reinvent his/her role as a teacher. Darwin (2004:3) refers to the change to the new paradigm as the end of ‘conventional’ instructional design that was “generally behaviorist cognitivist in emphasis, highly linear in form, abstracted from teaching/learning process and grounded in systematic rigidity and that understanding of effective learning has changed with emerging consensus around constructivism” (Darwin, 2004:3).

Learning of this type suggests that the boundaries of the New Vocationalism have extended to both higher and secondary education. This change requires a new VET professional who is capable of forging the way forward, as advocated by the High Level Review (Schofield & McDonald & ANTA, 2004a). This is necessary and crucial for a significant pedagogical transformation. The subsequent events of the last three decades, such as the introduction of CBT and the advent of Training Packages that were formed as part of the Training Reform Agenda, require a significant shift in the pedagogical thinking of the VET teacher that cannot be easily understood and applied in practice, in both teaching and learning, without an applied theory of learning. It is important for VET teachers to upgrade to the level of the new Vocational Education Practitioner.

In 2006, the Western Australian Department of Education and Training pointed out that to be effective in the world of VET in the next 5 years, VET practitioners will need: an understanding of learning theories, including how various learners learn,
learning styles, adult learning principles, simulations, and both problem- and project-based approaches to learning (WA Department of Education and Training, 2006:38). This is a challenge for new VET practitioners.

3.6.5. New pedagogy

The High Level Review (HLR) pointed out that the implications of new changes concerning knowledge, skill and learning propose significant challenges and complexities for education and training practices, designed to develop a workforce that can meet the demands of the economy (Chappell et al & ANTA, 2003:13).

Australia’s VET system is characterized by an increasing diversity of contexts, clients, learning sites and practitioners. Providers delivering vocational education and training programs include schools, TAFE colleges, Adult and Community Education (ACE) providers, industries, and private providers that compete with each other to supply vocational programs and services in this newly established market (Chappell et al & ANTA, 2003:13). Currently, there are over 5000 providers in Australia, consisting of government and private RTOs (Skills Australia 2011).

As a result, the traditional curricula that contained the recommended teaching, learning and assessment practices are no longer useful and are unable to respond to such complexity (Chappell et al & ANTA, 2003). The teachers who are now charged with the added responsibilities need to be involved in preparing, delivering and managing VET programs by developing suitable teaching, learning and assessment products and instruments. To be able to function as a new VET practitioner in a changing VET system is a formidable task. Without doubt, the confusions and misunderstandings reported in the research and documented by the High Level Review have emerged as a result of such complexity being imposed on teachers. As stated earlier, nothing short of a theory of applied learning is able to clarify these misunderstandings.

Given that the High Level Review admits to such a level of complexity, it also points out that this transformation requires practitioners who have a sophisticated appreciation of the pedagogical choices that are not only available to them but which are also consistent with the context, clients and learning sites that make up the arena in which they work (Chappell et al & ANTA, 2003:13). It is argued that the platform
provided by the theory of applied learning facilitates the use of pedagogical choices by practitioners through application of the theory, as explained in Chapter 4. Further, Chappell et al & ANTA (2003) pointed out that successful implementation of programs in the Training Packages context depends on the VET teacher’s expertise and the pedagogical orientation that they are able to deploy to meet the increasingly diverse requirements of their clients.

The “Quality is the Key” report points out that effective vocational education and training (VET) providers and practitioners are the key to meeting Australia’s changing vocational skill needs and ensuring that employers and individuals alike get the training they deserve” (Mitchell et al, 2006:3). In terms of practitioners’ effectiveness, Mitchell et al (2006) points out that, they need skills which make them effective in a potentially wide variety of learning contexts (Mitchell et al, 2006:3). The question is ‘what skills do practitioners need?’ The Western Australia Department of Education and Training (2006) places greater emphasis on advanced pedagogical skills for those who have moved beyond basic competence, focusing attention on the importance of reflective practice and strategic enquiry for all VET professionals” (WA Department of Education and Training, 2006:52). These new requirements pose the complex pedagogical challenges being faced by new vocational education practitioners in the new vocationalism environment.

It was anticipated that Training Packages, as “industry endorsed vehicles that connect work and learning” (Chappell & ANTA, 2003: VIII), would represent significant complexities to serve the needs of the new vocational practitioner, in the environment of ‘New Vocationalism’. The significant pedagogical challenges posed by competency-based training packages to the new vocational education practitioner, in the new order in education, are the result of the widespread changes affecting VET and the New Vocationalism. These changes have significant implications for the pedagogical methods and have drifted away from what has traditionally been understood. What is required? How a VET pedagogy that is learner-centered, work-centered, and attribute-focused requires “pedagogical approaches and strategies that vary from those traditionally used in the VET sector” (Chappell & ANTA, 2003:14) needs to be understood.
A number of studies (Azemikhah, 2006; Smith and Keating, 2003; Schofield and MacDonald & ANTA, 2004a) indicate a paradigm shift from a traditional system that was mostly content-based to a competency-based method of delivery that resulted in the inclusion of all the constituents of competence in teaching and learning, and not merely the content. It is argued that the learning theories proposed in the past merely focused on content-based learning in an environment in which content was dominant. The new paradigm requires application of the content knowledge and skills, either in a simulated work environment or on the job, to a list of ‘Performance Criteria’ (Schofield & MacDonald, 2004). The new environment of learning requires a theory of applied learning that upholds a philosophy of facilitating understanding, i.e., where learning takes place not only by developing knowledge of the content, but also through the application of it.

What is required now is that teachers, in a competency-based system, not only need to teach and assess content, but also have to ensure that the learners achieve ‘competency’. Students are required to apply knowledge, skills and attributes to performance in an integrated approach, as specified by the competency standards (ANTA, 2005). Based on the above requirements, it is evident that the Training Packages model has introduced enormous pedagogical complexity for teaching in the VET sector.

In addition, the move to the competency-based method has introduced a number of new concepts (Mansfield, 2004) for the VET sector, inherent in the Training Packages: competence, Units of Competency or competency standards, elements of competency, performance criteria and variables, to name just a few. These have replaced more commonly understood concepts: curriculum, courses, subjects, content, topics, and activities. These new concepts have also added further uncertainties and complexities to the problems of teaching in VET.

This revolutionary shift in emphasis, from content to competence, has created complexities and a host of pedagogical confusions and misunderstandings. Smith & Keating (2003) asserted that even after the move to the competency-based system of training (CBT) in 1987, curriculum documents continued to be prepared with the focus on areas of content rather than on learning outcomes. This approach in developing curriculum continued for years and in most cases up until the advent of the
Training Packages in 1996. More than five years after the advent of the Training Packages, the Australian National Training Authority (ANTA) commissioned a nationwide review of them, titled ‘High Level Review’, to investigate the causes of these misunderstandings and confusions that were hindering successful implementation of the Training Packages.

The High Level Review documented a number of teaching dilemmas and complexities that are mostly of a pedagogical nature (Schofield and MacDonald & ANTA, 2004; Azemikhah, 2005a) in the implementation of the competency-based Training Packages. In June 2004, the Australian Minister and State and Territory Ministers for Vocational Education considered the review findings and agreed to six major areas of action to address these challenges (Gawler, 2004; ANTA, 2004):

- Action 1 – A new settlement
- Action 2 – Better TP design
- Action 3 – Rigorous and inclusive development and review process
- Action 4 – An effective qualification framework
- Action 5 – Supporting teaching learning and assessment
- Action 6 – Improving pathways

Action 1 explained that all stakeholders had under-estimated the massive changes that Training Packages represented to providers and systems. Under a new ‘settlement’, ANTA undertook to provide the necessary leadership to instil confidence in Training Packages and to develop more supportive and adaptive systems and processes. A shared understanding of the role and importance of Training Packages will be fostered so that they met the workforce skill needs of Australian industry now and in the future. Action 2 placed emphasis on good design with a focus on knowledge, skills and performance rather than rules. Action 3 required that TPs must be of high standard, serving multiple purposes that include entry-level training, higher level qualifications and shorter skills sets. Action 4 stated that the AQF must be clearly understood by TP developers to ensure that TPs met the needs of industry and users. Action 5 stated that to support high quality teaching, learning and assessment, some mechanism to enhance VET professionalism would be provided. Finally, Action 6 pointed out that valid pathways will be available into and through Training Packages and into higher education to meet the needs of the full range of potential learners.
3.6.6. Supporting quality teaching, learning and assessment

Research was undertaken as part of the Consortium Research Program: ‘Supporting vocational education and training providers in building capabilities for the future’ (Mitchell, Chappell, Bateman, and Roy 2005a). In the early stage of this research, two papers were released in Australia, in June 2005, titled Critical Issues, a draft literature review on critical issues in teaching, learning and assessment in vocational education and training, and Complexities and Opportunities, a discussion paper on critical issues in teaching, learning and assessment in vocational education and training funded by the Australian, State, and Territory Governments through the Department of Education, Science, and Training (DEST). The National Centre for Vocational Education Research (NCVER) managed the discussion and responses to these papers.

Critical Issues (Mitchell, Chappell, Bateman, and Roy, 2005b) highlighted recent thinking and research at the national and international level, attempting to inform the development of teaching, learning and assessment practices in the VET sector. This report addressed critical issues in a preamble and three sections: ‘What learners and clients want’, ‘Skills and resources needed by VET practitioners’ and ‘Implementation of innovative approaches’. The purpose of the Critical Issues paper was to draw the attention of the VET community and other researchers to the issues that still remain unresolved. The report begins by drawing attention to the fact that the VET environment is ‘an environment of significant change’ (Mitchell et al, 2005b:2) and the drivers of change that are continuously having impact on the VET environment have been classified into external and internal drivers. Internal drivers included:

- Increased expectation for responsiveness,
- Pressure for greater accountability,
- Rethinking approaches to teaching, learning and assessment,
- Changing workloads, and
- Student characteristics (Mitchell et al, 2005b:3).

External drivers of change included Government policies, and the expectations of both the industry and the community.
3.6.7. Complexities and Opportunities Report (Mitchell et al, 2005)

Mitchell et al, (2005a) encouraged VET practitioners to come to understand the complexities and, at the same time, be responsive to opportunities. The critical issues and success factors of skills needed by VET practitioners emphasised the need for learning programs and resources to be addressed. The Consortium Research Program that commenced with distribution of Complexities and Opportunities discussion paper resulted in a number of reports, including the report titled, Quality is the Key. This is discussed in the next section.

3.6.8. Quality is the Key (2006)

The Quality is the Key report (Mitchell, Chappell, Bateman and Roy, 2006) has provided a comparative commentary and analysis of critical issues in teaching, learning and assessment in vocational education and training (VET) in Australia and in further education (FE) in Scotland and England, in order to promote continuing discussion concerning the future directions for change in these areas of practice. Mitchell et al. (2006) pointed out that the three Governments were pursuing a reform agenda in which quality had become an overarching critical issue for contemporary VET/FE. “One important critical issue is that many VET practitioners need improved skills in implementing training packages, despite their widespread availability in the sector, in some cases, for seven to eight years” (Mitchell et al. 2006:7). In the absence of a theory of applied learning it is clear why after decades these skills and understandings are still lacking. This is symptomatic of the lack of a theory of applied learning where both the content knowledge and its application are theorised.

In relation to critical issues, Mitchell et al (2006:14) pointed out that “each of these issues remains the subject of debate within the sector”. The final conclusion reached by the Quality is the Key report indicates that many VET practitioners generally need to improve their skills in the implementation of Training Packages.

Tyler (1949) asserts that so-called implementation would only be meaningful if pursued within the parameters of a theoretical framework, pointing out that practice would otherwise be chaotic and merely a collection of isolated activities. However, while Tyler was ignored in this context, the focus on quality in the VET environment
was further pursued in a policy titled *Australian Quality Training Framework (AQTF)* 2007 (Australian Government, 2007b).

### 3.6.9. Australian Quality Training Framework (AQTF) 2007 – Aiming at quality outcomes

In 2001, the Australian Quality Training Framework (AQTF) replaced the Australian Recognition Framework (ARF), which was revised in 2005 and again in 2007 (ILO, 2009). With the advent of AQTF that was introduced in 2002, a national framework was created for VET under which the registered training organisations (RTOs) continue to be able to meet national standards by focusing on industry requirements. In this way, they were required to continuously improve their system to achieve quality outcomes (Australian Government AQTF, 2007a).

AQTF 2007 provided a framework for meeting the requirements of national standards. RTOs may achieve recognition as a quality committed RTO or an outstanding RTO, by meeting the “Excellence Criteria” of the framework.

Essential Standard 1 is comprised of 5 elements. Element 1 refers to the point that RTOs collect, analyse and act on relevant data for continuous improvement of quality training and assessment. The current focus on quality referred to in this research, dates back to the 1980s, despite other literature that dates back to the 1940s. In Australia during 1980s, an increasing commitment emerged in the commercial and industrial sector to developing and delivering quality (Muller and Funnell, 1991:3) that led to the emergence of Total Quality Management (TQM). Given that in vocational education, measures of quality can be derived from input as well as output, the question that needs to be answered is what quality means in the context of vocational education, particularly in relation to learning, assessment and pedagogy.

Muller and Funnell (1991) point out that quality in education denotes effectiveness. Effectiveness is concerned with outcomes that are in line with the needs and demands of clients, i.e., the learners as well as employers (Muller and Funnell, 1991). Given that Smith and Keating (2003) emphasised “the central notion of Total Quality Management is to devolve responsibility for improving quality to those who do the work” (Smith and Keating, 2003:34), employers and industry supported the outcomes that are in line with gaining employment through the implementation of employability.
skills in VET. This means that to remain employed, the learners should develop and maintain these skills throughout their working lives.


In 2008, the National Quality Council (NQC) approved the approach of embedding employability skills into all nationally endorsed Training Packages (Department of Education Science and Training (DEST), 2006). Employability Skills are defined as, “skills required not only to gain employment, but also to progress within an enterprise so as to achieve one’s potential and contribute successfully to enterprise strategic direction” (Commonwealth of Australia, 2002:3) This process of embedding took some time. Finally, in 2008, the employability skills were embedded in all the Training Packages in Australia implying that these skills also need to be integrated into teaching, learning and assessment (Allen Consulting Group, 2006). According to a report by Allen Consulting Group on Employability Skills (Allen Consulting Group, 2006), teaching, learning and assessment in VET depend on how successfully this integration is achieved. In June 2008, National Quality Council (NQC) published the final report, Investigation into industry expectations of Vocational Education and Training Assessment.


The prime purpose of this report was to examine the perceived mismatch between assessment outcomes and industry standards in order to build industry confidence in the outcomes of VET assessment. The report asserts that the VET system makes the same claim as to the ability of the person who completes a VET qualification that “they can perform particular tasks and duties to the standard of performance expected in the workplace – regardless of the context in which they gained those skills” (National Quality Council 2008:4). The National Quality Council (2008) reported that, “employers disagree with this claim and have different expectations depending on where the skills were gained and how the candidates were assessed” (National Quality Council 2008:4). According to this report, where and how to assess competency, as well as whether the expectations of the workplace are met or not, have been ongoing issues. Some submissions lodged by stakeholders to this investigation focused on dissatisfaction of industry with the assessment of competency in
in institutionally based training (National Quality Council, 2008:5). The report has highlighted that “there are wide variations in the quality of how people are assessed and hence the level of confidence in the outcomes. There is a particular concern about ‘tick and flick’ assessment” (National Quality Council, 2008:18).

The report concluded that a more consistent approach could be developed through moderation and that there is a need for sufficient practice, namely that a skill may be learned in a short time but competence comes after sufficient practice. Assessment should be taken after that practice period.

During 2008, a Joint Steering Committee of the National Quality Council (NQC) and Council of Australian Governments, COAG was formed to report on *VET products for 21st Century* by undertaking a wider study, as well as on the embedding of employability skills in the Units of Competency rather than qualifications as a whole. At the beginning, the employability skills were embedded only in the qualifications and not in individual Units of Competency.


This report, released in June 2009, was the culmination of more than 12 months of work by a Joint Steering Committee of the National Quality Council (NQC) and Council of Australian Governments (COAG) Skills and Workforce Development Sub-Group, and resulted in a policy framework signaling the following key areas of reform:

- The need to revise the current definition of ‘competency’ to embody the ability to transfer and apply skills and knowledge to new situations and environments.
- A restructure and streamlining of Training Packages, including separating the performance standards from guidance and supporting information.
- A full review of packaging rules as applied in Training Packages, to ensure maximum flexibility and consistency within and across Training Packages and Accredited Courses.
- Establishment of a joint working group of the NQC and the Australian Qualifications Framework Council (AQFC) to investigate introducing a national credit system.
A stronger focus in VET products on preparatory and enabling qualifications, and Language, Literacy and Numeracy requirements.
(National Quality Council, 2009)

The first two points of the reform, i.e., revising the definition of competency and the streamlining of the Training Packages, are relevant to this research. From 21 recommendations that were listed in the report, four recommendations focus on the re-definition of competence and two recommendations focus on the streamlining of the Training Packages.

Recommendation 1 revises the definition of competency:

Competency is the consistent application of knowledge and skill to the standard of performance required in the workplace. It embodies the ability to transfer and apply skills and knowledge to new situations and environments.
(National Quality Council, 2009:6)

The section highlights the following points (National Quality Council, 2009):

☐ The primary focus of competency standards in Australia is therefore on the achievement of performance standards required for specific occupations.

☐ Each Unit of Competency must also embed employability skills relevant to the unit and contain explicit language, literacy and numeracy requirements relevant to the unit. However, these reflect, but must not exceed, the work requirements for the unit.

☐ Similarly, knowledge requirements in the Unit of Competency must be derived from the requirements of the work task.

The National Quality Council (2009) report also emphasised the requirements for the streamlining of the Training Packages by moving advisory material, accumulated over time, to other parts of the Training Packages where warranted, consolidating components as well as presenting the units in plain English (National Quality Council, 2010a).


This report, which embodies recommendations 16 and 17 of the ‘VET Products for the 21st Century’ Report, was published in December 2010. It lays down the key features of streamlined Units of Competency of Training Packages, and describes the purpose of the streamlined model as separating performance standards from guidance
and supporting information. Training Packages need to be ‘fit for purpose’ to meet the four quality principles of responsiveness, recognition, flexibility and functionality. (National Quality Council, 2010a:3).

The changes that are relevant to this research are a collection of separate guides that are planned as additions to streamline Training Packages, as part of the companion volume to the Training Packages. This collection of separate guides was designed to advise teachers and to assist in the implementation of the Training Package as follows:

- **Learning Strategies Guide** - This Guide will provide the learning strategies to address the importance of understanding the learning process. It will facilitate the learning which provides choice for learners. Learning in a particular industry will be explored in the content of the relevant Training Package and in line with the appropriate learning approaches suitable to that industry.

- **Knowledge Guide** - This will outline the broad discipline knowledge as well as industry-specific knowledge that are important in the context of the relevant Training Package, consistent with the redefined notion of ‘competency.

- **Assessment Strategies Guide** - The assessment approaches and tools that are suitable for the relevant Training Package will be provided in this Guide, together with relevant advice on workplace contexts and simulated environments (NQC, 2010).

One of the outcomes of the streamlining process was to assist teachers in becoming aware of various learning and assessment strategies that were, and continue to be integral to the implementation of the training packages.

### 3.6.14. Creating a future direction for VET: Discussion paper (Skills Australia 2010)

As the focus of this research is on the development of competency, learning, VET delivery and pedagogy that involves both teachers and learners, this section of the Literature Review explores both the Skills Australia Discussion Paper (2010) and the Skills Australia Final Report (2011). Firstly, the issues highlighted by the Skills Australia Discussion Paper (2010) about the teaching and learning in VET, in terms of VET delivery, are explored.
The issue of quality of VET provision is a central theme of this Discussion Paper. The paper emphasises that the professional standing of VET practitioners underpins quality. It further refers to the point made by the UK Commission for Employment and Skills (2010) that, “the quality of an education system cannot exceed the quality of its teachers” (UK Commission for Employment and Skills, 2010:9).

Given the above dictum, this research emphasises that the quality of VET teachers cannot exceed that core quality which is their own competence. Further, the quality that their learners need to develop cannot, or may not exceed, the core quality that the VET teachers possess. It is argued that VET teachers’ success depends on deep understanding of each of the components of competency and how these components are inherently inter-connected and inter-related to play their role in the development of learners’ competence. The question is whether the VET teachers have developed such an understanding of VET pedagogy in teaching, learning and assessment 15 years since the advent of the Training Packages.

The Skills Australia Discussion Paper 2010 has provided some major insights into the problem by referring to the recent OECD review of VET in Australia. The OECD review (2010) has stated that challenges that are faced by Australian VET are crucial, as the VET system in Australia has created wide variations in assessment practices. This evidence, per se, suggests that VET practitioners in Australia have developed a diverse range of understandings of teaching and assessment practices in the context of Training Packages.

The National Quality Council (NQC) has instigated research into the underlying causes of such variations in VET practice in Australia. The findings of the NQC identified the following key elements contributing to these variations (Skills Australia, 2010):

1. An understanding of what it means to be ‘competent’ by industry, employers, learners and VET practitioners
2. The calibre of the RTO
3. The currency of the assessors’ industry knowledge
4. Whether the assessor took a ‘tick and flick’ approach or whether they used a variety of evidence-gathering techniques. (Skills Australia, 2010:183)
The first point refers to the fact that the meaning of ‘competent’ as understood by industry is at variance with its meaning as understood by employers or even learners. As each party attaches different meaning to what being competent means, each party has contributed to such variance in the practice of teaching and assessment. The second point refers to the fact that the calibre of RTO, such as being larger or more sophisticated, has also contributed to variation in assessment practices. The third point highlighted that assessors’ currency in comparison to other assessors in the field has also resulted in variation in assessment practices. Finally, whether the assessment is supported by availability in evidence of learner’s competence variations in assessment practices become evident.

The OECD findings (2010) of wide variations in assessment practices in Australian VET, and the NQC findings (2010) that these variations are the consequence of variations in the understanding of what it means to be ‘competent’, indicate that there are much deeper underlying problems. In fact, these misunderstandings are symptomatic of deeper problems in Australian VET.

The misunderstanding of competence and competency, among stakeholders after fifteen years is sufficient evidence to indicate that, in fact, deeper-rooted problems are still lingering around VET teaching. In other words, the misunderstanding and confusion about the concept of competence and what ‘to be or being competent’ is among employers, learners, teachers and industry stems from deeper-rooted misunderstandings and confusions since the advent of the Training Packages fifteen years ago. The Skills Australia Report (2011) has referred to the point that NQC has defined competency in 2010, suggesting that the new definition may resolve such misunderstandings. It is argued here that AQTF 2007 has already defined competence and that these findings are current, but the new definition is nothing more than a repetition of previous inadequate definitions of competence. This review indicates that the issue of misunderstanding is a deeper issue than the NQC’s definition of competence can address. The grave situation in VET will continue unless the definition of competence is accepted and adopted as a national definition informing the much-needed theoretical framework for teaching in VET.

The Skills Australia report has responded by stating that, “a renewed focus on quality teaching and learning across the VET sector needs to reflect this distinctive character,
both in initial training and in the continuing professional development of VET practitioners” (Skills Australia, 2010a:61). This research argues that to develop and maintain such a focus requires a theoretical framework where this focus is emphasised and without it, the problem remains unresolved.

In addition, Skills Australia (2010) reports that such an ‘applied practical’ or ‘learning by doing’ approach has been labeled as the narrow approach to competence in vocational education and training, leading to barriers in successful student transition between VET and higher education. It is argued here that the only way to address the narrow approach to competence is by broadening it, which requires a theory of applied learning. A theory of applied learning is necessary to give educational depth and meaning to the concepts of ‘applied practical’ and ‘learning by doing’.


Skills Australia (2011) also points out that in implementing Training Packages, knowledge is displaced from the centre of the curriculum in competency-based qualifications, thereby denying students access to theoretical knowledge that they need in the workplace, even though the purpose of competency-based qualifications is to prepare students for the workplace. This raises a further issue of this knowledge displacement by VET teachers and trainers who should have developed the necessary skills in the implementation of the Training Packages.

This is an issue of serious significance, and raises concerns as to why so many government policies and research activities during this long period have produced less than satisfactory results in educating VET practitioners to work skillfully with the packages. The key issue has been overlooked, and this research attempts to provide a way forward. The High Level Review finding has emphasised that the implementation of Training Packages is even more important than improving Training Packages as “products” (Schofield & MacDonald & ANTA, 2004a:5). Successful implementation requires a theoretical framework to underpin teaching and implementation of the courses.

Therefore, it is concluded by this research that:
Firstly, the implementation of Training Packages is even more important than improving Training Packages as "products" (Schofield & MacDonald & ANTA, 2004a:5).

Secondly, it is well established that practitioners need to be able to skilfully work with training packages (Skills Australia, 2011:117).

Thirdly, to become skilled practitioners, practitioners need to be trained to include all the component parts without overlooking relevant knowledge or any other component.

Fourthly, to be trained to include all the component parts without overlooking them requires a deep and clear understanding of the pedagogical inter-relationships of these component parts.

Achieving these crucial objectives is only possible through a comprehensive pedagogical and theoretical framework that balances theory and practice in VET delivery. As Smith (2010) and Skills Australia (2011) highlighted: at present “there is particular risk of underpinning knowledge being overlooked in workplace delivery” (Skills Australia, 2011:117). It is argued that, without a theoretical framework, not only could the knowledge component be overlooked, but other components are also more or less at risk of remaining invisible.

One of the goals of streamlining the Training Packages is to improve VET delivery by placing more emphasis on the knowledge component. This research asserts that the redesign, placing more emphasis on the knowledge component, may improve the delivery of knowledge to a limited extent, but does not theoretically, or in practice, help the practitioners to understand “how the Training Packages work or how to work with them” (Schofield & MacDonald & ANTA, 2004a:5).

Smith (2010:3) concluded that the evolution needed is better quality control and better teacher/trainer training, not a radical change to the system. This suggests that instead of more changes to the existing system, Australian VET requires a better teacher/trainer training approach. A better approach requires a theoretical and pedagogical framework as a vehicle to facilitate the knowledge that Tomlinson (2010) asserts needs to be communicated to learners by VET teachers and trainers. Without a theoretical framework, there is no vehicle for communicating that knowledge.
3.7 Conclusion

Part One of the Chapter commenced by referring to the Lisbon strategy that was launched by the European Union (EU), in 2000, which set the objective for Europe to become the most competitive knowledge based economy internationally. The EU realised in 2003 that to achieve this goal requires that both lifelong learning and competency development should be included in VET delivery programs. The two projects DeSeCo (2002) and Tuning (2000) contributed to this process. While the DeSeCo (2002) project added meaning and conceptual depth to the popular notion of lifelong learning (Rychen, 2003:2), the Tuning project (2000) focused on developing subject-specific knowledge and skills as the basis for university degree programs for higher education. The Tuning project (2000) also emphasised the development of generic competencies that are transferable for lifelong learning.

In Part Two, a review of vocational in the UK from early 1980s was provided. In the early1980s, UK education system was shaken by the ‘Thatcherite revolution’ leading to a plethora of white papers called “New Vocationalism”. As a consequence, in the late 1980s to the early 1990s, competence advanced to all spheres of post-16 education and Britain, the ‘Trojan Horse’ of the competency movement, developed NVQs and GNVQs. The White Paper titled, Employment for the 1990s (UK Government 1988) set the plan for the decade of the 1990s in which recognised standards of competence for all occupations relevant to employment were to be drawn up by organisations that were industry-led, and the National Council for Vocational Qualifications (NCVQ) was formally established in 1996 to implement it.

The two issues that surfaced were: the status of VET in society and synchronization of the world of work to the world of learning. Hence, the success of such profound reconstruction depended on successful offering of NVQs by colleges as well as the parity of esteem between vocational and higher education. To achieve such an outcome, the White paper titled, ‘Education and Training for 21st century’ (1991) was released by the government.

The result of all these reforms did not bear fruit and was not promising, so that in 1999, the UK economy was still suffering from relatively low productivity. Moser (1999) looked into the causes of the situation and found that one in five adults in the country was not functionally literate, and far more people had problems with
numeracy, hence, a wide-ranging National Strategy was proposed. On this basis, the Learning and Skills Act (2000) was endorsed in 2001 to establish the learning and skills councils (LSCs) to address areas of funding and planning across the UK, as well as ‘Success for All’, which was launched in November 2002 as the government’s agenda to reform the learning and skills sector and transform local provision of vocational education.

After decades of reforming by 2005, the government realised that the vocational education sector needed reinvigoration as it has not achieved as expected.

In the same year, the government, after examining the Foster (2005) report issued the ‘FE reform white paper (2005)’ and set a number of goals as the mission for further education for the UK. However, by 2007 the government realised that to achieve these goals as set by FE reform they need to focus on teacher training. Thus, from September 2007, the government expected that that all new staff employed as teachers and trainers in the learning and skills sector (VET) would be trained to a standard that allowed them to achieve Qualified Teacher Learning and Skills status (QTLS) and be licensed to practice by the Institute for Learning (Learning and Skills Sector, 2007). This process did not produce the high expectation predicted at the start and caused the inequities between teachers of academic and vocational education to surface, along with the pernicious effects of this division on the learning experience.

Hence, in 2010, Sir Mike Tomlinson was commissioned to inquire into teacher training, and the fundamental issue of inequity and the impact on learning (Skills Commission – Tomlinson, 2010). The Tomlinson Inquiry (2010) revealed two major areas of neglect in Vocational Education and Training Sector as follows:

The first area of neglect was that teachers of vocational education have been a neglected group within the teaching profession, even considered to be second best. The second area of neglect has been the neglect of vocational and applied pedagogies and that there is a clear need to develop a theory of applied learning.

In the UK, Professor Alison Wolf was called by the Secretary of State to investigate, how to ensure that vocational education provides for progression to higher learning and higher employment. The conclusion of the Wolf report was that the trend in recruitment places more emphasis on experience than academic achievement which
indicates that the 14-19 cohorts who have been trained as competent are not in fact competent, and that the employers cannot be fooled.

Part Three of the Chapter highlighted that recently the OECD has encouraged the member countries to base their global competitiveness on ‘high-quality’, innovative goods and services. Secondly, COAG has recognised ‘high quality’ as a ‘critical issue’ that drives productivity and global competitiveness. Thirdly, COAG has put the spotlight on the solutions that the VET system can offer. VET solutions require that VET practitioners are able to work skillfully with the Training Packages to deliver quality teaching, learning and assessment.

Hence, to be able to work skillfully with the Training Packages has been the key quality issue of teaching in the VET sector in Australia, which was the most significant finding of the High Level Review (Schofield & MacDonald & ANTA, 2004a). It was argued that to educate VET teachers to the required level for quality teaching needs a theoretical framework. According to Schofield & MacDonald & ANTA, (2004a), quality teaching requires understanding “how the training Packages work and how to work with them” (Schofield & MacDonald & ANTA, 2004a:4-5). According to Tyler (1949) the so-called implementation would only be meaningful if pursued within the parameters of a theoretical framework, pointing out that practice would otherwise be chaotic and merely a collection of isolated cases. This is indicative of VET in Australia at the present time.

Hence, a theory of applied learning, comprised of a theoretical and pedagogical framework, is required to boost understanding of the two aspects of VET teaching that are prerequisite to skillful work with TPs. This understanding will improve the quality of teaching in VET on two fronts, as specified by Schofield & MacDonald & ANTA, (2004a:5), i.e., ‘how TPs work’ and ‘how to work with them’. This improvement in quality of teaching will produce ‘high-quality’ products and services. Therefore, working skillfully with Training Packages (Skills Australia, 2011) requires skillful understanding directed at these two dimensions: To understand skillfully how TP work and be able to understand how to skillfully work with Training Packages. A theoretical framework that addresses these two aspects for VET teaching needs to be nationally adopted to support quality teaching of VET delivery in order to deliver high-quality products and services.
In 2010, Smith postulated both the pedagogical divide and knowledge displacement as implementation issues. Resolving implementation issues requires pedagogical theoretical framework (Tyler 1949). Thus, improving the products as strategy to solve pedagogical and theoretical problems was not recommended by the HLR (Schofield & MacDonald & ANTA, 2004a:5).

Despite the above findings, the NQC has undertaken a streamlining project to improve the products (Training Packages). This strategy by the NQC indicates that the HLR (2004) has been overlooked.

As the High Level Review suggested, the pedagogical problems in the Training Packages context are problems in relation to either how the TPs work, or how to work with the TPs. To skillfully work with them, teachers need to develop their competence in these two dimensions of skillful delivery and be able to differentiate these two dimensions. The differentiation of these two types of understandings, and the issues that are pertinent to them, is crucial to understand the teaching, learning and assessment problems in the VET environment. As the HLR review put it, “This is a key issue that demands attention in order to achieve improvements in the quality of teaching, learning and assessment practice” (Schofield & MacDonald & ANTA, 2004a:5). In other words, understanding how to improve the quality of teaching, learning and assessment in VET depends entirely and solely on these two dimensions (aspects). The VET teachers need to be competent in both dimensions to be able to skillfully work with the Training Packages, and achieving these goals is possible via a theoretical framework.

In addressing this highly problematic situation, this research has proposed a theoretical framework of Competencivism. An outline of this theory is discussed in the next chapter with a view to creating the necessary theoretical framework that is central to teaching and learning in the VET sector in Australia.
CHAPTER 4: THE CONCEPTUAL AND THEORETICAL FRAMEWORK

4.1 Introduction

Chapter 3 concluded that to work skillfully with the Training Packages curriculum, it is crucial that VET teachers and trainers be adept at two dimensions of curriculum implementation: how the Training Packages work and how to work with the training packages (Schofield & MacDonald & ANTA, 2004a:5). These two dimensions or aspects are necessary pre-requisites for quality teaching and assessment by VET teachers, in order to train competent VET graduates who are able to deliver high quality goods and services in Australia.

The National Quality Council (NQC) has highlighted stakeholder concern regarding the complexity of the Training Packages (National Quality Council, 2010:6) in particular, the size of the Training Packages and their fit-for-purpose (National Quality Council, 2010:6). To deal with these concerns, the NQC (2010) applied a formula to simplify, segment and shorten the Training Packages. This research argues that these amendments are aimed at the form and not the substance of VET delivery complexity. Hence, while these changes in presentation improve the format, the complexity of the substance of Training Packages delivery remains the same.

Such streamlining of format may improve the way knowledge about Training Packages is presented, but does not foster understanding of how the Training Packages work at the level of delivery and how to work with them (Schofield & MacDonald & ANTA, 2004a:5). This is confirmed by Perkins and Unger (1999:96) who assert that knowledge, in itself, does not guarantee understanding. Their research findings support the principle that mental models and schemata of trainers are important in understanding and implementing the complexities of curriculum reform, such as that required in VET. The Tomlinson Inquiry (2010) has further confirmed that developing pedagogical understanding is more complex than developing subject knowledge. Given that Tyler (1949) emphasised that a theoretical framework is required to develop understanding in education, it is argued that the Double Heuristic Model is a mental model framed by the theoretical framework of Competencivism.
(Azemikhah, 2008), and is an appropriate pedagogical tool for implementation of training programs in VET.

The European Centre for the Development of Vocational Training (Cedefop, 2008) stated that globally, VET systems are still at a moot point as to whether or not they have delivered sustainable employment to their participants, though they have undergone a period of continuous reform. This dissertation began with questioning why, after continuous reforming of the VET systems, around the world for the last decade or so, VET systems are still unable to deliver competencies that lead to sustainable employment for their learners (Azemikhah, 2012). In an attempt to investigate the intricacies of this question, as the key question, an examination of the interplay of various policies and research projects that were undertaken across Europe, UK and Australia in the delivery of vocational education and training, has been carried out (Azemikhah, 2012). It was found that a theory of applied learning is necessary to facilitate pedagogical understanding that can be used in applied vocational learning to transform VET delivery into a workable, teachable and learnable format.

Given that a theory of applied learning is required, this research proposes the theory of Competencivism (Azemikhah, 2008) as the theory of applied learning for VET, as a framework that provides a conceptual tool that embraces the theoretical complexity inherent in VET training, and provides a platform for engaging in a pedagogical approach that centres on the development of competence through learning. Before articulating this framework, the definition of competence adopted for this study is outlined.

4.2 Concept of competence

The conceptual framework underpinning this research upholds two aspects of competency that need to be emphasised in its definition: what competency is and how competency is to be developed. It is proposed that the following definition provides the basis for understanding the complexity of developing competence.

Competence is:

“A quality that needs to be developed by the learners both conceptually and physically; It needs to be conceptually developed in the minds of the learner
based on the constituents of competence (underpinnings and attributes), and physically developed and perfected by performance (based on performance criteria) resulting in a balanced hands-and-mind equilibrium” (Azemikhah, 2005a).

This definition is comprised of four components:

1. Competence is a quality that needs to be conceptually developed in the mind of the learner, based on the constituents of competence (underpinnings and attributes).
2. Competence is a quality that is physically developed and demonstrated by the learner.
3. Competence is a quality that is perfected by performance.
4. Competence is a quality that results in a balanced hands-and-mind equilibrium.

Each of these components will now be more fully explained.

1. *Competence is a quality that needs to be conceptually developed in the mind of the learner, based on the constituents of competence (underpinnings and attributes)*

   Steven Covey (1989) pointed out that every creation needs to be visualised and conceptualised in the mind before it can be realised physically. The definition utilised in this research rests on this significant link between the concrete (the hands) and the abstract (the mind) and the relationship established between the two. In recognising this association between hands and mind, a link between the conceptual development of the mind and physical development of the hands is established as a platform for the development of competence.

2. *Competence is a quality that is physically developed and demonstrated by learning*

   The physical development of competence unfolds by “doing, which takes cognizance of conditions, observes relations of sequence, and which plans and executes in the light of this knowledge” (Dewey 1933:7). Dewey’s assertion suggests that cognizance of prescribed required knowledge, skills and attributes, as well as observing the sequence of performance criteria are important in developing competence. Hence, the physical development of competence, based on performance criteria, cannot take place if the learner has not conceptualised it in his or her mind through cognition. The
mind map the learner has formed assists the learner to follow through, and eventually develop the desired competency. The competencies that are formed in this fashion will endure, remaining with the individual learner to maintain and enhance their productivity (Azemikhah, 2007).

3. Competence is a quality that is perfected by performance

In *The Question of Certainty*, Dewey (1933:3) was concerned with the uncertainty and inferiority placed on activity, and the lower value attributed to it in comparison to the value that is inherently connected with the object of knowledge. According to Dewey (1933:4), the intelligently directed action is an art by which the security of values in the activity can be attained, and that the chief consideration in the security of these values lies in perfecting the *methods* of action.

This suggests that to improve their performance, the learners need to perfect their way of acting on the performance criteria. The process of perfecting is actually the process of improving, which, in turn, invests value in what they do as learners. By developing a clearer understanding of performance criteria, providing richer responses and better presentation of their work, plus providing valid and sufficient evidence of their performance, the learners are able to demonstrate their perfection of methods of action.

4. Competence is a quality that results in equilibrium of hands-and-mind

The fourth component of the definition involves maintaining an omnipresence of the mind in the competency development process. The learner, as the shadow of his facilitator, needs to constantly maintain the equilibrium of hands and mind in the process of competency development. The following figure (4.1) illustrates this equilibrium or balance.
Maintaining the equilibrium of hands and mind involves the two processes of mental reflection (the Mind) and physical action (the Hands). These dual processes work simultaneously to transform the learner and this transformation relies on individual construction of meaning so that experience and knowledge are in equilibrium (Stevenson, 2000), as the following diagram illustrates. This view is confirmed by Ashleigh (2001) who emphasised the significance of both conceptual and procedural knowledge in education and that both of these aspects are not mutually exclusive, but complementary.
The equilibrium is the balancing element controlled by the learner and facilitated by the teacher. This suggests that the simultaneous working of the conceptual element (the mind), and the physical element (the hands) is balanced (the equilibrium) through the interaction of the processes of mental reflection and physical action.

### 4.3 Competencivism

Competencivism (Azemikhah, 2008) is comprised of four inter-related premises that constitute the facilitative framework of the study. As discussed in previous chapters, it is now widely recognised that teachers and trainers should become learning facilitators (Cedefop Synthesis, 2009:120). This shift of emphasis in facilitative teaching, as opposed to instructive teaching, suggests that the interplay of the abstract (the Mind) and the concrete (the Hands) in competency development should be facilitated within a teaching framework. The shift from instructive teaching to facilitative teaching in learning theory (Cedefop Synthesis, 2009:120), requires that the new VET pedagogies surrounding the abstract and concrete notions are to be realised in the facilitative framework of Competencivism (Azemikhah, 2008).

The teachers need to continue assisting learners in developing competence in the framework while the learners are applying the required knowledge, skills and
attributes. They should continue this until such time as the learners are confident (Azemikhah, 2008), independent (Azemikhah, 2005b), current (Azemikhah, 2008), and competently intelligent (Azemikhah, 2007). Hence, the learners need to demonstrate that they have achieved the four premises of confidence or certainty (Premise 1), independence or autonomy (Premise 2), currency (Premise 3) and competency intelligence (Premise 4). The following diagram illustrates these four premises.

Figure 4.3: The four premises

4.3.1. **Premise 1 - Certainty**

This premise postulates that individuals engage fully in the activities of life and perform according to the certainty that they possess a special quality called competence. There is confidence in the efficacy of their performance (Competency Certainty). Such certainty is both essential and crucial for the competent accomplishment of the desired outcome in activities of life. According to this premise, the learner and the assessor should agree that the competency has been attained (Azemikhah, 2008).
The assessor of competence must also be certain that the learner has achieved competency through their engagement in the facilitation process. In attesting to such a certainty, the teacher needs to ensure that both he/she, as the assessor, and his/her learner are confident of the outcome of the assessment process that confirms the learner’s competency certainty. Hence, the assessment of competence, in the context of Training Packages, involves both the learner who is engaged in the facilitation process and the facilitator who is also the assessor.

Both parties must reach an agreement on the question of Competency Certainty. The learner’s ‘Competency Certainty’ should be communicated to the assessor (teacher) through assessment tasks. In addition, the assessor must satisfy himself/herself by inference from observation or other methods of evidence-gathering, that he/she is also certain or confident that the learner is competent. Sometimes, the assessor may have difficulty in making a decision regarding the learner’s performance. In such situations, the teacher is neither confident nor certain whether the learner is competent or not, because of the binary nature of competency-based assessment. While the learner perceives himself/herself as competent, the teacher may/may not have reached such a conclusion. Competencivism argues that the two parties in competency-based assessment, i.e., the learner and the assessor, must agree on the outcome of the assessment process (based on the perceptions of both parties of the efficacy of specific performance).

However, as the Competency Based Assessment is a binary system, sometimes the assessor, or even the learner, may be on the borderline and not sure either way. This view is confirmed by the Assessment Research Centre of the University of Melbourne. In a manual handling training program (Nicholson & Gillis, 2003:7), a rating tool was used to judge between competent (scale 1 and 2), borderline (scale 3) and not yet competent trainees (scale 4 and 5).

Thus, the assessment of competence in the context of Training Packages involves both the learner and the assessor and, in addition, their agreement on the question of Competency Certainty. Assessment is initiated by the learner, who is confident or certain that he is competent. However, the learner’s Competency Certainty must be communicated to the assessor (teacher). In addition, the assessor must go about satisfying himself/herself, by inference from observation, or other methods of
evidence-gathering, that he/she is also certain or confident that the learner is competent.

The following diagram (Fig. 4.5) provides a mechanism for decision-making about shared confidence (Azemikhah, 2008). The binary nature of competency results in nine areas of possibilities or combinations. The grey area in the diagram illustrates that both parties are in agreement as to the attainment of competency. Each area is labeled by letter A to I and is individually explored below.

Figure 4.4: Competency certainty (CC) diagram

In area A, the learner may have just engaged in the competency development and is still in the *Not Yet Competent* position. At this stage, the learner is developing his/her competency and the teacher also is certain that the learner is in the *Not Yet Competent*
position. The teacher is not able to infer competence from the learner’s performance and the learner attests to such a position.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Learner</th>
<th>Competency achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>uncertain</td>
<td>uncertain</td>
<td>No</td>
</tr>
</tbody>
</table>

In Area B, the learner is uncertain as to whether he/she is competent or not. While this is the case with the learner, the teacher position is that he/she is certain that the learner is not yet competent. The equation is as follows: Teacher is uncertain, learner is neutral the result is ‘No’.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Learner</th>
<th>Competency achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>uncertain</td>
<td>neither certain nor uncertain</td>
<td>No</td>
</tr>
</tbody>
</table>

In Area C, the learner feels competent and is certain. However the teacher is uncertain. This scenario is where the learner may not be aware of the complexity of CBT and that the learner is needed to perform well, even if he may have learned the required knowledge. The teacher is aware of the learner’s level of competency and not certain whether the learner is competent.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Learner</th>
<th>Competency achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>uncertain</td>
<td>certain</td>
<td>No</td>
</tr>
</tbody>
</table>

In area D, while the learner thinks he/she is not yet competent the teacher is on the borderline. The teacher is not certain whether the learner is competent or not. This position does not yield a positive yes to the question of whether the competency has been achieved by the learner, as the following table illustrates.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Learner</th>
<th>Competency achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>neither certain nor uncertain</td>
<td>uncertain</td>
<td>No</td>
</tr>
</tbody>
</table>
Area E is central in this model. What this position entails is that both teacher and the learner are neither certain nor uncertain as to whether competency has been achieved. In such a situation, the result of summing up their certainty yields a negative outcome, as the following table demonstrates.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Learner</th>
<th>Competency achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>neither certain nor uncertain</td>
<td>neither certain nor uncertain</td>
<td>No</td>
</tr>
</tbody>
</table>

Area F is unique in that while the learner believes that he is competent, the teacher is still uncertain. In such a situation, the conclusion is negative and the learner is not deemed competent as yet, as the following analysis demonstrates.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Learner</th>
<th>Competency achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>neither certain nor uncertain</td>
<td>certain</td>
<td>No</td>
</tr>
</tbody>
</table>

Area G is the reverse of area C. In area C, the learner thinks he/she is competent while the teacher is not certain. In this position (area G), the teacher is certain that the learner has achieved competency but the learner does not agree with the teacher and thinks he/she is not competent. In such situations, it is better to clarify or let the learner develop his/her competency further. This situation is not satisfactory for the learner. As CBT is a learner-centered system, the learner cannot be deemed competent.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Learner</th>
<th>Competency achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>certain</td>
<td>uncertain</td>
<td>No</td>
</tr>
</tbody>
</table>

In Area H, the learner is in a better position than in area G, as the learner is on the borderline, while the teacher is certain that the learner has achieved competency. In such a scenario, it is possible to negotiate with the learner and the learner may accept that he/she is competent; otherwise the outcome is still a ‘No’, as reflected in the following table.
Area I is the shaded area. This is the area where both the assessor and the learner are confident and certain that the competency has been attained. The learner is deemed to be competent and the assessor can attest to the learner’s competence. The three levels of performance level assessment (PLA) used in Queensland also apply in this area.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Learner</th>
<th>Competency achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>certain</td>
<td>neither certain nor uncertain</td>
<td>No</td>
</tr>
</tbody>
</table>

As the above analytical tables illustrate, the model yields a positive ‘Yes’ result only when both the learner and teacher are convinced that the competency has been achieved. Hence, assessment of competency is based on the certainty and confidence of both parties to the assessment, i.e., the learner and the assessor agree that the particular competency has been attained and the statements to this effect should be signed by both learner and assessor.

**4.3.2. Premise 2 - Independency**

The achievement of such certainty requires the individual’s engagement in a facilitation process to develop competency and continue on this path until he/she arrives at a point of transposition, where he/she attains independency. According to the second premise of Competencivism, arriving at the point of transposition is possible through a constant application of knowledge and skills to performance, where the learner becomes independent of his/her facilitator (Azemikhah, 2008).

Thus, the learner’s engagement in the competency continues until he/she has attained independence in the Unit of Competency (Competency Independency). At each level of learner engagement, represented by expanding circles in the competency theory (Figure 4.6), the learner’s level of competency and professionalism elevates to a higher level of achievement (Azemikhah 2005a; Azemikhah 2007):
At the point of transposition of the competency and learning, the learner becomes self-sufficient to learn independently of the facilitator when confronted with new cases or concepts within the precincts or boundaries of the Unit of Competency (Azemikhah 2005a:5).

According to this premise, the learners need to go through a number of problem cases from simple to complex. At each iteration (illustrated by expanding circles in the competency theory), the learner’s level of competency and professionalism elevates to
a higher level, where the level of problem solving sophistication increases. This process continues until the learner attains mastery and arrives at the point of transposition (Azemikhah, 2005a). At the point of transposition, the learner moves from the ‘Not Yet Competent’ position to the ‘Competent’ position. Throughout the ‘not yet competent’ stage, the learner is developing both his/her competency and competency intelligence (explained later). During this stage, the learners are engaged in the process of constructing the relevant conceptual structure or network of concepts in memory.

The results of many experiments in recent research, (for example Anderson 1993; Soden 1994; Smedley & Sutton 2002), suggest that conceptual structure is stored in the form of concepts in memory. However, on this basis, the “concepts which are meaningfully related to one another are stored in a structure which shows the relationships between the concepts in that structure” (Soden 1994:38). The meaning of any concept is derived from its relationship with other concepts. This has been further confirmed, in 1996, in the studies undertaken by Ericsson (Ericsson, 1996).

Competency development continues as the learners’ network of concepts becomes larger and more sophisticated, allowing the learner to cross the point of transposition and move to the competent stage. At the point of transposition of the competency and learning, the learner becomes self-sufficient to learn independently of the facilitator. At the point of transposition, the learner enters into a new stage, or cycle of learning, in which the learning depends entirely on the learner’s competency and thus, learning becomes the function of the competency itself (Azemikhah, 2005a:5)

4.3.3. Premise 3 - Currency

To remain competent, it is crucial to maintain one’s currency in the area of expertise. The process of maintaining currency requires the individual to engage in the integration of new knowledge, disintegration of old (obsolete) knowledge, and the reintegration of the existing knowledge to performance, using skills as the integrative agent.

Without currency, the knowledge and skills become outdated and obsolete. This premise involves the three functions of integration, disintegration and reintegration of knowledge and skills as a perpetual process (Azemikhah, 2008). These functions
yield new knowledge that leads to the enrichment of the learner’s existing body of knowledge (Azemikhah, 2008). In Competencivism (Azemikhah, 2008), new knowledge is not only a construction, but also develops from the disintegration of old knowledge or old skills, as a perpetual process (Azemikhah, 2008). According to Clayton, Harding, Toze & Harris (2011) the erosion of competence, which is the consequence of professional obsolescence, occurs when individuals do not have the ability to undertake continuous learning to sustain current knowledge. Hence, to stay current, it is necessary for the competent individual to disintegrate the obsolete knowledge and skills. This disintegration is the process of unlearning the obsolete skills and knowledge. Such a process is, in fact, learning to unlearn these skills as a measure to prevent the erosion of competence. Replacing such skills with new skills, as Mitchell et al (2006) have elaborated, adds to the learner’s existing body of knowledge. This process of disengaging obsolete knowledge and skills is similar to the process of the application of new knowledge and skills. Both processes are important to stay current and up to date.

Of relevance to the VET sector, integration occurs between knowledge and performance, using skills as the bridge or integrative agents that generate the confluence of existing relevant knowledge with performance.

Currency involves the disintegration of obsolete knowledge to enable the reintegration that enriches the learner’s existing body of knowledge, and the enrichment process, per se, yields new knowledge. It is argued that the processes of ‘integration, disintegration, reintegration and yielding of new knowledge’ are possible by interconnecting the conceptual side (Mind) and the physical side (the hands) of learning. Hence, this process of interconnecting these two sides (hands and mind) is considered as a dynamic and crucial interaction that is necessary in knowledge construction, and is naturally occurring within the individual. Competencivism (Azemikhah, 2008), as the theoretical framework uses this natural and dynamic interaction of hands (concrete) and mind (abstract) as the core process that is linked to the development of competence.
Such a perpetual process is a necessary component of staying current in any field of study and without it professional obsolescence can occur (Clayton et al, 2011). Clayton et al (2011) have elaborated that professional obsolescence occurs when individuals do not have the ability to undertake continuous learning to sustain current knowledge.

From such a point the individual needs to maintain his/her independency as long as he/she is functioning and delivering goods and services within the precincts of the competency.

4.3.4. Premise 4 - Intelligence

As was discussed in Chapter 2, in the United States, the competence-based selection approach was found to be an effective indicator of job performance to identify individuals with psychosocial attributes associated with superior performance. This approach replaced tests of cognitive intelligence (IQ) (McClelland, 1973) and suggests that competency intelligence (CQ) ranks at a similar level of significance to emotional intelligence (EQ). Given that: Firstly in 2005 “the correlation of IQ and EQ levels of superior performance proved to be significant and strong” (Aydin, Leblebici, Arslan, Kilic and Oktem, 2005:701). And, secondly, Competency intelligence
(Azemikhah, 2007) has a role to play in the development of competence as well as in the selection of competent individuals. It is argued, here, that such correlation needs to be extended to include competency intelligence (CQ) as the link in the IQ – EQ equation to form the ICEQ. Based on the premise of intelligence in Competencivism it is the combination of these three intelligences (ICEQ) that, in fact, contributes to superior performance by facilitating the CQ link between these two intelligences. On this basis, the 4th premise of the theory of Competencivism postulates that to remain competent the individual is required to enter into an agreement with the self to develop and apply competency intelligence (Azemikhah, 2007:1) as the CQ link. That is:

The learners need to be able to, adopt the required skills in the right sequence, demonstrate the required attributes at the right moment, while performing in the appropriate context, underpinned by the required knowledge. The development of Competency Intelligence is an important catalyst and co-requisite in the competency development process (Azemikhah 2007:1).

According to this Premise, the possession of a set of skills, knowledge and attributes is, of itself, of no avail. A competent individual who is expected to demonstrate superior performance (McClelland, 1973), in addition, needs to:

…possess the intelligence of putting them all together by integrating and coordinating the constituents of competence in unison, and objectively, and with due regard to, and, in congruence with, the timing, the sequence as well as the purpose of the Unit of Competency (Azemikhah 2007).

The individual learner who aims to attain to the superior performance (McClelland, 1973) by applying competency intelligence during the competency development process needs to pay undeviating regard to intelligent direction (Azemikhah 2007).

According to Dewey (1933), the separation between knowledge and action (theory and practice) has been perpetuated, resulting in the attribution of lesser value to activity and greater value to the object of knowledge. Dewey was concerned with the inferiority placed on activity and the lower value attributed to it. On this ground, Dewey (1933) further asserts by referring to the point where:

The arts of intelligently directed action are the means by which security of values are to be attained (Dewey, 1933:4).

And, in order to secure these values, he asserts that:
The chief consideration in achieving concrete security of values lies in the perfecting of methods of action (Dewey, 1933:7).

He points out, further, “more activity, blind striving, gets nothing forward” (Dewey, 1933). And, finally, the impetus of Dewey’s assertions culminates by his stating that:

Regulation of conditions upon which results depend is possible only by doing, yet only by doing which has intelligent direction (Dewey, 1933:7).

Given that the intelligent direction invests value in the activity, suggests that securing value in the competency development process requires intelligent direction. This is why Dewey (1933) so vehemently emphasised intelligent direction in the Question of Certainty because:

Intelligent direction is the doing which takes cognisance of conditions, observe relations of sequence, and which plans and executes in the light of this knowledge (Dewey, 1933:7).

Combining the meaning of intelligence as the faculty of understanding with the action of directing it in a situation, yields the position that intelligent direction is how to proceed with a high degree of understanding. This is possible through the faculty of understanding, which is the exercise of human intelligence.

During the application of intelligent direction, the learner’s network of concepts becomes more sophisticated, leading to an enhancement of the learner’s body of knowledge in this developmental process (Figure 4.8).

As this learned capability is developed, the learner is engaged in the process of understanding how to work with the requirements of the Units of Competency. Such a developmental process has the potential to enable the learner to construct a new, unique, accurate and sophisticated response for each new, unique problem in the context of training. In this integrated approach, the learner needs to adopt the required skills in the right sequence, demonstrate the required attributes at the right moment, while performing in the appropriate context based on apposite performance criteria, underpinned by the inherent required knowledge.

Competencivism (Azemikhah, 2008) provides the theoretical framework of this study and has at its core the concept of competence. Competencivism confirms the constructivist philosophy of knowledge construction. But, the process of constructing new knowledge in Competencivism results from integration, dis-integration and re-
integration of the existing body of knowledge to performance, using skills as the integrative agent. The Competencivist epistemology is a process of application of knowledge through a bridging process that yields new knowledge. It is this yielding of the additional knowledge beyond the constructed knowledge that adds deeper insights to the repertoire of a learner’s network of knowledge.

The Competencivist epistemology also goes beyond Pragmatist epistemology. While Pragmatist epistemology (Weber, 1960) states that statements are true if they work in practice, Competencivist epistemology states that statements are true if they integrate knowledge to practice by using the skills and attributes in the construction of knowledge, leading to, or yielding, further new knowledge beyond the constructed knowledge.

Philosophically, it can be argued that Competencivist epistemology goes further than both Pragmatist (Weber, 1960) and Constructivist epistemologies (Nola and Irzik, 2005). Hence, it has a broader epistemological outlook than both Pragmatism and Constructivism, as it is wider than these philosophies by giving recognition to the yielding of new knowledge. The new knowledge in Competencivism is as additional knowledge above and beyond the constructed knowledge resulting from the process of knowledge construction by disintegration of obsolete knowledge and integration of new knowledge.

Further, in Competencivism, while the learner is physically involved in the process of application of knowledge and skills to performance during competency development, the yielding of new knowledge is cumulatively stored in the minds of the learner.

4.4 Double Heuristic Method (DHM)

In the following chapter, a pedagogical tool, called the Double Heuristic Method (DHM) designed to operationalize the concept of competence, is discussed. As illustrated in Fig 4.9 below, Competencivism informs and underpins the DHM, which is a pedagogical device that teachers can adopt for VET delivery.

The Double Heuristic Method (DHM) (Azemikhah, 2005a) is a method for the integration of skills in the context of Units of Competency of the Training Packages. The study is designed to investigate how teachers in Vocational Education and
Training (VET) in Australia deal with the Double Heuristic Method (DHM) as an alternative model for teaching in the VET Sector.

![Diagram of DHM framework](image)

**Figure 4.7:** Theoretical framework of competencivism underpinning the DHM

### 4.5 Conclusion

The first Competencivist premise states that individuals perform in life on the basis of a certainty that they hold a special quality called competence. They have to be certain in their performance. Attesting to such certainty requires that both the learner and the assessor agree as to whether or not the competency has been attained.

The second premise is that attainment of such certainty by both parties, the learner and the assessor, is possible through the learner’s engagement in the process of learning to develop competency and the assessor’s engagement in facilitating this
learning, such that the learner arrives at the point of transposition and attains independency (Azemikhah 2008).

The third premise is that the learner focuses on the process of competency development by continuously maintaining his/her currency in the area of expertise to prevent the erosion of competence, which is the consequence of professional obsolescence (Clayton et al, 2011).

This process requires the individual to engage in the integration of new knowledge, disintegration of old (obsolete) knowledge, and the reintegration of the existing knowledge to performance using skills as the integrative agent. The processes of ‘integration, disintegration, reintegration, and yielding of new knowledge’ are possible by interconnecting the conceptual side (Mind) and the physical side (the hands) of learning.

Finally, during the development of competency, the learner needs to also consider the refining of the process by using competency intelligence (4th Premise). In the context of developing Competency Intelligence, the learner is engaged in the process of understanding how to work with requirements of the Units of Competency in terms of knowledge, skills and performance. By working in such multiple contexts in unison, the learner’s Competency Intelligence, as a learned capability, is developed. While the theoretical framework of Competencivism provides a theoretical basis for framing the study, it also presents as applied theory of learning to assist in the implementation of VET globally.
CHAPTER 5: THE DOUBLE HEURISTIC METHOD (DHM)

5.1 Introduction
In the previous chapter, the theoretical framework of Competencivism (Azemikhah, 2008) was introduced and the chapter concluded with the premise that the theory of Competencivism informs and underpins the Double Heuristic Model of teaching and learning. In this chapter, an explanation is given of the Double Heuristic Method (DHM). This method is comprised of two heuristics and was designed as a pedagogical device for VET delivery in Australia and elsewhere.

This chapter firstly describes what the DHM is. Then the chapter focuses on explaining the components of the first and second heuristics. This explanation unfolds the intricacies of the two heuristics by explaining how they can pedagogically work in unison, facilitating the development of competence, while, at the same time, providing an understanding of the meaning of competency development in the context of VET in Australia. After describing the components of the DHM, the chapter turns its focus to the application of the DHM, by providing an example of how it can be utilized as a pedagogical tool in VET delivery.

5.2 The Double Heuristic Method
The DHM has a solid foundation as it is based on Vee diagrams that grew out of twenty-years of research (Novak & Gowin, 1984:55) to find a method to facilitate learning and to understand the structure of knowledge (Novak, 1988). Gowin and Alvarez (2005) have asserted that, *The V is a tool that helps us to identify the components of knowledge, clarify their relationships, and present them in a visually compact and clear way* (Gowin and Alvarez 2005:xvi). The DHM was developed as an extension of Gowin’s Vee (Gowin and Alvarez, 2005), and was designed as a pedagogical device that gives meaning to the understanding of competency development by clarifying the components and presenting them in a visually compact and clear way. In the process of developing competency, grasping the meaning of competence is central to learning (Gowin and Alvarez, 2005).

Hence, the DHM works on the basis of the philosophical argument that individuals must grasp meaning before they can learn. (Gowin and Alvarez, 2005: x). Developing
competency is a more complex and thorough learning process that requires learners to link their knowledge to performance by skills. When the grasped meaning is attained by using the DHM in this manner, then, the learners are able to demonstrate competency.

The DHM is comprised of two heuristics: the First and Second Heuristic. Given that a heuristic is something employed as an aid to solving a problem or understanding a procedure (Novak and Gowin, 1988), the First Heuristic of the DHM is used as an aid for understanding the process of competency development by the learners. The Second Heuristic of the DHM enhances the learning process through guiding the learners, by the use of focus questions, in the required direction leading to improved learning. In addition, the Second Heuristic of the DHM utilizes appropriate teaching strategies, as a necessary component, leading to the desired learning outcomes. The shaded area in the following diagram, Figure 5.1, illustrates the First Heuristic of the DHM. The unshaded area illustrates the second heuristic of the DHM. As the following diagram illustrates, each of the heuristics of the DHM has a number of components. It is important to get an understanding of both heuristics and their component parts in more detail.

Figure 5.1: The Heuristics of the DHM
5.2.1. The First Heuristic

According to Novak and Gowin (1988), without using the Gowin Vee diagram, there is no interplay between the thinking or abstract component of learning, the conceptual, and the doing or concrete component of learning, the physical, and, therefore, learning may be meaningless. The first heuristic of the DHM was designed on the basis of the above assertion to give meaning to the interplay of the knowledge component of the units of competency of Training Packages, and the performance criteria as illustrated in the following diagram, Figure 5.2. The double-sided arrow represents skills as the interplaying element between conceptual and physical dimensions in the First Heuristic.

![Diagram of First Heuristic of the DHM](Image)

Novak and Gowin (1988) argued that their approach helps the learners to see the interplay between the two sides. In the same vein, the skills are used in the designing of the First Heuristic of the DHM as the interplaying medium to achieve the desired integration in the Training Packages context of competency development.

The pedagogical significance of the First Heuristic is that it is designed to represent the concepts, performance criteria, and skills that are implied or relevant to a learning
activity in a pedagogical map. Thus, it facilitates the grasped meaning (Gowin and Alvarez, 2005) to be attained by the learners. The component parts are pedagogically related and the First Heuristic of the DHM represents a pedagogical picture of these relationships.

There are four component parts in the First Heuristic, as listed below, that are discussed in the following paragraphs. The process of constructing the First Heuristic is an evolving process where these component parts are identified and mapped in what becomes the First Heuristic:

- Concepts (Variables)
- Skills
- Performance Criteria
- Competency Learning Event (CLE)

5.2.1.1. The concepts

Concepts are the knowledge components of the VET curriculum and are referred to as variables or range statements in the Units of competency of the Training Packages. Smith and Keating (2003) stated that the ‘Range of Variables’ shows “the different types of the application of the competency that might be taught to students” (Smith and Keating, 2003:165).

Range statements, or variables, are terminologies referred to concepts in the text of the performance criteria. The listed meanings in the range represent a number of conceptual applications of knowledge components required to be taught. Teachers, by reviewing these lists, are able to identify the concepts or knowledge applicable to any Competency Learning Event or lesson.

5.2.1.2. The skills

To act upon the performance criteria, the learner requires skill development. Allen Consulting Group (2006) defined skill as follows:

A skill is the ability to do something well, usually gained through experience and training (Allen Consulting Group 2006:12).

There are two types of skills applicable to VET delivery: Required skills and employability skills. The Required skills are listed in the text of the ‘Unit of
Competency’. To identify the required skills, a teacher needs to browse through the list and identify skills that animate the performance criteria. In other words, using that skill, the learner is able to act upon performance criteria and put the performance criteria on which assessment is based into action.

Employability skills were introduced into the Training Packages delivery in 2006. The employability skills were defined by the Australian Chamber of Commerce and Industry and the Business Council of Australia as:

Skills required not only to gain employment, but also to progress within an enterprise so as to achieve one’s potential and contribute successfully to enterprise strategic directions. (Allen Consulting Group 2006:11)

In 2006, the Allen Consulting Group (2006) emphasised that to be proficient in a broad range of employability skills was a high priority for workers in Australia, as follows:

Employers in Australia now focus on adaptation, cost reduction, increased productivity, and new products and services. Employers see employability skills as important because jobs today require flexibility, initiative and the ability to undertake many different tasks. Jobs are not as narrowly prescribed and defined as in the past and, generally, they are more service oriented, making information and social skills increasingly important. (Allen Consulting Group, 2006:11)

The employability skills together with the required skills form the interplay between knowledge and performance in the Double Heuristic Method (DHM).

5.2.1.3. Performance criteria

Each of the performance criteria represents a requirement of students to do something which has to be animated with the specific intent. Smith and Keating (2003) have stated that “Performance Criteria specify the level of performance required and to be developed and demonstrated by the students” (Smith and Keating 2003:165). The demonstration of performance, as part and parcel of competency development, needs to be assessed at the point where the learner achieves autonomy and independency. At this point, the learner needs to demonstrate the range of performance criteria specified in the Unit of Competency.
5.2.1.4. Competency Learning Event

Any activity that is taking place in the process of learning as competency development should engage the learner in a workplace context. This requires learning activities to be formulated and presented in the field. In order to achieve this aim, teachers must satisfy the requirements of the relevant Unit of Competency in relation to the context of relevant workplaces. All of the assessments, sessions, activities, tasks, case studies, projects, tutorials, excursions and experiments need to be contextualized in this manner to reflect workplace relevancy.

Hence, one should simply apply workplace scenarios based on the performance of a competent person in the workplace context. The next step is to add descriptions and further enhancements as per workplace requirements. The learning event that is covered in a session by teachers needs to be designed on this basis. This would assist the learners in their development of competence in a particular workplace context.

Thus, for the tasks to be performed competently, the learners in the contextualized workplaces will demonstrate the required knowledge, together with the acquired skills. The First Heuristic enables the teacher to plan the learning event to ensure the achievement of competency in the workplace through the demonstration of the interplay of knowledge and skills.

5.3 The Second Heuristic

The Second Heuristic is designed to frame the material that has been formulated in the First Heuristic so that teachers are able to successfully deliver the required training through comprehensive pedagogical approaches to learning. Hence, the extent of the material included in the Second Heuristic depends on the teacher’s decision as to how much of the required knowledge is included. Depending on the teacher’s decisions, the required knowledge, elements, teaching strategies and focus questions are identified for inclusion in the Second Heuristic, as a platform for pedagogical engagement. Focus questions are the interplaying elements between physical and strategic dimensions.
There are four component parts that need to be carefully formulated in the Second Heuristic: Required knowledge, Elements, Strategies, and Focus Questions.

5.3.1.1. Required knowledge

The teachers need to review and examine the concepts that they have already included during preparation of the First Heuristic. The teachers are now required to decide how much content knowledge may be needed to facilitate learners’ understanding of those concepts as specified in the First Heuristic.

5.3.1.2. Elements

Given that a number of Performance Criteria have already been included in the First Heuristic, the relevant elements of competency that are inclusive of the performance criteria are included in the Second Heuristic. Smith and Keating (2003:66) have identified a similarity between the elements of competency and learning outcomes because both start with verbs. Similar to Performance Criteria, the elements of competency are about doing and are listed on the physical component of learning of the DHM.
5.3.1.3. Teaching strategies

Teaching Strategies are an important part of the DHM construct and essential for the effective delivery of the First Heuristic, as discussed previously. The question is, ‘What teaching strategies and focus questions are necessary to be included in the Second Heuristic to achieve the most effective result?’ Teaching strategies are formulated with the aim of the repositioning of the learners from a ‘Not-yet-competent’ position moving towards the ‘competent’ position. Hence, those teaching strategies that, in the teachers’ view, are required to enhance the learners’ performance to become competent are to be included in the Second Heuristic of the DHM.

5.3.1.4. Focus questions

Focus Questions form the interplay between physical and strategic dimensions and are designed to enhance the effectiveness of teaching strategies. Focus questions are necessary in facilitating the learning process by maintaining learners’ focus on the relevant areas of expertise, content and skills, as they develop their competency. Hence, the teacher needs to formulate relevant questions, in order to assist the learners to stay focused on the learning path, while moving towards a competent position. In other words, the Focus Questions maintain the students’ attention and direct learning towards the demonstration of outcomes, providing evidence of competency.

5.4 Pedagogical significance of the DHM

The pedagogical significance of the DHM heuristic model is twofold:

Firstly, the DHM model gives recognition to the fact that the components of competency are pedagogically inter-related. Secondly, the teachers, upon completion of the First Heuristic, need to frame it in various components of the Second Heuristic to ensure quality learning and engaging pedagogy.

In order to understand the pedagogical significance of the DHM, it is important to recall that during the First Heuristic of the DHM, the components of knowledge, the key concepts, relevant skills and performance criteria are pedagogically linked. When the teachers are certain as to what concepts, skills and performance criteria they need to incorporate into their teaching, the decisions as to how to pedagogically frame the
First Heuristic must be made in the Second Heuristic of the DHM. Hence, in the process of constructing this heuristic model, the teachers need to frame the First Heuristic by reflecting on the following questions:

- How much Required Knowledge is needed to frame the concepts?
- Which Elements frame the selected Performance Criteria?
- Which teaching strategies are pedagogically sound to frame the delivery of the First Heuristic of the DHM?
- What are the most appropriate Focus Questions that maintain learners’ attention throughout the process of acting on the selected Performance Criteria in the First Heuristic?

By understanding the component parts of the First and Second Heuristics, including the focus questions and teaching strategies as explained above, it becomes clear that the whole DHM has been designed to assist VET teachers to allow their learners to attain and demonstrate competency. When the First and Second Heuristics are completed, it becomes clear that the holistic frame of the DHM has three dimensions: Conceptual, physical and strategic. The conceptual dimension of the DHM is comprised of the concepts and the required knowledge. Both required knowledge and concepts are pedagogically related. The required knowledge is a broader area of knowledge comprised of a number of topics and concepts. The conceptual dimension of the DHM matches with the left side of the Gowin Vee (Gowin and Alvarez, 2005).

The physical dimension of the DHM is about doing, and is where the elements of competency and the performance criteria are listed. The relevant Unit of Competency also lists both the elements and performance criteria. The Performance Criteria are the smaller steps within the elements of competency, and that are to be mastered by students. In other words, the learner is deemed competent when he/she is successfully assessed in all the performance criteria in the Unit of Competency.

Skills connect the conceptual dimension of the DHM to the physical dimension of the DHM. In other words, the skills are constantly interplaying between these two sides. Each performance criteria is to be animated through some action as the doing part of the DHM. Being the doing part, each performance criterion that needs to be acted upon by learners requires some skills. These skills are identified and listed in the DHM Template.
The strategic dimension of the DHM is constructed on the basis of the teaching strategies or assessment strategies selected by the teachers. If the DHM is mapping the assessment, the assessment strategies are listed on the strategic side of the DHM. On the other hand, when teachers are using the DHM template to map the sessions, the teaching strategies are listed. Hence, depending on whether it is used for the assessment or the teaching, the DHM strategic side is constructed accordingly. When the DHM is used for assessment purposes, the strategic dimension should include assessment strategies, and assessment instruments and the ‘evidence’ required to be collected by teachers. On the other hand, when it is used for teaching purposes, then teaching strategies, types of teaching activities, types of resources and the relevant sections of the resources, as well as relevant tutorials, are listed.

5.5 How the DHM is used

When fully completed the DHM looks essentially like the following diagram.

![Figure 5.4: The completed DHM template](image)

The shaded areas in Figure 5.4 are the integrated data that need to be designed by the teachers in the DHM template for delivery. *It is not enough to know what the topic is about, one must understand why and how new information is related to what is already known* (Gowin and Alvarez 2005:3). The DHM enables both the teachers and the learners to understand why and how all the components are related. Thus, the relationships of the components defined by teachers, using the DHM as a tool, enable their learners to grasp meaning of competency when applied to the learning events. The DHM is used as a method to aid in the understanding of meaningful relationships among these components (data) as illustrated in Figures 5.3 and 5.4.
The shaded area in the above diagram, Figure 5.4, is comprised of both First and Second Heuristics of the DHM. The following Illustrating Example demonstrates how the DHM can be applied. The Unit of competency used for this purpose is “BSBWRT301A - Write simple documents”. This unit describes the performance outcomes, skills and knowledge required to plan, draft and review a basic document before writing the final version.

5.5.1. Illustrating example of using the DHM

In this example, it is assumed that the teacher is planning to prepare the DHM template for session 2, for teaching his/her learners how to write a Business Letter. As the focus of the session is on business letter writing, he has designed the following activity for the session:

ABC Ltd has received a letter in which the customer, Mr. John Smith, the Managing Director, has informed us that the goods received by their business did not conform to the requirements as per the agreement dated 14/02/2013. The learners in this instance are required to draft a letter of apology in which the following points are to be covered:

- Acknowledging that we have received their letter
- There has been an unintentional mistake on our part
- Our business intends to replace with goods that conform to the requirements
- It extends our apology

Required:

In this session, the students are required to apply the performance criteria for Element 1 and Element 2, and to draw a draft for this letter.

5.5.1.1. First Heuristic

To complete the first heuristic, it is required that the teacher browses through the performance criteria and select the number of performance criteria applicable to this illustrating example. It is assumed that after browsing through the Unit, the teacher has selected the following relevant performance criteria for delivery of this session.
### Table 5.1: Selecting relevant Performance Criteria

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Plan document | 1.1. Determine audience and purpose for the document  
| | 1.2. Determine format and structure  
| | 1.3. Establish key points for inclusion  
| | 1.4. Identify organisational requirements  
| | 1.5. Establish method of communication  
| | 1.6. Establish means of communication |
| 2. Draft document | 2.1. Develop draft document to communicate key points  
| | 2.2. Obtain and include any required additional information |

#### 5.5.1.1. The concepts

The teacher, by checking the bold italicized wording used in the performance criteria, refers to the range statement and chooses the relevant concepts. For example, the first performance criterion is to determine audience and purpose for the document.

In this instance the teacher needs to find who the audience is, and what the purpose of the activity is. By consulting the Range Statement, he or she can quickly determine that the audience is an external customer and the purpose is clarification of issues. These two concepts are then listed in the First Heuristic. Similarly, other concepts are identified by the teacher and listed in the First Heuristic:

- **Audience** – internal and external customers
- **Purpose** – clarification of issues
- **Format** – letters
- **Structure** – organisation of the material to suit the format
- **Organisational requirements**
  - house style requirements
  - identified authorities for signatories for correspondence/communications
- **Method of communication** – use of the appropriate register or style of language – formal, standard or informal
- **Means of communication** – Email (use MS Word)
5.5.1.1.2. Required Skills

By checking the Required Skills the teacher may pick up both literacy skills and problem solving skills to be relevant in this session to be used. The teacher decides to emphasize both of these skills in the session. These skills are used to connect the concepts to Performance Criteria. For the sake of simplicity, the Employability Skills are not included in this Illustrative Example.

After identifying the relevant Concepts, skills and performance criteria, the First Heuristic is constructed as follows:
Figure 5.5: First Heuristic of the DHM
5.5.1.2. Second Heuristic

In the Second Heuristic of the DHM, the Required Knowledge, Elements, Focus Questions and Teaching Strategies are covered. Two of these components, the required knowledge and elements are extracted from the Unit of Competency and inserted in the Second Heuristic. The focus questions and teaching strategies are formulated by teachers to be utilized in delivering the session. These are covered next.

5.5.1.2.1. The Required Knowledge

Practically, the required knowledge for this Unit is as follows:

- basic grammar, spelling and punctuation.
- communication protocols
- how audience, purpose and method of communication influence tone
- organisational policies and procedures for document production
- resources to assist in document production, such as dictionary, thesaurus, templates, and style sheets.

Teachers need to browse through the list of required knowledge and select the knowledge pertinent to the session at hand. In this case all the required knowledge is relevant and is to be listed in the Second Heuristic.

5.5.1.2.2. Elements

The elements are listed in the Unit of competency. In this illustrating example, only two of the Elements are relevant to be included as follows:

1. Plan document
2. Draft document

5.5.1.2.3. The Focus Question

Teachers need to formulate one or a number of focus questions that enhance learning to maintain the learners’ attention to successfully complete the task at hand. In this case, the following focus question is used:

How can the learners best respond to customer needs and maintain customer satisfaction and loyalty to the business?
5.5.1.2.4. Teaching Strategies

The teachers need to decide which strategies, in the best possible way, assist them to deliver the session successfully to achieve the best outcomes. In formulating teaching strategies, they may rely on their experience paying due regard to the audience and the manner of delivery. Strategies such as lecture, presentation, workshop, hands on exercises are used. In this case, hands-on exercises using MS Word may suit after a short presentation on the components of business letters. The teachers may include what evidence the students need to submit as a proof that they have completed the tasks for the session or assessment. In this example, the students need to submit a completed draft copy of the business letter.

The above components are now inserted in the DHM template for the Second Heuristic. The following diagram, Figure 5.6 illustrates the completed DHM template.
Session 2 - Business letters

Figure 5.6: Completed DHM showing both First and Second Heuristics
5.6 Using the DHM for assessment purposes

Now, assume that the example provided above is an assessment instead of a session. Hence teaching strategies are replaced with assessment strategies. In this instance the teacher needs to use assessment strategies to test whether his/her students are competent in drafting business letters. In this example assume that the teacher requires the students to complete a supervised competency test and produce the draft letter as the evidence of their competency. The following diagram, Error! Reference source not found., portrays the completed DHM for such an assessment.

Figure 5.7: Completed DHM showing both First and Second Heuristics for an assessment.

5.7 Conclusion

It is concluded here that the successful delivery of courses in the context of CBT and Training packages requires the DHM approach (method). This Chapter described what the DHM is and how it leads to such a realization. The chapter described the DHM construct and the two heuristics of the model, the First Heuristic and the Second Heuristic. The chapter explained how the Second Heuristic frames the First Heuristic, and how, together, they can deliver training for VET in Australia. The pedagogical significance of the First Heuristic is that it maps the relevant component parts that are necessary in delivery of sessions, assessments and learning activities. The First Heuristic of the DHM represents the pedagogical picture of these inter-related
components: concepts, skills and performance criteria. When this picture is completed it needs to be framed. Thus, the function of the Second Heuristic of the DHM is to frame the First Heuristic. The Chapter explained how the framing is to be completed through suitable teaching strategies and focus questions. The process of Double Heuristic was demonstrated in the Chapter by an illustrating example: ABC Ltd. The ABC Ltd case used in the chapter demonstrated the application of the DHM to a session, as well as, an assessment.
CHAPTER 6: METHODOLOGY

6.1 Introduction
This chapter articulates the research methodology of the study. This study is embedded within a qualitative tradition and was carried out within the interpretive paradigm and adopted Symbolic Interactionist (Blumer, 1969) as its theoretical position. The principles of grounded theory methodology guided the data collection and data analysis and primarily adopted semi-structured interviews (O’Donoghue, 2007:85) for the collection of data. In this chapter firstly, the theoretical underpinnings of the study are outlined. Secondly, the central research question and guiding questions are described. Thirdly, an overview of the methods of data collection and the study population is explicated. The data analysis approaches used in the study are then described. The final section focuses on evaluation of the methodology in terms of trustworthiness (Lincoln and Guba, 1985) of the study comprised of credibility, transferability, dependability and confirmability. Ethical considerations are also outlined.

6.2 Theoretical underpinnings of the study
This study aims to contribute to the academic discipline of education and training by developing a substantive theory which theorises VET educators perspectives on how they manage their role as facilitators of learning by using the proposed Double Heuristic Method (DHM) as a pedagogical tool. The central research question was: How do the practitioners deal with the Double Heuristic Method (DHM) that provides teachers with an alternative pedagogical model of teaching for the competency-based Training Packages in the VET Sector? The research attempted to establish that such a substantive theory is crucial to the advancement and sustainability of the practice of teaching competency in VET.

The study was shaped by Symbolic Interactionism which has become a well recognised orientation for an approach that is generally used to refer to the study of group life and human conduct (Blumer, 1969:1). Symbolic Interactionism does not merely give a ceremonious nod to social interaction but rather it recognises social interaction to be of vital importance in its own right (Blumer, 1969:8). Blumer (1969)
elaborated that this importance lies in the fact that social interaction is the core of human conduct, instead of being merely a means or a setting for the expression or release of human conduct (Blumer, 1969:8).

In framing the aim of the study, in terms of how teachers deal with the DHM, the study adopted Herbert Blumer’s (1969:2) three premises, explained later, within the Symbolic Interactionist tradition. Positioning the research in this manner acknowledged Symbolic Interactionism as an approach, grounded in action and process.

6.2.1. Central research question:

The central research question is consistent with this perspective through which the collecting of data sought to “yield verifiable knowledge of human group life and human conduct” (Blumer, 1969:21) about how VET teachers, in this instance, deal with the DHM.

The focus of the research, principally, was on the process of competency development managed by practitioners, to identify how they benefit from the application of the DHM in their practice. The practitioners identified the requirements of the Units of Competency in the Training Packages; using the DHM, they formulated the plan of study to facilitate the learning process that focused on competency development. Then, in developing assessment tools, they were also guided by the DHM. While practitioners performed in the context of Double Heuristic Method, based on the requirements of the relevant Unit of Competency, their perspectives were sought. In other words, as practitioners performed in such a context they were asked to communicate their perspectives on the Double Heuristic Method (DHM), and their perspectives on how the participants formulated their learning plan, using the DHM, in the context of the Unit of Competency of their choosing.

6.2.2. Guiding questions

The study addressed a central research question, as stated earlier, and the three guiding questions, as outlined below, shaped the implementation of the study on how practitioners dealt with the Double Heuristic Method (DHM) as an alternative
pedagogical model of teaching for the competency-based Training Packages in the VET Sector?

☐ What are their intentions?
☐ What are their strategies?
☐ What are their outcomes?

These guiding questions were developed from the central research question, and are consistent with contemporary readings of Symbolic Interactionism (O’Donoghue, 2007). They were designed to develop the substantive theory as the central finding of the study. This approach is consistent with an interpretivist methodology for investigating the perspectives of VET practitioners on the Double Heuristic Method (DHM).

What follows is a full explanation of the methodology of the study that has been undertaken in this research. The chapter is divided into six sections.

Firstly, the theoretical underpinnings of the study are outlined. Secondly, the central research question and guiding questions are analysed. The third section focuses on locating the methodology within Symbolic Interactionist theory. A fourth section gives an overview of the methods of data collection and study population is explicated. In the fifth section, the data analysis approaches used in the study are described. In the final section, the study is evaluated against the four criteria of trustworthiness (Lincoln and Guba, 1985), i.e., credibility, transferability, dependability and confirmability.

6.2.3. Symbolic Interactionism

Crotty (1998) pointed out that, Symbolic Interactionism is all about those social interactions whereby we enter into the perspectives, attitudes and values of the community, becoming persons in the process” (Crotty, 1998:8). This suggests that, in the process of investigation, it is possible to put oneself in place of others (Crotty, 1998:75). The origins of Symbolic Interactionism (Blumer, 1969) can be traced to the Chicago school of the 1920s and 1930s. Although it was Blumer (1969) who coined the phrase Symbolic Interactionism, George Herbert Mead (1934) set the foundations some years earlier by contending that individuals develop a sense of who they are (self) through interactions with others. Blumer (1969) as a student of Mead (1934)
became his mentor’s spokesman and interpreter. He argued that “interpretation takes place in such a way that the individual is continually interpreting symbolic meaning of his or her environment (which includes the actions of others) and acts on the basis of this imputed meaning” (Bryman, 2001:15).

According to Bryman (2001), there has been a tendency to “view Symbolic Interactionism as occupying similar intellectual space to the hermeneutic-phenomenological tradition” (Bryman, 2001:15), so Symbolic Interactionism can be considered interpretive in its research orientation.

The hermeneutic-phenomenological tradition is concerned with the notion that human behaviour is related to the context in which it occurs. Clearly, the behaviour can only be understood from the meanings that the individuals ascribe to the phenomena within the given context. Similarly, Symbolic Interactionists are searching for an increased understanding of the meaning that a particular phenomenon has for individuals in everyday life. In reality, individuals create meanings from their interactions with the world in which they live – they construct, adjust, influence and are influenced (Woods, 1992).

Central to Symbolic Interactionism is the concept of self-construction, interaction, voluntarism and symbols. Mead (1934) believed that the self was developed through interaction with the social world. He was concerned with the inner experience of the individual, which he believed involved this construction and interpretation within the self, and between self and others. For Mead, social interaction was a process of construction. Individuals are constantly defining and interpreting the context in which they find themselves, in order to find individual and common meaning (Blumer, 1969). According to Mead (1934), social organisations provide a framework within which individuals construct their actions.

Social organisation is fundamentally the everyday understood interactions that individuals engage in within society. There are the shared meanings of society that result in expected and similar behaviours. Mead (1934) draws attention to the fact that the new contexts and experiences that the individual is required to construct and interact with in order to find new pathways of knowing, cannot rely on an expected behaviour. So, in research terms, the implications of Mead’s ideas and a Symbolic Interactionist approach require the investigator to follow how meanings are formed.
The principles of Symbolic Interactionism, outlined by Blumer (1969), are instructive when considering how the central research question and consequent guiding questions were selected and formulated.

6.3 Locating the research question within the Symbolic Interactionist theory

As stated earlier, the study has adopted the three premises of Symbolic Interactionist tradition, as follows. The first premise is that, “human beings act towards things on the basis of the meanings that the things have for them” (Blumer, 1969:2). The second premise states that, “the meanings of such things is derived from, or arises out of, the social interaction that one has with one’s fellows” (Blumer, 1969:2). The third premise expresses that, “these meanings are handled in and modified through an interpretive process used by the person in dealing with the things he/she encounters” (Blumer, 1969:2).

These principles have been used as a foundation in this study in exploring, firstly, how teachers deal with Double Heuristic Method and to seek teachers’ perspectives on the DHM, while they have been actually dealing with its application in the context of teaching and learning in the VET sector. The three principles of Symbolic Interactionism (SI) and how they relate to the guiding questions are outlined in the following paragraphs.

The first principle of SI is that, “human beings act toward things on the basis of the meanings that the things have for them” (Blumer, 1969:2). The study has investigated how VET teachers assigned meaning to the Double Heuristic Method (DHM) while they were involved in the process of facilitating learners to develop competence, in the context of VET in Australia. It was important to explore their perspectives on both competence and its development by learners using the DHM. It was from such understanding that the study has arrived at its substantive theoretical propositions.

Therefore, it was necessary to study the activities and the reported thoughts of VET teachers while using the DHM in the teaching environment, by asking through interview how they facilitated the process of competency development, enquiring as to what their intentions were, how they would achieve these in action, and in the long term what were their outcomes?
It was important, then, in this study to ask teachers what meanings they hold for their roles as facilitators, and what perspectives they hold on the use of the Double Heuristic Method (DHM) as a consequence of these meanings. Further, it was important to ask what strategies they have had for the delivery of training and assessment, when adopting the DHM.

The second principle of Symbolic Interactionism refers to the starting place or foundation of the meaning in that the “meaning of such things is derived from, or arise out of, the social interaction that one has with own fellows” (Blumer, 1969:2). As a result, it was imperative to understand how meaning arose in “the process of interaction between people” (Blumer, 1969:4) in this case through classroom pedagogy. In addition, the interaction of VET teachers will assist in defining the meanings that they attribute to the phenomenon of competence, in relation to the hands-and-mind equilibrium, which is embedded in the DHM.

Hence, the pursuit of the aforementioned guiding questions throughout the study enabled the researcher to develop an understanding of the meanings that VET teachers hold for the phenomenon of competence, and the pedagogical actions in which they engage daily, as a consequence of using the DHM.

The third premise is that these meanings are handled in, and modified through, the interpretive process used by the person in dealing with the things he/she encounters (Blumer, 1969:2). Blumer’s assertion (1969) implies that meaning developed, within a social context, will be modified through an interpretive process. Further, that the interpretation of meaning by VET teachers as facilitators of competency development should not be regarded as the mere automatic application of established meanings but as a formative process in which meanings were used and revised as instruments in the guidance and formation of action (Blumer, 1969:4). It is important, then, that the meanings attributed to the role of facilitator are understood by VET teachers in order for them to play an active part in this process of self-interaction (Blumer, 1969:5). In this study, the researcher attempted to understand the meanings and resultant actions being attributed to the DHM by VET teachers. This was achieved by gathering and analysing data encompassed in the contexts in which the development of the session plans and assessments were taking place.
In the previous section, the three major principles of Symbolic Interactionism have been outlined and their relationship to the central research question and the guiding questions shown. The guiding questions are not the specific questions to be answered, but are used at the initiation of the research, as a guide to generate data about the phenomenon of facilitation of competency development, using the DHM. The first guiding question contributed to the development of what Travers (2006) refers to as an “interview guide” for first interviews with the participant VET teachers. Travers (2006) describes the objective of the “interview guide as assisting the researcher to explore topics in greater depth through probes, or asking for explanation or clarification of answers” (Travers, 2006:95). It was expected that the interview guide would allow the researcher to engage in exploration with the interviewees in the research area. This was achieved by a series of broad guiding questions from the interview guide, as illustrated in Table 6.1.

<table>
<thead>
<tr>
<th>Guiding Questions</th>
<th>Examples of questions in the interview guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you deal with the Double Heuristic Method (DHM) for the teaching of competency-based Training Packages?</td>
<td>How did you deal with the application of first heuristic of (DHM), i.e., performance criteria, variables, and skills as the bridge?</td>
</tr>
<tr>
<td></td>
<td>How did you deal with the application of second heuristic of the DHM, i.e., required knowledge, elements, strategies, and focus question(s)?</td>
</tr>
<tr>
<td><strong>What are your intentions?</strong></td>
<td>What were your intentions when implementing the first heuristic of (DHM), i.e., performance criteria, variables, and skills as the bridge?</td>
</tr>
<tr>
<td></td>
<td>What were your intentions when implementing the second heuristic of the DHM, i.e., required knowledge, elements, strategies, and focus question(s)?</td>
</tr>
<tr>
<td><strong>What are your strategies?</strong></td>
<td>What are your strategies as a teacher when implementing the first heuristic of (DHM), i.e., performance criteria, variables, and skills as the bridge?</td>
</tr>
<tr>
<td></td>
<td>What are your strategies as a teacher when implementing the second heuristic of the DHM, i.e., required knowledge, elements, strategies, and focus question(s)?</td>
</tr>
<tr>
<td>Guiding Questions</td>
<td>Examples of questions in the interview guide</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------------</td>
</tr>
</tbody>
</table>
| **What are your** outcomes? | What are your outcomes when implementing the first heuristic of (DHM), i.e., performance criteria, variables, and skills as the bridge?  
What are your outcomes when implementing the second heuristic of the DHM, i.e., required knowledge, elements, strategies, and focus question(s)? |

Table 6.1: Development of the interview guide questions from the guiding questions.

Thus, the participating VET educators were questioned about their aims, intentions, motivating reasons and the significance (Blackledge & Hunt, 1985) that they attributed to the DHM. They were asked many ‘why’ questions in the process of probing their position and reasoning. As the study progressed and unfolded and the participants were in the process of completion of their learner’s guide, further questions were developed and compiled for the second ongoing interviews.

### 6.4 Data gathering and study population

Data gathering and analysis that were undertaken in this study were guided by the principles of grounded theory (Strauss & Corbin, 1998), which is substitute to Symbolic Interactionism (Charmaz, 2000). As O’Donoghue (2007) observes, grounded theory and Symbolic Interactionism are, in fact, complementary. What follows here is a brief explanation of how the grounded theory approach (Strauss and Corbin, 1998) advised the data collection and analysis, and how it related to the extent of data gathering and selection of the participant sample.

### 6.5 Grounded theory

Grounded theory (Strauss and Corbin, 1998) is an approach which was developed in the 1960s in order to generate theory from observations of real life events as they were occurring (Grbich, 2007:70). In adopting grounded theory, an inductive approach was used to generate a substantive theory in relation to how VET teachers dealt with the DHM. The assumptions underpinning grounded theory come originally from Symbolic Interactionism and presume that reality is a constructed and shifting entity, and that social processes can be changed by interactions among people (Grbich, 2007:71).
Thus, in this study, grounded theory methods are not rigid prescriptions for collecting data, but rather refer to specific analytic strategies which the researcher can “use in turn to inform and refine the developing theoretical analysis” (Charmaz, 2000:509).

The data was collected for this study from semi-structured interviews, initially guided by the central research question. The initial interviews followed the professional development program that introduced the conceptual or theoretical framework for the study. The first interviews were scheduled after the participants engaged in the application of the DHM in their delivery planning. Analysis followed immediately and was “guided by emerging directions in that analysis” (Punch, 1998:167). The second interviews were undertaken throughout after the completion of the sessions and assessments. This ongoing cycle continued for all participants until theoretical saturation was achieved. This process that has been adopted in this research is referred to, by theorists, as theoretical sampling. Charmaz (2000) describes this process as a choice the researcher makes “to develop their emerging categories and to make them more definitive and useful” (Charmaz, 2000:519). This suggests that the aim of the sampling undertaken is to refine ideas rather than increase the size of the population of the study. For example, in this research, the second interviews were organised around digging deeper into the meanings that each participant attached to the emerging categories in the first interviews or ensuing interviews. This process was necessary to refine the meaning that participants attached to categories, and to find out whether the assigned meanings changed over time. This refining process was designed to “explore topics in greater depth through probes, or asking for explanation or clarification of answers” (Traverse, 2006:95). In this refining process, a number of “why” questions were asked to probe the participants’ minds to explore the deeper meanings they had adhered to in certain categories (O'Donoghue, 2007). Hence, theoretical sampling in this research was a process in which both data collection and data analysis was enacted, in parallel, until it became clear to the researcher that data saturation has occurred and no more data was needed. In this research, for example, data saturation generally occurred towards the end of running the second interviews.

6.6 Study population and theoretical sampling
Initially, about thirty TAFE Teachers were approached seeking their interest in the study. From this group 16 were selected purposefully to encompass the diversity and
range of experiences present in the target population, namely the teachers delivering courses in the Training Packages context who had experience at both sides of the continuum of experience. In the continuum of experience about 85% of the participants had between 20 to 30 years of experience in teaching in VET while the range of experience of remaining 15% of participants were between 2 to 3 years. This was required to ensure the mix represents both experienced teachers as well as new teachers. These participants were, then, invited to the first PD in February, 2009 that was presented by the researcher prior to data-gathering phase.

The data-gathering phase of the study commenced in February, 2009, and continued until October 2010. During April 2009, some of the participants approached the researcher for a revision of the DHM process before they could apply the method in their teaching during the second semester of 2009. This indicated that it was necessary to develop a second professional development program to assist the participants. A professional development program that was more illustrative of the DHM process, providing clear steps to be followed by participants, was essential.

In May, 2009, a second professional development program comprised of a hand out and a DHM template that was developed for use in the start-up meetings with the individual participants. It became clear to the researcher that this start-up kit or package should be comprised of two components, i.e., a template that the participants were able to use as well as some clear and simple procedure providing a stepwise method of how to apply the DHM. Hence, the start-up kit comprised of these two components was created by the researcher, and both the template and the eight step process were used as a reference throughout the interviewing and data collection.

Each participant was approached individually during May and June, 2009. A number of appointments were made after contacting each participant individually for this initial or start up meeting. On this basis, both the template and the professional development hand out (the DHM eight step procedure) were distributed to the participants. The plan and the details of the data-gathering timetable are contained in Table 6.2.
<table>
<thead>
<tr>
<th>Months</th>
<th>Data Gathering Tasks</th>
</tr>
</thead>
</table>
| February 2009       | First Professional Development (PD)  
A PD program was designed to familiarise participants with the Double Heuristic Method and train them to implement it. The PD was presented on 19/02/2009. (Appendix A) |
| April 2009          | Participants approached the researcher for more in-depth PD regarding the application of the Double Heuristic Method.                                                                                           |
| May 2009            | The DHM template and the DHM Eight Step process were developed. (Refer to Appendix A)                                                                                                                                  |
| May to June 2009    | Initial interview – The initial interviews were organised as a follow up on PD. The DHM template and the DHM Eight Step process were distributed and explained in the Initial Interview. In this process, the researcher walked each participant through the DHM eight step process and rectified their queries. They were reminded that the first interviews would be organised any time after they have applied the DHM in their work. |
| June-December 2009  | First Semi-structured interviews – The first semi-structured interviews were organised and held from June 2009. The participant teachers were approached individually. A number of appointments were made after contacting each participant individually for the first semi-structured interviews. The questions (refer to Appendix B) were designed to probe the participants’ minds in various ways to provide their perspectives and in order to capture the underlying concepts behind their thinking. At these meetings the DHM template and the DHM Eight Step process document (Appendix A) were used to develop a deeper understanding of this approach. |
| Jan – April 2010    | Preparing Second semi-structured interview questions based on the findings of the First Interview.                                                                                                                     |
| May – Oct 2010      | Second Semi-structured interview and ensuing interviews where necessary –  
The second interview was designed to probe participants’ minds in exploration into the deeper meanings that they hold on the findings from the first interview. This exploration led the researcher to reach to their dept of knowledge, experience and understanding to reveal further underlying reasons of the findings that emerged from First Interviews. These, the second interviews, provided the opportunities to participants to further reflect on their perspectives that were given rise to these findings. Each group of questions were classified and listed under the pertinent emerged categories. Participants’ minds were also probed by some questions on the emerged categories for confirmation. |

Table 6.2: Data gathering chronology
6.7 VET teachers

VET teachers are mostly trained vocational educators. They are specialists in their own occupations. Each teacher is required by the employer institute to develop the required program of study for the area of his or her specialisation in the DHM context. In other words, each teacher is expected to prepare a program of study that embraces the key learning areas as prescribed by the relevant Unit of Competency in the training packages context. For example, accounting teachers design their program of study as prescribed by the Financial Services Training Package. It can be anticipated that the study will provide the opportunity to collect contrasting perspectives, in order to understand how they deal with application of DHM for the development of learner’s competence in the VET context.

6.8 The interrelationship between data collection and analysis

The concurrent and systematic gathering and analysis of data in the study was consistent with general methodology of grounded theory that governed the research activities in this study. Strauss and Corbin (1998:158) have referred to the interrelationship between data gathering and analysis as the constant comparative method. From this perspective, the process of gathering and analysing of the data were undertaken concurrently in the study throughout 2009 and 2010 and in some areas in 2011.

6.9 Semi-structured interviews

The major sources of data collection used in the study were semi-structured interviews. Other techniques, such as informal discussions and telephone conversations, were also used to gather data (ANTA, 2002). This combination of methods ensured that all the perspectives of participants in the study were collected, analysed and reported.

The time allocated to each interview was up to two hours. The interviews were based on a series of pre-designed questions in the form of an interview guide based on the research guiding questions (Travers, 2006). The interview guide allowed extra time for further questions on significant replies (Bryman 2001:110). Travers (2006) has pointed out that the interview guide needs to be originally developed on the basis of important topics in the research questions and literature review.
Following Travers (2006) each interview was preceded by a preparatory period for the purpose of ice-breaking with the interviewee, for just chatting to develop a relationship to make the interviewee feel more relaxed. The places of interview were arranged with the participants. As it was presumed beforehand, the places of interview were mostly at the participants’ college or office. All the interviews and telephone conversations were tape-recorded and transcribed for further coding and analysis. The interview questions were aligned to the purpose of the study and the theoretical framing of the methodology.

As stated earlier, the key and guiding questions of the study were:

- How do the practitioners deal with the Double Heuristic Method (DHM) that provides teachers with an alternative pedagogical model of teaching for the competency-based Training Packages in the VET Sector?
  - What are their intentions?
  - What are their strategies?
  - What are their outcomes?

### 6.10 Probing questions

Several types of probing questions were designed to reach deeper levels of meaning that participants held pertinent to the concepts and categories that emerged from the first interviews. These probing questions were adopted to explore deeper layers of meaning into the findings that emerged from the first interviews. Some examples of the types of probing questions were as follows:

Stating a finding and asking their perspectives on that finding, as follows:

- What is your perspective on this finding?
- Do you think both practical and theoretical aspects are important?
- In your view, would the DHM be more useful in this regard to new teachers, experienced teachers or both?

Utilising quotes from first interviews used in the following interviews followed by probing questions such as:

- Do you agree with this quote? Why? Why not?
Some quotes were used as a probe, per se, followed by a number of probing questions. For example a participant stated that, “The DHM allowed me to articulate better”.

- What is your perspective on this finding?
- Does the DHM help you to articulate better?
- Is the DHM a framework for explaining?
- In your view would the DHM be more useful in this regard (articulating and explaining) to new teachers or experienced teachers or both?

Using probing questions such as those outlined above, the ongoing round of interviews were implemented during participants’ spare time following the emerged categories resulted from the initial data analysis. These interviews were organised to elicit data in relation to the outcomes of the implementation of the DHM. Teachers were asked to critically reflect on the full range of conceptual relationships which were developed as the components of emerging theory (Lincoln and Guba, 1985:314). This was the most crucial technique for establishing the credibility of this qualitative study. However, generally speaking, analysis of data started as soon as sufficient data were collected and were undertaken concurrently with data collection. In other words, data collection and analysis were integrated throughout the study. This approach is consistent with the grounded theory approach, which requires the researcher to maintain a close connection between data and emerging concepts as an essential ingredient in developing trustworthy and authentic theory (Glaser & Strauss, 1967; Strauss & Corbin, 1994).

### 6.11 Recording of data

Grbich (2007) points out that interviews lead to valuable data for analysis. Traverse (2006) confirms that the main purpose of interviewing is to come away with data that can be analysed. This study has audio-recorded the interviews. However, if the sound recording would have created problems for interviewees, other methods such as note taking would have been used.

Throughout the process, the data was collected electronically as voice files which were word processed and converted into Word™ documents. These documents were then divided into sections, using headings and saved as memos. Notes were then created to represent the concepts/categories within the documents. The emerging
concepts identified from the data were then tabulated on the basis of their relationships. The concepts were categorised and coded on that basis. The coding of the data was performed by identifying the relationships between the data concepts. Each group of the related concepts was then listed as a category and called by a name that best defined that category.

6.12 Data analysis

Miles and Huberman (1990:49) pointed out that “the ideal model for data collection and analysis is to interweave them from the beginning”. Hence, for the analysis of data a method of coding called open coding was used. Under this approach data collection and analysis can be successfully inter-woven. Strauss and Corbin (1990:81) pointed out that Open Coding is “the process of breaking down, examining, comparing, conceptualising and categorizing data”. They further elaborated that, during the process of coding, data needs to be scrutinized line-by-line to identify similarities as well as differences in order to produce concepts, and the inquiry is opened up to reveal meaning and the motives of the interviewees. The researcher is required to be imaginative and vigorous, as the analysis at this juncture informs the remaining steps of the inquiry (Strauss & Corbin, 1990). Willis (2006:259) emphasised that, “the task of data analysis is meaning-making”.

Hence, in this study, the transcript was coded using an open coding approach on a line-by-line basis which continued concurrently with the data gathering. Refer to Figure 6.3 and 6.4 to see the illustration of some examples. Charmaz (2000:515) pointed out that “coding keeps us thinking about what meanings we make of our data and that, it is asking questions of it and pointing to gaps that lead it to focus on during subsequent data collection”. This process of questioning and making comparisons with data is often referred to as the constant comparative method. Implicit to this approach to research, the comparison of data may take place between different people, individuals, at different points of time, and between categories and subcategories (Charmaz, 2000; Glaser, 1978:192). Charmaz (2000:515) clarifies that, by using comparison, the researcher is more attuned to the participants realities and further, that the researcher’s emerging theories will be grounded in that reality. Therefore, data was collected from interviews and coded using the three types of coding: open coding (code notes), axial coding and selective coding. From these extensive coding
meaning making unfolded and intimately a substantial theory was built. Through the process of open coding, one’s own and others’ assumptions were analysed, questioned or explored, leading to new findings (Strauss & Corbin, 1990:62).

Strauss (1991:30-1) has pointed out that the concepts developed, at this stage, are provisional and many questions, such as the following should be asked:

- What category does this incident indicate?
- What is actually happening in the data?
- What is the basic problem(s) faced by participants?
- Will what accounts for their basic problem or problems force the generation of a core category or categories which will be at the centre of the theory and its eventual write-up?

Strauss (1991:31) asks the big question: “What is the main story here, and why?”

### 6.12.1. Code notes and theoretical memos

In the course of analysis and theory development stages, theoretical memos were used in addition to code notes. Both code notes and theoretical memos were combined in order to explore processes, assumptions, actions leading to structure the data (Charmaz, 2000). Strauss and Corbin (1990) have described both code notes and theoretical memos. They explained that while code notes contain detailed descriptions and the explanation of conceptual labels which emerge from the data, the theoretical memos were developed in order to track coding results, as well as experiment with further coding. The following table illustrates some instances of recorded comments from participants and the relevant coding, assigned by the researcher.

<table>
<thead>
<tr>
<th>Interview transcript</th>
<th>Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>With the DHM you know the path you walk.</td>
<td>Confirmatory</td>
</tr>
<tr>
<td>Using the DHM I know what I am doing is valid.</td>
<td>Validity</td>
</tr>
<tr>
<td>The DHM puts more precision into the process</td>
<td>Precision</td>
</tr>
<tr>
<td>The DHM provides a better picture</td>
<td>Seeing the picture</td>
</tr>
<tr>
<td>The DHM is a clear picture</td>
<td>Seeing the picture</td>
</tr>
<tr>
<td>“It makes a lot of difference as I said before. The difference is by using”</td>
<td>Guiding</td>
</tr>
</tbody>
</table>

151
Table 6.3: Some examples of open coding interview transcript

This method, the DHM, you know the path that you walk and where you are going whereas using others, you’re just going somewhere you do not know, you are in the darkness.”

Without the DHM there is a degree of ‘lostness’

The DHM puts you back on the track

Guiding

Guiding

Throughout the process some of the important comments and concepts were underlined or highlighted. Notes were added, representing the concepts/categories within the documents such as those illustrated in the above table. The identified concepts were categorized on the basis of their relationships. The concepts that were identified from the data were then tabulated on the basis of their relationships.

The closely related concepts were written in the relevant locations on a cardboard to identify the categories. Therefore, the concepts were categorised and coded on that basis. The coding of data was performed by identified relations between the data concepts. Each group of the related concepts were then listed as a category and called by the name that best defines that category.

These were then manually classified and coded into tables. Any further data were also manually entered onto the board using large cardboards.

The data so gathered were continually updated during data gathering and analysis process. A system for archiving and protecting the data was established. These were preserved and properly stored in a safe place. This was necessary to ensure that all categories of data and subcategories can be tracked. It is also an assurance that the credibility and dependability of the study undertaken are maintained (Bryman, 2001). At the conclusion of the open coding stage the concepts such as those listed in Table 6.4 emerged:
<table>
<thead>
<tr>
<th>Concepts</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Improving Performance</td>
<td>The data collected indicated that the DHM framework has been used by participating teachers as an approach to improving their teaching strategies. One of the participants, when asked about his intentions in using the DHM, pointed out that, “my intention was to improve my teaching strategy”. Another participant referred to the point that his intention was to improve performance, and when this is achieved the learners will also benefit”.</td>
</tr>
<tr>
<td>2 - Communicate effectively</td>
<td>The data collected has established that DHM has been identified by participants as a means of improving teaching effectiveness. In other words, The DHM has been identified as an approach that allows teachers to communicate knowledge more effectively to their students. For example, one of the participants has emphasised that the role of teachers is to communicate knowledge effectively. Having said that this participant has stated that the DHM approach, in particular the first heuristic of the DHM helps teachers to achieve this teaching objective.</td>
</tr>
<tr>
<td>3 - Confirmatory</td>
<td>Many participants referred to the fact that the use of the DHM is confirmatory at the levels of planning and implementation of learning experiences. For example one participant, expressed that, “The DHM allows me to check that what I have been doing is correct”. Another participant added that “by using this DHM method, you know the path that you are walking and where you are going, whereas the other ones, you’re just going somewhere you do not know, you are in the darkness” so my intention was to confirm what I am doing is right. A third teacher, also, mentioned that, “The DHM probably confirmed what I am doing is right”. The DHM tool is clearly useful in assisting teachers reflect on their practice and building confidence.</td>
</tr>
<tr>
<td>4 - Guiding</td>
<td>It is the perspectives of the participants that the DHM acts as a guideline for planning and teaching. For example one of the participants stated that “it makes a lot of difference as I said before. The difference is by using this method, DHM, you know the path that you walk and where you are going whereas using others, you’re just going somewhere you do not know, you are in the darkness.” In other words, “the learners as well as the teachers have got the guidelines. Another participant stated that, “when we do this plan, the outcome would be in line with the requirements by National Training and Information Service (NTIS), so if we follow the DHM as a guideline, I believe we are on the right track. Hence, the DHM has been referred to as a guideline that enables both teachers and assessors to teach and assess the students work within the scope of the requirements of the national regulatory body.</td>
</tr>
<tr>
<td>5 - Defining Relationships</td>
<td>It seems that for the teachers, particularly the new ones, the links between or integration of the components of the Units of Competency are important. For example, one of the participants while using the DHM explained and pointed out that, “it is the connectedness of the components that make sense in the DHM”.</td>
</tr>
<tr>
<td>Concepts</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>6 - Managing</td>
<td>The DHM is referred to by participants as an approach to manage both assessment and teaching. One participant pointed out that the DHM is “not only useful in the planning, but also in measuring the outcome with the plan, the intention and the goals.” Another participant stated that, “setting goals and aims and achieving them is part of managing; hence, I suppose, plan all your sessions and the DHM will actually supports that process”.</td>
</tr>
<tr>
<td>7 - Clarifying</td>
<td>The DHM approach has been identified by participants as a vehicle that removes ‘Fuzziness’ in VET teaching practices. This finding is aligned with comments such as ‘it brings more clarity’, ‘it is more clear’, ‘very clear’, ‘clearer’, ‘more accurate’, ‘DHM has made it clear’, ‘clearly’. For example one of the participants pointed out that by introducing the DHM the ‘fuzziness’, is removed from teaching in the context of Training Packages. Another applicant explained that, “The DHM allows me to see things more clearly”. Even a third participant mentioned that, “if the students use this as well then obviously it defines for the students more clearly what in actual fact expectations are.”</td>
</tr>
<tr>
<td>8 - Validity</td>
<td>This category further supports the DHM to be confirmatory as participants validate their approach. The participants were always looking for something that can validate their approach and to ensure that what they are following is correct and that they are on the right track. One of the participants was referring to the fact that he was looking to validate his approach and his way of teaching and whether they are including all the requirements as specified by Australian Qualification Training Framework (AQTF). This participant pointed out that, “My intention was to improve my teaching strategy. That was the intention and to look into a new approach and apply it.” His initial intentions were to improve his approach and to confirm that his approach is in line with the requirements. His aim was to ensure that he is on the right track. This supports the DHM as the means for validation.</td>
</tr>
<tr>
<td>9 - Precision</td>
<td>The DHM approach has been identified by some participants as a vehicle for teaching that is precise and exact. Thus, it introduces precision and exactness into the practice of teaching in the context of Training Packages. One participant purported that, “you are removing the ‘fuzziness’ from it and putting more ‘precision’ to the whole process.” Another participant stated that, “The DHM would allow me as a teacher, instead of being 80 per cent correct, to be 99% correct. And if I go through that process I’m going to be able to be more precise, in most instances. I will be more correct by using this. It is very hard to miss anything if you follow this process. It is hard for you to miss any part of it. I would be more correct using this model.”</td>
</tr>
</tbody>
</table>
### Concepts Description

<table>
<thead>
<tr>
<th>Concepts</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 - Appropriateness</td>
<td>The DHM model is used by some teachers to maintain an appropriate balance between practical and theoretical aspects of delivery regarding the unit for which they are responsible. In other words, in the context of Training Packages teachers see the importance of being able to find the balance between the theoretical aspect of delivery and the practical aspect of delivery. It is the perspectives of one of the participants that, “The DHM framework allows me, and in my decision whether it is going to be practical or theory I would be more correct using this model” and further, “The DHM helps me to learn the theory that is necessary to walk in the classroom and deliver it”.</td>
</tr>
<tr>
<td>11 - Seeing the Picture</td>
<td>Some participants referred to the point that the DHM diagram has provided a picture of what they thought they knew or what they think they were doing. For others, it was a clear picture of what they need to do. In other words, they have seen all components in one place that are linked in a pedagogical way. This picture that they have seen helped them to have more confidence in what they are doing. One participant stated that “The DHM aligns with my beliefs, and aligns with my approach and most importantly gives me the opportunity seeing as a big picture what I have been doing”. Another participant described that, “The DHM gives us a clear picture whether the students have missed this part or whether they have completed the tasks according to the requirements.”</td>
</tr>
<tr>
<td>12 - Constructiveness</td>
<td>As one of the participants pointed out, “not even I thought about the important point that all these ‘bits and pieces’ are provided, but there is no structure to it.” Another participant elaborated that using the DHM new teachers will get a structure that they can work with. A third participant stated that NTIS has provided a number of components without clearly defining the relationships of these components. Therefore, no picture can be visualised while, by applying the DHM, a picture can be easily visualised or created for the assessments or sessions for that matter, because the DHM defines these relationships. The defined relationships of these bits and pieces provide the clarity and understanding.</td>
</tr>
<tr>
<td>13 - Articulating</td>
<td>In response to the question, what effect, if any, do you think using the DHM has had on your practice, one of the participants responded: “the DHM allows me to articulate my application”. Yes, my thinking, and my application to some extent. It is the framework for explaining.” In other words, the DHM was referred to as a framework for explaining the complexity of the relationships of components and the process. And, again, by asking the question that what improvements in your practice have resulted from application of first and second heuristics, this participant has elaborated: “The DHM allowed me to articulate better”.</td>
</tr>
</tbody>
</table>

Table 6.4: Emerged concept categories

### 6.12.2. Axial coding

The aim of the second stage of data analysis, using Axial coding, was to identify the relationships that existed between the concepts to connect each of the identified
categories in an attempt to build a dense texture of relationships around the axis (Strauss 1987). In other words, the axial coding was used to integrate the concepts (categories) that were generated during open coding from analysis of data. Strauss and Corbin (1990) have highlighted the focus of axial coding as: “specifying a category (phenomenon) in terms of conditions that give rise to it; the context (its specific set of properties) in which it is embedded; the action/interaction strategies by which it is handled, managed, carried out; and the consequences of those strategies” (Strauss and Corbin, 1990:77).

This phase of analysis revealed that the axis of these categories was related to the three main concepts of, Synthesising, Clarifying and Confirmatory (roles) of the DHM, as illustrated in the following table.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthesising</td>
<td>Managing</td>
</tr>
<tr>
<td></td>
<td>Seeing the Picture</td>
</tr>
<tr>
<td></td>
<td>Comprehending the Structure</td>
</tr>
<tr>
<td>Clarifying</td>
<td>Appropriateness</td>
</tr>
<tr>
<td></td>
<td>Articulation</td>
</tr>
<tr>
<td></td>
<td>Effective Communication</td>
</tr>
<tr>
<td></td>
<td>Precision</td>
</tr>
<tr>
<td>Confirmatory</td>
<td>Validity</td>
</tr>
<tr>
<td></td>
<td>Guiding</td>
</tr>
<tr>
<td></td>
<td>Improvement of performance</td>
</tr>
</tbody>
</table>

Table 6.5: Categories emerged

6.12.3. Selective coding

Selective coding is a process of integrating categories, with a particular reference to a central or core category while concurrently and systematically relating the core category to other categories (O’Donoghue, 2007). During this process, it was necessary and important to continuously validate the emerging relationships in a coherent manner. Persevering in the selective coding process eventually resulted in refinement and the development of the emerging theory (O’Donoghue, 2007).
It was this process of integrating categories while maintaining reference to synthesising, that revealed this category to be the central or core category. Hence, the process of integration from the data gathered in the context of the research indicated that participating VET teachers dealt with the Double Heuristic Method (DHM) by using the model to synthesise the component parts of the Unit of Competency to make meaning of the competency learning events such as sessions and assessments.

Throughout this process, it was revealed that it is this synthesising characteristic of the DHM that gives rise to the sense of clarity and confirmation throughout the process of delivery. The findings were strong and enabled the generation of three key substantive theoretical propositions.

6.13 Findings and further Chapters

The theoretical propositions, the findings of the study are theorised in Chapters 7, 8 and 9. These chapters explain the findings of different categories and propositions that have emerged throughout the study. These chapters report on the propositions based on the findings, as summarized in the following table:

<table>
<thead>
<tr>
<th>Propositions</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the context of Training Packages, teachers see the Double Heuristic Method (DHM) as a clarifying approach for VET delivery in Australia. The Double Heuristic Method is seen to clarify the multi-faceted relationships of many and varied components, in the delivery of Training Packages that VET teachers are delivering to their students.</td>
</tr>
<tr>
<td>The second proposition is that there is a strong conviction amongst participating teachers that, by using the DHM, they are able to confirm the practices in which they engage. In such a context, they see the DHM approach playing a confirmatory role in strengthening and maintaining their confidence, confirming that what they are doing is right and that they are on the right track to ensuring that the requirements of Training Packages and AQTF are met.</td>
</tr>
<tr>
<td>Teachers see the Double Heuristic Method (DHM) as a meaning-making apparatus with a synthesising role for VET delivery in Australia. This gives competency a structure, an approach and a clear construct, in order to make meaning of integration.</td>
</tr>
</tbody>
</table>

Table 6.6 Three key theoretical propositions grounded in the data of the study
6.14 Evaluation of the study

Given that the methodology in this study was positioned within the context of the interpretivist paradigm, it was necessary to evaluate the study in terms of trustworthiness. Thus, in order to achieve this evaluation, the standards of credibility, transferability, dependability and confirmability as suggested by Lincoln and Guba (1985) to establish trustworthiness of qualitative research were considered and are elaborated in the following paragraphs.


Credibility is to ensure that the collected or reported data is truthful and “credible findings and interpretations will be produced” (Lincoln and Guba, 1985:301) as a result. Bryman (2001) has pointed out that the research is credible if it is based on “cannons of good practice” (Bryman, 2001:272). In order to give the cannons of good practice a reality and make the findings truthful and credible in this research, the quotes collected from the first interviews were utilised to formulate the second interview and following questions for respondent validation. Lincoln and Guba (1985) have pointed out that findings and interpretations are viewed as credible if participant validation, are incorporated in the research. This method was used not only for reconfirming credibility of the participants’ statements but also, according to Lincoln and Guba (1985), it provided opportunities to explore the findings and understand deeper layers of their meanings. Thus, the approach taken by this research is in line with Bryman (2001), who referred to respondent validation, where data arrived at by the researcher is provided to participants.

6.14.2. Transferability

Transferability is whether there is the possibility of the transfer of findings to other situations. This study aims to produce a “thick description” which would detail the phenomenon of (DHM) being investigated for its implementation. Using “thick description” strategy, this study has included a number of examples that were provided by the data analysis that allows application of the theoretical propositions to others for possible transferability of the findings of the study to other learning or teaching contexts.
6.14.3. Dependability

Dependability is to ensure that findings are consistent and that, “records have been kept at all phases of the research” (Bryman, 2001:273) to allow the development of an ‘audit trail’ (O’Donoghue, 2007). O’Donoghue (2007) has clarified that, “The development of an ‘audit trail’ has become an accepted strategy for demonstrating the stability and track-ability of data and the development of the theory in qualitative studies”. This research has maintained a proper ‘audit trail’ to ensure both stability and track-ability of data.

6.14.4. Confirmability

Confirmability is to ensure that the “data and the interpretation of the data are grounded in events rather than the inquirer’s personal constructions” Lincoln and Guba (1985:324). In other words, it is to ensure that the researcher has not “overly allowed personal values or theoretical inclinations manifestly to sway the conduct of the research and findings driving from it” (Bryman, 2001:274). This study has ensured that the findings are grounded within the participants’ experiences, while engaged in the implementation of Double Heuristic Method (DHM).

The confirmability was achieved by transcribing the first interview responses and presenting these to participants throughout the second interviews seeking their confirmation, prompting them to reflect on what they have answered previously in the first interviews. This approach generated deeper insights into the meaning they ascribed to their responses in the first set of interviews. Thus, the participants reviewed and confirmed their own previous responses and commented on deeper insights about their previous answers.

6.15 Ethical considerations

Approval to conduct this research as outlined in this chapter was sought from relevant Registered Training Organisations (RTOs), whether TAFE Institutes or private providers. Ethical approval was also obtained from the university that sponsored the doctoral candidate. In addition, maximum effort was made to ensure that the principles of anonymity and confidentiality are observed throughout the research.
The identity of the participants remained confidential and was not disclosed either verbally or in publications based on the study. All participants were assured that their verbal or written accounts would be treated with confidentiality and would be used solely for this research. To this end, participants were only identified by pseudonyms in all interview transcripts. This helped to maintain their anonymity throughout all phases of the research project.

6.16 Conclusion

This study was designed within the interpretive paradigm, shaped by Symbolic Interactionism (Blumer, 1969) as the theoretical position, pursuing grounded theory methodology (Strauss & Corbin, 1998), and the methods of semi-structured interviewing (O’Donoghue, 2007). The aim of this research was to investigate and generate theory on how teachers in Vocational Education and Training (VET) in Australia deal with the Double Heuristic Method (DHM) as an alternative model for teaching in the VET Sector.

The chapters that follow reveal the findings of the study including three key theoretical propositions. Each chapter, 7, 8, and 9, deals separately with each of the propositions:

Proposition One.

In the context of Training Packages, teachers see the Double Heuristic Method (DHM) as a clarifying approach for VET delivery in Australia. The Double Heuristic Method is seen to clarify the multi-faceted relationships of many and varied components, in the delivery of Training Packages that VET teachers are delivering to their students (Chapter 7).

Proposition Two.

There is a strong conviction amongst participating teachers that, by using the DHM, they are able to confirm the practices in which they engage. In such a context, they see the DHM approach playing a confirmatory role in strengthening and maintaining their confidence, confirming that what they are doing is right and that they are on the right track to ensuring that the requirements of Training Packages and AQTF are met (Chapter 8).
Proposition Three.

Teachers see the Double Heuristic Method (DHM) as a meaning-making apparatus with a synthesising role for VET delivery in Australia. This gives the teaching of competency a structure, an approach and a clear construct, in order to make meaning of integration. Teachers, in using the DHM, engage in a number of processes, namely: seeing the picture, seeing the structure, and VET delivery planning (Chapter 9).

In the final chapter, the interplay of the three theoretical propositions is articulated in a manner that demonstrates the generation of a new model of pedagogy for VET, based on the use of the Double Heuristic Model. This model is conceptualised as the Progressive Revelation of Pedagogical Engagement (PROPE).
CHAPTER 7: CLARIFYING ROLE OF THE DOUBLE HEURISTIC METHOD

7.1 Introduction

This chapter and the subsequent two chapters present the central elements of the theory of Progressive Revelation of Pedagogical Engagement (PROPE), which was generated through the act of this research. The question that guided the research was: ‘How do the practitioners deal with the Double Heuristic Method (DHM) that provides teachers with an alternative pedagogical model of teaching for the competency-based Training Packages in the VET Sector?’ This question was pursued in the case of teachers specifically within the VET context in Queensland, Australia. Three propositions have been generated as follows:

1. In the context of Training Packages, teachers see the Double Heuristic Method (DHM) as a clarifying approach for VET delivery in Australia. The Double Heuristic Method is seen to clarify the multifaceted relationships of many and varied components, in the delivery of CBT that is central to the Training Packages that VET teachers are delivering to their students.

2. The second proposition is that there is a strong conviction amongst participating teachers that, by using the DHM, they are able to confirm the practices in which they engage. In such a context, they see the DHM approach playing a confirmatory role in strengthening and maintaining their confidence, confirming that what they are doing is right and that they are on the right track to ensuring that the requirements of Training Packages and AQTF are met.

3. Teachers see the Double Heuristic Method (DHM) as a meaning-making apparatus with a synthesising role for VET delivery in Australia. This gives the teaching of competency a structure, an approach and a clear construct, in order to enable the integration of the component parts in a pedagogically meaningful way. Teachers, in using the DHM, engage in a number of processes, namely: seeing the picture, seeing the structure, and VET delivery planning.

This Chapter focuses on the proposition on the clarifying Role of the DHM as follows:
Proposition 1

In the context of Training Packages, teachers see the Double Heuristic Method (DHM) as a clarifying approach for VET delivery in Australia. The Double Heuristic Method is seen to clarify the multi-faceted relationships of many and varied components, in the delivery of CBT that is central to the Training Packages that VET teachers are delivering to their students.

Proposition 1 focuses on how the clarifying role of the DHM has contributed to teachers’ understanding of teaching competencies in the VET sector, thus, allowing them to see more clearly the requirements for the implementation of the Training Packages. This chapter will examine this key proposition. In exploring this proposition, there are four key concepts that underpin the proposition that will be discussed. These are: Appropriateness, Articulation, Effective Communication, and Precision. This chapter will deal with each one of these concepts in turn.

7.2 Appropriateness

In the context of Training Packages, teachers recognise the importance of using the DHM because it enables them to find the balance between the theoretical aspect of delivery and the practical aspect of delivery. The DHM model is used by some teachers to maintain an appropriate balance between practical and theoretical aspects of delivery, regarding the Unit of Competency for which they are responsible.

For example, it was brought to Ian’s attention that the DHM has been identified as a means of maintaining the balance between the theoretical components of the Training Packages and practical aspects of pedagogical delivery. In response to the question of whether both theoretical and practical aspects are important, Ian elaborated that:

> Of course they are important, obviously in the theoretical aspect you initially determine what the theory is, then you apply to the practical aspect. In other words, every theory that you profess has to be related to practice. (I, 2:3)

In the same vein, Patrick pointed out that:

> The DHM framework assists me in my decision-making both theoretically and practically. (P, 1:5)

Further:
The DHM helps me to choose the right theory that is necessary for the teaching of my subject before I can walk in the classroom and deliver it. (P, 1:10)

Ian added:

The DHM provides a pathway from theoretical to practical application of VET delivery, a pathway for analysing and improving an existing application. Being such a path; the DHM connects theory to application. (I, 2:3)

In the same vein, Ray agrees:

I think the DHM is very important. I think that is where you work at your delivery methods and strategies, and the need to align whether there is a theory or skill, because each of them is in different framework. So it is important. (R, 2:2)

Patrick further asserted that:

The DHM Model allows me to think about my subject, allows me to be more precise in picking up what I am going to teach in theory and how I am going to do it in practice. (P, 2:4)

The data presented here illustrates that the DHM assists teachers to focus on both theoretical and practical aspects, and that the DHM as an appropriate tool provides the clarity to link theory and practice. This illustrates one dimension of the concept of Appropriateness. The second dimension of Appropriateness is that the DHM itself is regarded as the theory, as the following participant pointed out:

Underpinning the DHM is the theory; a robust way of doing teaching… Well, if I have to explain about competency development to people, yes, it would be a very good way. (G,1:28/7:14)

The DHM is characterized as a robust way of engaging in the practice of teaching in VET, comprised of the theoretical and practical sides of VET delivery. In other words, the DHM is regarded as an appropriate way of explaining to others both the theoretical process of competency development, as well as its practical side. In this way, the DHM can be used by teachers as the means of articulating both sides of the theory and practice.

To response to the question, “What are your strategies as a teacher when implementing this heuristic approach (DHM)?” Patrick reported that:

…the DHM brings me to a more practical level where I can teach my unit across to students in a simple way. (P, 1:5)
In other words, by using the DHM, this participating teacher translates the complexity of Training Packages requirements into a simple and practical delivery of the unit to his students. This was evident when he said,

The DHM is allowing me to look at what I am delivering and explore the areas to become more practical rather than theoretical. (P, 1:5)

This maintaining of the theory and practice were elaborated further by Harry when he stated:

First the DHM helps me to include the required knowledge consisting of relevant theories and principles as part of the content that I teach in my units because what I teach is based on these principles. Some of the variables and concepts in the Units of Competency that I teach are relevant to these theories or principles. On the other hand, the Double Heuristic Method (DHM), is a theoretical framework that is also based on a number of principles that are delineated in the Training Packages and AQTF. Using DHM I maintain a balance between both of these aspects of theory and practice in the Units of Competency that I am responsible for. (H, 2:2)

While for Harry, “appropriateness” means maintaining a balance between theory and practice, Patrick pointed out that the DHM is appropriate in reminding him of the theory that underpins his teaching.

When I started off I had to learn all the theory again. You virtually have to learn the theory because you have forgotten. You learnt it when you were a student. So yes, DHM helps you to learn the theory … It will help you to do that. (P, 1:9)

This participant (Patrick) reported that it is more useful to use the DHM as a means of maintaining the right balance between the theory and practice of VET teaching in the Training Packages context. In response to the question of, “What are your strategies as a teacher when implementing this heuristic approach?” he revealed that:

The DHM brings me to a more practical level where I can bring theory across to students in a simple way. (P, 1:5)

In other words, some of the participants have used the DHM to translate the complexity of Training Package requirements into a simple and practical delivery to students by maintaining an appropriate balance between theoretical and practical aspects of VET delivery.
7.3 Articulation

In response to the question, “what effect, if any, do you think using the DHM has had on your practice?”, one of the participants responded: “The DHM allows me to articulate my application... It is the framework for explaining.” (G, 1:11)

Thus, the DHM has been referred to as a framework that is useful in explaining the complexity of the relationships of components and the process of teaching in VET.

In the same vein, Patrick clarified that, “the DHM is a framework that makes you understand what you are going to do. And, one of the big reasons why, is that the DHM is making you think of your area of teaching in a comprehensive way.” (P, 2:5)

Hence, the DHM invites teachers to reflect comprehensively in their area of teaching by using it as a reflective mechanism for understanding the intricacies of competency development. In other words, the DHM helps the participating teachers to reflect on the day-to-day activities in their area of teaching when designing assessments or session plans. The DHM, as a tool for reflection, assists them to think of their areas of teaching in depth. It can be concluded that by reflecting better on their area of teaching, teachers can better articulate what they teach.

Similarly, Gloria pointed out that, “The DHM is the framework for explaining.” (G, 1:11) This view is confirmed by Harry who stated that:

> The DHM provides me with a way of explaining how the component parts are linked together. For example, how skills relate to performance, how performance criteria relate to knowledge and to the rest of components, as well as how to develop assessments and sessions succinctly. I am able to better articulate my teaching and to explain all these parts to other teachers and students meaningfully. Because the DHM explains how all these bits and pieces are pictorially connected, it is easy to articulate meaningfully the application of the Units of Competency to VET teaching. (H, 2:3)

He further commented that, “Without the DHM, I do not know where each component part is in the whole and how each component connects to the other components in a pictorial manner meaningfully.” (H, 2:3) Patrick agreed that:

> “The DHM does allow you to articulate more precisely what you are teaching and what you are going to teach.” (P, 2:5)

Thus, the DHM has been referred to as a framework for explaining the complexity of the relationships of components and the process. Regarding the DHM as a vehicle for
the articulation and explanation of intricacies of VET teaching. Ray was asked whether, in his view, the DHM is useful for new teachers or experienced teachers. He declared that:

I think for both. I think it is worthwhile for everybody particularly for those who have not had enough teaching experience to see why. There is a program by a Canadian professor that is important for you to see. It has a visual presentation. It says if you do this it is because we want you to achieve all sorts of other things. And you can see the direct links which was very clever. And I think that the DHM is similar. If you highlight this one, all of a sudden it shows where it went to. I think that is clever. (R,2:3)

Harry agreed that the DHM allowed him to meaningfully communicate and articulate his teaching. He said,

I have experienced that the reviewing of the assessments and sessions with other teachers has achieved meaningful outcomes. Without using the DHM it is difficult to discuss the intricacies of assessments meaningfully, as the interconnectedness of components is absent. (H, 1:4 )

Harry summarized that the DHM as a theoretical framework explains the intricacies of the components of delivery in the training packages context. He further elaborated that with the DHM as a skeletal framework it is possible to articulate these components and their relationships in a meaningful way. (H, 1:4)

The data suggest that the DHM has been identified as a means of explaining the multifaceted and multi-relational components of Training Packages to third parties such as other teachers, managers and students. As was referred to earlier, most participants have regarded the DHM as a means of explaining these relationships and the inter-connectedness of various components that are important in VET teaching. It is regarded by these participants as a very good way of communicating to others the process of competency development. It can be concluded from the data that the DHM provides the means to articulate VET teaching better. As the DHM facilitates articulation, the communication to others about competency development becomes clearer and more effective.

7.4 Effective communication

The data collected in this study establishes that participants have identified the DHM as a means of improving teaching effectiveness. In other words, the DHM has been
identified as an approach that allows teachers to communicate knowledge more effectively to their students. For example, one of the participants emphasised that the role of teachers is to communicate knowledge effectively, as a strategy:

  My strategy as a teacher is to communicate knowledge effectively. In any event that is what you’re going to do. What you’re going to do is to communicate knowledge in an effective manner so that they will actually learn. So I think that is always your goal. (G, 1:25)

Having said that: this participant stated that the DHM approach, and in particular the first heuristic of the DHM, helps teachers to achieve this teaching objective. By the same token and, in a response to the question of, “In which way do you think you like the DHM? Gloria pointed out that:

  It is an attempt to describe the interlinked processes required in planning, delivering and assessing. (G, 1:28/7:14)

This comment further confirms the view that the DHM is a useful tool in explaining the interlinked processes which are used by teachers for communicating such knowledge to students. Gloria sums up this sentiment by saying:

  I think the DHM is trying to convey to the practitioners the rich store of knowledge and skills that can be crafted into meaningful experience. (G, 1:28/7:15)

This is further confirmed by Ian who stated that:

  Using the DHM, you got the knowledge and skills, then you are applying these to the real teaching that can be crafted into a meaningful experience … (I, 2:4)

Hence, the DHM was identified as useful in crafting meaningful learning experiences. In exploring the possible underlying reasons for such a claim? Harry elaborated that:

  Because the relationships of skills and knowledge to other concepts are meaningfully established in the DHM, I have been able to produce meaningful resources comprised of meaningful learning experiences for my students. I have received feedback from these students that are indicative of such an outcome. (H, 1:5)

In other words, the DHM has been regarded as a means of conveying information, describing, explaining, and communicating knowledge meaningfully.

These meaningful experiences involving the use of the DHM, according to Garry, also convey to students what they are going to produce as learning outcomes. He said:
You can then use the DHM as a communication tool to your students. So they know what they are going to produce. (G, 1:16)

By sharing the DHM with students, it was reported that they knew exactly what was involved in an assessment, activity or session. The DHM enhances the teacher’s attempt to communicate knowledge effectively to the students.

Harry reported using the DHM to communicate knowledge to his students. He has pointed out that, “My strategies were to involve my students in the DHM process. I believe in learners’ involvement in the DHM and not by hiding from them what we are doing, as has been the case” in the past (H, 1:12). He further added that:

I put the students at the centre of the DHM process so that they can see what is required of them. They were then provided with a skills matrix for each piece of work they need to produce. I put the onus of responsibility on them to ensure that they are using the skills as listed on the DHM and skills matrix by placing a tick on the matrix against each skill that they have used in doing the performance criteria. They were required to return the completed, ticked and checked skills matrix for marking. (H, 1:12)

However, some participants did not support the provision of a full DHM template to students. For example, Ray argued that the DHM template might be too difficult for students to understand. He was concerned that some students may not comprehend it. (R, 2:4)

On the other hand, Gloria has taken a middle ground approach by responding to the question, ‘whether to use the DHM template for students’ as follows:

It can be. I’ll use a very simple diagram, a simple mind map approach, a mind map which is very, very simple and takes out all the complexities. For example, if you want to go from A to B, it is almost linear.” (G, 2:5) Because they look at and say it is wonderful. But, if it can be shown, it is an idea of where we already are, where are we going? How are we going to get there? (G, 2:5)

She agreed to the notion that by communicating knowledge in an effective manner, using the DHM, the students actually learn because they become aware of what is expected:

Because their awareness level has been raised by the teacher, …they have greater awareness of what it is that they need to communicate (students) and how to communicate that. (G, 2:5)
Raising learners’ awareness by communicating knowledge of where they are and how to get there leads to meaningful learning outcomes for students. The DHM is deemed to play an important role in this regard. While some teachers are using it for communication, other teachers say it is difficult for students to understand, while others say to use a simplified version of it.

Based on the analysis of the collected data, no matter which lesson or topic the teacher is intending to teach, the role of a teacher to communicate it in an effective manner to the learners is vital. This role, according to Garry is the main goal and strategy when applying the DHM. The DHM provides the template and the approach that helps teachers to achieve such an end. On the question of effectiveness in the context of communication of knowledge, this participant referred to two aspects to achieve effectiveness:

- What activities I am going to give to make it more effective?
- How I am going to teach it?

Further to the question of effectiveness, this participant elaborated that effectiveness means whether she has achieved the desired result. The desired result, she added, is knowing whether the students learned from what he had given them. Had they acquired competency in the unit and whether they have achieved learning where “learning is what they have absorbed that brings about permanent change in their behavior?” (G, 1:26). This participant further reported that, “educational psychology of behavior is the ability to perform, so it brings about permanent change in learners’ ability to perform” (G, 1:26).

This participant added that the DHM assists teachers in the process of communication of knowledge effectively, leading to permanent change in learners behavior. These types of learning occurs at two levels, that of recognition and recall. When we achieve recall, learning is permanent, and this is what the teachers in this study, by using the DHM, are aiming to achieve.

### 7.5 Precision

Since the advent of Training Packages in 1996, when the massive changes occurred in VET delivery, the VET teachers realised that they were required to be precise, exact and accurate in the teaching of the Units of Competency of Training Packages by
incorporating various component parts in an integrated fashion. The VET teachers were asked to comply with various lists and requirements without being provided with a pedagogical and theoretical approach that can weld together these disparate parts. This has created a situation where the teachers have been questioning themselves as to whether they are meeting the requirements of the units of competency. They want to be right and to feel that they are complying precisely with these requirements on which they are being audited.

One of the findings in this research is that as a result of the DHM application in VET teaching ‘fuzziness’ has been eliminated and higher levels of ‘precision’ have been reached in delivery. This finding is in line with the view of participants, for example, “You are putting more ‘precision’ to the whole process of teaching in VET.”

This removing of ‘fuzziness’ was referred to by other participants as removing complexity and what is unknown, as pointed out by Ian: “By using the DHM you are removing complexity, in other words you are removing the un-known” and “…therefore eliminating vagueness.” (I, 2:6)

The reason for eliminating ‘vagueness’, removing ‘fuzziness’ and what is ‘unknown’ has been referred to by Ray, who has identified that the DHM rationalizes the process of competency development and thus removes confusion in VET teaching in the context of Training Packages. The DHM has been identified by this participant as addressing this vagueness by clarifying the relationships of the disparate component parts of competency. Patrick discovered that:

Fuzziness is removed because you have got a set procedure here. And, if you have a set procedure and you follow the DHM, then there can be no room for error, so you don’t forget anything. (P, 2:9)

By way of confirmation, Warwick, in response to “what are your perspectives over all on this and what do you think about these strategies?” pointed out that, “I think in a way the DHM gives us very clear procedures, you know” (W, 1:13). And when asked, “So, the effect on your practice is it becoming clearer?” (W, 1:13), he answered, “Clearer with better outcomes” (W, 1:13). He notes that the DHM is more precise than the existing marking guides used for assessment of students work.
The markers guide is very limited, while the DHM shows all these performance criteria, strategies, all the focus questions and all the critical aspects. With the DHM, being implemented as the markers guide, it will be very useful in assessing the students. (W, 1:13)

Warwick highlights that using the DHM as a marker’s guide is thorough, as it assesses the students’ work in a comprehensive way. This indicates that at present the quality of the marking of the assessments is in question. The DHM can alleviate current shortcomings and remedy the situation. The DHM provides more details and in-depth information and hence, has a comprehensive approach for teachers and their practices which are not possible in the current regime.

Warwick stated that the DHM provides him with better understanding of marking. This participant pointed out that the DHM made it clear, by actually linking the variables, employability skills, required skills, performance criteria that make marking of students work easier to accomplish, “Before the DHM model I was purely marking based on the markers guide or NTIS which are not clear. But the DHM made it clear”. (W, 1:14) He responded to the question of whether he would be better off with time, accuracy, precise understanding, with: “yes, precise, precision and more accurate.” (W, 1:14)

In the above quote, Warwick suggests that being precise also means being more accurate in what he does as a teacher. Patrick, who referred to the level of accuracy that he can achieve by using the DHM, purported that, “I would be more correct in my work using the DHM. That is what I have found” (P, 1:5). What Patrick is referring to is that he is able to plan and deliver assessments and sessions that accurately reflect the requirements of knowledge, skills and performance criteria of the Units of Competency through the use of the DHM. This reference once again clearly demonstrates that VET teachers are constantly attempting to be able to accurately comply with the requirements.

In other words, VET teachers are constantly attempting to be meticulous. This feeling of wanting to be more precise in their teaching practice is woven through the fabric of VET teaching practices. They are attempting to be exact in their day to day work. They realised that by using the DHM higher levels of accuracy and precision were within their grasp, as Patrick indicated:
The DHM would enable me as a teacher to be 99% correct in my teaching…
Because, all the component parts are written down on the DHM template, and
if I go through the DHM process, I’m going to be able to be more correct.
(P, 1:3)

The above quote clearly indicates that being correct is an important feeling that VET
teachers need to experience. Under the dire circumstances of continuously being
audited, the teachers need to deliver with precision. If they do not follow the exact
requirements needed, they are not able to pass the audit successfully. As the DHM
gives them the confidence of being 99% precise, they are able to demonstrate their
competence. It seems that the DHM enables VET teachers to achieve the precision
required of them without missing any important component, as Patrick further
emphasised:

While, by using the DHM, it is very hard to miss anything, if you follow this
process and go through it. It is hard for you to miss any part of it. Whereas, if
you are looking at the training packages and you are designing an evaluation
sheet, or whatever, you might miss something. (P, 1:4)

This further confirms the view that without using the DHM there is a risk of non-
compliance as teachers may miss a component part or a requirement. The auditing
reports are the evidence to confirm that this is the case.

In the same vein, Harry pointed out that:

I have included the skills matrix in the learners guide entitled introduction and
assessment booklet. My students not only are aware of the skills matrix that is
based on first heuristic of DHM, but are required to ensure that they have
applied it to their work. They are required not only to ensure that they have
applied each of the components as listed on the skills matrix but also they are
required to tick each variable, required skills, employability skills and the
performance criteria when they apply them. This will provide ‘exactness’ in
the competency development process that assures the teacher that the learners
are ‘on the track’. In other words, it is a good feedback to the teacher or
assessor. (H, 1:1)

In other words, this participant uses the ‘Skills Matrix’ that is based on first heuristic
of the DHM to ensure that the students do follow the requirements and apply them. In
addition, this practice guarantees that students do not miss any of the required
components which ensure precision and exactness. Harry elaborated further on the
concept of ‘learners are on the track’ that:
The journey of competency development is a journey that is started at point A, to arrive at the destination or point B where the learning outcomes are achieved. It seems like an airplane flying from point A to point B. 90% of the time the airplane deviates and is off the track. This also happens to the learners and students they might be off the track. It is the teacher’s responsibility is to keep them on the track by various approaches in the pedagogy of competency development. (H, 1:2)

This confirms the view of Patrick that by using the DHM teachers will achieve 99% precision and accuracy. Harry refers to the DHM as a means of staying on the track to ensure that precision is achieved.

Harry further elaborated and explained what he meant by exactness as follows:

The learners need to be aware that they are involved in the process of competency development right from the start. In other words they must be told that the process of learning involves competency development process which at its core is the first heuristic represented by the DHM. They are required to understand the process and apply the required components specified by teacher in this task or assessment. Having made them aware of this process, they are required to demonstrate that they are aware of it, that they are applying it and that they know there are checks and ticks in place that they are doing it. This is different to a loose approach, at present, where the teachers are avoiding, in most cases, to provide this information to students and not asking them to ensure an understanding of the competency development and applying it in the process. (H, 1:2)

This participant is referring to the fact that the students are not aware that they are engaged in competency development courses that differ from the traditional paradigm. This participant has declared that the learners must be aware of and they must understand the process and be able to apply the components in their learning. In fact, teachers and TAFE colleges have not been providing this information to the learners. Hence, the learners do not have an understanding of the competency development process. If such transformation is required and VET decides to have informed learners, there is a need to firstly have informed teachers. The question that remains to be answered is how teachers who are not clear about competency themselves can satisfy students’ queries and clarify students’ questions and make them aware of the competency development process.
7.6 Conclusion

The first proposition that has emerged in this research, together with its four underpinning concepts, has been indicative of the Clarifying Role of the Double Heuristic Method (DHM) in VET delivery of competencies. This Clarifying Role has provided the participating VET practitioners with confidence and assurances in VET teaching that they have realised what they have been expected to accomplish in VET teaching.

The proposition is based on the four inter-related concepts of Appropriateness, Articulation, Effective Communication and Precision. These underpinning concepts have emerged from the analysis of the data that was collected from the participating teachers. In summary these underpinning concepts are as follows:

**Appropriateness** - The DHM model is used by some teachers to maintain an appropriate balance between practical and theoretical aspects of delivery regarding the Unit of Competency for which they are responsible.

**Articulation**: The DHM has been referred to by participants as a framework for articulating their teaching practices given the complexity of the relationships of components and the process of teaching in VET. In other words the DHM has been identified by VET teachers as a means to articulate their applications. The DHM has been also used as a framework to explain the multifaceted and multi-relational components of Training Packages to third parties such as other teachers, managers and students. On this basis, the DHM invites teachers to reflect comprehensively in their area of teaching by using it as a reflective mechanism for articulating the intricacies of competency development when designing assessments or session plans.

**Effective Communication**: The DHM has been identified by participants as a means of improving teaching effectiveness as it assists teachers to communicate to their students about competency development. The DHM has been identified as an approach that allows teachers to communicate knowledge more effectively to their students.

**Precision**: The DHM rationalizes the process of competency development and thus removes confusion in teacher’s perception of VET teaching in the context of Training Packages. The DHM has been used as a marker’s guide, as it assesses the students’
work in a comprehensive way. In using the DHM, higher levels of accuracy can be achieved.

In conclusion, the participating teachers viewed the clarifying role of the DHM to be very important as they applied the DHM in their practice of teaching competencies in the VET Sector. The next chapter focuses on the confirmatory role of the DHM, and explores the three underpinning concepts that emerged within that proposition. It shows that through the use of the DHM, teachers are more capable of complying with the requirements of the Training Packages and the AQTF.
CHAPTER 8: TEACHERS’ PERSPECTIVES ON THE CONFIRMATORY ROLE OF DOUBLE HEURISTIC METHOD

8.1 Introduction

The previous chapter, Chapter 7, provided an analysis of the teachers’ perspectives on the Proposition 1, the Clarifying Role of the DHM. The focus of this chapter is to move the analytical spotlight on the perspectives that the participants, in this research, expressed about the Confirmatory Role of the DHM. By turning the analytical eye to this important proposition, the chapter examines their responses and reveals the manifold meanings that the participants intended to communicate in the context of three perspectives: Validity, Guiding and Improvement of performance as follows:

Proposition 2

The second proposition is that there is a strong conviction amongst participating teachers that, by using the DHM, they are able to confirm the practices in which they engage. In such a context, they see the DHM approach playing a confirmatory role in strengthening and maintaining their confidence, confirming that what they are doing is right and that they are on the right track to ensuring that the requirements of Training Packages and AQTF are met.

The main focus of this Proposition is on the confirmatory role of the DHM and explores VET teachers’ perspectives on how they see and interpret the DHM as a confirmatory approach. In addition, this proposition explores VET teachers’ understanding of the confirmatory role and the meaning they ascribe to this role. This proposition is underpinned by three key concepts. These concepts are Validity, Guiding, and Improvement of performance. This chapter explores each of these key concepts, individually, and then draws to a close with a significant conclusion.
8.2 Validity

This concept further supports the DHM to be confirmatory as participants validate their approach to VET delivery. One of the participants referred to the fact that, in using the DHM framework, he was looking to validate his approach and his way of teaching according to all of the requirements of the Australian Qualification Training Framework (AQTF). This participant pointed out that:

My intention was to improve my teaching strategy. That was the intention and to look into a new approach and apply it (I, 1:20).

His initial intentions were to improve his approach to teaching units of competency and to confirm that his approach is in line with the requirements. This supports the argument that the DHM is useful for the validation of their teaching.

Gloria was asked about the 1st heuristic. She stated:

I think the heuristic is really very reflective of how I do it intuitively anyway. It was a new way of looking at things, more or less the mechanisms that I intuitively used and, of course, my intuition is based on knowledge the students required on a period of time in diverse cohorts. So it’s not a magical pop-up approach. It is intuitive in terms of true meaning based on all that knowledge and the skills and abilities (G, 1:5).

In contrast to Gloria, when Garry was asked what his intentions were when he was implementing the first heuristic of the DHM, he responded, “So the intention is to make sure that what I am doing here, in actual fact, is ‘valid’” (G, 1:23).

This participant not only confirmed that he uses the DHM for validation purposes, but also, he elaborated further by linking validation to appropriateness and fairness. By “fairness”, he meant that he was ‘assessing fairly’ in the light of the unit requirements and the variables identified for this assessment, and that he is not over-assessing his students to make it unfair.

Ray was asked, “What improvements in your practice have resulted in from the application of 1st heuristic of (DHM)?” He responded:

Okay it is realising that I am doing it anyway, I guess that’s it. It made me confident or probably confirmed what I am doing is right (R, 1:27).

While Garry uses the DHM for validation purposes, Ray applies the DHM for “Evaluating and reviewing, as well as validating” (R, 1:31).
This participant uses the DHM to evaluate, review and validate his work. This further confirms Proposition 2, that teachers are using the DHM to validate their work as a VET teacher.

Patrick pointed out a significant difference between using the DHM and not using it when he commented that:

> Because when you are looking at a Training Package on its own, … to work out what you are going to teach, how you are going to teach it, there is nothing like the DHM to tell you whether what you are doing is valid or not. (P, 2:16).

According to Patrick, in using Training Packages on its own, there is no approach to map these component parts in an interconnected way, as the DHM does. In other words, by using the DHM this problem is addressed. Patrick further elaborated that:

> I think DHM is something that put the things together and … puts it into more perspective. It is the picture. (P, 2:16)

He responded to the question: whether the DHM is good for new teachers or experienced teachers, or both, as follows:

> I think what you should do in your research, you should say that it is suitable for both, but it is very important that the beginning teachers are taught the DHM method. (P, 2:18)

When Warwick was asked: “What are your outcomes when implementing the first heuristic of (DHM)?” he responded:

> I believe that when we do this plan, the outcome would be in line with the requirements by National Training Information Service (NTIS). So if we follow this as a guideline, I believe we are on the right track. (W, 1:8).

In the same vein, Garry has said that his intention has been to make sure it covers what is intended, and is valid.

It is clear that these participants have been using the DHM to validate their work in line with the requirements of the regulatory body, to clarify and confirm their initial intentions through the use of the DHM. Therefore, this concept revealed that VET teachers are using the DHM as a means of validating their work, to confirm the requirements of AQTF and Training Packages.
8.3 Guiding

It is the perspectives of most of the participants that the DHM acts as a guideline for delivery and planning of both teaching and assessing of the Units of Competency of the Training Packages. For example, one of the participants, Ian, stated that:

It makes a lot of difference as I said before. The difference is by using this method, the DHM, you know the path that you walk and where you are going whereas using others, you’re just going somewhere you do not know, you are in the darkness. In other words, the learners as well as the teachers have got the guidelines (I, 1:15).

Another participant, Warwick, pointed out that:

When we do this plan, the outcome would be in line with the requirements by National Training and Information Service (NTIS), so if we follow the DHM as a guideline, I believe we are right. (W, 1:8).

Hence, the DHM has been referred to as a guideline that enables both teachers and assessors to teach and assess the students work within the scope of the requirements of the National Regulatory Body. In this sense, the DHM is usually aligned to combine what is important for the learners in the development of competence within the context of the requirements of Training Packages (NTIS).

It is clear that the DHM provides a benchmark for the planning and delivery of VET practice that can be used by the VET practitioners as a guide. The teachers used the DHM both as a guide and a benchmark. As a guide, the DHM guides them in how to bring the components into the DHM template and where to place them, and it also guides them in linking the components in a meaningful way. According to participants, this is then used as a good benchmark for planning and delivery of teaching in VET. “… using the DHM as a confirmatory tactic is a good benchmark and starting point” (G, 1:2).

Gloria referred to the DHM as a means of recognising the ingredients of knowledge, skills, attributes and performance criteria by teachers successfully when planning and delivering the Units of Competency. In this regard she referred to the DHM as a “recipe of ingredients” (G, 1:5). What she meant was that it could be used like a recipe is used by the chef as a guide in the process of achieving the desired results or dishes. In the same manner, the DHM is used to achieve the desired competency by
recognising the ingredients of knowledge, skills, attributes and performance criteria in the process of achieving the desired competency or results.

In addition, this participant referred to the point that, in using the DHM, the desired result will be achieved successfully irrespective of “when you, and how you, and, under what conditions you put a product together”. (G, 1:5). In other words, irrespective of which product you are going to produce, you can still apply the DHM framework in the process of product development. Garry, has supported that the DHM needs be given to students as a guide as to what is expected of them. In his own words:

   It is how we want you to go about it. The DHM is giving me a guide to the students. To say right, you do this and this is the path you’re going to take.
   (G, 1:16)

According to this participant, the DHM process guides the teachers in preparing the DHM template for each session. As a result, teachers can share the completed template with the students during that session. In this way, students understand teacher’s expectations in relation to the sessions or the assessments. Also, the completed DHM template serves “…as a communication tool to your students. Hence, they know what they are going to produce, because they see all the relevant components to this session summarized and linked on the DHM template”. (G, 1:16)

Garry further commented:

   “Students ask: well what’re you asking me to do?” and in response I would then tell them, “what we want you to do, this is this strategy; it is how we want you to go about it…” Hence the DHM provides me with a guide that I can use for my students. That is why I think the DHM is telling to my students what the expectations are (G, 1:18).

In response to question about guidance, Gloria pointed out that:

   Again from the teaching point of view, when you link the DHM with the employability skills and required skills it could give you possibly some guidance depending on the types of examples that you are going to use (G, 1:33).

It is clear that as the DHM approach and template focuses on employability skills as the bridge that integrates the variables (concepts) to performance criteria, it guides the teachers in identifying employability skills and linking them to relevant performance criteria in a simple way.
From a similar viewpoint, Gloria supported the belief that the DHM provides guidance and a method to integrate employability skills in the process. Firstly, she used the DHM to develop some assessment benchmarks incorporating employability skills for a new program of study. Then she used those assessment benchmarks to develop content for the new program.

I used the DHM to construct the assessments benchmarks that then allowed me to then focus on scoping the content, keeping in mind that the benchmarks were my guides. They have encapsulated the employability skills, the tasks skills, the relevant knowledge and also the performance criteria. The DHM made it easy, extremely easy (G, 2:13).

Ian, in response to “What are your perspectives on the 1st heuristic?” explained that:

It gives … us guidelines to provide the learner with what variables are going to be covered. And also guidelines to what sort of performance that we have to achieve to meet the requirements. (I, 1:2)

This quote not only further confirms that the DHM provides guidelines to the learners but also confirms its use to teachers.

We are achieving for the learners what area needs to be covered, and then what skills you want to cover that the unit needs to have. How you’re going to achieve that competency. Therefore it provides guidelines for the learner (I, 1:3).

Thus, this participating teacher emphasised that the DHM framework provides both teachers and learners with the guidelines that they need for teaching as well as learning. When same participant was prompted to respond to the question, “What do you mean by guidelines?” He elaborated that:

I mean how I am going to approach my teaching. How I am going to help the learners to achieve their objectives. The DHM is giving me some sort of template (I, 1:16).

He confirmed:

The DHM will give me the guidelines that I need in teaching leading to improvements. It’s going to take me to improvements. Improve my career improves my teaching skills (I, 1:16)

Warwick also affirmed in a similar fashion with his statement, “the bridge in the DHM template links all the skills and performance criteria, but you do need the
required skills to meet the performance criteria and bridging them together, … it actually gives us a guideline” (W, 1:9).

Hence, so far it has been illustrated that the DHM was referred to as a guideline in many instances during the first round of interviews. This finding suggests that the DHM provides, not only the guidelines to teachers, but also has relevancy to guiding the learners. The inter-linkage between the guide to the teachers as well as learners is quite significant. For example, while for teachers, the DHM template links all the skills and performance criteria by bridging, it was confirmed that “it actually gives the teachers a guideline” (W, 1:9). On the other hand, by listing the variables (or concepts) skills and performance criteria, it guides the learners to focus on the areas of importance for their learning.

The comments made by Warwick that the DHM can also be used as markers guide were also interesting. This participant referred to the DHM as a ‘base’ and when he was asked what he meant by the ‘base’, he provided the following answer:

The DHM is, like when you are doing some work, the guide, when we do assess we need a markers guide. This is like a guide (W, 1:15).

A Marker’s Guide can assist teachers in marking the students’ assessments in an integrated approach where all the components are seen as an important part of the assessment and not be regarded as something to be assessed in isolation. Thus, the DHM is assisting teachers to mark the students’ work as interlinked components in a holistic manner. It can be argued that this is not usually the case in VET.

Patrick argued that the DHM is a ‘good guideline’ rather that a ‘marker’s guide’. He emphasised that if we use the DHM, we are in line with the requirements of National Training Information Service.

He further elaborated:

That means we will do the assessments according to the requirements by the NTIS. Yes, this will leave me to stay on the right track… (W, 1:14).

To the question, “do you think that the focus question used in the DHM is doing that sort of thing?” he responded:

Yes the learner’s outcome will also benefit, because if we have assessed the work correctly, we can actually guide them in the right direction, sometimes
the students have not done the work answering the right questions, you know. Because we have a useful tool for assessment we can pinpoint the errors the students make so we can guide them back to the right track. So it’s a benefit to them in the learning process (W, 1:2).

In this way, the DHM becomes a tool to ensure that the learners achieve the learning outcomes that are intended to be achieved by the Unit of Competency. This integrated learning pathway is greatly enhanced through the use of DHM, as it provides a picture of the intended integration of the various components of the Training Packages. Without the DHM, students risk failure through the omission of key components.

In addition, when Ian was asked to provide his view regarding how the DHM helps him to achieve his aims when teaching the Units of Competency, he highlighted that, “Well, it will give me the guidelines that I need in teaching leading to improvements” (I, 1:16).

The multiple references to the DHM as guidelines highlight the confirmatory role of the DHM in giving assurance to teachers that the path they are embarking on leads to improvements. As Ian concludes, the DHM helps “you know where you’re going. You know what the obstacles are. You know what are the weaknesses and strengths that you are going through” (I, 1:15). Thus, he concludes that the DHM provides the ultimate guide to keeping teachers and learners on the relevant learning path, so that all learning outcomes can be fulfilled.

In the same vein, Gloria declared that the DHM has assisted her in creating a set of assessment benchmarks that has guided the development of assessments for the new Certificate IV for Celebrants.

It is evident that teachers are able to use the DHM as a guide to develop assessment instruments, as well as assessment benchmarks for new qualifications and study programs. This section has illustrated how the application of the DHM assures VET teachers in understanding the delivery process, leading to improvements in their performance.

8.4 Improvement of performance

One of the goals of AQTF is continuous improvement in teaching strategies (Australian Government AQTF, 2007a). The data collected in this research indicates
that participating teachers have used the DHM framework as an approach to improve their teaching strategies. One of the participants, when asked what his intentions were in using the DHM, has pointed out that, “My intention was to improve my teaching strategy” (I, 1:20).

Another participant referred to the point that his intention was to improve performance and, when this was achieved, the learners would also benefit. He stated, “The DHM improves teachers’ performance, therefore the students benefit” (G, 1:34). Clearly, teachers are looking for ways and means to improve their performance and the DHM is seen to be helpful in this regard.

As was evident earlier, when Ian was asked, “How do you think DHM helps you to achieve your aims when teaching the Units of Competency?” he pointed out that “well it will give me the guidelines that I need in teaching, leading to improvements” (I, 1:16). He emphasised that the guidelines are different from any other guidelines. He claimed that these guidelines lead teachers to deliver as required and to improve their work practices, resulting in better outcomes.

One of the outcomes of the DHM approach, as discovered by teachers, has been the improvement in aspects of their delivery. For example, one participant has been more specific by referring to the improvement in his teaching strategy, and highlighted that this is a result of using DHM. Gloria believes the “robust structure” (G, 1:20) of the DHM is the contributing factor to improvements in delivery.

Here, Gloria refers to the strength of the framework in providing “a more informed and satisfying learning experience and much improved chance of success” (G, 1:14). Hence, the DHM has been identified as a ‘robust approach’ that improves the chance of a successful delivery of Training Packages in the VET sector. It is clear that, not only does the DHM approach improve VET teachers’ teaching strategies, but also results in a much-improved chance of success.

Another benefit of using the DHM is that it is a mechanism for embodying the employability skills in teaching practices which increase the chances of learners’ employability, as Garry commented:

It is going to improve the learners’ employability skills. Are we, in actual fact, giving them something to do to improve their employability? (G, 1:11).
One of the difficulties in VET delivery has always been the embodying of the employability skills in the teaching practices, as these were added on ten years after the advent of Training Packages, which has been a surprise to many teachers. The DHM, as an integrated approach, has addressed and resolved this difficulty of embodying these skills in VET delivery, and this aspect of the DHM has been regarded as contributing to improvements in VET teaching, as commented by Garry.

It may have an improvement in a way, in fact, to the structure of assessment … by … embodying the employability skills particularly (G, 1:11).

It can be concluded that, the inclusion of employability skills in VET teaching and delivery has become more crucial and more important in recent years, and embodying these skills in VET delivery is under the scrutiny of auditors. VET teachers have been trying to devise ways to ensure their compliance in terms of embodying these skills. The DHM was seen by participants as an approach that addressed this issue, resulting in improvements in VET delivery and leading to improved perspectives on Employability Skills.

Another interesting point that was discovered by participants was the improvement in confidence. In this regard, Ian has pointed out that he feels a sense of self-assurance. He commented as follows.

The DHM is the predetermined path that you are walking on. So therefore, you know where you’re going. You know what the obstacles are. You know what are the weaknesses and strengths that you are going through. So therefore you know where you are walking (I, 1:15).

In other words, with the DHM there is the feeling of confidence that confirms teachers are on the delivery path in the context of Training Packages and where they are heading. By using the DHM, there is an improvement in that feeling of self-assurance that allows teachers to know where they are in relation to the formulation of competency development and delivery, as they comply with the requirements of Training Packages and AQTF.

The DHM is going to take me to improvements, improves my career, improves my teaching skills (I, 1:16)

While these participants referred to the point that the DHM is going to improve their teaching, Warwick’s view pointed to assessment:
Yes, my intention was that if I use this heuristic approach for assessment, I am hoping to get better results for the assessment (W, 1:5).

In the same vein, Gloria, pointed out that the DHM has had an impact on the structure of assessment, as follows:

It may have an impact in a way in fact to the structure of assessment. To make sure that, in actual fact, are really embodying the employability skills, particularly (G, 1:11).

While some participating teachers referred to the improvements that the use of the DHM approach produces in their work, others referred to how the DHM produces improvements for learners. For example, Warwick was asked a question of what improvements in his practice have resulted from the application of the first heuristic of (DHM). He responded:

The First heuristic gives me a better understanding and I think it is also improving the students learning… (W, 1:9)

Therefore, not only does this participant refer to better understanding of the competency development in the Training Packages context, but also highlights the point that it improves students’ learning. As this finding is also important in the context of Training Packages and the DHM, it is explored further in the next part of data analysis relating to the concept of improving performance.

8.4.1. Improvement in students’ learning

As mentioned earlier, Warwick, in response to the question on improvements, highlighted the point that the DHM improves students’ learning:

In comparison, Ian, on the question of outcomes, commented that:

The outcome, of course, is that the learners would get better results from it. Their achievement will be better measured. They will have a better outcome obviously. Hence, learners’ competency will be achieved (I, 1:15).

He then further linked the teachers’ outcomes to the students’ outcomes and concluded:

Actually teachers’ outcomes are the learners’ outcomes. In other words teachers achieved their objectives. That means the learners have achieved their objectives (I, 1:15).
Garry affirmed that improvement in teacher’s performance would benefit students, as he pointed out that:

“Well, it improves teachers’ performance, therefore these students are going to benefit…” (G, 1:34).

However, to ensure that the students will benefit from the DHM, this participating teacher supports the notion that the DHM be given to students as a guide on how they need to go about their learning. He pointed out that:

The DHM is giving me a guide for the students. To the students I can say right, you do this. This is the path you’re going to take (G, 1:16).

According to this participant the students always ask the teacher, “Well, what’re you asking me to do?” (G, 1:16) and as the teacher I would respond to my students, while showing the DHM, “This is what I want you to do. This is the strategy; this is how I want you to go about it” . Hence, by sharing the completed DHM with the students, they can see the importance of various components in the learning process.

Other participating teachers did not support this view. For example, Patrick asked:

“But, will they understand the DHM? All the teachers have the background information. The students who come in do not have the background information”. (P, 2:20).

Patrick argued that, as students do not have the background in competency development, it is hard for them to understand the DHM. Gloria was asked whether she agreed with Garry’s view about sharing the DHM form or template with students. Gloria argued that if the students are given a simplified version of the DHM, like a mind map, they may understand. This is the approach that Gloria used for her students. Gloria was asked whether she meant something like a skills matrix that lists the skills and performance criteria in a tabular format. She responded “not even that”. she elaborated on the mind map such:

Because they look at it and say it is wonderful. But it can be shown. It is an idea of where already are we? Where are we going? How we are going to get there? (G, 2:5)

This suggests that the students receive simplified version(s) of the DHM. By receiving it, they know exactly what is involved in this assessment, activity or session. Gloria added:
Their awareness level has been raised by the teacher. So they have greater awareness of what it is that they need to communicate? (G, 2:5).

8.5 Conclusion

The data reported in this chapter has revealed that the DHM has given teachers an apparatus that they needed to ensure that the integration of component parts of the units of competency is meaningful and makes their teaching methods valid. The DHM has become the guideline that assists them through the tasks of teaching that had previously been cumbersome for them. It has been shown at the outset that teachers have always been anxious that their work must be correct, as they have been constantly subject to AQTF audits from the curriculum section of the Department of Education Training and Arts. The DHM addresses such anxiety.

It is evident that the DHM has been to these VET teachers a guide; a guideline to ensure as curriculum designers for the units that they are responsible for carrying out their work according to such guidelines. These guidelines have given them confidence and assurance that they are “doing it right”, they are correct, or they are “on the right track”. The data analysis indicates that the DHM has fulfilled such a guideline.

The data has also revealed that not only is the DHM seen by participating VET teachers as a guideline, but the data has also shown that the DHM has contributed to improving teachers’ performance in various ways. This revelation has also enhanced students’ learning. The consequence of this finding is that this, in turn, leads to a higher level of completion of studies.

However, there have been a variety of views in terms of how to communicate the DHM to students, in order to assist them in their learning. One perspective is that the whole DHM diagram or template can be shared with students. Another perspective is that a simplified version such as a skills matrix, which is a table listing the relevant variables, employability skills, required skills and performance criteria, is appropriate. The third perspective is that a simplified version be used. Clearly, teachers use the DHM in a number of ways to improve teaching and enhance student learning.

In summary, the second proposition that has emerged in this research has been indicative of the confirmatory role of DHM. This confirmatory role has provided the participating VET practitioners with confidence and assurances in VET teaching.
These findings indicated that the VET system lacks an approach or method to guide the teachers’ steps in the delivery of Units of Competency in the context of Training Packages. Providing the DHM has initiated new understanding and confidence.

The underpinning concepts of this proposition that were explored in this chapter were Validity, Guiding, and Improvement of performance. In summary, these underpinning concepts are as follows:

**Validity:** The DHM is confirmatory in validating teaching practices. The data indicated that the participant teachers were looking for something to validate their approach in teaching that gives them the assurances they need in their day-to-day tasks.

**Guiding:** It is the perspectives of the participants that the DHM acts as a guideline for planning and teaching in line with the requirements by National Training and Information Service (NTIS) that enables both teachers and assessors to teach and assess the students’ work within the scope of the requirements of the National Regulatory Body.

**Improving Performance:** One of the goals of AQTF is continuous improvement in teaching strategies (Australian Government AQTF, 2007a). The data collected in this research indicates that participating teachers have used the DHM framework as an approach to improving their teaching strategies and, when this is achieved, the learners will also benefit. It can be concluded that when teachers are looking for ways and means to improve their performance, the DHM is seen to be helpful, even necessary, in this regard.

The next chapter focuses on the synthesizing role of the DHM that gives the teaching of competency a structure, an approach and a clear construct. The process of synthesizing is a meaning making process as the teachers realize that the integration in the context of the DHM method makes sense. The chapter explores the three emerging concepts of seeing the picture, seeing the structure, and VET delivery planning.
CHAPTER 9: TEACHERS’ PERSPECTIVES ON SYNTHESISING ROLE OF DOUBLE HEURISTIC METHOD

9.1 Introduction

So far, the analysis of the data gathered by this research in the previous chapters, Chapter 7 and 8, revealed that the participating teachers were aware of the Clarifying and Confirmatory Roles of the DHM as they applied the model to their practice. This chapter provides a summarised analysis of the data derived from participant’s responses on the Synthesising Role of the DHM model. It mirrors forth the common understanding of how the third role of the DHM, the Synthesising Role, facilitated their delivery in the context of the Training Packages as outlined in the following proposition:

**Proposition 3**

Teachers see the Double Heuristic Method (DHM) as a meaning-making apparatus with a synthesising role for VET delivery in Australia. This gives the teaching of competency a structure, an approach and a clear construct, in order to enable the integration of the component parts in a pedagogically meaningful way. Teachers in using the DHM, engage in a number of processes namely: seeing the picture, seeing the structure, and VET delivery planning.

Proposition 3 explains how the synthesising role of the DHM has contributed to meaning-making, and how teachers make sense of the many components and varied requirements for the implementation of the Training Packages. In this chapter, the three key concepts that underpin this proposition will be explored. These concepts are *seeing the picture, comprehending the structure* and *VET delivery planning*. This chapter will deal with each one of these concepts, one by one.

9.2 Seeing the picture

After using the DHM and applying it to their delivery planning, some participants argued that by using the DHM, they have seen what they thought they knew, but
could not quite explain or depict it before. Now, they understand the explanation or depiction through the DHM. It seemed to them that all the “bits and pieces” as delineated by the Training Packages now make sense to them, as the component parts are rationally interconnected and interlinked in the DHM approach. Through the DHM, participants come to see all the requirements of the Training Packages as presented in a single diagram, and where all the component parts were interlinked in a logical way. They articulated this holistic view as “seeing the picture”.

The picture that these participants have seen in this way has been useful in boosting their confidence and giving them assurances in their roles as VET practitioners, because now they feel and think that they are able to follow and act on all of these requirements. In the following paragraphs, various participants elaborate the usefulness of the DHM, and how it facilitates a holistic approach.

One of the participating teachers (Ian), used a metaphor of his own approach in teaching, in order to explain how he perceives the holistic framework of the DHM.

…in certain units like statutory accounting, when I go to the class I start by saying that I’m going to introduce a new concept today that you already know. But, if I ask you to define this concept, you may not have the skill of painting the picture of it or providing the definition of it. I am going to help you so that you become able to express that knowledge in your own words.”

And a further possibility is that, you may already know the concept. But you are not aware that you know it. So, I am going to paint a picture. When you see the picture, then you would say that, ‘I know it’. Then, you will be able to give the description for it. (I, 1:13)

Ian illustrated in the interviews how he felt as a VET teacher when the Training Packages were introduced, requiring various components to be integrated without an holistic framework. Planning was left to VET teachers to sort it out, without a scaffold to produce what a picture of VET teaching should look like. In other words, the expectation has been that the teachers are capable of somehow putting the pieces together without any model like the DHM.

Another participating teacher, Harry, referred to these components as the “jigsaw pieces in the Training Packages puzzle” that the DHM has been designed to solve, by producing a holistic picture of these pieces.
The Training Packages have provided many parts to a jigsaw puzzle. These parts are produced by the industry and other stakeholders. They then tried to make these parts work by asking teachers to assemble and solve the puzzle. The DHM, by defining the relationships of these parts has assembled the components to the puzzle pedagogically into a picture that we can be understood (H, 1:19).

The Jigsaw Puzzle syndrome metaphor used by this participant reflects the situations where a number of pieces are to be assembled in a puzzle without knowing or seeing the whole picture of it in the first place. It is argued here that if the same puzzle is given to a number of individuals, their starting points, the ending points and their results might be as different as the number of participating players. In other words, no two may get the same result.

In terms of “the jigsaw puzzle” Ian explained his experience when the DHM was introduced to him in the following way. His explanation was broken down into five steps for simplicity:

1. Teachers already know it.
2. The teachers are not aware that they know it.
3. So, the DHM is going to paint a picture of it.
4. Then, teachers would say: they knew it after they saw the picture of it.
5. Then teachers will be able to give a description of it.

Now each of these steps is elaborated individually:

**9.2.1 The teachers already know it**

Teachers know that they need to deliver the units of competency in the context of Training Packages. Teachers also know that the component parts need to be delivered in an integrated manner. Even if they already know it, when they are asked to explain it, they may not be able to provide a vivid picture of integrated VET delivery or depicting the interconnectedness of the parts as a picture or construct.

**9.2.2 The teachers are not aware that they know it**

Teachers may not be fully aware of the meaning of integration in the context of Training Packages. The VET teachers have developed a knowledge of various requirements of Training Packages, as well as the explanations of the component parts,
through many workshops and professional development activities. It is possible that they know more than they think they know about the integration of the component parts, but they may not be aware of their knowledge.

9.2.3 **So, the DHM is going to paint a picture of it**

The DHM template paints the picture, or provides a picture or structure of VET teaching that depicts the interconnectedness of the component parts.

9.2.4 **Then the teachers would say they knew it.**

The VET teachers, by seeing the picture, that is the DHM, would say they knew it. In other words, although they could not paint the picture themselves at the beginning and put the jigsaw pieces together, nevertheless the minute the jigsaw is done, and the picture is revealed in front of them, they would say, “I knew it”.

9.2.5 **Then the teachers will be able to give a description of it**

After the teachers have seen the picture in the previous stage and admitted that ‘they knew it’, then they are able to produce a description of it. For example, by seeing and applying the DHM in their delivery planning, some participants referred to the point that they have seen what they thought they knew but could not quite explain before, and now they see that explanation in the DHM.

The above explanation by Ian suggests that when teachers see the DHM they would say they knew it. This further suggests that the DHM depicts what they were trying to solve in their minds for some time.

In response to a question of whether he wanted to add anything, Ian said:

> As I said, it aligns with my beliefs, and aligns with my approach, and most importantly gives me the opportunity seeing as a ‘big picture’ what I have been doing. It shows me, it somehow tells me a good picture. (I, 1:24)”

Ian has found that not only does the DHM align with his beliefs and his approach in VET delivery and teaching, but also the DHM has provided the opportunity of seeing the ‘Big Picture’ in relation to what he has been doing. The DHM is showing him a holistic view of VET delivery in the context of competency-based Training Packages.
There would be a future if there would be appropriate training sessions, because the teachers have to believe in it. (I,1:24)

In a nutshell, Ian is referring to the point that the DHM has provided him with a comprehensive framework for what he has been trying to do for years.

There is an underlying point here to note, and that is, that there is no ‘Big Picture’ or holistic framework for teaching at present. Without a framework, there is no clarity at present for what they are doing. In other words, at present teachers in VET are not able to visualise what they are doing. Hence, when they see a picture of what they are doing as practitioners, then it makes sense to them and gives meaning to their practice because they are now able to visualise a holistic view of what they are supposed to be doing. When they are able to visualise the DHM structure in their minds, it will enable them to follow it. Then, they are able to develop the confidence that what they are doing is right. Without the DHM, they are not able to visualise their work holistically and they may see it as confusing. For example, Ray pointed out that “the so-called Unit of Competency, I believe leads to more confusion” (R, 1:22). This indicates that the confusion over Training Packages still persists. However, by using the DHM, the teachers in this study maintained a clear picture or structure in their minds, leading to clarity instead of confusion.

The DHM promotes integration according to participating teachers.

The DHM pedagogically assembles the components parts and produces a picture from the jigsaw pieces that the government, NTIS and AQTF have produced (H, 1:19).

As Ray said:

All these ‘bits and pieces’ are provided, but there is no structure to it (R, 1:48)

Ray is referring to the component parts, such as employability skills, required skills, required knowledge and performance criteria. He agrees there is no structure to interconnect these parts into a picture of the Units of Competency. The assembling of these component parts that VET teachers are required to include in their teaching is not conceivable without the DHM structure or picture. By using the DHM, they can also monitor the students and identify whether students miss any component part or not.

This view is confirmed by Warwick, who stated that:
The DHM gives us a clear picture whether the students have missed this part or whether they have completed the tasks according to the requirements. (W, 1:5)

This participant, in response to a question of what he would expect to achieve using the DHM, pointed out that:

Well, what I can achieve is that… when I do the assessment of the students work I will do it more “effectively”, “efficiently” because I have in my hand this summary showing me very clearly what are the skills and required knowledge to meet that performance criteria (W, 1:5).

It other words, the double heuristic approach provides a template that has been regarded as the summary or as “good summary”. This “good summary” becomes a yardstick for the teachers and assessors to ensure very clearly whether the range of skills and knowledge that should have been covered is in fact covered.

Along the same lines, Harry was asked in which way he thought that he liked the DHM. He stated:

I like the DHM as it provides a seeing eye that sees the parts and their relationships and hence the whole picture (H, 1:18)

This participant further elaborated on what he meant by “the whole picture”:

By using the DHM, I can see the whole picture for competency development. It has provided a condensed DHM form and template, an easy and stepwise approach to design, plan and assess competency (H, 1:18)

The reference to the whole picture means that, without the DHM, the teachers are not able to visualise the whole picture. Harry further emphasised that:

The most important usefulness of the DHM is that it defines the relationships of these components in a meaningful and pedagogically sound approach. The DHM pedagogically assembles the components parts and produces a picture from the jig saw pieces that the government, NTIS and AQTF have produced” (H, 1:19).

Ian has seen the linking of the component parts as a “big picture”, Ray saw it as a “structure”, while Warwick has seen it as a “brief summary”. They are all referring to the synthesising nature of the DHM. What these references mean is that all the components parts such as employability skills, required skills and performance criteria are synthesized into a holistic framework for teaching. Warwick put it succinctly by saying “The DHM gives me a ‘better picture’ of what is required” (W, 1:3) The DHM
has simplified layers of complexity that underpin the understanding of competency, resulting in meaningful clarity.

This indicates that the DHM has derived the meaning of competency development latent in the Training Packages which otherwise lay concealed beneath the surface. This meaning-making aspect of the DHM that emerges from its synthesising role provides teachers with clarity and precision.

Outside of the DHM, there is no single tool or vehicle that draws the relationships of the components together. Warwick stated that, he “can still check things without DHM but will be more difficult” (W, 1:4).

The other concepts that have been referred to by this participant are “effectively” and “efficiently” which suggest that the DHM approach not only provides clarity but also at the same time maintains effectiveness and efficiency for the teachers and assessors while performing their work. In other words, because the teachers and assessors need to exercise their judgment in the process of assessing, they need to have a clear picture of the requirements and components to base their assessments on. The DHM provides a “clear picture” or “construct” and hence facilitates the process of exercising judgment effectively and efficiently.

The DHM has thus depicted the interconnectedness among the component parts of the puzzle of competency and has configured these component parts into a meaningful structure that is covered next.

**9.3 Comprehending the substructure of the DHM**

In the previous section, the data revealed that the participating teachers have seen the picture for VET teaching. What they have seen, in reality, is a holistic approach to planning through the DHM. While in the previous section the focus was on framing, the data on comprehending the frame is outlined forthwith.

Teachers have realised that so far in VET teaching there have been many “bits and pieces” but there has been no structure to assemble these component parts into a whole picture. “…All these ‘bits and pieces’ are provided, but there is no structure to it” (R, 1:48) Ray has clearly highlighted that there is no structure to guide VET teachers to assemble all these ‘bits and pieces’ into an integrated whole.
Given that the DHM has been referred to as a robust structure, the questions are: What does a structure do? And how can it be defined as a structure?

Warwick stated:

It is like the human being, as if we have all the organs, but we don’t have a skeleton to hold it. The DHM is like this framework that holds it (W, 2:44).

In other words, the DHM is the skeletal structure which provides a framework for the teaching of competency.

Thus far, data has revealed that, at present, there is no structure that VET teachers can rely on. At present there is no structure within which VET teachers can implement a number of various components parts, without knowing in which way and how these parts are related. There is no structure to make meaning of these parts. However, by using the DHM, the participating teachers are able to work with these component parts as an interconnected whole. That is the difference, as Garry has elaborated:

Using the DHM new teachers will get a structure that they can work with (G, 1:37).

The reference to a structure that the teachers can work with is indicative of a need for a structure for the teachers to work with the component parts, and to formulate and plan their delivery comprised of teaching and assessment. Gloria has referred to the point that the DHM provides the teacher with a structure within which to work, as follows:

I think the DHM allows the writer or planner, delivery planner, if you like, to call that person, a structure within which to work, the sequential structure without being linear in nature (G, 1:1).

In other words, the DHM provides a structure within which the VET teachers can work to develop their plan of delivery. This participant further has pointed out that the DHM structure is a ‘sequential structure’ and, provided the following comment:

It is sequential, in that there are clear stages in the process. However, it is nonlinear enough to allow folding the steps and also between various steps and also between two main heuristics (G, 1:1).

The sequential structure of the DHM is comprised of two main heuristics, First and Second Heuristics. These two heuristics are the sub-structures. In terms of the First Heuristic sub-structure where a bridge is constructed, Harry has pointed out that the
secret to developing competence, using the DHM structure, is to construct the competency core, the First Heuristic sub-structure, by bridging, as follows:

The first heuristic is the core of competency development. Here is where the learner starts to bridge and while the learner is engaged in constructing the bridge he/she develops his competency (H, 1:3).

Hence, constructing the bridge as part of this robust structure leads to learner’s competence. He further elaborated that:

When the bridging structure is laid down properly as the core activity in this process the foundation of competency development is solid and will produce competent individuals” (H, 1:4).

This participant further elaborated that:

The 1st heuristic is the foundation that holds the whole structure of learner’s competence. As such, it needs to be properly laid down. It has to be solid with an appropriate strength that can bear the structure as the competency is constructed on this foundation as the base of the competency (H, 1:4).

Harry provided the following answer, when he was asked about his perspective on the application of second heuristic of the DHM:

My perspective on the application of second heuristic is that, having laid down the foundation, the second heuristic is built on the solid foundation. Hence the learner starts to explore the deeper understanding of the knowledge and elements. In other words, learners explore the depth and breadth of knowledge because this structure can sustain itself on the solid foundation that was laid down by the learner in the 1st heuristic (H, 1:5).

Hence, both of the first and second heuristics’ substructures play a role in the DHM frame reflecting Gloria’s view of the DHM: “A structured approach, the interconnections both within and between the two heuristics…” (G, 1:1).

It is this emphasis on constructing these two substructures, which involves a number of interconnections within and between these heuristics that makes the process of implementing the DHM more meaningful. Not only are the heuristics interconnected, but also, within each of the heuristics, the component parts are inter-connected. In other words, between the two heuristics, there are interconnecting components that are locked into appropriate positions. Garry commented that the DHM is all about “constructiveness”, listing the three concepts of construct, structure, parts and the interconnectedness or inter-relationships of the parts. This participant responded to the
question of what effect, if any, did he think using the DHM had on his practice, as follows:

I guess that ‘thinking constructively’ is about identifying what you’re doing, and focusing exactly on their teaching requirements (G, 1:33). … The DHM has a ‘standardized structure’ which you can use along all your units (G, 1:35).

In other words, this participant not only referred to the DHM as having a structure, but a ‘standardized structure’ that he regards as a benefit and advantage, as follows:

The DHM enables a standardized structure which you can use along all your units, standardized structure I think that is an advantage (G, 1:35).

Harry referred to the standardized structure as the DHM:

The DHM defines the relationships of these parts; hence, it gives the construct the meaning and clarity. Unfortunately, the whole system is pushing to make these parts to be learned and understood without defining these relationships of these parts (H, 1:22).

It can be argued that without synthesising the component parts into a structure by defining the relationships of the component parts, the structure loses its meaning and clarity. This view is confirmed by Patrick, in response to the question of whether he agreed that the DHM synthesises these parts, giving meaning and clarity to the DHM structure:

I agree with this proposition. I believe it does. It does allow you to construct and synthesise from the Model that we have here. The DHM allows you to do that (P, 2:37).

In the same vein, Harry has elaborated that as the DHM has clearly defined the parts and their relationships, it has given the construct the meaning as follows:

The DHM is a way to show the structure of competence, as it has clearly defined the parts and the relationships of all these parts; therefore, has given to the construct the meaning and the clarity (H, 1:22)

On this basis, he has linked the clear relationships of the component parts with meaning making. In other words, the meaning making which is the result of the synthesising role of the DHM is born of bringing together the parts to the competency structure. Thus, the DHM approach has given the competency construct the structure it deserves, portraying the DHM as a meaning-making apparatus:
The DHM does give the competency a structure. It helps VET teachers, make meaning of it, to understand it. I can understand the Training package using this Model (P, 2:37).

Harry states:

As the DHM defines the relationship of the parts to this construct it clarifies the ambiguities. The DHM assists teachers in understanding the relationships of these parts in their teaching and it clarifies ambiguities for them. The DHM gives meaning to competency development process where it was otherwise vague and confusing. The DHM facilitates lesson planning. DHM also provides a basis for validation and moderation. DHM construct creates an appropriate equilibrium between the knowledge of variables and performance criteria. The equilibrium is achieved by mediating between variables and performance criteria, as a response to a competency event (H, 1:23).

Thus, using DHM contributes to the meaning making, resulting in diminution of vagueness and clarification of ambiguities in VET teaching and delivery. Therefore, it will assist in validation and moderation. Hence, in this chapter so far we have covered the ‘seeing the picture’ and ‘comprehending (seeing) the sub-structure’. These two concepts facilitate understanding the DHM structure that plays a major role in seeing the delivery or how to deliver at VET level discussed in the next section.

9.4 VET delivery planning

The DHM is referred to by participants as an approach to manage both assessment and teaching. Some participants also refer to it as a tool to monitor whether the students are on the right track in order to accomplish the tasks prescribed by the elements of competency within the Unit of Competency that the teacher is delivering. The VET delivery involves both planning and implementation of VET teaching, and DHM facilitates both, according to the perspectives of the participants. In this section, the focus is on using the DHM structure and the DHM process, and applying it to VET delivery. VET delivery is what the VET teachers are involved in, i.e., the day to day activities as a teacher. The practitioners’ aim is to use the DHM structure to deliver according to the Training Packages context. In this regard, Harry was asked how he thought the DHM helped him to achieve his aims when teaching Units of Competency. This participant provided the following answer:

DHM helps me, as it provides the approach to plan and design and deliver. Without DHM, there is no approach or methods and it is left to teachers to scratch their heads and where to start and what to do first. My aim is also to
ensure that the learners are in the process of developing competence in the unit and to include all the components that are required by NTIS and AQTF in the process. DHM provides all the required components and the steps to follow (H, 1:19).

In the above quote Harry pointed out a number of component parts of VET delivery and pointed out that the DHM helps in planning, designing and delivering.

### 9.4.1 Planning

To deliver each Unit of Competency, the VET teacher is required to plan. Planning forms part of teaching and as such part of a VET teacher’s responsibility. Using the DHM structure and the process would help in planning, as one of the participant teachers pointed out, that the DHM is:

> Not only useful in the planning, but also in measuring the outcome with the plan, the intention and the goals (I, 1:21)

Along the same lines, Garry pointed out that:

> …setting goals and aims and achieving them is part of managing; hence, I suppose, plan all your sessions and DHM will actually supports that process (G, 1:30).

Ian stated:

> They’re very useful in planning. You got goals, you start with the goals here, outcomes there and you measure them and you match them. And the DHM is a very useful instrument for that purpose (I, 1:21).

In response to the question of “what are your outcomes when implementing the first heuristic of (DHM)?” , he answered that, “the outcomes would be much better because they are well planned”. Hence, by using the DHM for planning the participating teachers are achieving better outcomes. In relation to how the planning is followed in the DHM approach, Ray pointed out that:

> Once I have looked at how we are going to assess, then how you’re going to train. …I think the intention was to look, just I was talking about to plan the delivery in more sequential fashion (R, 1:38).

What Ray is referring to is that the DHM approach supports the planning as well as designing of the assessments before session planning. This is the approach that Ray has adopted, which is in line with the DHM approach that is planned in a sequential fashion.
It is interesting to note the difference that DHM makes in planning. When Garry was asked, have you given any thought that the use of DHM would make a difference for you than not using the DHM? Does it make a difference? He responded.

In broad terms, yes, it makes you focus on, the planning and the structure of your teaching plan …yes, or teaching sessions (G, 1:35).

He further elaborated that:

“DHM just probably gives you, I guess, support for your session planning and by including a reported activity to make sure your session plan; your sessions in fact achieve their ends (G, 1:31)

In this way, Garry has referred to the DHM as a comprehensive approach for VET delivery planning. The next discusses that, when planning is completed, it becomes the basis for designing both assessments and sessions.

9.4.2 Designing

Gloria referred to the DHM as:

An icon size overview of the whole learning experience and assessment experience and provides the basis for designing sessions (G, 1:4).

Participants argued that teaching sessions are designed in more detail to include the variables, required knowledge and performance criteria, as well as employability and required skills. In other words, in the designing of sessions, using the DHM template, not only are all the components included but also the teaching strategies.

While in the design of assessments, the Double Heuristic Method provides a template that is regarded as the summary which becomes a yardstick for the teachers and assessors, to ensure very clearly the range of skills and knowledge that should have been covered in the design of assessments. Warwick pointed out that:

...I have in my hand this summary showing me very clearly what are the skills and knowledge required to meet that performance criteria (W, 1:6).

This summary will assist in the design of sessions, as the teacher knows exactly what needs to be covered. On the other hand, in the design of assessments, the DHM assists teachers not to forget employability skills, as they are also part of the structure, as Garry asserted:
The DHM may have an impact, in a way, in fact, to the structure of assessment. To make sure that assessments, in actual fact, are really embodying the employability skills particularly. Because what we are looking for is an outcome to get job (G, 1:11).

While Garry referred to the impact of the DHM on the structure of assessment, Gloria referred to its impact on the structure of teaching sessions, as follows:

DHM makes a difference and the difference is that DHM makes you focus on the planning and, in particular, makes you focus on the structure of your teaching sessions (G, 1:36).

Both the advent of Training Packages as well as employability skills have transformed the structure of the teaching sessions in such a way that these skills needed to be incorporated in the teaching and assessment plans. By using the DHM approach, as data has revealed, VET teachers are able to manage and design with a positive impact on such structure for their sessions.

9.4.3 Delivery

In terms of delivery, based on the DHM, it is a question of whether students are to be made aware of the DHM or not. Regarding student awareness of DHM approach and structure, Garry has pointed out that when students are involved in the DHM approach, it would tell them what the expectations are which, according to him, is important. In his own words, he pointed out that:

If the students use this, as well, then obviously it defines for the students more clearly what, in actual fact, the expectations are (G, 1:18).

However, to ensure that the students will benefit from the DHM, this participating teacher supports that the DHM be given to students as a guide as to how they need to go about their learning:

So that more in the point of view of giving me a guide to the students, to say right, you do this, and this is the path you’re going to take (G, 1:16).

According to this participant, the teacher can share the completed template with the students during teaching in that session. In other words, the students know what they are going to produce because they see all the relevant components to this session summarized and linked on the DHM template. He further commented that because students always say, “well what’re you asking me to do?” and, in response, I would
then tell them, “What we want you to do, this is the strategy; it is how we want you to go about it” (G, 1:16).

The second issue that was revealed was the awareness of students about learning using DHM. Harry supports this awareness that Garry has referred to. He referred to the point that, in the delivery and management of teaching, the learner’s awareness and knowledge of the competency development process is crucial. This participant elaborated as follows:

The learners need to be aware that they are involved in the process of competency development right from the start. In other words, they must be told that the process of learning involves competency development process which, at its core, is first heuristic represented by the Skills Matrix, that they are required to understand the process and apply the required components as specified by the teacher in this task or assessment. (H, 1:27)

In the same vein, Garry elaborated that:

Then, they will understand that where they are going and what are expected from them often (G, 1:35).

And he further added that, “…then I think it is a useful guide for students as to what the expectations are”. (G, 1:18).

The data has also revealed that when the teacher is focusing on the teaching aspect of delivery, then the DHM has to be mapped on that basis. In this regard, Garry pointed out that:

Okay, again, if you’re thinking from the teaching point of view rather than assessing point of view, I say what it is going to do is to focus your attention on the methods and the materials in the practical exercises that you are going to deliver (G, 1:31).

In this way, the DHM template needs to be prepared in accordance with the management of teaching delivery, Garry explained that: “I don’t know if you want to have another, another one, …’managing the teaching’ ” (G, 1:16) and that: “then they would have DHM with teaching strategies”. (G, 1:17)

The data has revealed that the delivery approach on the basis of an integrated double heuristic method offered by the DHM has been identified by participants to make a significant contribution to the learning of the mechanism of VET delivery.
Hence, the data revealed that there is not anything like the DHM in vocational education and training. On this basis, the participants have emphasised that it is a necessity that the DHM be included in the training of new teachers as follows:

I recommend the DHM to all beginning teachers. All new teachers who are coming in should be trained in the DHM way because what the DHM does as I said before instead of learning 70 or 80 percent and producing a 70 to 80 percent correct product, they will learn and produce a 99% correct product. Because they will look at all these things and will start with DHM on the basis of what is right. So, it is a pro-forma for the beginning teachers”. (P, 1:9)

Patrick further emphasised this point, when he was asked to response to the question: ‘Do you think it will assist teachers in their learning as well assessment?’ He then elaborated as follows:

Yes it does, the DHM helps you to learn, again as an experienced teacher I have learned the subject and everything stays in your mind when you have done it a number of times. But as the beginning teacher what I found, when I started off I have to learn all the theory again. You virtually have to learn the theory because you have forgotten (P, 1:9).

He emphasised, further, that:

I think as an experienced teacher that the DHM would help the beginning teacher be more proficient earlier than he would if he never had this. I think that the DHM would have a good prospect (P, 1:11).

It is the views of the experienced teachers in this research that the DHM is a solid foundation for the wider teaching profession as a whole who have recommended it to help those entering the teaching profession. This research strongly argues that the knowledge and the practicability of the DHM Model framed by the Applied Learning theory of Competencivism goes far beyond the VET context into and across all spheres of teaching profession from schools, whether elementary or secondary, to higher education arena in Australia and globally.

9.5 Conclusion

The synthesising role of the DHM emerged from the data, where the DHM is seen as an holistic framework for planning and implementation in the VET sector. The configuration of these component parts, as seen in the DHM structure, enables
teachers to see the structure of what is defined as competency. As is evident in this chapter, the data has revealed that competency structure is comprised of its component parts of required knowledge, variables, employability skills, required skills and performance criteria, and the substructure of the DHM facilitates and ensures the achievement of such.

The data has also indicated that these component parts are related to one another as central to the DHM both as a frame and within its substructure. Further revelations from data have indicated that the DHM in its interconnectedness of the component parts bring synthesis, clarity and meaning to understanding of competency and competency development.

The participants recognize that the DHM brings collective meaning to what would otherwise be a number of individual parts in isolation. VET practitioners have perceived the DHM as meaningful, in synthesising the component parts of the competencies at the levels of design, delivery and assessment.

These revelations have indicated that it is not sufficient and effective to know, to teach or to learn these disparate parts individually, because the competency is an integrated phenomenon that is bigger than the sum of its component parts. When teaching the competency units, one must see and understand these components parts as an integrated structure to make sense of competency. The configuration of these component parts in the DHM structure enables teachers through synthesis to grasp the meaning of competency as an holistic phenomenon. Having grasped this understanding enables teachers to plan, design and deliver in a clear, efficient and meaningful way.
CHAPTER 10: THE THEORY OF PROGRESSIVE REVELATION OF PEDAGOGICAL ENGAGEMENT

10.1 Introduction

The aim of this research was to investigate how teachers in Vocational Education and Training (VET) in Australia deal with the Double Heuristic Method (DHM) as an alternative model for teaching in the VET Sector. This thesis concludes by synthesizing propositions to generate a substantive theory of pedagogy that underpins VET teaching using the DHM as a framework.

In the 1980s, the United Kingdom was the first European country that embraced competency-based training (CBT), followed by Germany and France. The UK adopted a functional approach to CBT, while Germany and France pursued a holistic approach. Like the UK, the Australian VET system pursued the functional approach to CBT, and has faced continuous challenges in the implementation of its Training Packages since 1996.

The shift to competency-based training in Australia fundamentally required a fundamental change in delivery of VET programs. As a result, the Australian Government introduced a comprehensive reform agenda including Training Packages as the new national curricula. The Training Packages were a national initiative for the implementation of competency-based training in Australia.

The Training Packages had a unique structure, and were comprised of the Units of Competency instead of subject modules. These Units of Competency determined the required knowledge, essential skills and performance criteria instead of content topics and learning outcomes that were customary in traditional curricula. Teachers were required to integrate these components in a holistic way for the delivery of their courses and to enable students to demonstrate competency in the field.

Despite the introduction of a new curriculum model, VET teachers had little training on how to deliver the units of competency and this led to pedagogical challenges for many teachers. In such an environment of pedagogical confusion, the Double Heuristic Method (DHM) was introduced to address some of these anomalies and to
facilitate the integration of the unit component parts into a holistic program of delivery.

In a context where teachers, who are working in the VET context, have faced continuous challenges throughout the implementation of the Training Packages since 1996, the research reported in this thesis examined how teachers have used the DHM to deliver programs designed to result in competency development. As teachers faced what was deemed to be a significant set of challenges in the Australian landscape, it was important, indeed necessary, to undertake a study of this type to investigate just how VET teachers in Australia were dealing with curriculum reform and the requirement for new forms of pedagogical engagement with students within the discourse of CBT. The study adopted a qualitative method to investigate the perspectives of the VET teachers to gain insights into how they have dealt with the challenges of VET delivery.

This inquiry was designed within an interpretive paradigm in seeking to capture VET teachers’ perspectives on adopting the DHM as an innovative model of pedagogical engagement that addresses the many dilemmas that surrounded the implementation of curriculum reform in the VET sector in Australia. Central to the research question is the investigation of how teachers deal with this alternative model of teaching, the DHM, from their own frame of reference and in one particular context.

Qualitative methods have been used for data collection and analysis. The primary sources of data collection were semi-structured interviews. To generate a substantive theory the data analysis was based on the principles of grounded theory as outlined in the work of Strauss and Corbin (1990). In pursuing this approach to methodology in the two years of data collection and analysis three types of coding: open coding, axial coding and selective coding, were utilised.

As the Double Heuristic Method is a relatively new approach in vocational education in Australia, there has not been any prior research in this area. Hence, this research contributes to developing new insights into teachers’ perspectives and responses to this new approach of the Double Heuristic Method in teaching the Units of Competency of the Training Packages in one VET context in Australia.
10.2 Discussion

As discussed in Chapter 2, the advent of Training Packages has been regarded as a revolution in VET education in Australia. Training Packages in Australia required the teaching of a number of Units of Competency that have replaced subject modules. Each Unit of Competency consists of a statement of required knowledge, a suite of skills to be developed, as well as performance criteria against which demonstrated outcomes will be assessed. No pedagogical method has been advocated through the curriculum reform process, neither any directive as to how the range of knowledge and skills are to be integrated into re-conceptualised teaching practices, underpinned by performance criteria. The Training Packages lack a theoretical and conceptual framework that supports the necessary pedagogies for competency development. Teaching staff are ostensibly positioned in a pedagogical void.

The so-called revolution in VET education has created a paradigm shift in teaching and learning and, with it, a host of misunderstandings that have been referred to in this research as pedagogical perplexities. The confusion arose when the teachers could not make sense of the segmented parts of the VET curriculum that need to be integrated into a holistic teaching experience. Three main areas of pedagogical confusion were identified at the outset:

a. Misunderstandings about competency-based training and its embodiment in Training Packages;
b. Confusion between the specification of competence contained in Training Packages, the curriculum, its delivery and resources to support teaching and learning; and
c. Confusion between curriculum and the methods of teaching (pedagogy). (Schofield and McDonald 2004:26)

This research was designed to address the pedagogical confusions in VET delivery through the use of the DHM, with a view to bringing clarity to VET teaching, assessment, and delivery. The data analysis, shaped by the principles of grounded theory (Strauss and Corbin, 1990, O’Donoghue, 2007), led to the development of the substantive theory: the Theory of Progressive Revelation of Pedagogical Engagement (PROPE). The substantive theory was built from the propositions that were elicited throughout the data analysis. Implicit within the theory and the propositions are three
key revelations, namely, synthesizing phases, clarifying phases and confirmatory phases of pedagogical planning and delivery that ensure quality learning experiences and pedagogical meaning making for both teachers and students. It is evident that in order to address pedagogical confusion that underpins the reformed VET curriculum, a theoretical and conceptual framework is required. In this case the DHM has been mooted as an appropriate scaffold.

The graphic below, Figure 10.1, captures the shape of the DHM design, as the ‘rich picture’ that depicts the relationships of these components necessary for pedagogical understanding and clarity to support VET teachers’ planning and implementation, shifting them from a position of pedagogical confusion to one of clarity.

In using the DHM, VET teachers have been able to see more clearly how competency is constructed and how it can be realised through systematic pedagogical planning, implementation and assessment. It has been found, that this in turn will enhance their pedagogical practice of delivery, simplify the complexity and solidify teaching to ensure quality learning outcomes for students.

Figure 10.1: The DHM and clarity outcome
Throughout the entire process of implementation of the DHM, and as progressive pedagogical revelations unfolded, it became evident that the mandated knowledge and skills were addressed in a systematic manner, which had previously been impossible. The knowledge and skills that were inherent in the teaching of competency were dealt with overtly as the teachers advanced through the various stages of the entire process.

However the move from confusion to clarity is more complex than the model suggests. As the participants of this study implemented the DHM, it became evident that a series of pedagogical modifications occurred in and throughout their planning and teaching practices. The progressive changes in teaching unfolded differently for each participant, but it was evident in the analysis that the dynamics of working with the DHM can be characterized as a series of pedagogical revelations as depicted in Figure 10.2. A more comprehensive analysis of the dynamics of the theory follows below.
Figure 10.2: Theory of Progressive Revelation of Pedagogical Engagement (PROPE)
The process of ‘Comprehending the structure’, as depicted on the right side of the diagram, occurs at the outset of the planning process when the DHM template is introduced. The manner in which the First and Second Heuristic interact is explained to teachers as a useful structure on which to build pedagogical engagement.

After comprehending the structure, teachers took up the planning through the use of the DHM. This was described fully in Chapter 5. As the process of pedagogical meaning making unfolded, the “big picture” was conceptualised, the template was complete and teachers comprehended the use and purposes of the DHM. The progressive revelations were evident as teaching, learning and assessment unfolded through the scaffold of the DHM. The move towards the emerging “picture” through planning provided opportunities to clarify and confirm teaching, strategies, assessment tasks and pedagogical engagement. The “unfolding” process was portrayed as the interaction between a process of progressive revelation and the process of pedagogical meaning making.

It was this set of interactions that contributed to a more lucid pedagogical understanding of VET delivery. This, in turn, resulted in deeper understanding of competency development through clarification and a more mature confirmation of teachers’ work. Without this interaction, the understanding and the meaning making of VET pedagogy is tenuous. Thus, participants, in seeing the full ‘picture’, grasped the meaning of VET delivery in the context of CBT; they comprehended the true sense of the unit’s application in the Training Packages context; they were able to clarify the confusion; and they confirmed their practice of delivery as VET teachers.

This complex process of moving from confusion to clarity using the DHM, through a series of pedagogical revelations and achieving a comprehensive understanding in relation to teaching competency in the VET sector, has been generated through the data analysis and is referred to as the Theory of Progressive Revelations of Pedagogical Engagement (PROPE).

10.3 Recommendation for practice

The new substantive theory of Progressive Revelations of Pedagogical Engagement (PROPE) implies new practices for the VET sector. These are outlined below:
1. There is a need for a complete pedagogical revisioning and understanding of the delivery of programs that develop competence based on the theory of Progressive Revelations of Pedagogical Engagement (PROPE)

2. There is a need for developing greater clarity for teachers and students in engaging with the inter-relationships of the components in Units of Competency of the Training Packages, through the use of a pedagogical framework, namely the DHM

3. There is a need for holistic assessments in Training Packages context where the knowledge, skills and performance criteria are holistically tested and marked. The DHM allows this to happen.

4. Teaching, learning and assessment in the VET sector require a solid theoretical framework and vehicle to equip teachers. The DHM fulfils this need.

10.4 Recommendations for Future Research

While this case study has a relatively small number of participants, the development of the substantive theory has provided deep insights into how teachers can move from pedagogical confusion to clarity if the appropriate pedagogical framework is provided. Further, it is clear that all VET teachers pedagogically engage in the context of competency-based Training Packages in differing ways. What is significant is that the DHM provides a scaffold for teachers to move through phases of certainty and uncertainty as they clarify, confirm and synthesise their pedagogical approach to teaching and learning in relation to competency-based Training Packages.

Whether this process of meaning making is replicated in other contexts is yet to be determined. This could be realised through a larger study, across a set of highly differentiated learning environments within the VET sector. However it is of significance that this study has provided very rich data that supports the generation of a substantive theory of Progressive Revelation of Pedagogical Engagement based on three sound theoretical propositions. This study provides a number of possibilities for further research in vocational education as follows.

1. As this study was limited in the number of participants who agreed to take part in the research, it is recommended that a larger study, across
a set of highly differentiated learning environment be conducted on a greater scale. This type of research would also enable the more extensive testing of the validity and reliability of four premises of Competencivism: Premise 1: certainty, Premise 2: independency, Premise 3: currency and Premise 4: intelligence.

2. Similar to earlier studies, the DHM has wider applicability in various educational environments and contexts. The study should be replicated across contexts in Australia as well as in various countries in the Asian region, Europe, the UK and the US.

The aim of this research was to investigate how teachers in Vocational Education and Training (VET) in Australia deal with the Double Heuristic Method (DHM) as an alternative model for teaching in the VET Sector. The research was imperative due to a shift to competency-based training in Australia fundamentally required fundamental change in delivery of VET programs. As a result, the Australian Government introduced a comprehensive reform agenda including Training Packages as the new national curricula. The Training Packages were a national initiative for the implementation of competency-based training in Australia. Curriculum reform of this type, while designed to enhance the quality of learning, it is clearly evident that such reform has been problematic on many fronts, despite ongoing policy development. This research was designed to address the pedagogical confusions in VET delivery through the use of the DHM, with a view to bringing clarity to VET teaching, assessment, and delivery.

This thesis concludes by synthesizing propositions to generate a substantive theory of pedagogy that underpins VET teaching using the DHM as a framework. From the analysis of the data, three propositions became evident namely:

1. In the context of Training Packages, teachers see the Double Heuristic Method (DHM) as a clarifying approach for VET delivery in Australia. The Double Heuristic Method is seen to clarify the multi-faceted relationships of many and varied components, in the delivery of CBT that is central to the Training Packages that VET teachers are delivering to their students.

2. There is a strong conviction amongst participating teachers that, by using the DHM, they are able to confirm the practices in which they engage. In such a context, they see the DHM approach playing a confirmatory role in strengthening and maintaining their confidence,
confirming that what they are doing is right and that they are on the right track to ensuring that the requirements of Training Packages and AQTF are met.

3. Teachers see the Double Heuristic Method (DHM) as a meaning-making apparatus with a synthesising role for VET delivery in Australia. This gives the teaching of competency a structure, an approach and a clear construct, in order to enable the integration of the component parts in a pedagogically meaningful way. Teachers, in using the DHM, engage in a number of processes, namely: *seeing the picture, seeing the structure,* and *VET delivery planning.*

In closing it has become evident, as a result of this study, that the theory of Progressive Revelation of Pedagogical Engagement (PROPE), based on the perspectives of the participants in this study, facilitates a revisioning of competency delivery and a re-engineering of Units of Competency. In adopted the DHM, VET teachers are able to see more clearly how competency is constructed and how it can be realised through systematic pedagogical planning, implementation and assessment. This in turn, has enhanced their pedagogical practice of delivery, clarifying and confirming the complexity teaching to ensure quality outcomes. It has been shown that the DHM becomes a powerful tool for addressing what has been problematic in the delivery of VET programs for some time, including the reshaping of design, implementation and assessment through an holistic approach and a necessary integration of the component parts that brings meaning and greater effectiveness to pedagogy and student learning. This process, it has become clear, reflects the theory of Progressive Revelation of Pedagogical Engagement. Such a theory makes a significant contribution to the theorizing of VET programs and the reconfiguring of the pedagogical framework required to ensure quality learning and the successful development of competency for and teachers and learners within the vocational training sector in Australia.
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APPENDIX A: PROFESSIONAL DEVELOPMENT PROGRAM
ON DOUBLE HEURISTIC METHOD (DHM)

Professional Development Program on the Double Heuristic Method (DHM)

An Alternative Pedagogical Model For Teaching In The Context of Competency-based Training Packages

This work has been produced based on the PhD research study at the University of Adelaide titled:

“The Double Heuristic Method: Perspectives on how teachers deal with an alternative model for teaching in the VET Sector”.

By: Homi Azemikhah
Preface

In 2004, the High Level Review (HLR) warned us that, “Competence (and therefore competency-based training and assessment) appears on the surface to be a deceptively simple concept but, theoretically, and in practice, that simplicity melts away to reveal conceptual complexity” (Schofield & McDonald & ANTA, 2004a:16). In 2005, to respond to the HLR call to deal with such complexity, Azemikhah introduced an approach titled, “Double Heuristic Method (DHM)” for the integration of skills into VET teaching practices in the context of Training Packages.

With the advent of Employability Skills, and the requirement that these skills also need to be integrated into the teaching, learning and assessment (Allen Consulting Group, 2006), the use of the DHM and the skills matrix has become more important (Azemikhah 2008). According to a recent report by Allen Consulting Group on Employability Skills (Allen Consulting Group, 2006), teaching, learning and assessment in VET depend on how successfully this integration is achieved. Clearly, the DHM as an integration tool is the means to successfully achieve such an outcome.

Competency-based Training Packages require a comprehensive pedagogical approach which integrates Required Knowledge, Required Skills, Performance Criteria and, recently, the Employability Skills into practice. This professional development program is designed to introduce the much-needed pedagogical approach to assist you (teachers and trainers) in the delivery of courses to meet your needs in the current VET environment.

Learning outcomes

As a result of completing this Professional Development you will be able to:

- Identify constituents of competence as incorporated in the Units of Competency
- Improve the quality of your training and assessment, as per AQTF 2008 (Continuous improvement)
- Analyse competence
- Draw Competency Diagrams for integration
- Use a Relational Model of Pedagogy for Training Packages
Identify the relevant Employability Skills and Required Skills for Units of Competency

Integrate both ES and RS in both delivery and assessment using the Double Heuristic Method

Set a number of assessments for each Unit of Competency

Background
This professional development program is the product of a PhD project to establish a pedagogical approach for the teaching of the Units of Competency in the Training Packages context by integrating the Required Knowledge, the Required Skills and Employability Skills to Performance Criteria as prescribed by the Units of Competency of the Training Packages. This new pedagogical approach, titled the Double Heuristic Method (DHM), has been designed on the basis of the orientation taken by the High Level Review and endorsed by the recent VET reports, and meets the pedagogical needs of VET to comply with the comprehensive integration requirements demanded by Training Packages, AQTF (2007), and Employability Skills.

The DHM approach is an integrated model that facilitates both understanding and implementation of these requirements (Training Packages, AQTF, and Employability Skills). This is a pedagogical approach for the teaching and assessment of competence in the context of VET Training Packages.

Audience and purpose
This professional development program is designed to be used by the participant teachers and trainers in the research project. The purpose of the program is to acquaint the participants with the intricacies vouchsafed by these new policies on integrated competency development for teaching and assessment. The program then aims to simplify these intricacies by clarifying the up-to-date knowledge in these areas.

The purpose of the program is to present the DHM approach by way of illustrations. It will help the participants, through simple examples, to apply the method in the delivery and assessment of their own units.
Your perspectives will be sought on the model as to its suitability for teaching in the VET Training Packages context.

**Intended use of the Professional Development program**

You are encouraged to review this Professional Development program for discussion, as well as for use at the workshop provided. You are also encouraged to use it later when applying it to the Unit of Competency of your choice.

**Introduction**

You are aware that learners (your students), in developing their competency, need to go through a learning process while you, as the teacher, are facilitating and monitoring their development of competence. In other words, you are aware that you are helping your students to gradually be able to arrive at the point where they can demonstrate their competency by successfully completing the required assessments. Therefore, in the Training Packages context, you are dealing with the concept of competence and relating it daily to your students’ progress in your practice. For this reason, the professional development program starts with the definition of competence adopted in this approach.

You are also aware that, from the point when the students enroll to the point when they are deemed as competent, they are going through a competency development process. While studying, the students are either ‘on the job’ or ‘off the job’. The Model of Pedagogy for the Training Packages, explained later, illustrates both ‘on the job’ and ‘off the job’ contexts.

In addition, when as a teacher, you are designing the assessments or sessions, you are continuously to be informed by the requirements of Units of Competency, as well as the AQTF and the Employability Skills. The Double Heuristic Method (DHM) is designed to assist you to meet these needs. You are also aware of the DEST publications and in particular the following requirement extracted from the Training Package Development Handbook Guidelines: “Competency based assessment assumes that each of the performance criteria in a unit will be covered in an integrated way” (NSSC, 2011:27). NSSC (2011:27) further elaborates that, “this will avoid
assessment which treats performance criteria as separate, discrete functions dealt with through an inappropriate ‘checklist’ approach.” Hence, the practical application of Double Heuristic Method which is the integrated approach to both learning and assessment processes satisfies this important requirement.

**Competency-based training**

During the late 1980s, the Australian Government identified that for Australia to achieve its goals of macroeconomic reforms, the Australian workforce would need to become much more competitive by improving its flexibility and adaptability at the global level (Dawkins, 1988). Billett (1999:1) asserts that “Competency Based Training (CBT) was selected by government to secure these goals and became linked with this economic reform movement.” As Smith and Keating (2003:121) argue, “CBT became the foundation stone of the training reform in Australia.” In1989, a decision to implement a uniform national CBT approach to VET (Billett 1999:4) was made by the Ministers to embark on the adoption and the implementation of the competency-based training system in Australia, and the establishment of the National Training Board (NTB) (Smith 1999:107) for the development of competency standards.

**Training Packages**

In 1996, Australia introduced competency-based Training Packages that replaced VET curricula (Smith and Keating 2003). As Training Packages were regarded as the basis of VET curriculum, they were designed to “make training more flexible, accessible and relevant to industry” (ANTA 1996. cited in Smith and Keating, 2003:147). Training Packages are comprised of Units of Competency (competency standards). They contain specific instructions to package a number of qualifications, as specified. “Training Packages also include details on assessment and, in support materials (formerly called ‘non-endorsed components’) learner guides, resources for teachers” (Smith and Keating 2003:147). Training Packages are considered as "tools of practice" (Schofield & McDonald & ANTA, 2004a:27).
Australian Quality Training Framework (AQTF) 2007

Under the AQTF, 2007, Registered Training Organizations (RTOs) are to meet national standards by focusing on industry requirements, ensuring clients’ needs are met, and continuously improving their system to achieve quality outcomes (Australian Government AQTF, 2007a).

On this basis, AQTF 2007 has provided a national framework for meeting these requirements. Organizations seeking recognition as RTOs must satisfy the “Essential Standards”. In addition, an RTO may achieve recognition as a quality committed RTO or an outstanding RTO, by meeting the “Excellence Criteria” of the framework. However, assessment under “Excellence Criteria” is voluntary. “Essential Standard 1” focuses on how the RTO should provide quality training and assessment (Australian Government, 2007c). These requirements suggest that RTOs must move between quality and excellence to continue their operation as an RTO.

Essential “Standard 1” is comprised of 5 elements. Element 1 refers to the point that RTOs collect, analyze and act on relevant data for continuous improvement of quality training and assessment. The current focus on quality, referred to in this paper, dates back to the 1980s, despite a literature that dates back to the 1940s. In Australia, “during the 1980s, an increasing commitment emerged in the commercial and industrial sector to developing and delivering quality” (Muller and Funnell, 1991:3) that led to the emergence of Total Quality Management (TQM). Given that in vocational education measures of quality can be derived from input as well as output, the question that needs to be answered is what quality really means in the context of vocational education, particularly in relation to learning, assessment and pedagogy. Muller and Funnell (1991) have pointed out that quality in education denotes effectiveness. Further, they elaborate that effectiveness is concerned with outcomes that are in line with the needs and demands of clients, i.e., the learners as well as employers (Muller and Funnell, 1991). This suggests that quality teaching and learning may be synonymous with ‘effective teaching and learning’. Thus, for teaching and learning to be effective in the VET sector, one has to more clearly define the concept of “competence”, in terms of quality indicators or issues.
The Definition of Competence in this research

Current research (Azemikhah 2005a, 2005b, 2007), albeit in different papers, has argued that competence, as the pivotal concept, is central to the context of quality teaching, learning and assessment in the VET sector. Firstly, competence has been clearly defined as a preferred set of assets that results from learning. This is recognized as a quality of the learner in completing vocational education and training.

Clearly, teachers in the VET sector need to facilitate and assess competence as a quality of the learner, while the learners need to develop it. If it is ill-defined as a quality that people must facilitate or develop, it is futile to look for strategies, pedagogies and methods to assist its facilitation or development.

The High Level Review (ANTA, 2004) has not settled on a clear definition of competence as a learner’s quality, but rather has attempted to highlight the significant components of competence in relation to a definition, without clearly defining the term. In other words, competence, as a quality, is not defined and there is no set definition that can be communicated to teachers for facilitation, the result of which has been pedagogical confusion.

The competency development process in this research circles around the definition of competence as a quality of the learner. This research argues that until competence is clearly defined, the whole competency development process will fail to achieve its objective. In other words, without a clear definition of competence, competency development is a farce, because there is no hook that this process can be hung on. There is no foundation that competency development can be built upon. At present, the question that needs to be answered is: what definition of competence is the basis upon which the learner is developing his/her competence, and what definition of competence is the VET practitioner’s facilitation based upon? It is important that the definition of the competence that the learner is developing and that the teacher is facilitating is very clear for the development or facilitation process to take place effectively. In addition, the learner is going to be assessed eventually by the facilitator. The assessor’s judgement concerns whether the learner is competent and has acquired competency on the basis of the definition. If there in no definition informing the assessor’s judgement, then the assessment result is in question, as there is no sound theoretical basis for the assessment. And if it is not known which definition of
competence informs the assessor’s judgement as to whether the competency has been attained or not, the assessment result is vague and unclear. Unless these questions for both learners and assessors are answered, the activities around competency development and assessment do not have a clear target to be aimed at. Based on the above arguments, the theoretical framework in this research for teaching and facilitating the development of competence is built on competence as a quality of the learner. This definition of competence is central to understanding and working in the context of this research, as all the methods, approaches and the theory pieces are constructed around this definition.

In 2005, Azemikhah (2005:4) defined competence, in line with the orientation taken by the High Level Review, as: “a quality that needs to be developed by the learners both conceptually and physically. It needs to be conceptually developed in the minds of the learner based on the constituents of competence (underpinnings and attributes), and physically developed and perfected by performance (based on performance criteria) resulting in a balanced hands-and-minds equilibrium.”

This definition is comprised of five components as follows:

1. “A quality that needs to be developed by the learners both conceptually and physically.”

2. It needs to be conceptually developed in the minds of the learner based on the constituents of competence (underpinnings and attributes), and

3. physically developed and

4. Perfected by performance (based on performance criteria)

5. Resulting in a balanced hands-and-minds equilibrium.”

These components are discussed next.

1 - Competence as a ‘Quality’ of the learner

The significance of this definition is that competence is not only an ability or a capacity, but a quality “character and capacity” that the Mayer Committee has used. In addition, “a personal attribute, a trait, a feature of a person’s character, an accomplishment and attainment of a skill” collectively are all constituents of competence. This definition also links the conceptual development, or intellectual
development (the Mind), to physical development (the Hands), that neither of the definitions by the NTB or the Mayer Committee referred to. It also includes the perfecting of methods of action advocated by Dewey (1933).

Therefore, by adopting the definition of competence as a learner quality, we have combined competence as being the sum of a learner’s abilities, capacities, skills and attributes. In other words, a learner’s competence as a learner quality is comprised of all of these constituents, as quoted in Oxford’s definition of the learner’s quality.

2 - Conceptual development of competence (Minds)

Dr. Steven Covey in the “Seven Habits of highly Effective people” has pointed out that every creation needs to be seen in the mind before it happens in reality (Covey 1998). By the same token, every competency needs to be visualised and conceptualised in the mind before its development can be realised physically. For this reason, the definition rests on this significant link between the mind and hands.

By giving recognition to this association of hands and minds, the definition establishes a link between the conceptual development (the Mind) and the physical development (the Hands).

3 – Physical development of competence

The physical development of competence takes place by “doing which takes cognisance of conditions, observes relations of sequence, and which plans and executes in the light of this knowledge” (Dewey, 1933:7). Dewey’s assertions suggest that the “competency development process requires a direction that takes cognizance of prescribed conditions, such as required knowledge, skills and attributes, as specified in the Unit of Competency, as well as observance of the sequence for example in the performance criteria.” (Azemikhah, 2007:2) Hence, the physical development of competence, based on performance criteria, can not take place if the learner has not seen it in his/her mind. The mind map the learner has formed assists the learner to follow through and eventually develop the desired competency. The competencies that are formed in this fashion will remain with the individual learner longer, thus contributing to his/her productivity at work.
4 - Competence needs to be perfected by performance

In addition, this definition supports the argument by Dewey (1933:4) that to secure value in competency, teacher and learner should focus on perfecting of methods of action. In other words, it is based on Dewey’s (1933:4) argument that, “the arts of intelligently directed action are the means by which security of values are to be attained.” Further, in order to secure these values, he asserts that “the chief consideration in achieving concrete security of values lies in the perfecting of methods of action”. According to Dewey (1933:4), it is the perfecting of methods of action that will invest value in competence or competencies which is included in the definition.

5 - Competence must result in a balanced hands and minds equilibrium

The secret to the development of competencies is to maintain constantly a ‘balanced hands and mind equilibrium’. In other words, as the learner performs the tasks referred to in the performance criteria, he or she constantly sees it in the mind through constant monitoring, and maintains an omnipresence of the mind in the competency development process. The learner is alert as he sees himself/herself as the shadow of the facilitator, ensuring that this constant alertness and omnipresence of the mind is maintained at all times throughout the competency development process.
Competency Diagram

As a basis for the definition of competence, a competency diagram is constructed in the form of a ‘V’ representing the Vocational Competence and illustrating the definition as follows:

The above diagram represents the dual processes of Hands and Minds as the competency development process is comprised of the mental reflection process (the Minds), as well as the physical action process (the Hands). These dual processes are simultaneously working to transform the learner and this “transformation relies on individual construction of meaning so that experience and knowledge are in equilibrium” (Stevenson, 2000:509). This suggests a competency diagram comprised of the conceptual element (the minds), the physical element (the hands) and the balancing element (the equilibrium), as well as the two processes of mental reflection and physical action, as illustrated in the next diagram.
The equilibrium, in the above diagram, is the balancing element in the competency diagram controlled by the learner and facilitated by the teacher.

**The inclusion of skills in the diagram**

By including skills such as Generic Skills or Employability Skills that play the most important part in the competence development process, we can bridge these two processes. In Competencivism, the skills form the bridge that integrates the conceptual (minds) and the physical (hands) sides in the competency development process, as illustrated in the following diagram.
The above diagram has been embedded in the Model of Pedagogy for Training Packages that is covered next.

**Relational Model of Pedagogy for Training Packages proposed in this research**

So far we have dealt with the development of vocational competence being comprised of the dual processes of mental reflection (mind) and physical action (hands) that are embedded in the competency developmental process. In other words, the competency development is the dual processes of hands and minds that are simultaneously taking place while the learners are studying the Units of Competency. These dual simultaneous processes are illustrated in the Relational Model of Pedagogy as ‘V’, representing ‘Vocational Competence’. The competency diagram as illustrated in the previous section is embedded in the Relational Model of Pedagogy for Training Packages.

It represents the two environments of learning advocated by the Training Packages, i.e., ‘workplace’ and ‘simulated workplace’. In the simulated workplace, the learners assume themselves as ‘simu-learners’, who are learning in a simulated environment,
while the learners in the workplace assume themselves as ‘worker learners’ who are learning in the real work places. The RMPTP model has introduced the concept of simu-learning in the Training Packages context that includes all the work-related learning that is taking place outside the ambit of workplaces.

Figure 4 – Relational Model of Pedagogy incorporating dual processes of Vocational Competence©.

The presumed relational positions of the processes of learning, teaching, and training, as well as facilitating, are defined in the model. In the RMPTP Model, the learners move away from unemployment (nil competence) positions towards stable positions of competency and employment (individual and collective competence). VET is illustrated in the Model as either the ‘Inner VET’ or the ‘Outer Vet’. The focus of the Inner VET is on Training Packages, while the focus of the outer VET is on courses other than Training Packages. In the remaining part of this section various components of the model are explained.

**Context**

As competencies need to be developed in a context, the shaded areas illustrate the context areas. On this basis, the competencies need to be developed in the context of either a workplace or a simulated workplace. In other words, the relational model of
pedagogy is comprised of two hemispheres. These hemispheres represent, firstly the workplace context and, secondly, the simulated workplace context.

**Vocational competence ‘V’**

The ‘V’ in the model, as was illustrated in the previous section, represents the definition of competence. The significance of embedding the diagrammatical representation of the definition of competence in the Model of Pedagogy is that competence is the pivotal term and the whole of the competency process hinges on this term. Learners are constantly moving towards vocational competence represented as ‘V’ in the model. This model was constructed to illustrate the complexity and interrelationships of many components, and truly illustrates the development of competence in the complex context of VET in Australia that is dominated by the Training Packages structure. However, the model is applicable to VET at a global level.

**Learning process**

The learning process is illustrated in the model as a line. It establishes the relationship between the learner (worker-learner) and knowledge. In other words, the learning process is a process in which the learners are involved in constructing their knowledge of the concepts, as specified in the Unit of Competency or within the field of study in a larger sense. The learning process provides learners with ample opportunities to increase their knowledge while facilitated by their teacher.

**Simu-learning process**

The simu-learning process is also a process that establishes the relationship between a simu-learner and required the knowledge offered. While simu-learners use simulation to develop competency, the knowledge they learn is closely similar to the worker-learners. In other words, both simu-learners and worker learners are learning similar concepts and practices within the Unit of Competency or within their field.
Facilitation process

The facilitation process defines the ways the trainer can make the process of competency development easier for the learner to acquire and engage. It may be regarded as similar to the training process. For this reason, they both are represented by a single line on either side of the teacher’s position in the model. Hence, both approaches are available for utilisation by teachers and trainers.

Training process

The training process involves the worker-learners who are learning on the job while being facilitated in the process. The training for this group is usually based on a contract between the employer and the training organisation. The teachers or trainers who are engaged in the training process have access to the workplace where the worker-learners perform their jobs.

Teaching process

The teaching process is still important, as there are instances that the teachers need to discuss new theories or concepts in a more broad sense for the learners’ understanding of the field. The teaching process provides a deeper level of knowledge for the learners, where both simu-learners and worker-learners are assisted in their competency development process. The items of Required Knowledge are listed in the Unit of Competency. The teaching process involves the transmission of some important and relevant parts of the broad knowledge in the field by various teaching methods. In other words, the teaching process is important, as it contributes to acquisition of relevant knowledge by both simu-learners and worker-learners as the foundation upon which a solid competence can be developed.
Simulated Workplace

As (ANTA, 2003a) asserts, “There are simply not enough suitable workplaces that can provide links with educational institutions” (Chappell & ANTA, 2003:36). This assertion suggests that some learners not only may not have access to workplaces but, in addition, the institutions may not be able to provide a workplace experience for these learners. But, on the other hand Chappell & ANTA, (2003:36)- has established that using Training Packages “work experience, either real or simulated, is almost an obligatory feature”. If work experience, either real or simulated, is almost an obligation under Training Packages requirements, using simulation remains the most appropriate alternative for simu-learners.

Thus, simu-learners require developing their skills in a simulated environment. It would appear that there is a need for a pedagogic tool to be constructed as a vehicle to integrate the three dimensions of competence, utilising a “learner-centered, work-centered and attribute-focused approach. This amounts to a pedagogic tool that has an integrative capability using skills in order to bridge the physical action and mental reflection” (ANTA, 2004a).
Simulation for Training Packages

(Elgood, 2000) asserts that simulation is a title used for training material “that can equally well be described as ‘game’, ‘exercise’, ‘activity’ or ‘structured experience’” (Moy et al., 2000,p.17). The suggested eight possibilities for use in simulation by TAFE NSW are hierarchically arranged, as follows:

- Actual trading businesses operated by TAFE NSW sections
- Simulation activities that provide actual products or services but do not trade
- Simulated businesses, trading in a simulated environment
- Model workplaces
- Technology assisted simulations
- Case study scenarios
- Structured role play of work situations
- Practical tasks

The first three simulation possibilities are more likely to meet the requirements of the Training Packages “where assessment of competence may occur in a workplace or simulated workplace” (Moy et al., 2000,P 17). This research suggests case study scenarios and structured role-play as the best-suited approaches for simu-learners.

Workplace

The workplace is the context in which the worker-learner is engaged to develop his/her competencies. It is an environment in which the learner is facilitated by the trainer and, at the same time, works under supervision in a real world in terms of his/her performance.

Point Of Nil Competence (PONC)

This point in the model represents the theoretical point where the competencies are supposedly at the lowest and not yet formed. It also shows that the individuals are not yet engaged in the competency development process. In this stage, those who are
interested in becoming engaged in learning are in the process of finalising their decisions to become a simu-learner or worker-learner. In other words, they are thinking about whether ‘they can or can not do it’, or whether they will engage in study or not. In this stage, they are not able to satisfy the demands of employment opportunities available to them, and chances of employment are at the lowest level because this point theoretically represents the lowest point on the employment line.

Point Of Expert Competence (POEC)

The point of expert competence is a point in the employable region where the learners are competent and ready to be employed. Learners in the employable region are employable. They are competent in terms of competency and application of employability skills (ES).

Pedagogical Repertoire

Pedagogical repertoire is a reservoir of pedagogical strategies that are available and applicable to the competency development process. A mix of these strategies can be combined to ensure that the competency development process becomes an enjoyable and meaningful process for both the learners and facilitators.

Competencivist Pedagogy

The Competencivist pedagogy, explained later, is used for the development of competencies. This pedagogy is used as a shell, while at the same time other learning theories inform the competency development process. For example, while for the construction of knowledge we may use constructivism, at the same time we must ensure that the integration of the knowledge into performance is maintained, using skills as the bridge or integrative agent.

In Competencivist pedagogy, new knowledge is not only a construction but also develops from the disintegration of old knowledge or old skills.
Of relevance to the VET sector, the integration occurs between knowledge and performance, using skills as the bridge or integrative agents that generate the confluence of existing knowledge with performance. This process of teaching and learning has been described in previous papers (Azemikhah, 2005b) as the Double Heuristic Method (DHM).

The process of integration, disintegration, reintegration, and yielding of new knowledge is central to learning, pedagogy and assessment.

Employment Line

The Employment Line indicates how employable the learner might be. At the lower end is the point of nil competence where the learners are not employable, while at the upper end, the Employment Line crosses through the ‘Employable’ region where the learners are employable. Learners who are positioned on the ‘Employment Line’ in the ‘Employable’ Region have developed the competencies and the ‘Employability’ skills.
Simu-learner

Simu-learners are the learners who are learning in a simulated workplace context or by use of simulation. They are not employed and, hence, they are still looking for a job, or they may be working, but not in the same field. Hence, their area of work may not be consistent with their field of study.

Worker-learner

Worker-learners are the learners who are employed and are developing their competencies on the job.

Dynamism of the Model

Arrows in the model illustrate and indicate the movements of simu-learners and worker-learners. As they start to develop their competencies, they are moving up towards ‘Vocational Competence’, illustrated by the ‘V’, and towards the ‘Employable Region’. The learners in the model occupy a number of positions. The central position of the learner is the position of control. In other words, the learner in this position controls how he or she is moving towards the ‘Employable Region’, and ‘Vocational Competence’. As the learner moves up towards the ‘Employable Region’, the learner uses his/her own discretion to integrate his/her knowledge to performance using both ‘Required Skills’ and ‘Employability Skills’, as well as attributes, throughout the competency development process. The advent of employability skills supports the learner’s move in his/her upward direction to arrive at the employable region, by integrating these skills in the process of competency development.

Central Position of the Learner

The learner is centred between equilibrium and knowledge in the model. The significance of this position is that the learner is in control to utilize the vocational education system feeding the learner with appropriate support and his own internal process in the development of competence, by maintaining the equilibrium for his/her
own progress. In other words, there are two important major systems that are simultaneously taking place to shape the learners developmental activities. One is the vocational education system feeding the learner with the appropriate knowledge he requires. On the other hand, the learner, being in charge of his/her own development, maintains the equilibrium between conceptual and physical sides using these dual processes.

**Employable region**

The learner, after attainment of competencies, arrives in the ‘Employable Region’. In other words, the learner has now acquired the ‘Required Knowledge’ and is equipped with the Required Skills and Employability Skills (ES) to integrate the Required Knowledge with performance as enunciated and emphasized by the AQTF 2007 and has been transformed into an employable individual who is sought for by employers. Arrival at this region by both simu-learners and worker-learners is the optimum achievement aimed at by Training Packages.

**The Learning Process: Development of Competence and the application of Double Heuristic Method**

VET teachers need to address two pedagogical dimensions of their work. There is the teaching dimension or pedagogy of teaching that requires the integration of knowledge, skills and performance, and there is the assessment dimension that involves the certainty of whether a learner is competent or not.

In terms these two pedagogical dimensions, the Double Heuristic Method (DHM) is used (Azemikhah, 2005b). It is a method for the integration of skills in the context of Units of Competency in the training packages. With the advent of Employability Skills, and the requirement that these skills also need to be integrated into teaching, learning and assessment (Allen Consulting Group, 2006), the use of DHM and the skills matrix has become more important. According to a recent report by Allen Consulting Group on Employability Skills (Allen Consulting Group, 2006), teaching, learning and assessment in VET depend on how successfully this integration is achieved. Before starting to work on DHM, it is important to review the steps to deliver a unit of competence or steps to prepare assessment instruments as follows.
Steps to deliver a Unit of Competence:
1. Take a copy of each Unit of Competence.
2. Highlight the selected items from the Range of Variables, required knowledge and skills
3. Add any additional items to the Range of Variables, implied knowledge, skills as well as any contextualisation
4. Decide on delivery strategies relevant to each each Element for the attainment of competence
5. Ensure all knowledge and skills are being developed during the delivery and all performance criteria are being covered
6. Also list the necessary learning resources, essential equipment
7. Design and plan for the holistic assessment of competence

Steps to prepare assessment instruments based on the DHM:
1. Take a copy of each Unit of Competence
2. Highlight these items: Critical aspects of assessment, Elements, Performance Criteria, Evidence Guide and Range of Variables
3. Ensure to contextualize or add any requirement necessary for contextualization
4. List how, where and when individual performance criterion is assessed as well as holistic achievement of the competence in the Unit of Competency. How achievement of competence will be demonstrated by learners.
5. List any existing instruments to be used as exemplars
6. Utilize the DHM template to develop all the assessments based on the DHM Eight step process
7. Ensure that all aspects of assessment are being covered for the unit or combination of units including the sequence and timing of the assessments or whether each assessment is the first, second, third or the final assessment.
8. Develop all the sessions based on the DHM Eight Step Process to facilitate the learners to be able to be tested as per the set assessments.
The DHM eight step process

The DHM Eight-step process is used for the design and development of programs of study for the Units of Competency of Training Packages comprised of sessions and assessments. These steps are as follows:

1. Setting up the level of difficulty (from simple to complex) to design a session plan and/or an assessment
2. Drawing the first heuristic of DHM
3. Constructing the Skills Matrix
4. Drawing Second Heuristic of DHM
5. Creating Session or Lesson Plan (content) and assessments
6. Repeating step 1 to 5 until all assessments and session plans are completed
7. Constructing the study program for the unit
8. Preparing the Learning guide for the unit

Step 1 –Setting up the level of difficulty in order to design sessions for learning or assessment

According to competency theory, the teacher and assessors are required to facilitate the learners to progress from the ‘Not Yet Competent’ position to ‘competent’ position. Throughout each iteration of competency development, the level of learner’s competence elevates to a higher level until the learners reaches the point of transposition (POT).

However, each iteration requires a well-designed assessment to move the learner further. Throughout this formative stage, the level of difficulty increases as the level of complexity increases. Six levels of simplicity to complexity (STC levels) have been established in this research to illustrate levels of difficulty, as illustrated in Table 1. Therefore, the teachers (assessors) need to design a number of sessions and assessments in the context of the Unit of Competency to accomplish this task.

The teacher may start by designing some sessions and assessments to be used during the course to build the learner’s competence and confidence on the basis of STC levels. In other words, these sessions and/or assessments start from simple to complex levels, i.e., from one to several performance criteria or to full set of performance
criteria in the Unit of Competency. It is also possible to apply the full range of performance criteria from a simple to a complex case.

If there have been some assessments that have been used previously in the unit, it is possible to review and update them in the light of ‘Required Knowledge’, ‘Required Skills’ and ‘Employability Skills’.

It is possible to consult with the texts available in the relevant area and select a number of cases from simple to complex levels. These cases should be contextualized further around the variables or concepts. They may need to be reviewed to add materials to be upgraded for the inclusion of required skills and employability skills. These cases could be based on a single topic or a number of topics.

Although an assessment may be constructed on the levels prescribed in the above table, STC level must increase, at least to a higher level of complexity, for example, level 5 to elevate the learner’s competence to higher level towards the point of transposition (POT). The assessment may be constructed in a number of parts; for example, part A, part B etc. In the following illustration, part C of competency test 1 in the unit FNSACCT407B is used to illustrate this process.

<table>
<thead>
<tr>
<th>Simple to Complex (STC) Levels</th>
<th>Details</th>
<th>Session (S)</th>
<th>Assessment (A)</th>
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<tr>
<td>STC Level 1</td>
<td>Single performance criteria (SPC)</td>
<td>(SPCS)</td>
<td>(SPCA)</td>
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<tr>
<td>STC Level 2</td>
<td>Number of Performance Criteria (NPC)</td>
<td>(NPCS)</td>
<td>(NPCA)</td>
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<td>(SEA)</td>
</tr>
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<td>STC Level 4</td>
<td>Number of Elements (NE)</td>
<td>(NES)</td>
<td>(NEA)</td>
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<tr>
<td>STC Level 5</td>
<td>Entire Unit (U)</td>
<td>(US)</td>
<td>(UA)</td>
</tr>
<tr>
<td>STC Level 6</td>
<td>Cluster of units (CLU)</td>
<td>(CLUS)</td>
<td>CLUA</td>
</tr>
</tbody>
</table>

Table 1 - STC levels

STC levels can be applied to teaching, learning (sessions) and assessment in the Training Packages context using case studies, projects or activities whether on the job or off the job. The case studies, project and activities can be designed at any of the
above STC levels. The following case study from Brown (2007) has been adopted as part C of competency test 1 for the Unit of Competency FNSACCT407A (Financial Services Training Package) is used to illustrate the application of DHM method.

**Illustration of Steps 1 & 2**

You are required to open a new MYOB data file for a Snack Bar and perform the following tasks to produce a Profit and Loss report that represents the financial position of the business for the end of the month:

- Change the business name
- Edit purchases command Centre Preferences
- Enter Purchase transactions for the Snack Bar
- Enter the Purchase of Services
- View the amounts owing to suppliers
- View and adjust your item list
- Enter the order of stock items
- Print purchase orders
- View purchases register
- Record the delivery of items ordered
- View unpaid supplier invoices and due dates
- Record purchase of assets on credit
- Record supplier payment
- Check accuracy of purchases entered
- Set up payments to suppliers using electronic payments
- Enter payments to suppliers using electronic payments
- Check discount entry
- Email remittance advice
- Create Electronic payment data file
- Electronic payment report
- Record delivery of goods on back order
- Process goods returned to supplier
- Check accuracy of data
- Record an overcharge
- Record receipt of refund cheque
- Enter purchase from a supplier without an ABN
- View the Supplier Ledger for the month
- View payables Reconciliation Summary report
- Reconcile Supplier Statements
- View details of GST paid (Cash Basis)
- View details of GST paid (Accrual Basis)
- Display Items list
- View Details of Items purchased
- Print Profit and Loss”
Performance Criteria

The above case study involves a number of performance criteria. Brown (2007) has listed the following performance criteria:

- 2.1 - Input data is collated, coded and classified before processing
- 2.2 - A wide range of cash and credit transactions are processed in both a service and trading environment
- 2.4 - The system outputs is reviewed to verify the accuracy of data input
- 2.5 - Adjustments are made for any detected processing errors
- 3.1 - Any new general ledger accounts, customer, supplier, inventory and fixed asset records are added as required
- 3.2 - Any existing chart of accounts, customer, supplier, inventory and fixed asset records are maintained and updated
- 4.1 - Reports to indicate the financial performance and financial position of the organization are generated
- 4.2 - Reports to meet the GST reporting requirements of the organization are generated
- 4.3 - Reports to ensure that subsidiary ledgers/accounts reconcile with the general ledger are generated
- 5.1 - Regular back-ups of the system are made to ensure against loss or corruption of data

Teachers are required to facilitate the learner’s competency development in the context of the Units of Competency and, in particular, identify the list and sequence of relevant performance criteria. However, the learner, in following this sequence, faces some new terms (variables) as embedded in the text of performance criteria. Each variable may refer to a number of concepts. The teacher needs, in this process, to identify the relevant concepts. In addition, the teacher (facilitator) needs to review the employability skills, as well as the required skills in the context of the assessment, and list these skills. In summary, the teacher is required to construct the following lists:

- The relevant Performance Criteria
- The relevant Variables and Concepts embedded in the text of Performance Criteria and list them
- The relevant Employability Skills
- The relevant Required Skills
The relevant performance criteria

After a case is selected, the case needs to be reviewed in the light of the Unit of Competency to identify which performance criteria are to be performed. As laid down in the above table, the teacher may also identify at which STC level the new assessment might be. For example, this illustration is at STC level 2 and involves a number of performance criteria, as listed above.

The relevant Variables and Concepts

Through a simple review of the performance criteria, the relevant variables can be easily identified. The next step is to review the concepts listed for each variable. The teacher can decide which concepts are important and pertinent to the case at hand. If this is an on-the-job assessment, it may equally apply in those circumstances. The outcome of this process would be a list of variables and the relevant concepts.

In this illustration, the following variables/concepts are relevant:

- T9 - purchase invoices
- T10 - purchase orders
- T19 - purchase and sale of stock
- T22 – Adjustments
- SL1 - accounts receivable
- SL2 - accounts payable
- SL3 – inventory
- SL4 - fixed assets
- R11 - Other reports
- R1 - profit and loss
- O7 – security
- TH1 - on screen help

Employability Skills

Both the Employability Skills and the Required Skills are coded. These codes are then used in the Skills Matrix. The codes used in the first heuristic of DHM, as well as in the skills matrix, are listed as follows.
**Employability skills used in Competency Test 1:**

- **PL1** establishing and maintaining an accounting system
- **PL2** maintaining accounting records for compliance purposes
- **PL3** maintaining systems, records and reporting procedures
- **PL4** processing accounting data and preparing reports
- **PS2** checking the accuracy of calculations
- **PS5** solving discrepancies
- **com1** compiling data and preparing financial statements and ad hoc reports
- **com2** developing and writing reports to specifications
- **TE1** adapting to change in technology and working within ergonomic guidelines

**Required skills**

The codes used in the skills matrix.

**Required skills used in Competency Test 1:**

Skills requirements include:

- **R S1** keyboard skills
- **R S2** computer literacy
- **R S3** numeracy for financial calculations and analysis
- **R S4** proofreading to check details/calculations
- **R S5** reading, interpreting financial statements and reports
R S6  problem solving skills for providing discrepancy solutions
R S7  recording, gathering and classifying financial information

Step 2 – Drawing the First Heuristic of the DHM

The relationship of variables, employability skills, required skills and performance criteria are mapped using the First Heuristic of DHM as follows:
Figure 6 – First Heuristic of DHM for the Unit FNSACCT407B
Step 3 – Constructing Skills Matrix

At step three, after these skills are mapped into the DHM diagram, the Skills Matrix is constructed. The ‘skills matrix’ represents the first heuristic of DHM in a tabular format. An example of such a matrix is provided in Figure 7. This matrix is used in Competency Test 1 in the Unit of Competency: FNSACCT407B at North Brisbane Institute of TAFE (BNIT) in Queensland.
### FNSACCT407B

- Set up and Operate a computerized accounting system

#### Competency Test 1 Part C: Skills Matrix

<table>
<thead>
<tr>
<th>Variables</th>
<th>Employability</th>
<th>Required Skills</th>
<th>Performance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>PL4, PL1</td>
<td></td>
<td>RS1, RS2, RS3, RS7</td>
<td>2.1 - Input data is collated, coded and classified before processing</td>
</tr>
<tr>
<td>T9 - purchase invoices</td>
<td>PL4</td>
<td>RS1, RS2, RS3, RS7</td>
<td>2.2 - A wide range of cash and credit transactions are processed in both a service and trading environment</td>
</tr>
<tr>
<td>T10 - purchase orders</td>
<td></td>
<td>T9, T10, T19</td>
<td></td>
</tr>
<tr>
<td>T19 - purchase and sale of stock</td>
<td>PS2</td>
<td>RS4, RS3</td>
<td>2.4 - The system outputs is reviewed to verify the accuracy of data input</td>
</tr>
<tr>
<td>T22 – Adjustments</td>
<td>PS5</td>
<td>RS6, RS3</td>
<td>2.5 - Adjustments are made for any detected processing errors</td>
</tr>
<tr>
<td>PL4, PL3</td>
<td></td>
<td>SL1, SL2, SL3, SL4</td>
<td>3.1 - Any new general ledger accounts, customer, supplier, inventory and fixed asset records are added as required</td>
</tr>
<tr>
<td>SL1 - accounts receivable</td>
<td></td>
<td>SL1, SL2</td>
<td>3.2 - Any existing chart of accounts, customer, supplier, inventory and fixed asset records are maintained and updated</td>
</tr>
<tr>
<td>SL2 - accounts payable</td>
<td></td>
<td>SL3, SL4</td>
<td></td>
</tr>
<tr>
<td>SL3 – inventory</td>
<td></td>
<td>PL1, PL2, PL3</td>
<td></td>
</tr>
<tr>
<td>SL4 - fixed assets</td>
<td></td>
<td>PL3, PS2</td>
<td></td>
</tr>
<tr>
<td>PL2, PL3</td>
<td></td>
<td>PL3, PS2</td>
<td></td>
</tr>
<tr>
<td>R11 - Other reports</td>
<td>com1</td>
<td>RS1, RS2, RS4, RS5</td>
<td>4.1 - Reports to indicate the financial performance and financial position of the organization are generated</td>
</tr>
<tr>
<td>R1 - profit and loss</td>
<td>com1, com2</td>
<td>RS4, RS7</td>
<td>4.2 - Reports to meet the GST reporting requirements of the organization are generated</td>
</tr>
<tr>
<td>R11 - Other reports</td>
<td></td>
<td>4.3 - Reports to ensure that subsidiary ledgers/accounts reconcile with the general ledger are generated</td>
<td></td>
</tr>
<tr>
<td>R1 - profit and loss</td>
<td></td>
<td>PL3, PS2</td>
<td>4.3 - Reports to ensure that subsidiary ledgers/accounts reconcile with the general ledger are generated</td>
</tr>
<tr>
<td>O7 – security</td>
<td>PL2, TE2</td>
<td>RS2</td>
<td>5.1 - Regular back-ups of the system are made to ensure against loss or corruption of data</td>
</tr>
<tr>
<td>TH1 - on screen help</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 7 – The Skills Matrix – an example
Step 4 – Drawing the Second Heuristic of the DHM

Identifying Required Knowledge

At this stage, it is necessary to identify those items of the required knowledge that are applicable to the case at hand from the available items listed in the Unit of Competency. It is important to review these items and select the most appropriate ones to be listed on the right side of the DHM.

Knowledge requirements include:

RK1  • current relevant legislation and statutory requirements including those relating to occupational health and safety (OH&S)
RK2  • relevant source documents and information contained within source documents
RK3  • principles of double entry accounting
RK4  • principles and practices of accrual accounting
RK5  • organisational procedures and policies relating to maintaining financial records
RK6  • current financial legislation

Identifying relevant principles, professional standards and theories

In this case study, as the Snack Bar needs to produce financial reports, the accounting standards that address the requirements for financial reporting need to be covered in the session plan.

Drawing for teaching and assessment strategies

The teaching and assessment strategies need to be formulated; for example in this unit the following teaching strategies used are brain-storming, lecturing to cover variables and concepts, and hands on practice while supervised by the teacher. The learners are going to set up data files and process the transaction, and produce reports. For the
assessment strategy, simulation case study using computerized accounting system was adopted.

**Formulating focus questions**

Focus questions are designed to facilitate the strategies and to serve the purpose of the Unit of Competency. The focus question, for example, may be how you can utilize the Employability Skills to maximize servicing the purpose of the unit, as listed in the second heuristic.

**Reviewing the description and the purpose of the Unit of Competency.**

The purpose of the Unit of Competency is embedded to remind the learners and emphasize the purpose, focusing on achievement.
Figure 8 – Second Heuristic of DHM
Step 5 – Creating the session or lesson plan

After the Second Heuristic of DHM is completed, it is used to prepare a session plan for teaching of the unit or to ensure that the required assessment is successfully prepared. The teacher needs to ensure that the required knowledge are covered either in early sessions or spread throughout all the sessions. Secondly, depending on the needs of the learner, the teacher may cover the required knowledge and relevant variables and concepts within the principles delineated in the second heuristic. The teacher can vary the case details, such as name, numbers, and addresses etc. but keep the structure of the case intact. Some text books provide a number of cases or problems from simple to complex that can be used in this process. In other words, the second heuristic of the DHM can be used to flexibly create a session plan that can be amended to serve the learner’s needs. The following example, Session 9, is provided from the learners’ guide for the unit FNSACCT407B as an illustration.

Session 9 – Purchases Command Centre –

As Session 9 in this unit, FNSACCT407B, covers Purchases, it is important that the required knowledge in the context of purchases be reviewed and listed. The following table illustrates this matching.

<table>
<thead>
<tr>
<th>Knowledge requirements:</th>
<th>Purchase Command Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>GST Legislation</td>
<td>GST for Purchases</td>
</tr>
<tr>
<td>relevant source documents and information contained within source documents</td>
<td>Purchase Invoice, Purchase order</td>
</tr>
<tr>
<td>principles of double entry accounting</td>
<td>Double Entry for Purchases</td>
</tr>
<tr>
<td>principles and practices of accrual accounting</td>
<td>Accrual Accounting for Purchases</td>
</tr>
<tr>
<td>organisational procedures and policies relating to maintaining financial records</td>
<td>Purchasing procedures and policies</td>
</tr>
<tr>
<td>current financial legislation</td>
<td></td>
</tr>
</tbody>
</table>

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From the above table and, in the light of the relevant performance criteria, the following variables/Concepts are construed:

- purchase invoices
- purchase orders
- purchase and sale of stock
- Adjustments
- accounts receivable subsidiary ledger
- accounts payable subsidiary ledger
- Inventory subsidiary ledger
- fixed assets subsidiary ledger
- Other reports: Electronic Payment reports, Purchase orders
- Profit and Loss
- Security
- On screen help

In addition to Required Skills, the Employability Skills are incorporated in both the learning and assessment processes in this Unit of Competency. Thus, by completing this assessment, the learners have automatically used the skills listed in the Skills Matrix. However, it is important that the learners are aware that they are required to utilize the Required Skills and Employability Skills. This can be achieved by including the Skills Matrix in the assessment, asking members to confirm their awareness and use of these skills by placing a tick mark against each item. This process will place the required emphasis on their awareness and promote ownership of Employability Skills and Required Skills by the learners.

**Step 6 – Repeating step 1 to 5**

The steps 1 to 5 are completed a number of times, until the teacher is satisfied that he/she has covered all the performance criteria and provided the assessment of performance in a number of settings. The teacher may be willing to include one assessment that covers all
the performance criteria in the Unit of Competency. These assessments provide a number of session plans, as each might have included one or more topics for the session.

**Step 7 – Constructing the study program for the unit**

The session plans constructed, as above, form the basis for creating and formulating the program of study for the unit.

**Step 8 – Preparing the Manual of Competency Development (Learners Guide)**

A learners’ guide (manual of competency development) can be easily constructed, as follows:

- Determine the number of sessions based on the content (Required Knowledge)
- Determine topics within the range of Required Knowledge as appropriate, and concepts (variables) for each session
- Determine the timing of each assessment
- Ensure to include at least one holistic, summative assessment covering all the Performance Criteria
- Prepare a tabular presentation of the learning guide
- Prepare explanatory notes for learners
- Include explanation of most variables and concepts covered in each session
- Always leave one or two concepts for the learners to research and learn independently in some areas of the Required Knowledge. Provide guidelines to help the learners in their research.
- Ensure assessment includes a couple of new concepts for the learners to research within the range of the Required Knowledge and write about their findings.
Addendum: Assessment of Competence and the application of Competency Theory to set the number of assessments for each Unit of Competency

As the assessment of competence is an important part of the competency development process it is also important to be able to set the number of assessments for the units to serve the unit purpose. The assessment not only invests value in the competency development process but also invests certainty and confidence in the learner. Assessments of competence are the sign posts that boost learner’s confidence. Arriving at the point of transposition (POT) is the learner’s aim and objective (Azemikhah 2005b) where the learner becomes independent of his/her facilitator and can perform independently of the facilitator by achieving autonomy.

Figure 9 – Competency theory
At the point of transposition (POT), both the facilitator and the learner attain competency certainty that will be discussed later. In other words, by arriving at the point of transposition, both the learner and the assessor are able to attest that the learner has achieved competency. Put simply, the learners achieve competency when they have attained mastery in the Unit of Competency. They are now able to apply performance criteria to new problems or cases independently. The learners are now able to examine new cases, identify, and study new concepts, if any, and using their acquired skills, they can perform in accordance with the requirements of performance criteria of the Unit of Competency independently. At that point, the learners are deemed competent and the relationship of ‘learning to competency’ is transposed into ‘competency to learning’. When competency and learning are transposed, the learner moves from the ‘Not Yet Competent’ position to the ‘Competent’ position. The learner’s level of competency and professionalism elevates to a point where it can take care of his/her learning.

Competency Theory is comprised of two stages, the ‘Not Yet Competent stage’ and the competent stage. As the competency based training is a binary system the learner is either deemed competent or not yet competent.

**Not Yet Competent stage**

This is a stage in which the learner starts to engage in the competency development process in order to reach the point of transposition. During his/her journey from the commencement to the point of transposition (POT), the learner occupies a number of positions. He may become a simu-learner and in this position, continuously develop his/her competency in terms of knowledge, skills and performance, using the DHM in a simulated environment. He or she may also become a worker learner, using the DHM in real workplaces.

During this journey of becoming competent and achieving competency, the learner may go through a number of iterations. Each iteration is illustrated in the competency theory as a circle that is continuously expanding and becoming larger. This denotes the learner is
developing competence and growing independence. As the learner’s level of competency increases, the learner approaches the point of transposition of learning and competency. This is the point at which the learner is deemed competent and certain that he is confident in his competency. The learner’s arrival at this point indicates the completion of the first stage, i.e., the Not Yet Competent stage of competency development. Thus, the learner enters into the competent stage that is covered next.

**Competent Stage**

To be deemed competent, the learner needs to enter into this second stage of competency development. This is the stage in which the learner becomes confident that he/she is competent. In other words, the learner is certain that he/she has achieved the competency of his/her choosing. This is the stage where the learner’s objective is fulfilled and the learner has become independent of the facilitator. At this stage, the learner can function without relying on somebody else. The reliance on the facilitator or coach was a characteristic of the ‘Not Yet Competent’ stage that the learner has now left behind. His/her reliance on himself/herself is a characteristic of this stage and the learner has reached the required certainty that by relying on himself/herself to perform in the required tasks he/she continuously strengthen his/her confidence. In other words, this is the sign that he/she has reached full autonomy and independency in this second stage. However, as professionalism requires a continuous improvement by maintaining the currency of his knowledge and skills, he/she continues his journey by moving towards excellence.