

**THE IMPACT OF COMPETENCE-BASED
ASSESSMENT ON LEARNERS' EMPLOYABILITY:
THE CASE OF VOCATIONAL EDUCATION IN
MALAYSIAN SECONDARY SCHOOLS**

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**The Impact of Competence-based Assessment on
Learners' Employability: The Case of Vocational Education in
Malaysian Secondary Schools**

by

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Special Dedication

In ever loving memory of my mother, Maimunah, who had shown me the strength, courage and patience in enduring hardships in life with hope, perseverance, sincerity and faith in God and thus, inspiring the person I have become today. She was the best mother one could ever ask for and this thesis is especially dedicated to her.

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Abstract

Learners are purportedly able to apply competences attained and acquired in competence-based assessment (CBA) outside the assessment event but this claim has yet to be studied and explained (Tanner, 1997). Thus, this study aimed to investigate the effectiveness of CBA that has been implemented in Malaysian secondary schools since 2002 by Malaysia Examinations Syndicate (MES) in preparing students with adequate and relevant employability skills. The specific aim was to develop instruments and procedures that could be used to predict students' employability.

The literature review instigated competence as the fundamental constituent of employability; the constructive interactions between knowledge and skills which then constitute the operational engagement. To explore this concept, a mixed-methods approach was employed across all 19 schools in the country offering the subject of Basic Interior Decorations (BID), resulting in 320 completed student questionnaires and 19 assessor questionnaires, 76 student interviews and 19 assessor interviews, 93 observations and 190 student portfolio reviews. The questionnaires had been adapted and modified to suit the participants. All the instruments were translated into the Malay language to facilitate responses.

The study showed that students undertaking CBA of BID have developed student engagement that contributed to the development of adequate and necessary employability skills. It identified individual, job-related and organisational factors that influenced students' employability and the dimensions of employability (Organisation Sense, Occupational Expertise, Anticipation & Optimisation, Personal Flexibility and Affective Reactions) that contributed to students' success. Based on the outcomes, this study then proposed Predictive Employability Profile (PEP) to be further explored and developed for future use in predicting students' employability.

Follow up research needs to be carried out on the effectiveness of CBA in Malaysia. The study contributed significantly in proposing a procedure for predicting employability, the PEP, which could be useful for selection at various levels and organisations when it has been fully developed.

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List of Abbreviations

AIP	Assessor Interview Protocol
AQ	Assessor Questionnaire
ARP	Aquaculture and Recreational Pets
BID	Basic Interior Decorations
BOF	Behaviour Observation Form
CAMC	Competency Assessment and Modular Certification
CBA	Competence-based Assessment
GCSE	General Certificate of Secondary Education
GGs	Gerontology and Geriatric Services
HSC	Higher School Certificate
MCDC	Malaysian Curriculum Development Centre
MCE	Malaysian Certificate of Education
MHR	Ministry of Human Resource
MoE	Ministry of Education
MoHE	Ministry of Higher Education
MoW	Ministry of Works
MRRD	Ministry of Rural and Regional Development
NOSS	National Occupational Standards
NVTC	National Vocational Training Council
PEP	Predictive Employability Profile
PGDE	Postgraduate Diploma of Education
SIP	Student's Interview Protocol
SPM	Sijil Pelajaran Malaysia
SQ	Student's Questionnaire
STP	Sijil Tinggi Pelajaran
RAIP	Refined Assessor Interview Protocol
RAQ	Refined Assessor Questionnaire
RBOF	Refined Behaviour Observation Form
RSIP	Refined Student Interview Protocol
RSQ	Refined Student Questionnaire
VET	Vocational Education and Training

Chapter 1

Research Preamble

1.1 Introduction

This chapter summarises the background of this study, the formulation of the research focus and the research questions, and the overall thesis structure. Figure 1.1 shows the structure of this chapter. The subsequent chapters will also illustrate an outline of the chapter content to guide the reader throughout the thesis.

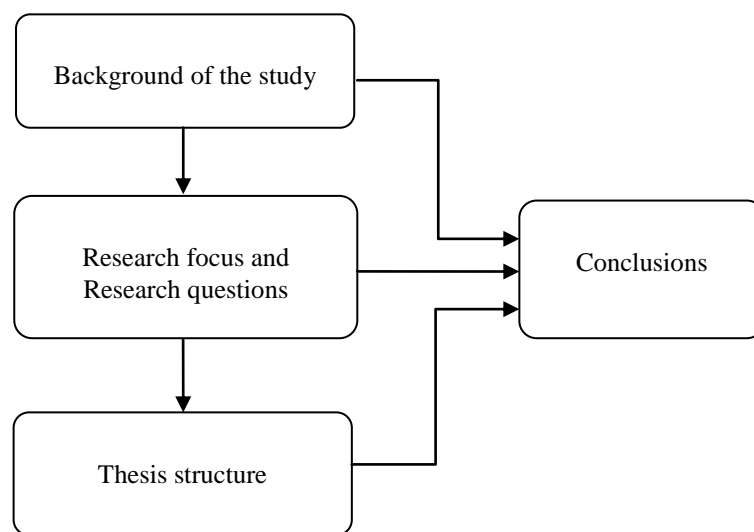


Figure 1.1: Structure of Chapter 1

1.2 Background of the Study

Malaysia is on its journey towards the realisations of Vision 2020; moulding a distinctive developed nation with its own identity and characteristics. Education plays an important role in ensuring the vision is materialised and thus schools have become the learning and training centres to develop intellectual and skilled

individuals who possess positive attitudes to contribute to nation building. This aspiration is outlined in the national education philosophy which reads:

“Education in Malaysia is an on-going effort towards further developing the potential of individuals in a holistic and integrated manner, so as to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonic, based on a firm belief in and devotion to God. Such an effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards and who are responsible and capable of achieving high level of **personal well-being** (emphasis added) as well as being able to contribute to the harmony and betterment of the family, the society and the nation at large”

Ministry of Education Malaysia (n.d.)

In other words, education in Malaysia is being designed to cater for the development of individuals who are not only able to acquire relevant knowledge and skills but also are able to foster virtuous values pertinent to religious belief within themselves. This inner-self development is expected to generate harmonious individuals who could perform well in their undertakings and subsequently are able to contribute to the prosperity of the nation. This philosophy of education is used as the basis for any change in the curriculum or assessment systems in Malaysia.

1.2.1 Vocational Education and Training in Malaysia

Malaysia, like many developed countries in the world, has employed vocational education and training (VET) to focus on generating skilful workforce in the industries. Many ministries such as the Ministry of Human Resource (MHR), Ministry of Rural and Regional Development (MRRD), the Ministry of Works (MoW), Ministry of Higher Education (MoHE) and the Ministry of Education (MoE) have been involved in developing human capital within their jurisdiction. Each ministry has its own vocational curriculum, forms of assessment and even qualifications accredited to its colleges or training institutions (eg. Mara Skills

Development Institute under MRRD, Malaysia Construction Academy under MoW, Community College under MoHE). The MHR on the other hand, does not have these training institutions but has set National Occupational Standards (NOSS) across various occupational areas for its National Vocational Training Council (NVTC) programmes and qualifications at various levels; from basic to professional. Any accredited training institutions undertaking NVTC programmes and qualifications will have to employ NOSS and follow all the required procedures provided. These other ministries basically provide opportunities for school leavers or those who have completed their compulsory education, to experience vocational trainings whereas it is only MoE that provides vocational education and training for upper secondary school students aged 16 to 18 years old.

1.2.2 Introduction of Competence Based Assessment in Malaysia

The national education philosophy, together with current economic and employment demands have informed the introduction of relevant vocational subjects to some Form Four and Form Five students in academic secondary schools by the Ministry of Education since 2002 in addition to the existing vocational subjects offered in the vocational schools. These Form Four and Form Five students are in the final two years of their compulsory education in Malaysia. The implementation of these vocational subjects is the result of cabinet approval on the 23rd June 1999 to offer Industrial Technology subjects based on a memorandum entitled “Expansion of Technical and Vocational Programme”, that had been proposed by the Minister of Education (Lembaga Peperiksaan Malaysia, 2002). The objective is to promote the development of knowledge and skills pertaining to craft work or technology involving electrical wiring, furniture making and other similar areas of work. Moreover, this proposed vocational education and training programme was also designed to further reinforce positive values such as good work ethics, diligence, integrity, tolerance, gratitude and pursuit of excellence (Government of Malaysia, 2001). The knowledge and skills acquired by students in these areas together with the internalised positive attitudes are anticipated to enable them to secure suitable

employment, venture on their own in small scale entrepreneurship and/or extend their training to higher levels. In other words, the aim is to generate skilled and semi-skilled individuals in the technical and vocational fields (LPM, 2002) who will also be able to fulfil the aspiration of the national education philosophy.

Consequently, twenty two vocational subjects in five major industrial areas have been identified and introduced in academic secondary schools in stages from 2002 to 2005. These vocational subjects are the continuum of the Integrated Living Skills subjects which are taught in the lower secondary. The introduction of these vocational subjects in academic secondary schools provides opportunity to the students with technical and vocational inclinations to further enhance their knowledge and skills. Subsequently, they will be prepared for employment or any future undertakings that will enable them to contribute to nation building.

The VET curriculum in these academic secondary schools is modular based; and competence based assessment (CBA) has since been introduced by Lembaga Peperiksaan Malaysia (LPM) - referred to in English as the Malaysia Examinations Syndicate (MES) - with the name of Competency Assessment and Modular Certification (CAMC) as it is considered to be a more comprehensive, effective and practical assessment. The twenty two vocational subjects of five major industry areas that have been identified and introduced in the secondary schools in stages include a few which are absolutely new such as Basic Interior Decorations (BID), Aquaculture and Recreational Pets (ARP) and, Gerontology and Geriatric Services (GGS). The five industry areas are the Construction and Manufacturing, Agrotechnology, Home Economics, Servicing and Computer Applications.

The MoE emphasises the development of human capital as the second strategic thrust in its Education Development Master Plan 2006-2010 (Pelan Induk Pembangunan Pendidikan, PIPP) under the Malaysia's Ninth Plan (MoE, n.d.). The focus is on the development of a competent and employable workforce in various areas by preparing students with adequate knowledge, technical or hard skills, and

soft skills (such as interpersonal, self-presentation and communication skills). CAMC is considered important because it is not too exam oriented but is based on what the employers are looking for in the employees. This thrust to educate people in a more rounded way is consistent with the needs expressed by the Confederation of British Industry (CBI, 2010).

CAMC is believed to suit the needs and demands of a developing country like Malaysia to invest in human capital where it would help equip secondary school students with relevant and useful vocational knowledge and skills (LPM, 2002). In contrast to the present norm-referenced assessment, CAMC is a criterion-referenced assessment where students' performances are measured against a set of pre-determined performance criteria which are also industry-defined competency standards. These specified performance criteria which are made available to both the students and the assessors allow students to know what exactly to achieve in advance and allow the assessors to provide specific feedback that will help students to demonstrate competent performance. Hence, a high degree of transparency within the assessment process is achievable through this criterion-referenced assessment methodology (Canning, 2000). In addition to fulfilling the aspiration of the vocational curriculum, CAMC should be able to reflect students' ability that could be of use or beneficial to them in their future undertakings (LPM, 2002). This includes not only students' job-related skills but also a more comprehensive spectrum of abilities and skills including reasoning and social skills (LPM, 2002). CAMC is one of the preparatory programmes where students would be able to acquire relevant knowledge and skills that meet the industry standards and would also be able to internalise positive and progressive attitudes, values and ethics that are suitable for the needs of the industries (LPM, 2002). Therefore, relevant employers from the industries, people from the vocational training colleges, lecturers and teachers who have relevant knowledge and skills and are familiar with the needs and demands of the labour market in Malaysia were all involved in the setting up of the criteria or competency standards of respective subjects in CAMC. Thus, these competency standards could be used to reflect the minimum requirement of competent

performance expected in relevant industry areas in Malaysia. The implementation of CAMC in Malaysia is discussed in more detail in the following section.

1.2.3 The Implementation of Competency Assessment and Modular Certification (CAMC)

CBA was seen to be the way forward in vocational education and training (VET) because it provides personal and professional learning and development opportunities to students who normally cannot access higher education (Wolf, 1995; Ecclestone, 1996). Programmes such as the National Vocational Qualifications (NVQs) implemented in England appeared to have succeeded in providing opportunities to develop relevant job-related skills and encouraging autonomous and self-directing learning (Canning, 2000). NVQs are, however, considered costly and time consuming in practice due to their detailed and reductionist approach to assessment (Raggart, 1994; Wolf, 1995; Eraut et al., 1996). Another difficulty of NVQs is that the retention and completion rates of students are lower than those in more academic institutions (OFSTED/Audit Commission, 1993). Further, occupational barriers are reinforced as women achieve better in academic qualifications than men (Felstead et al., 1995). On the other hand, CBA, with its modular or unit-based characteristic is believed to be able to shape learners to perform competently in a range of work-related activities with relevant skills, knowledge and understanding required in employment (Training Agency, 1988/9).

Malaysia, like other developed countries in the world, would like to use the ideas of CBA to form vocational qualifications as alternative to academic qualifications to those interested in VET after taking into consideration the advantages and disadvantages of CBA. Hence, CAMC, an adapted and modified CBA model from the UK but with unique features that suit the Malaysian context, was implemented. In conception, CAMC is very much similar to the CBA model implemented in the UK especially the school-based performance assessment (LPM, 2002). The only difference is that CAMC consists of two major forms of assessment; school-based performance assessment and centrally-based written exams. The process of the

school-based performance assessment is basically similar to the NVQ model which includes the development of competence standards for the units of elements or the modules, the gathering of evidence directly or indirectly from various sources available (Wolf, 1995; Ecclestone, 1996; Canning, 2000), the assessment of evidence and the judgment on competence, the quality control device such as the monitoring, moderation, the internal and the external verification, and finally the modular certification (LPM, 2002; Ecclestone, 1996; Wolf, 1995). However, every step of the process in the model of CAMC is designed by the experts in the education and relevant industries in Malaysia to cater for the secondary school students. The adapted assessment and accreditation model in CAMC is as shown in Figure 1.2.

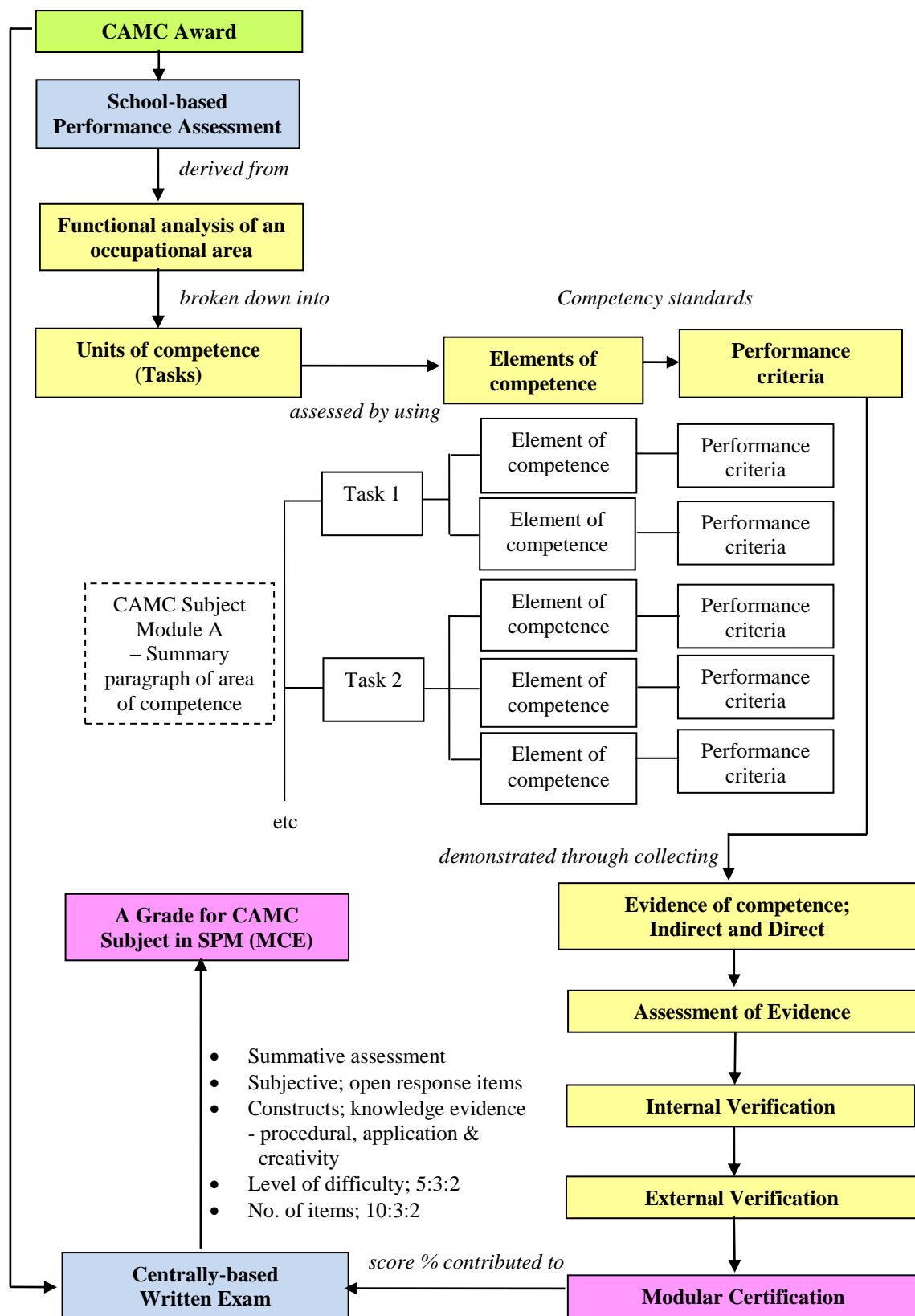


Figure 1.2: Assessment and Accreditation in CAMC

Adapted from: LPM, 2002; Ecclestone, 1996, p. 36; Wolf, 1995, p.19

Students are given sufficient time, space and opportunity to complete school-based performance assessment (LPM, 2002). They have the flexibility in performing tasks according to their readiness regardless of how much time is taken to accomplish the tasks and to demonstrate competence. All of these students are considered competent once they meet the specified criteria set in the competency standards. Assessors gather sufficient direct and indirect evidence of competence to base their judgment of students' competence. The internal and external moderators verify the gathered evidence of competence before modular vocational certificate is awarded to students who have accomplished the assessment modules satisfactorily. This modular certification applies a positive reporting system where only the accomplished assessment modules or skills mastered and no grades are stated in the certificate. Nevertheless, students' mastery of the assessment modules does contribute to the final grade of the CAMC subject for the MCE as the percentile of the accomplished modules is incorporated with the scores of the written exam using a matrix as shown in Figure 1.3. Students have to meet the minimum requirement of 30% of the accomplished assessment modules in the school-based performance assessment in order to be eligible to sit for the centrally-based written exam and to receive a grade for the CAMC subject in the MCE. Nevertheless, students could still receive the modular vocational certificate even when they have accomplished less than 30% of the assessment modules.

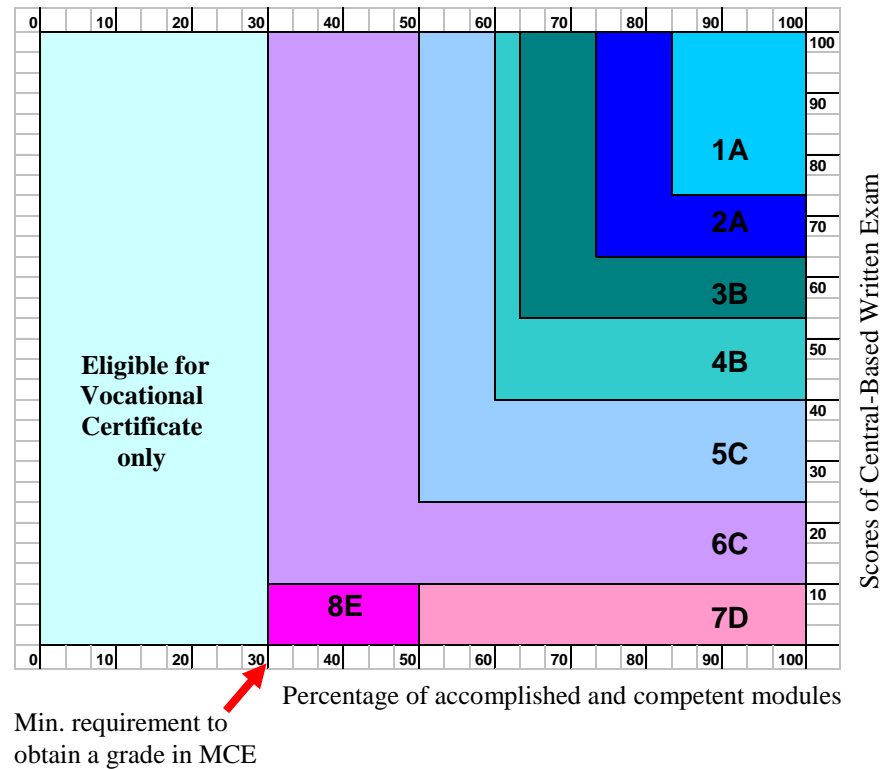


Figure 1.3: Matrix of Grading System for CAMC Subject in MCE Certificate

Source: LPM, 2002, Lampiran 5.

The other piece of evidence of competence in CAMC is students' scores in the centrally-based written exam which is then added to the percentage of the assessment modules accomplished to give a grade for the CAMC subject that will appear on MCE. This centrally-based written exam is a two and a half hour written examination at the Malaysian Certificate of Education (MCE) level and it is conducted by Malaysia Examinations Syndicate. The objective of this assessment is to assess students' knowledge based on their experience in accomplishing the tasks in the modules (LPM, 2002). It is a summative assessment consisting of subjective open response items measuring knowledge and evidence of relevant procedures, applications and creativity (LPM, 2002). It is taken by students at the end of their compulsory education for the MCE. There are 3 sections with 3 different levels of difficulty from low to high at a ratio of 5:3:2, thus the number of items in each section is 10, 3 and 2 (LPM, 2002). The question paper comprises procedural,

situational and experiential items that are very new in the Malaysian context of assessment and are found to be interesting, challenging and stimulating to the item builders as well as to the students. These types of items are believed to be more meaningful than the factual recalling items as they aim to encourage students to think and relate their prior learning in providing appropriate responses. Section A consists of ten procedural items of low difficulty level where students respond by recalling their experiences of doing the tasks in school. Section B comprises three items of medium difficulty level where students have to apply what they have done in school to new situations. Section C contains two items of the high difficulty level where students have to be creative and critical in giving responses. Items are set based on a Test Specification Table to maintain validity. Furthermore, functional graphics are used extensively, that is about fifty percent of the whole paper while coloured graphics are permitted to be used only when necessary. Students will be able to obtain grades ranging from 1A-2A being distinctions, 3B-6C being pass with credit and 7D-8E being pass for the CAMC subject in the MCE. Thus, students receive two certificates; the modular vocational certificate and the MCE with the grades of CAMC subject. Thus, CAMC is designed to suit the Malaysian context in preparing students with relevant knowledge, skills and attitudes that would enable them to be employable in the future. The analytical framework of CAMC is as shown in Figure 1.4 while Table 1.1 describes the characteristics of the model.

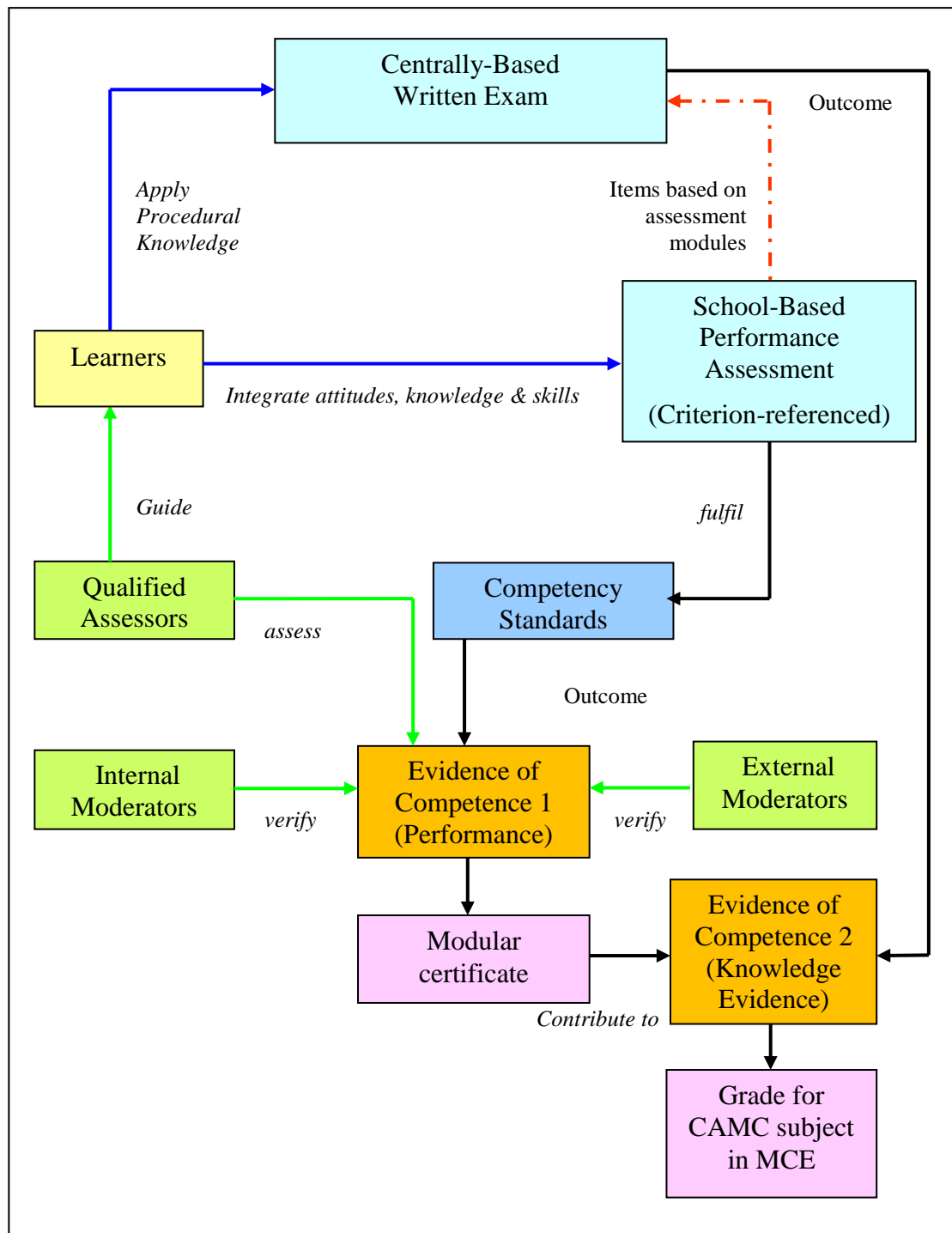


Figure 1.4: Analytical framework of CAMC

Adopted from LPM, 2002

Table 1.1: Characteristics of CAMC

CBA Model	Assessment	Characteristics
CAMC	<p>Assessment criteria are competence-based and specify mastery levels</p> <p>Assessment requires performance and knowledge as evidence</p> <p>Percentile of school-based performance assessment contributes to the final grades in central-based written exam</p>	<p>Competences are role derived, specified in behavioural terms and made public</p> <p>Competency standards;</p> <ul style="list-style-type: none"> - minimum quality or quantity - industry related <p>Demonstrated competence determines learners' progress rate</p> <p>Individualisation of learning, feedback to learners, modularization</p> <p>Learner and programme accountability</p>

Adapted from LPM, 2002

The question arises is whether or not these students who have undertaken CAMC would be able to demonstrate competence required by the industry in the future workplace. In other words, as CAMC has been given the emphasis to prepare students for employment in the Malaysian education system, it is necessary to determine its effectiveness: to address the question of whether or not demonstrated competence in CAMC would also be evident in the workplace. It is necessary to look into how well CAMC can prepare students for what they might be in the future and how well it can predict a student is going to perform the way he/she is expected to perform in the future workplace. It has been noted that a more complex and broader concept of CBA is the ability to transfer skills and knowledge to new situations and environments as well as the performance of tasks expected in the workplace (National Training Board, 1992). Although performance assessments in CBA claim high face validity, there is still insufficient evidence of other types of validity, especially criterion-related validity (Tanner, 1997). Generally, how well competences attained and acquired in CBA could be transferred to other contexts still needs to be studied and explained (Tanner, 1997). CAMC is of questionable value if

the emphasis on continued demonstration of competence is ignored. Therefore, this study was appropriate and timely to be carried out in determining whether or not CAMC serves the purpose it is designed for and subsequently helps equip students to become skilled and knowledgeable personnel in the workplace. This is inline with the Malaysian government policy to generate skilled and semi-skilled human capital by 2020 when Malaysia becomes a developed country. The basic problem is how to screen and examine the employability and workplace level of competence among the Form Five students who undertake CAMC. It has been noted that follow-up studies on predictive validity are often under resourced although it is thought to be simple and straight forward (Gillis & Bateman, 1999). Therefore, one way forward is to develop relevant and appropriate instruments and procedures to predict students' employability and apply them in Malaysia to help determine the effectiveness of CAMC.

1.3 Research Focus

The researcher who is employed by the Ministry of Education, has been involved in the introduction of CAMC in its early years and was charged, by the MoE with the task of exploring the extent to which CAMC has impact on students and their employability. In particular, the MoE wanted to know whether CAMC with its desires for more comprehensive assessment can make a difference to students' learning. As an initial screening device, the Ministry of Education sought the development of a tool: first to gather data to test for the prediction of employability and secondly to provide the basis for a developmental instrument which could be used with students and by teachers in a formative fashion. The funding of the researcher for a period of study leave meant that she was no longer employed in the Examinations Syndicate. Taking all these into considerations and realising the importance for the researcher to be objective while conducting the research, she pursued her determination to investigate the effectiveness of CAMC and the impact it has on students' employability. Moreover, her experience as a secondary school teacher in the past has inspired her to make educational assessment a valuable and

positive learning experience for students. Thus, she also wanted to investigate if CAMC was experienced positively by students. Rather than looking at students' employability in general, after scrutiny and thought-provoking discussions with supervisors, the researcher eventually focused on students' employability in relation to competence in the context of CBA and as aspired to by the national education philosophy. This concept of employability is discussed in Chapter 3.

The researcher also narrowed the scope of the study to look at students undertaking a newly introduced vocational subject, Basic Interior Decorations (BID), as the subject is unique, innovative and of great interest to her. As a newly introduced subject, BID provided opportunities for the researcher to explore various research possibilities that have not been done before despite the difficulties that might arise along with its introduction. BID is a combination of the decoration and construction work of an enclosed space; the floors, the walls, the ceilings and the artefacts. The researcher chose to investigate more deeply the key question of **'how can we predict the employability of students undertaking CAMC?'**.

1.4 Research Aim and Research Questions

The main aim of this research was to develop appropriate instruments and procedures in order to answer the above question **'how can we predict the employability of students undertaking CAMC?'**. The following research questions were formulated in pursuit of the research aim:

- **Research Question 1 (RQ1):** How can we define and describe employability in the context of CAMC?

Clear definitions and descriptions of employability in the context of CAMC will enhance our understanding. Consequently, measures or dimensions of employability could be constructed.

- **Research Question 2 (RQ2):** How can we measure the employability of BID students and what are the psychometric qualities (reliability and validity) of the measure developed for this study?

A psychometrically sound instrument developed for the study could be used to determine a proposed procedure to predict students' employability.

- **Research Question 3 (RQ3):** What are the dimensions of employability incorporated in CAMC of BID?

Identifying the dimensions of employability will enable us to further investigate the effectiveness of CAMC.

- **Research Question 4 (RQ4):** What are the factors that influence students' employability and are there any differences in the strength and pattern of the relations between these factors and the employability of students of different gender and race?

Knowing the factors will guide us to examine the strengths and weaknesses of CAMC. Identifying the employability of students of different gender might provide some explanations to issues related to gender bias in construction field. Likewise, identifying the employability of students of different ethnicity might give some clarifications on presumptions about work ethics among different ethnicity. Nevertheless, sensitivity of this particular issue has to be taken into consideration.

- **Research Question 5 (RQ5):** Are there any differences in perceptions of BID students' employability between the assessors and the BID students?

Finding out the state of students' and assessors' perceptions of BID students' employability will help us understand the dimensions of employability better.

- **Research Question 6 (RQ6):** How do the interviews with the assessors and BID students help explain any further contributions CAMC had on students' employability?

Identifying the effects of interviews in the study will allow us to consider them in the proposed procedure to predict employability.

- **Research Question 7 (RQ7):** To what extent and in what ways do observations of BID students at work and reviews of their portfolios serve to contribute to a more comprehensive and nuanced understanding of the predictive relationship between students' success and students' employability?

Recognising the impact of other qualitative measures such as observations and portfolio reviews will enable us to determine the inclusion of these measures in the proposed procedure.

- **Research Question 8 (RQ8):** In a proposed procedure, what measures are to be considered to determine students' employability effectively?

Identifying the measures will allow us to develop an appropriate and suitable procedure to predict employability.

Table 1.2 shows the matching of the refined instruments used in the study to provide evidence to possible answers to all of the research questions.

Table 1.2: Matching Instruments with Research Questions

	Refined Student Questionnaire	Refined Assessor Questionnaire	Refined Student Interview Protocol	Refined Assessor Interview Protocol	Behaviour Observation Form	Portfolio Review
RQ1	✓	✓	✓	✓	✓	✓
RQ2	✓	✓	✓	✓	✓	✓
RQ3	✓	✓	✓	✓	✓	✓
RQ4	✓	✓	✓	✓	✓	✓
RQ5	✓	✓	✓	✓	✓	✓
RQ6	✓	✓	✓	✓		
RQ7	✓	✓			✓	✓
RQ8	✓	✓	✓	✓	✓	✓

1.5 Thesis Structure

The thesis comprises ten chapters with various phases and major outputs as illustrated in Figure 1.5.

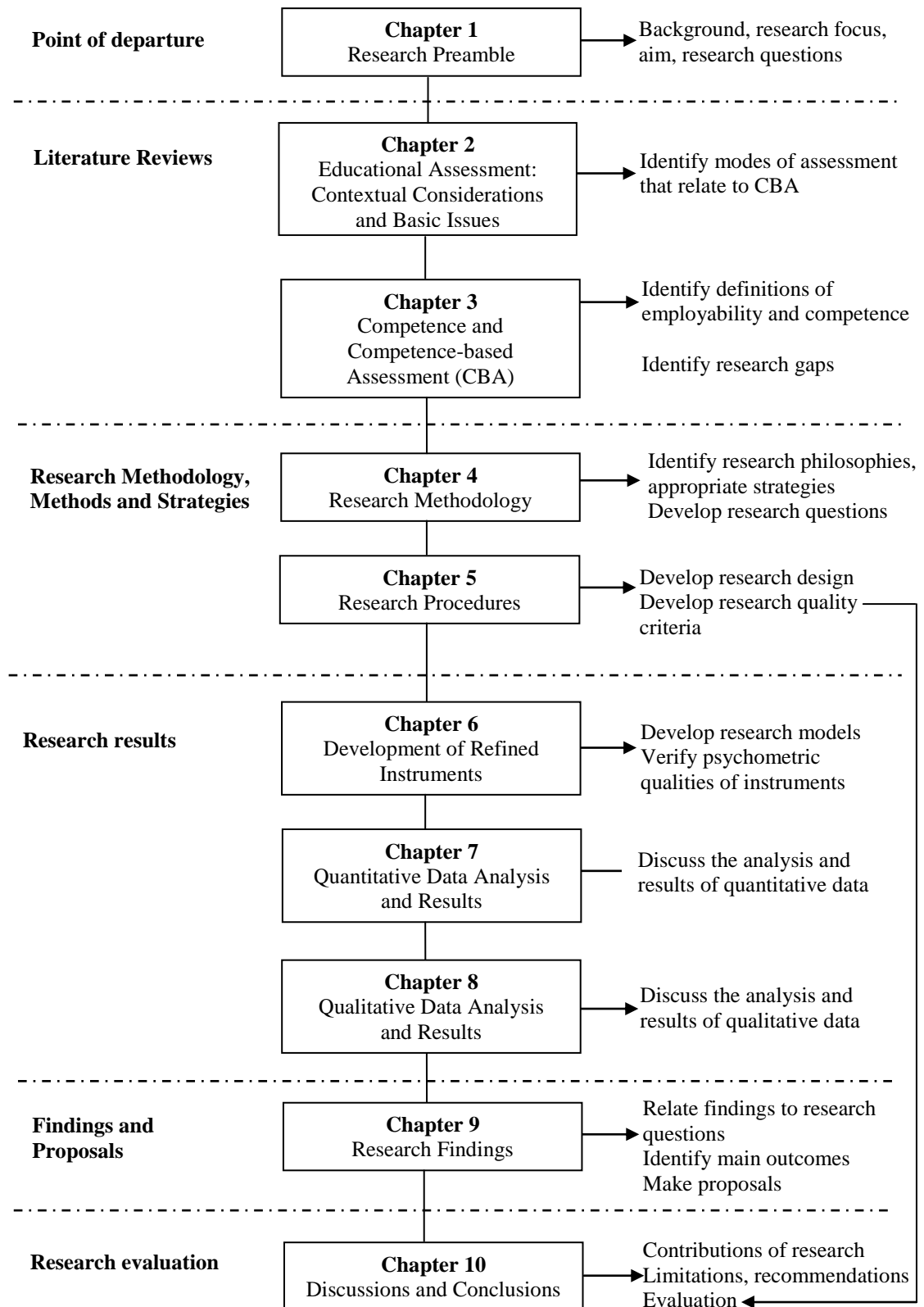


Figure 1.5: Structure of the thesis

Chapter 1 outlines the background and motivation for the research study. It then discusses the aim, objectives and research questions. It further presents the scope of the research and the structure of the thesis.

Chapter 2 is a literature overview of aspects of educational assessment. It focuses on the purposes and principles of educational assessment. It identifies the significance of validity and reliability in any form of assessment.

Chapter 3 is a literature review on employability in relation to competence and CBA. It examines the concept of competence in relation to CAMC and discusses the relevant elements of competence that are associated with employability. Thus, it explores the first research question (**RQ1**) on the definitions and descriptions of employability utilised in this study. Overall, Chapter 3 endeavours to identify the research gaps and needs. It concludes with identifying possible measures that might be considered to predict employability and thus providing evidence for the first part of **RQ2**.

Chapter 4 discusses the research philosophies and research strategies in the literature in order to identify a research paradigm and the most appropriate research strategies for this research. It evaluates various methodologies, tools and techniques, and subsequently matches them with the research purposes to develop the research design for this study. It presents all of the research questions in the study.

Chapter 5 outlines the research design and research methods adopted in this study. It then describes the procedures undertaken in the research project. It describes the development of all the instruments used in the study in detail. It also defines the research quality criteria to be evaluated against this research in Chapter 10.

Chapter 6 presents the development of the refined instruments and a research model of the study. The main objective is to verify the psychometric qualities of the instruments used in this study and thus provide possible answers to the second research question (**RQ2**).

Chapter 7 presents the overall analyses and results of the quantitative data: student questionnaire and assessor questionnaire. It describes the demographic characteristics of the participants involved in the study. It also displays the results of the observation which had been quantified.

Chapter 8 presents the overall analyses and results of the qualitative data: responses to open-ended question in Student Questionnaire, student interviews, assessor interviews and portfolio reviews. It describes the step-by-step guide to the analytic process utilised in this study.

Chapter 9 discusses the findings of this study. It elaborates the findings and relates them to answering several research questions (**RQ3 – RQ8**). It also discusses the role of student engagement as part of CAMC contribution and the development of a proposed procedure to predict students' employability that has emerged from the study; answering the eighth research question (**RQ8**). It further describes the detailed design of the proposed Predictive Employability Profile (PEP).

Chapter 10 is a concluding chapter which summarises the research process and presents the key research findings. The evaluation of the research against the quality criteria outlined in Chapter 5 is also presented in this chapter. This chapter presents the conclusions derived from the overall research findings and states the limitations of this research. It provides recommendations for future research and ends with the key points of the investigation.

1.6 Conclusions

The researcher embarked on this study based on her background, exposure and opportunity to discuss assessment priorities in Malaysia with experts (before and during the research), and on the literature in the area of educational and competence based assessment. After much reading and discussion, the overall question for deeper investigation to emerge was, "**How can we predict the employability of**

students undertaking CAMC? The *prima facie* question was operationalised into questions to guide the research study which was concerned to devise relevant instrumentation to predict employability. The following chapter introduces the contextual considerations and basic issues in educational assessment.

Chapter 2

Educational Assessment: Contextual Considerations and Basic Issues

2.1 Introduction

This chapter discusses the essential concepts and terminology in the literature of educational assessment. The review primarily covers the fundamentals of educational assessment with reference to its effects on learning, the instruments/procedures used, and the interpretations that could be made from it. Next, this chapter looks into the new modes of assessment and the essential principles and practice of assessment. The structure of this chapter is as shown in Figure 2.1.

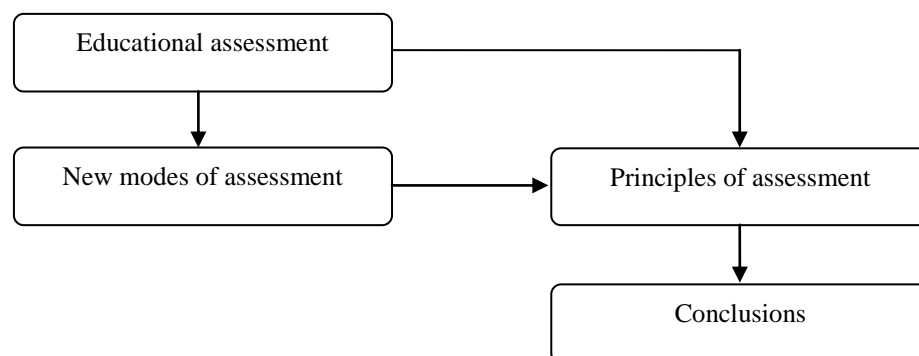


Figure 2.1: The Structure of Chapter 2

2.2 Educational Assessment

Educational assessment sets out to determine how effectively learners are learning and is an integral part of initiatives to improve educational provision in many countries across the world. Regardless of the specific purposes or forms of assessment in any one situation, educational assessment is a process of reasoning from evidence; evidence which comes from:

- Models of Learning - for example, on how knowledge is represented; on the social practices which support understanding; on the processes of reflecting on, and directing, one's own thinking; and on the processes and structures which underlie problem-solving.
- Data derived from assessments tools, instruments and procedures – for example multiple-choice tests, constructed-response tasks, demonstrating performance, portfolios, diagnostic interviews, and scheduled observation.
- Interpretations of the derived data to explain the extent to which the expected learning has occurred – in large scale assessment this interpretation is usually based on statistical probability (a summary of the patterning of the data given different levels of respondent performance) whereas in on-going classroom assessment, the teacher's intuitive sense of the results would be more common though this might well be buttressed by formalised qualitative analysis.

Although all three sources of evidence are implicated in educational assessment, they do not always receive equal treatment. Interpretation is often at an implicit level (Pelligrino et al, 2001), while instrumentation is frequently given (possibly misplaced) pre-eminence in sensationalised newspaper coverage. This chapter begins to probe these three elements of assessment.

2.3 Learning and Assessment

Conceptions of learning in formal education have changed in the last 30 years. From a process of assimilating bankable knowledge, learning is now viewed as a process of knowledge construction which is situated in particular contexts and is a function of complex reasoning and problem-solving. Although high degrees of knowledge are desirable, successful functioning in this day and age also necessitates adaptable, self-regulated behaviour from people who are

effective communicators (Birenbaum, 1996). Specifically Birenbaum (1996, p.4) lists:

- (a) Cognitive competencies such as problem solving, critical thinking, formulating questions, searching for relevant information, making informed judgements, efficient use of information, conducting observations, investigations, inventing and creating new things, analysing data, presenting data communicatively, oral and written expression;
- (b) Metacognitive competencies such as self-reflection and self-evaluation;
- (c) Social competencies such as leading discussions and conversations, persuading, cooperating, working in groups, etc., and
- (d) Affective dispositions such as perseverance, internal motivation, responsibility, self-efficacy, independence, flexibility, or coping with frustrating situations

This has led to the view that assessment should represent meaningful, significant and worthwhile forms of human endeavour and accomplishment (for example Birenbaum, 2003; Newmann & Archbald, 1992; Resnick, 1989). However, the realisation that learning need not be linear, atomistic and decontextualised, has generated an enormous literature on how its assessment should reflect the ways in which knowledge and skills are used in real world contexts. This literature reflects confusion and debate about the purpose and interpretation of assessment.

2.4 Teaching and Assessment

Aligned with the more elaborate understanding of what learning is, has been the realisation that teaching has to change to support learning (Bereiter, 2002;

Biggs, 1999; Brophy, 2002, 2006; Illeris, 2007). This has shifted the role of the teacher from being the transmitter of all knowledge to being supervisor, director, counsellor, master, apprentice and participant depending on the objectives of any one teaching session and the needs of the learners. In turn, assessment is now characterised as multi-dimensional and may well be described in terms which may include:

- the authenticity of the assessment,
- the number of measures used in any one assessment,
- the levels of comprehension demanded by the assessment,
- the intelligence required to address the assessment,
- the relationship of the assessment tools to learning processes and
- the responsibility for assessment (Segers et al., 2003).

Authenticity. This dimension reflects a change from decontextualised assessment of atomistic information to authentic contextualised assessment (for example, Berlak et al, 1992). The change can be exemplified in different formats for gathering information such as portfolio assessment (Arter & Spandel, 1992), performance assessment (Khattri et al., 1998) and other alternative assessment formats (Baron & Wolf, 1996; Linn et al, 1991; Wiggins, 1989) as distinct from short-answer or forced-choice response tasks (Stiggins, 1994). The demand for authenticity is intimately bound up with the issue of assessment validity (Maclellan, 2004) and is therefore not unproblematic.

Measures. Rather than describe a learner's achievement in terms of a single measure (as in an alphabetic or numeric grade) this dimension portrays achievement in terms of a profile (of multiple measures). This dimension is problematic given that profiles are more than simple aggregates or averages of individual measurement scores, and depend instead on quite sophisticated statistical methodology and data analyses (Ding, 2001). Further, the use to which the profiles are put may not result in improving learning or otherwise achieving the assessment purpose(s) (Dunn & Mulvenon, 2007; Stake, 2009).

Comprehension. This dimension reflects a change in cognitive demand. Whereas low level reproduction of factual information was once upon a time considered adequate, the need for higher order thinking (Resnick, 1987; 1989) means that considerably greater cognitive demand than hitherto is implicit in the assessment tasks. Rather than just the retrieval and comprehension of knowledge, the new era of assessment requires well developed analytic skills and knowledge utilisation skills of investigating, experimenting, problem-solving and decision making at all levels of education (Resnick & Resnick, 1992).

Intelligence. But not only are cognitive skills being assessed. This dimension includes metacognition in which the learner's monitoring of process, clarity and accuracy is expected together with self-system thinking in which the learner's awareness of overall motivation, emotional response, self-efficacy and task importance are all identified as important in teaching (Loyens et al., 2008) and in comprehensive assessment (Marzano & Kendall, 2007). Chamorro-Premuzic et al's (2010) work identifies a body of (15) 'soft skill' attributes considered to be strong and stable in their influence on achievement and in securing desirable vocational activity.

Relation to Learning. Early conceptions of assessment saw it as an event which took place sometime after teaching had been completed. Often it was designed by 'measurement experts' without any regard for the learners, the teacher or the curriculum (Birenbaum, 1996). As such it was concerned with making judgements on what the learner had achieved (Sadler, 1989), usually with a view to end-of-course reporting and certification. This contrasts with more recent conceptions which see assessment as a tool for enabling and enhancing learning *during learning* and, thereby, be formative (Cowie & Bell, 1999). Of all the dimensions this, perhaps, is the one that has attracted most approbation given the evidence for the value of formative assessment and well-timed feedback.

Responsibility. Where once upon a time, assessment was seen as the exclusive prerogative of the teacher, the advent of peer and self-assessment is clear

indication of developments towards learners' own responsibility not only for learning but also for assessment (for example, Longhurst & Norton, 1997; Noonan & Duncan, 2005; Struyven et al, 2003; Topping, 2003). However, while self-assessment is popular, and a pragmatic resolution in contexts where economic or organisational limitations pose impenetrable problems, it is not of itself considered sufficient in the assessment of competencies (Hartig et al, 2008), perhaps because correlations of self-assessment and objective test results are modest at best (Hacker et al, 2000; Kruger & Dunning, 1999). Further, a recent review of the literature concludes that empirical evidence for the effects of peer assessment on learning is still scarce (Van Gennip et al, 2009).

Clearly, then, even at this early stage of the thesis it is evident that assessment is a complex matter with its dimensions being both contested and in need of further examination. This complexity will be unpicked in subsequent chapters. Meanwhile it seems that educational assessment is now premised on the central idea that assessment is a tool for learning (Birenbaum, 1996; Wolf et al, 1991) and so judges how effective teaching and learning processes are in enabling learners to evidence whatever they have learned to do, as distinct from its previous concerns which were only to describe the level of mastery obtained in some demonstration or performance. The essential justification for favouring assessment that determines how well learning is taking place as distinct from assessment which judges achievement is that further learning must take place as a result of assessment (Stobart, 2006). While judging achievement may possibly involve describing individualised accomplishment, it ignores the cultural specificity and historical influences of different perspectives. Further, achievement, described in terms of grades and scores elaborately constructed through domain-referenced criteria, ignores the possibility that accomplishment could well be a function of luck, guessing or cheating. Finally, although it is assumed that achievement, at least within formal education, is the result of some pedagogic intervention intended to promote learning, such a relationship might well be fallible (if, for example, the learner could evidence criterial performance *before* the intervention). The aspiration for assessment to be concerned with learning rather than with only achievement does not deny that there are very considerable complexities to understand and resolve before

assessment can be claimed to have the integrity and fidelity which evinces unqualified confidence from all stakeholders.

2.5 Moving Towards New Modes of Assessment

Traditional modes of assessment - concerned, primarily, with achievement - have been guided by psychometric theory and practice. Psychometric theory is based on a probabilistic approach to reasoning, which is the degree of certainty/uncertainty (expressed as a statistic) characterising the likelihood that a particular behaviour/outcome will be the case in a particular situation. A range of theoretical positions such as Classical Test Theory, Generalisability Theory; Item Response Theory, have been used to model the measurement of human cognitive activity; each attempting to address the assumptions in measuring latent constructs (National Research Council, 2001). Psychometrics is the measurement and quantification of psychological phenomena such as abilities, attitudes, learning and personality. These phenomena are not directly observable and are inferred from overt behaviours that are assumed to operationally define the characteristic, or variable, that is of interest. The operational definition delineates the items/tasks that represent the extremes of, and the differential points between, these boundaries. On the basis of this theory driven specification of the variable, a scale or measuring instrument (such as a test or questionnaire, and comprising hierarchically arranged scales, subscales, tasks and items) is developed to measure the hypothesised variable (Leutner et al, 2008). Data are then gathered and various statistical models are applied to determine the extent to which the instrument functions as intended. Not surprisingly, such definition and quantification is impossibly difficult to achieve since the validity of the observation (the inference between the observation and the internal processes assumed to give rise to the observed behaviour) cannot be absolutely guaranteed. Further, the central importance of statistical rigour in validating the measures has tended to reduce to its simplest elements, even trivialise, the cognitive competencies which are tested psychometrically: a conclusion that has been recognised for many years (Northedge, 1976). However, the point is not that psychometric assessment is

wrong - it has provided a very rich base of increasingly sophisticated knowledge - but that the educational world now seeks assessment which addresses more than facts and basic skills (Wolf et al, 1991). They suggest that assessment practices must recognise:

- The complexity of our multicultural societies in which idealised, universal descriptions of progress are insufficient indicators of excellence;
- High-agreement reliability, as expressed by a summary statistic, is insufficient given the importance of multiple judgements (as can be found in professional or vocational practice): evidence such as scores falling within a range rather than being absolute values and participant involvement are also invoked.
- Differentiated profiles of achievement are necessary if assessment is to inform rather than measure the educational process: a range of measures, a variety of means of reporting and instrumentation which captures the dynamics of the social context of learning are all implicated.

Essentially what Wolf et al. (1991) and others (for example, Delandshere & Petrosky, 1998; Lohman, 1993; Snow, 1989; Snow & Jackson, 1993) raise are matters of assessment validity and reliability.

2.6 Validity

When the stakes in an assessment are high - that is when the consequence of a particular assessment result affects progress opportunities, access to further or higher education and entry to potential employment - it is particularly important that judgements are made on valid information (Sackett et al, 2001). Validity is an essential attribute of assessment and while it was originally thought to be

simple and non-problematic (Wolming & Wikström, 2010) it has been, and continues to be, the topic of considerable debate (Hood, 2009; Shepard, 1993). The specification of different types of validity – each of which is related to different purposes - generated dimensions such as content, predictive, construct, concurrent, convergent and discriminant validity. Distinctions between these dimensions were not always useful and so the different types were posited as elements in a unitary concept of validity in which construct validity was central and overarching (Messick, 1989). Messick also pointed out that validity was a matter of degree, rather than an absolute value, and that it referred not to the tests or instruments themselves, as originally described, but to the veracity of the inferences derived from test scores and *other indicators* (emphasis added). Thus, person variables and social context add to, and interact with, responses to assessment tasks and stimulus conditions.

However, there is still debate around validity as the property of measurement instruments (Borsboom et al, 2004) and validity as a property of interpretive inferences (Messick, 1989). Borsboom (2006) is of the view that most psychological characterisations of measurement are incomplete in their knowledge and use of psychometrics. Hood (2009), however, argues that the difference between Borsboom's position and Messick's is neither antagonist nor antithetical. While Borsboom and colleagues argue that only *one* interpretation of validity - namely whether a test measures the attribute it is purported to measure – is relevant, Messick argues that *many* interpretations (which can be informed by factors as various as the purpose of the assessment, the context in which the assessment took place, the ethics of any particular assessment and the consequences of the assessment for the different players involved) may be implicated. In the spirit of Hood's conclusion that the different views have the potential to complement each other, the thesis being developed in this study will be limited to criterion validity and content validity as the elements of construct validity; as these are the important dimensions in the assessment of competencies (Leutner et al, 2008).

2.6.1 Types of Validity

Construct Validity. The essential purpose of the assessment of competence is to predict what constitutes successful behaviour in a specified type of situation. The assumptions underpinning the theoretical construct of competence will be introduced in the next chapter. The relationship of the dimensions of the construct of competence to other variables (such as will be found in the specifics of the assessment of the vocational occupation of building and interior design) will constitute the empirical work of the study. Thus it is intended to evidence what the theoretical construct of competence means in one particular vocational occupation.

Criterion Validity. The extent to which behaviour and performance in some authentic context can be predicted from the outcome(s) of a particular assessment is the essence of criterion validity. The focus has moved from the theoretical adequacy of the assessment (construct validity) to how well the assessment realistically and accurately predicts performance in the workplace or some other real-life environment. Establishing criterion validity is central to the study being conducted here as it is concerned to construct a measure which, ultimately, will be adopted nationwide to shape learning and teaching in respect of building and interior design.

Content Validity. Here the focus is on the match between the assessment tasks to be undertaken by the learners and their representation in the real world context. Clearly content validity is important in competency-based assessment because competence in a specific authentic context is characterised by situational knowledge, situational procedures and situationally normative behaviour. Whether or not the content of the assessment is valid, requires expert input. In this study, the content validity of competence-based assessment will be factored in through reference to employers whose occupations require building and interior design, experts in curriculum design and policy makers to ensure that the development of assessment in building and interior design (BID) is consistent with Malaysian educational policy and strategy.

In summary, what is meant by validity in this study is development of criterion and content validity as these relate to the vocational occupation of building and interior design. These are manifestations of construct validity which is the elaboration of the theoretical ideas which comprise the construct of competence.

The centrality of construct validity brings into sharp relief, two main threats to validity: construct underrepresentation and construct irrelevance test variance. Construct underrepresentation means that the test or assessment instrument is too limited and does not capture important dimensions or facets of the construct. Construct irrelevance test variance means that extraneous clues in the assessment formats permit or inhibit learners to respond correctly or incorrectly, because of the clues and not because of their underpinning knowledge. The discussion which follows invokes criterion and content validity, by implication.

Construct underrepresentation is perhaps best illustrated through what Mesick (1994) himself calls task-driven assessment. In task-driven assessment the learner performs some meaningful and important task. The purpose is to judge how well the task is done and the performance and the product are essentially the same thing. What counts is the artefact or performance. So, as long as the assessment task elicits the skills underlying the performance in the domain of interest (as in acting, dancing, painting, bricklaying and so on), there can be little quibble about the validity of the task. This, however, is a theoretically pure characterisation. Educational decisions are rarely concerned with one particular performance but are typically more concerned with the underlying competencies that enable task performance, and how these can be generalised to new or novel situations (Haskell, 2001). So, in domains such as hairdressing or practical chemistry, not only is the outcome of interest but so too are whether proper procedures were followed in the execution of the 'performance', in order that the assessor can have some confidence that the hairdresser or chemist can ensure the safety of self and others. Regardless of how task-driven the performance is, it will invoke knowledge even if the knowledge is so embedded as to be a way of 'thinking and practising' (Hounsell & Hounsell, 2007).

Because of this need to generalise concepts (Haskell, 2001) from one situation to another, task-driven performance should not be a significant part of educational assessment. Rather, the concern to assess whether or not a person understands the underlying attributes or variables which represent the crucial components of the skilled performance (and thus draw on them at will) means that the performance assessment should be what Messick (1994) terms construct-driven (in which the knowledge, skills or other attributes to be assessed guide the selection of the task as well as the development of the scoring procedures).

Construct irrelevance test variance takes two forms (Messick, 1989). Extraneous variables can cause the assessment task to be experienced as difficult (say a heavy comprehension demand in an assessment of numerical calculation) or easy (say the distracters in multiple choice items all being obviously shorter than the target response, or target responses following regular ordinal patterns). Such contaminations of the assessment task contribute to inequitable assessment practice (Sackett et al., 2001). However, it is impossible to legislate in the abstract for construct irrelevance test variance since skills which may be of second-order importance for one interpretation of assessment performance may be the primary focus for another interpretation. Nevertheless, it is important to be aware of the possibility of construct irrelevance contamination, as this has implications for the extent to which performance on 'equivalent' tasks can be considered comparable (Moss, 1992; 1994).

The threats to construct validity underscore the importance of recognising that assessment instruments are approximate and imprecise both in terms of the constructs they purport to assess, and in the random error which can be precipitated in their usage. The use to which these measures are put therefore has to be in contexts of multiple measures for each construct under scrutiny and a theorised rationale for their usage (Messick, 1989). For all that Messick's detailed treatise on validity is now more than 20 years old, the argument for integrating a range of evidence to inform validity judgements has proved elusive in practice (Wolming & Wikström, 2010), with the focus being on the interpretations of scores rather than on assessment instruments themselves

(Moss, 2007). Wolming & Wikström (2010) are of the view that integrating different sources of evidence is a formidable task since the gulf between construct validity as a theoretical idea and criterion and content validity as actual assessment design practices is increasing, in spite of broader and more comprehensive notions of assessment.

2.7 Reliability

Reliability is the degree to which test scores are free from errors of measurement (AERA et al., 1985). In the measurement context it is not possible to avoid or correct errors of measurement so all measurements must be presumed to contain error. It is the quantification of consistency and inconsistency in the respondent's performance that is of interest in computing the reliability statistic (Feldt & Brennan, 1989, p. 105). To know how precisely or loosely a test score can be interpreted is a beguiling prospect but an accessible, practical solution does not exist. What does exist is statistical estimation of the margin of error we might tolerate, if the instrument is to have any validity. The two main statistics - reliability coefficient and the standard error of measurement – are mathematical tools which can be brought into service by educational and psychological researchers. However these tools do not exist in the absence of different cohorts of respondents and, because data gathering for reliability is often done in constrained administrative conditions, the resulting statistics may give a distorted picture of the trustworthiness that can be placed in the instruments (Feldt & Brennan, 1989). But the role of reliability is important: reliability is a necessary condition of validity though not a sufficient one and while its statistical veracity may at times be questionable, sources of measurement error can, nevertheless, stem from:

- The inherent variation in human performance (for example, motivation, self-efficacy, concentration, state of health, degree of prior knowledge)
- Situational factors in the assessment context (for example the level of noise in the environment, degree of mental preparedness)

- Assessor subjectivity (as when multiple assessors evaluate different components of the task variously, or when an individual assessor makes different judgements of the same assessment product on different occasions)
- Instrumentation variables (such as erratic functioning of the technology required to complete the assessment task, the nature and size of the sample of performance being assessed and its relationship to the defined universe of possible performance).

For the purposes of determining validity, however, it is not always essential to secure a reliability statistic. Moss (1994) argues for a conceptualisation of reliability that transcends statistical analyses. This is consistent with the perspective of qualitative researchers whose use of the term, dependability would correspond to reliability in quantitative research (Lincoln & Guba, 1985). Another dimension of reliability might be what is referred to as trustworthiness (Seale, 1999). The redefinition of reliability to meet the demands of assessment as it is currently conceptualised is in keeping with the growing awareness of what qualitative research methods, generally, have to offer (Strauss and Corbin, 1990).

2.8 Validity and Reliability - Where We Are Now

While both validity and reliability were once upon a time interpreted almost exclusively in terms of statistical models, they are now understood to be heavily context-dependent. Rather than relying on statistical inferences from fixed and predetermined data sets to make judgements, valid and reliable assessment is about whether inferences of competence (or incompetence) are dependable ones (Martin, 1997). As has been argued, validity and reliability are about much more than statistical interpretation, which derives from what Hager & Butler (1996) call the scientific measurement model. Validity and reliability are now implicated in the adequacy of the criteria, the robustness of the definitions of

human capability, the appropriateness of assessment task content, the clarity of the parameters of the cognate domains; features which characterise what Hager & Butler (1996) call the new, judgemental model. But while we are now at least more theoretically aware of developments in what can be meant by educational assessment, the judgemental model was implicit in Messick (1989)'s desire that the quality of assessments embraces both :

- How good the assessment is as a measure of the characteristics it is trying to elicit;
- How appropriate the assessment is for its intended purpose.

The first issue probes the validity of the assessment task (and its scoring) while the second issue probes the consequential validity of the assessment task. In this new era of edumetric assessment - as distinct from psychometric assessment (Carver, 1974) - task validity and consequential validity are central. Gielen et al. (2003) outline factors to consider.

2.8.1 Task Validity

New modes of assessment require that tasks be authentic. They need to represent accurately the real life problems that occur within the content domain being measured and they need to reflect the cognitive complexity required by an expert working in the domain. The core of authentic assessment is how real the learner's understanding is of the knowledge used in the field of practice into which the learner is being inducted. Overt performance alone is insufficient. The thinking processes that experts in the domain use would also require to be evidenced. Task specification is therefore crucial, both to avoid construct underrepresentation and construct irrelevance test variance (discussed above) and to provide sufficiently open-ended tasks, to encourage learners to demonstrate the full extent of their learning.

Judgements as to how well the task has been executed invoke some notion of 'scoring'. The scoring of task performance assumes that the task is congruent with the instruction; permits all learners to have equal opportunity to demonstrate competence; and that the criteria are relevant, transparent and comprehensible. The need to make assessment fair and accessible is undoubtedly challenging when authentic assessment typically requires longer tasks, more complex cognitive processing and deeper subject-matter knowledge. A further consideration is the latitude that learners might (quite properly) have in interpreting the stimulus task and constructing their responses, which challenges the reliable interpretation of performance. Norm-referenced criteria are of little use in educational assessment if they do not describe what learners can actually do. The currently preferred method, criterion referencing, is also problematic. If the specification of what constitutes competence becomes so precise that the assessment task is reduced to a set of routine, algorithmic subtasks making no authentic demands of the learner, it may encourage a hunter-gatherer approach to information (Ecclestone, 2002) which negates the underpinnings of edumetric notions of validity (William, 1998). Further considerations include the use of the criteria. Although fairness is often seen as being resolved in the specification of clear criteria, consistency does not reside in external, pre-specified criteria (William, 1996) and so to believe that reliable marking is a function of specifying clear criteria is naïve. Similarly, if the criteria are too concrete, they may merely stimulate learners to focus on superficial, behavioural actions (Gulikers et al, 2006), which is contrary to the intentions of edumetric assessment.

2.8.2 Consequential Validity

Consequential validity considers in what way(s) the effects of assessment influence the learner, curriculum, and the assessment programme. It is already well documented that assessment is very significantly influencing learning and teaching behaviour (for example, Biggs, 1999; Prosser & Trigwell, 1999). Learners can experience the effects of assessment in different ways (Gielen et

al, 2003). The cognitive complexity of tasks can have a positive effect through stimulating deeper-learning strategies, more critical questioning of content, and increased self-regulation on the part of the learner (Entwistle, 2000). The authenticity of the task may make the task more interesting and meaningful to the learner, and therefore perceived as useful in creating a context to develop relevant knowledge and transferable skills. The interest in, and subsequently perceived relevance of, the task may be motivating (Krapp, 2005; Hidi, 2006; Hidi & Renninger, 2006). The feedback which learners receive during and after completing assessment task can be formative (Black & Wiliam, 1998), particularly when this is in the form of information that can be used to alter the gap between one's actual or current level of performance and the goal, or reference level being aimed for (Sadler, 1989). Finally, learner involvement in the assessment process enables learners to strive for domain understanding rather than, as within traditional modes, experience assessment as something that is done to them (Struyven et al, 2003). The experience of formulating criteria and using them to make judgements is fundamental to the self-assessment that is necessary for self-regulation (Birenbaum, 2003) and authentic learning (Berlak et al, 1992; Gulikers et al, 2006).

If these consequences are all experienced positively, the consequential validity of the task can be understood as good; thereby strengthening confidence in the appropriateness of the task. However, the goodness of the match between expected and actual consequences of assessment can be quite slight, because of threats to consequential validity. The currently dominant perception of education as a significant catalyst for the improvement of social and economic conditions means that assessment as a political weapon may be privileged over assessment as a learning tool (Herman & Haertel, 2005). Another threat is the assumption that the formative function of assessment is necessarily motivating. It may be, but it may not as motivation is actively shaped by learners' perceptions of the control they have over the learning environment, their metacognitive processes, their perceptions of ability and their beliefs about the utility of effort (Birenbaum & Dochy, 1996; Prosser & Trigwell, 1999; Struyven et al, 2003). Cultural differences can also affect motivation: in some cultures motivation to learn can be assumed (Watkins, 2000) while in others it

may have to be fostered (Hidi & Harackiewicz, 2000). A final, and related, threat is in the oversimplification that formative assessment always leads to deep learning (Askham, 1997). Although effective formative assessment needs a constructivist or powerful learning environment (Birenbaum & Dochy, 1996), dominantly didactic teaching, high-stakes assessment and learners' reluctance to relinquish their dependence on teachers (Entwistle, 2000; Hounsell & Hounsell, 2007; Vermunt, 2007) can promote the surface apathetic approaches (Entwistle, 2000) that are so antithetical to new modes of assessment.

The sheer range of diversity amongst persons (economic status, ethnicity, political affiliation, sex, religious persuasion) means that assessment phenomena cannot be understood independently of the people operating therein and individuals cannot be understood independently of the assessment contexts in which they are required to perform (Blaine, 2007).

2.9 Concluding Remarks

This chapter has briefly touched on a number of issues which are germane to educational assessment: assessment is driven by some conceptualisation of learning; assessment data come from a number of (imperfect) instruments/procedures; and the interpretation of the data is both necessary and important in accounting for the process of learning, which is essentially not amenable to direct observation. What is evident from the indicative literature on these three issues is that there has been a considerable paradigm shift in educational assessment: from psychometric to edumetric conceptions. Educational assessment is about judging and improving learning in all of its complexities. The study as outlined in the subsequent chapters is an attempt to grapple with the complexities of learning whilst constructing an instrument that will be of use to a range of stakeholders.

Chapter 3

Competence and Competence-based Assessment

3.1 Introduction

This chapter begins with a brief account of employability to draw attention to the underpinning ideas on which it depends. The most fundamental of these underpinning ideas is that of competence, which is theorised in the vocational domain. Since the essence of employability is competence, the assessment of competence is key to the study; for which the following questions arise: **RQ1: How can we define and describe employability in the context of CAMC?** The answer to this question will be the basis for determining **RQ2: How can we measure the employability of BID students and what are the psychometric qualities (reliability and validity) of the measure developed for this study?** The chapter structure is captured in Figure 3.1.

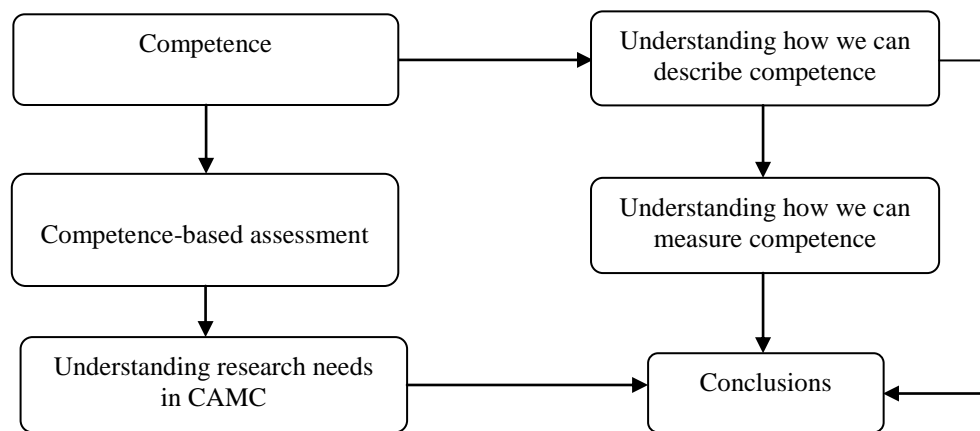


Figure 3.1: The Structure of Chapter 3

3.2 Employability

Employability has various nuances of meaning (Weigel et al., 2007) but its basis is the lifelong learning processes of acquisition, application and adaptability of competence (Harvey & Green, 1994).

Employability is the capability to gain initial employment, maintain employment and obtain new employment if required (Heijde & Heijden, 2005; Hillage & Pollard, 1998). Employability thus depends on the individuals' assets (their knowledge, skills and attitudes), on the individual deployment of such assets, on the presentation of those assets to employers and on the personal circumstances and labour market environment within which individuals seek work (Buck & Barrick, 1987; Harvey, 2004; Harvey & Locke, 2002; Knight & Yorke, 2002); Roger & Petty, 1995; Sherer & Eadie, 1987).

Determining a person's employability involves balancing the individual's 'portfolio' of assets with society's and/or employers' demand or need for the same assets. Hillage & Pollard, (1998) characterise this balance along several continua:

1. *vocational* skills at one extreme and '*softer*', *person* skills at the other
2. *demonstrating* assets (possessing evidence and certification of one's assets) at one extreme and *developing* assets (acquiring relevant, usable information to make informed decisions about labour market options) at the other
3. *entering* the labour market (from education or unemployment) at one extreme and *making transitions* between jobs and roles within the same organisation to meet new job requirements at the other
4. the *demand* for a particular type of workforce (from the deliberations of government and policy makers) at one extreme and the capability of individuals to *exploit* their assets, to *market and sell* them at the other

In other words, employability says something about the capacity of the individual to function in a job, rather than just to acquire the job (although acquiring a job is important). This capability to move self-sufficiently within the labour market to realise potential through sustainable employment (Hillage & Pollard 1998, p.2) derives from the ways in which students learn from their experiences. Students thus exhibit employability in respect of a job *if they can demonstrate a set of achievements relevant to that job* (italics added) (Yorke, 2006). It is the set of achievements relevant to BID which this study aims to unpack.

Malaysian policy makers who are driving forward the employability agenda have already made plain their priority groups: the population of persons for whom a vocational education allows the best contribution to society. In earlier parts of this dissertation it has also been made plain which of the arms of the Malaysian public policy infrastructure are best placed to drive forward such an agenda. The nature of the employability gap(s) in Malaysia is informed by the high demand from Malaysian employers for employees with the capability to acquire, apply and extend their competence. Gurvinder Kaur & Sharan Kaur (2008) confirm that employers are looking for employees who not only have certain skills but also are more flexible and adaptable in order to help companies accommodate to changing market needs. Further, a survey conducted in a local university in Malaysia indicated that students perceived personal attributes as the most important employability dimension required by employers (Latisha & Surina, 2010). These personal attributes are many in number and include loyalty, commitment, honesty, integrity, enthusiasm, reliability, self-presentation, common sense, high self-esteem, a sense of humour, motivation, adaptability, a sensible attitude to work-life balance and ability to deal with pressure; all of which could help the companies develop progressively. In other words, personal attributes are viewed both by employers and employees as most important. Employability skills which are considered to be deficient in technical graduates in Malaysia are interpersonal and thinking skills (Fitriehara, et al., 2009). Employers in the manufacturing industries in Malaysia perceived actual and potential employees as having sufficient technical skills but lacking in some of the important soft skills listed above (Gurvinder Kaur & Sharan Kaur, 2008; Mohamad et al., 2009; Ramlee,

2002). And this need for much wider competence on the part of employees (Lai & Lo, 2008) is accentuated in our new information and technology age (Clarke & Winch, 2006; Weigel et al., 2007). Thus Malaysian society in general and employers in particular are registering very keenly the need for its workforce to have a comprehensive range of assets which can be used adaptively and flexibly. The study being conducted here, acknowledges that employability can have an ethereal quality but would seek to specify it in terms of competence (which includes vocational and 'soft' skills) which can be evidenced and extended.

3.3 Competence

The previous chapter made plain that educational assessment is now concerned with much bigger, and more complex, units of learning than previously was the case. This comes from appreciating the composite of cognitive, metacognitive and social competence that is argued to underpin learning (for example, Birenbaum, 1996). Competence is a multifaceted concept which can refer to the skills and abilities a person has developed; the degree to which the person is effective in his/her interactions with the environment; and/or the level of success of a person's performance (Schultheiss & Brunstein, 2005). The emphasis given to each of the facets influences the meaning of competence in any one context. Competence as a profile of skills or overarching ability suggests some standard that is inherent in the particular task. Competence as an interpersonal skill which may change over time suggests that it might be a general goal which energises other behaviour. Competence as a measure of success suggests some outcome or grade which may, or may not, invoke normative comparisons. These different facets of competence are not mutually exclusive (Sternberg, 2005) however, since all are brought into the service of developing competence. Indeed, in its composite sense, competence is a way of interpreting the quality of performance in a coherent series of tasks which permits an indication of the learner's level of development, and consequently point to next steps in learning for the learner (Griffin, 2007). Frey & Hartig (2009) define competencies as "complex ability structures that are closely related to performance in

real-life contexts" (p.55) and which are acquired by learning. However, as Frey & Hartig (2009) point out, the assessment of competencies brings a new set of challenges: challenges to theorise competence within a domain; challenges to gather data to illuminate the domain and challenges to interpret the data in ways that are useful in educational practice.

3.4 Theorising Competence in a Vocational Domain

Competence has been variously defined but definitions typically include reference to ability, to effectiveness and to success (Elliot & Dweck, 2005). However, ability, effectiveness and success are not of themselves observable. Competence is therefore, an underlying cognitive construct which represents a general and perhaps idealised standard or form (Chomsky, 1965). Performance, on the other hand, is the overt behaviour which we can observe, and from which we may infer that a particular competence is present. But performance may not reflect competence in any pure way because there are many variables (such as context, ignorance, anxiety, ill-health, lapses of memory) which can interfere with how competent the performance might seem.

Nevertheless, the growth of criterion-referenced assessment (Glaser, 1963; 1990) and of outcome-based assessment (Ecclestone, 2006) has responded to this fundamental difficulty of the competence-performance distinction by extensively specifying what are believed to be clear criteria (Maclellan, 2004). It is against this difficult background that competence will be characterised: in terms of the constructive interactions between knowledge and skills which constitute the operational engagement.

3.4.1 Knowledge as Competence

Knowledge is a term that has various connotations depending on what, how and when it is used in decision making. In general, knowledge consists of a person's

understanding of information gathered through his/her experiences which is then translated into the process of making decisions or meaningful conclusions (Awad & Ghaziri, 2004). Basically knowledge is categorised into the declarative, procedural and conditional and, when utilised strategically will be beneficial and valuable to humans (Awad & Ghaziri, 2004). Figure 3.2 illustrates the categories of knowledge that will be discussed in this section.

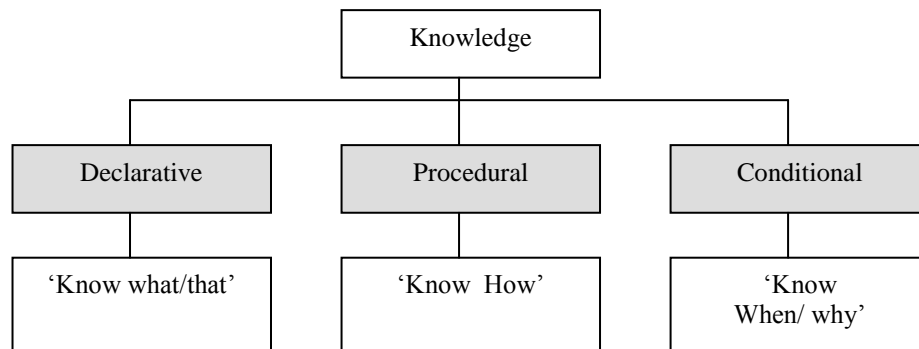


Figure 3.2: Categories of Knowledge

Source: Adapted from Eraut, 1994; Merrienboer, 1997; Clark & Chopeta, 2004; Anderson, 1976; Awad & Ghaziri, 2004

3.4.1.1 Declarative Knowledge

The first is the *know what* or *know that* knowledge which is called declarative knowledge. Other names for it would be descriptive knowledge or propositional knowledge (Eraut, 1994; Merrienboer, 1997; Clark & Chopeta, 2004) or even conceptual knowledge (Rittle-Johnson & Siegler, 1998). Declarative knowledge consists of facts, concepts and theories: information about the world that a person believes to be true and that the person is in a position to know. Declarative knowledge also includes the understanding of the principles that govern a knowledge domain and the interrelations between pieces of knowledge in a domain (Rittle-Johnson & Siegler, 1998). Declarative knowledge is further divided into the episodic knowledge and semantic knowledge (Anderson, 1976; Awad & Ghaziri, 2004).

Episodic knowledge refers to knowledge that is based on experiential information and episodes that have taken place in one's life which are kept in long term memory. It includes the context of where, when, and with whom one was when a particular event happened (Anderson, 1976; Awad & Ghaziri, 2004). For instance, when a student performs the hands-on wall painting performance-based assessment for the first time, he/she might vividly recall specific information of his/her experience such as the time, the examiner, the comments given and even his/her own inner feelings at that particular moment. Episodic knowledge is not formally 'taught' in the way that some pieces of declarative or procedural knowledge might be. It derives from one's experiences.

Semantic knowledge on the other hand, is highly organised knowledge that resides in the long-term memory (Awad & Ghaziri, 2004; Eraut, 1994) where information about the world, facts, vocabulary, major concepts, theories and relationships makes sense. Semantic knowledge about flower arrangement in the subject of BID for instance, would consist of the understandings about the flowers, the colours, vases or containers, the shapes of arrangements, the concepts and themes, and their interrelationships. Based on this knowledge, a student knows what designs of flower arrangement would be suitable for certain occasions, events, rooms or space. Essentially, semantic knowledge is memory for meaning and may be shared by many individuals.

3.4.1.2 Procedural Knowledge

Procedural knowledge is *knowing how to do something*. It includes the knowledge of how to perform a task or how to operate a piece of equipment based on certain steps, or processes. This type of knowledge refers to actions that are in sequences to solve problems and which sometimes can be considered skills (Rittle-Johnson & Siegler, 1998). Procedural knowledge can involve psychomotor skills such as fixing plywood to the wooden framework in the installation of a partition wall in a BID assessment module, where a student has to hold a hammer in one hand and a nail in the other, and pound the nail until the plywood is affixed to the framework.

The thrust of procedural knowledge is a set of connected steps between actions (Eraut, 1994; Merrienboer, 1997; Clark & Chopeta, 2004) which also includes knowing how to access and utilise the declarative knowledge effectively (Eraut, 1994) in order to obtain the desired outcomes. For example, if a student wants to install a ceramic tiled wall, first he/she has to prepare the required equipment and material and then cleans the surface. Once cleaned, he/she makes the appropriate markings. Next, he/she fixes the tiles on the wall according to the desired design; and subsequently he/she applies the finishing to the tiles.

3.4.1.3 Conditional Knowledge

The third category of knowledge is conditional knowledge. It refers to *knowing when* or *knowing why* to use declarative and procedural knowledge (Garner, 1990). This is considered to be the most important of the three categories of knowledge (Jones, 2007; Reynolds, 1992) as it directs one to make decisions about when to employ the other two kinds of knowledge appropriately and correctly. A BID student for example, may know what drilling is and how it is performed but it will be more reassuring if he/she precisely knows when or when not to drill to avoid any unfortunate incident in the workplace.

Because conditional knowledge enables one to adjust to the changing situational demands of each learning task (Schraw, 1998), it includes meta-knowledge of the self: awareness of one's own understanding, skills, thinking strategies and overarching theories (Eraut, 1994). One's knowledge of self can include awareness of one's strengths and limitations in accomplishing certain tasks and of when one needs to look beyond one's own resources. It can also include awareness of one's use of time, one's priorities and one's regulation of learning. Such awareness is acquired through reflections and feedback (Eraut, 1994). For example, a BID student may not be familiar with the construction of a suspended ceiling but, equally, be aware of his/her strengths, weaknesses and limitations. In such a situation, the student manages him/herself by taking all the necessary steps such as reading-up on relevant

materials, listening to teacher's instructions and paying attention to the teacher's demonstration. The student realises his/her own limitations and takes actions to overcome them so that he/she could construct the suspended ceiling without too much of a problem. Such awareness is acquired through reflections and feedback (Eraut, 1994) from self, friends and teachers at the workplace. In general, conditional knowledge when employed with declarative and procedural knowledge will determine desirable outcomes. To know when and how exactly a task is performed as well as what it is, what the process is and what the relationships are, is probably important to ensure that the required outcomes are achievable.

3.4.1.4 The Relationships between Different Categories of Knowledge

Hypothetically, the relationship between declarative and procedural knowledge could develop in one of four ways;

- declarative knowledge develops before procedural knowledge
- declarative knowledge develops after procedural knowledge
- procedural and declarative knowledge develop concurrently
- procedural and declarative knowledge develop iteratively

(Rittle-Johnson & Siegler, 1998)

As yet, there is little evidence for the third and fourth type of relations (Rittle-Johnson & Siegler, 1998). It is often argued that before one could utilise knowledge in context (as procedural knowledge), one has to acquire the explicit factual knowledge or the declarative knowledge first (Winterton et al., 2005). The importance of the acquisition and development of declarative knowledge that has to precede the development of procedural knowledge is evident in Gagne's (1962) model of hierarchical knowledge; identifying the knowledge set required for understanding, learning before performing well on a criterion task. According to this position, it is only when facts, concepts and theories are put into practice, that the knowledge will be beneficial to the users. In knowing *how* to perform a task according to the correct procedures, one actually employs the knowing *what* and

knowing *that* knowledge to achieve the looked-for outcomes or productions. This is to ensure that the process and the products are equally taken into consideration to ascertain favourable results (Merrienboer, 1997; Clark & Chopeta, 2004). In other words, procedural knowledge is ineffective if the declarative knowledge is absent from it. For example, if a BID student does not know the properties of cement in a mortar mixture, he/she may not be able to solve the problem when something goes wrong with the mixture even though he/she follows the steps correctly. And thus, one may not be able to resolve the problem related to cement the next time around. It is crucial for both types of knowledge be acquired and employed to ensure that tasks are performed appropriately to obtain encouraging outcomes and productions (Merrienboer, 1997; Clark & Chopeta, 2004).

On the other hand, Eraut (1994) asserts that procedural knowledge in some cases precedes the declarative knowledge. This is evidenced in various studies where children of the age of 2 ½ and 3 years old could count skilfully before they could actually understand the actual underlying concepts. These children could use the correct procedures in counting but they do not understand the underlying principles at first. They gradually develop the conceptual understanding after they have acquired the procedural knowledge. This phenomenon is similar to the one suggested by Cauley (1988) as sometimes children do not really use the conceptual knowledge to solve mathematical problems (Davis & McKnight, 1980). Despite the contradicting perceptions of the relationships of both types of knowledge, Eraut (1994) insinuates that those who have greater conceptual or declarative knowledge also have greater procedural knowledge.

Rather than 'take sides' on this issue, what is important for the thesis offered here is that *both* types of knowledge are important and useful regardless of which precedes the other in its acquisition. Rather, it depends on the context in which knowledge is utilised and how effective it works out for that particular situation. For example, it is essential for one to know the concept of gravity objects falling from a height will have different impacts depending on the weight of the object as well as the height. This declarative knowledge needs to be acquired first for careful handling of fragile

objects such as light bulbs. On the other hand, in the case of assembling a book rack, one has to acquire the procedural knowledge; the step by step approach on how to put the different parts together. Only when one actually follows all the steps on how to assemble all the necessary parts, can one be able to have a finished book rack. Hence, the value of declarative knowledge is when it is fully integrated with procedural knowledge (Eraut, 1994). Finally, inappropriate use of either declarative or procedural knowledge is avoided through incorporating conditional knowledge. Conditional knowledge acts as the determinant for employing declarative and procedural knowledge (Garner, 1990; Reynolds, 1992; Jones, 2007). It determines whether or not declarative or procedural knowledge is applied accordingly so that the outcomes are beneficial and favourable to every one concerned.

3.4.2 Skills as Competence

The term skills carries positive connotations of competence even though there are various meanings associated with it (Eraut, 1994). Skills involve the psychomotor abilities and cognitive abilities to perform a task efficiently (Cox, 1934; Eraut, 1994). In recent years, research into skilled performance has taken into account the broader cognitive skills of problem solving and decision making (Winterton et al., 2005). Proctor and Dutta (1995) define skill as goal-directed, well-organised behaviour that is acquired through practice and performed with economy of effort. What this means is that first, skill develops over time, with practice; second, it is goal-directed in response to some demand in the external environment; third, it is acquired when components of behaviour are structured into coherent patterns; and lastly, when skill develops, cognitive demands are reduced.

This section will discuss some ideas of what skills are. Skills are divided into technical and non-technical skills. The technical skills include the basic skills, thinking skills and specialist skills (Posner, 2008). The non-technical skills consist of the personal flexibility and interpersonal skills. Figure 2.3 illustrates the concept of skills discussed.

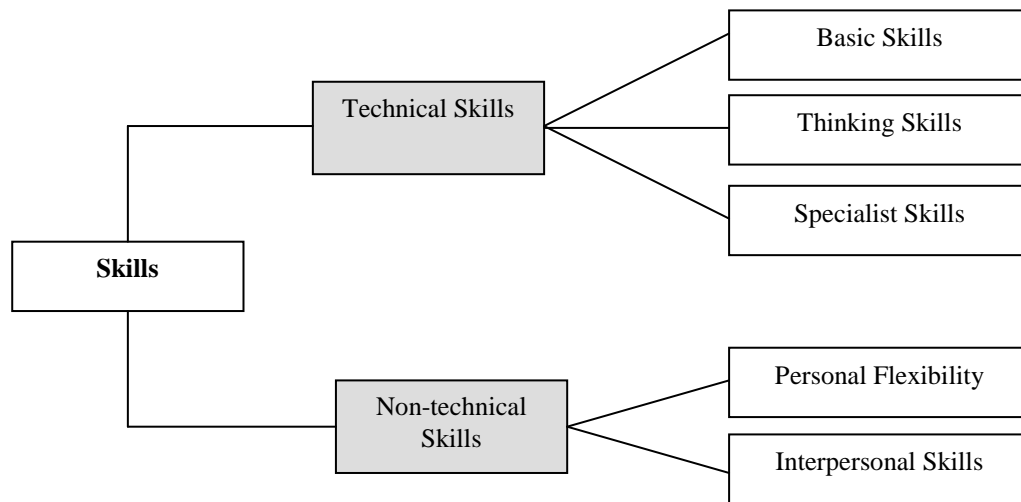


Figure 3.3: The Components of Skills

Source: Adapted from Posner, 2008; Roger & Petty, 1995; SCANS 2000; Carlson et al., 1990; Salthouse, 1986; Mulder et al., 2007; Sherer & Eadie, 1987; Harvey & Green, 1994

3.4.2.1 Technical Skills

Technical skills comprise the basic skills, thinking skills and the specialist skills. Basic skills include literacy, numeracy and oracy; skills that are considered core (Roger & Petty, 1995; Secretary's Commission on Achieving Necessary Skills (SCANS) 2000) and on which more complex skills are built. The very basic skills that one has to acquire are to be able to read, write, speak and listen to at least one language which is commonly used by the individual. Being literate is undoubtedly the key to obtaining more knowledge in this era of information technology and knowledge economy without which one is not likely to progress successfully. For example, a BID student has to fill in a form to get required materials and equipment for a particular BID task from the teacher but can do this only if he/she is able to read and write. Similarly, a student has to be able to listen to and understand instructions and questions asked in a BID class before giving suitable answers. Without these skills, a student is handicapped as he/she can hardly communicate with people around him/her or cannot even convey his/her feelings about certain things effectively.

Thinking skills are more advanced skills and they include skills such as problem solving, decision making (Carlson et al., 1990; Salthouse, 1986) and creativity. These high level skills are needed to ensure that individuals are able to work and cope with the job effectively and efficiently in order to increase the productivity of the company (Enhancing Student Employability Coordination Team (ESECT), 2005; Harvey et al., 2002). For example, when a mechanic identifies a problem in the engine of a car, he/she should be able to think of various ways to solve the problem and then decide the most suitable way to fix it before actually fixing it so that any unnecessary disruptions are avoided. Consequently, the owner is satisfied and happy with the service rendered, and would probably come back to the workshop for other repairs whenever needed. Being creative is another high end thinking skill (SCANS, 2000; Gonczi, 1994; Carlson et al., 1990; Salthouse, 1986) as it promotes new ideas, solutions, inventions, innovations and the like for the advancement of life. Creativity is vital to keep abreast with ever-changing technology.

The specialist skills include explicit skills in certain areas such as job-specific skills (Mulder et al., 2007; Sherer & Eadie, 1987) that one possesses and builds upon preparation and foundation skills (, Saterfiel & McLarty1995; Sherer & Eadie, 1987). For instance, a plasterer should have all the necessary skills related to the work of wall plastering; identifying faults such as cracks, using appropriate equipment and materials, and repairing the cracks accordingly. These hands-on skills are just as important as the thinking skills as what is thought has to be implemented in practical work. Both skills are interrelated and needed in making sure that a job is carried out properly.

3.4.2.2 Non-technical Skills

Non-technical skills consist of personal flexibility and interpersonal skills. Harvey & Green (1994) describe personal flexibility as being adaptive and adaptable. They unravel the meaning of being adaptive as the ability to bring one's knowledge and skills into an organisation as well as the ability to assimilate the organisational culture. For example, an engineering graduate going work for the first time would

bring to the workplace knowledge and skills that have been acquired at university. The graduate would use his/her knowledge/skill to adjust to and blend into the culture to be accepted by colleagues. Harvey & Green (1994) further describe adaptability as the ability to learn, add to and apply knowledge and skills in new situations. This means that one has to be able to transfer skills learned in one context to a new context (Haskell, 2001). Transfer has two distinct meanings. Most commonly it is understood as the application of *old* knowledge to *new* situations: a particular situation or context presents itself and triggers in the individual certain knowledge or skills as being appropriate. So, for example, having learned to install ceramic tiles floor finishing in BID class, a student can move on to install mosaic tiles floor finishing and indeed to other types of floor finishing such as wooden floor finishing. While the initial sensation of installing the new type of floor finishing may be a bit unsettling, a student's existing installation skills only need fine tuning to accommodate to the demands of the new floor finishing installation. A more elaborate understanding of transfer, however, invokes the requirement to learn *new* knowledge because the context for application is so different from previous experiences that old knowledge is not enough. It is in this second sense of transfer that, as Harvey & Green (1994) identify, the skill of adaptability is so important; being able to deploy one's existing skills but also grasping the opportunity to extend one's existing skills to new ones.

Interpersonal skills include communication skills and transformative skills (SCANS, 2000; Harvey & Green, 1994). We live in a world full of human beings, people of many languages and thus oral and written communication skills are essential. One really has to learn how to communicate politely and effectively so that relationships between people are maintained and/or restored (Posner, 2008). A receptionist at the office lobby for instance, should be polite and courteous when attending to clients' queries and dissatisfactions so that the corporate image is upheld while at the same time fulfilling clients' needs. The transformative skill is the ability to promote innovative teamwork through the use of high level skills such as analysis, synthesis and critique (Harvey & Green, 1994). As we live and work around people, it is unavoidable that we have to work with other people for most of the time where the

spirit of team-working is essential (Harvey & Green, 1994). For example, a team of architects working on a housing development in a confined area in the city has to be cooperative and supportive of each other in contributing ideas to the design of the development that would meet the requirements and satisfy the developer. Each one of the architects in the team has to be critical, analytical, tolerant and encouraging so that they could come up with a good design that is cost-effective within the timeframe given to avoid any delays in the subsequent processes.

3.4.2.3 The Relationships between Different Types of Skills, and Knowledge and Skills

The use of cognitive skills in the demonstration of skilled performance has raised the difficulty in categorising it as either knowledge or skill (Winterton et al., 2005) as the acquisition of skill and the demonstration of skilled performance involve a combination of underlying perceptual, cognitive and motor skills (Carlson et al., 1990; Salthouse, 1986). In other words, knowledge and memory play a major role in the acquisition of skills (Chase & Ericsson, 1982) which can be considered a prerequisite to any forms of skills to be acquired. Even the retention of relatively simple motor skills depends upon an understanding of results (Lavery, 1962) and verbalised knowledge, or knowledge that is articulated in the course of developing such skills (Berry & Broadbent, 1984). This can be seen in the three stage framework for skill acquisition developed by Fitts and colleagues (Fitts et al., 1961; Fitts & Posner, 1967). The cognitive phase of understanding the nature of how the task should be performed involves the deliberate process of acquiring knowledge; the associative phase involves related efforts put into realising suitable actions, and the autonomous phase occurs when spontaneous actions take place intuitively. In response to this approach, Anderson (1981; 1982; 1983; 1987) developed a similar framework for the acquisition of cognitive skill in which the declarative and procedural phases correspond to Fitt's cognitive and autonomous phases. Anderson further emphasised the significance of a continuous process of knowledge compilation involving the conversion of declarative knowledge into procedural knowledge.

The acquisition and comprehension of new knowledge demands inseparable interactions between knowledge and skills (Winterton et al., 2005) to the extent that increasing proceduralisation of knowledge characterises the higher competency levels whereby at higher levels, knowledge is converted to skills (Klieme et al., 2004). These technical skills are important in carrying out certain tasks but it would be more meaningful and effective if accompanied by the non-technical skills as they both will enhance the desired accomplishment of tasks (Roger Petty, 1995; Harvey & Green, 1994).

Competence is thus a complex construct. It is evidenced through performance and requires knowledge, skill (which may be construed as a type of knowledge) and understanding. Notions of competence have changed in recent years. While early notions lauded competence exclusively as outcomes-based achievement (Ecclestone, 2002), more recent thinking describes competence as a multifaceted concept which can refer to the skills and abilities a person has developed; the degree to which the person is effective in his/her interactions with the environment; and the level of success of a person's performance (Schultheiss and Brunstein, 2005). Either singly or in combination, each of these notions of competence – as ability, as effectiveness or as success – can be used to make judgements about self or other.

All of these ideas of competence demand knowledge (including skill) in ways that have been outlined above. The role of knowledge becomes very significant when we consider our current context, at the beginning of the 21st century. The urge to develop a competent workforce is evident in countries across the globe and this competence has to be founded on knowledge to solve problems that we do not yet know about (Bereiter, 2002). Fast-changing employment contexts (Casey, 1999) mean that a competent workforce is knowledgeable; is made up of persons who are flexible, responsive and self-managing; and who can use such resources to accomplish tasks and activities to whatever are deemed to be appropriate or high standards. It is therefore *how* knowledge is used that will influence the competence that can be evidenced. This knowledge-in-use to achieve competence can be thought of as engagement. Engagement refers to the intensity and quality of the learner's

involvement in initiating and carrying out learning activities (Wellborn, cited in Hijzen et al, 2007). Engagement is task-relevant behaviour which is socially oriented insofar as learners focus on the task and persist when obstacles occur but also provide help and emotional support to peers (Chapman, 2003). Engagement is the enactment of the intentional behaviour that is held in the mind and as such differs from motivation which is concerned with the cognitions underlying involvement, such as one's learning goals, one's attributions or one's self-efficacy. Engagement might be thought of as an indicator of an individual's motivation (Ryan, 2000).

3.4.3 Student Engagement as Competence

Researchers define students' attitudes towards and perceptions of schooling as well as their participation in school activities as student engagement (OECD, 2004). Student engagement is considered an important outcome of schooling and a predictor of achievement (Russell et al., 2005) as it is seen to increase students' motivation in learning which at the same time reduces the feelings of being alienated and disaffected from school (Russell et al., 2005; Fredricks et al., 2004; OECD, 2004). Student engagement is multifaceted in nature and this section defines it in three ways: behavioural, emotional and cognitive (Fredricks et al., 2004; OECD, 2007). Figure 3.4 illustrates the relevant definitions of student engagement. This section then continues with the discussion on how student engagement interrelates with knowledge and skills.

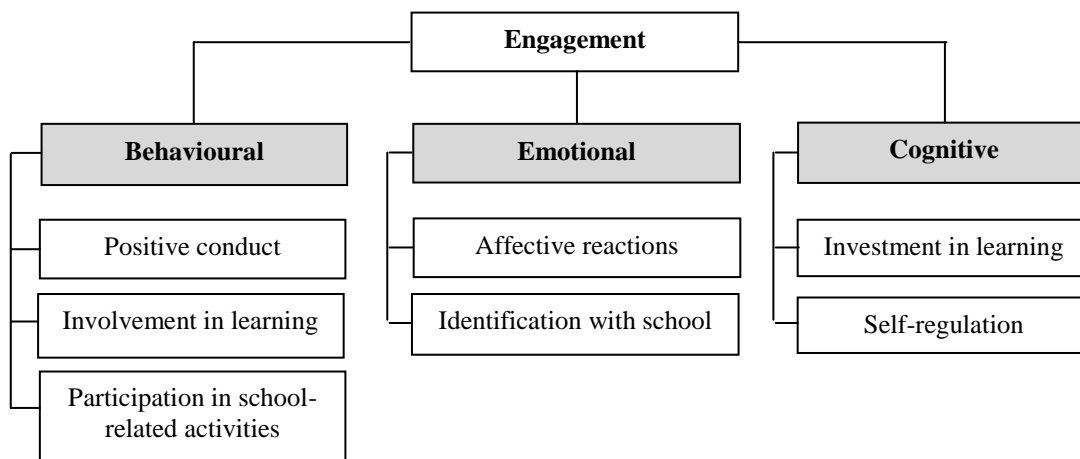


Figure 3.4: Elements of Student Engagement

(Adapted from: Fredricks et al., 2004; Finn et al., 1995; Skinner & Belmont, 1993; Connell & Wellborn, 1991).

3.4.3.1 Behavioural Engagement

School engagement has been predominantly measured by observable behaviours directly related to academic effort and achievement (Sinclair et al., 1998) and thus making it likely to be affected by what happens in relationships with teachers and peers, and by school experiences (Russell et al., 2005). The following section describes three different components of behavioural engagement: positive conduct, involvement in learning and academic tasks, and participation in school-related activities (Cunningham et al., 2006; Fletcher, 2006; Fredricks et al., 2004). The first component is the positive conduct which consists of students' willingness to follow the rules and adhere to classroom norms as well as to avoid any misbehaviour in school. For example, students wear proper school uniform as required of them without any hesitation in order to abide by the school rules. This is also true when students keep the classroom clean and tidy as their norm and thus will not dirty the classroom on purpose or vandalise the tables and chairs for any reason. They will behave themselves in a manner that is expected of them as students and will obey the teachers.

Next is students' involvement in learning and academic tasks which include behaviours such as effort, persistence, attention, concentration and class participation (Birch & Ladd, 1997; Finn et al., 1995; Skinner & Belmont, 1993). What this means is that students show their interest in the lesson being taught by getting actively involved in the teaching and learning activities. For instance, in a mathematics class, students would pay careful attention to the teacher's instructions and would ask questions to clarify any confusion. They participate in the discussion keenly to ensure that they really have grasped the essence of the lesson. They would try their very best without giving up easily till they could solve the mathematical problems given to them.

The third is students' participation in school-related extracurricular activities such as athletics and school governance (Finn, 1993; Russell et al., 2005). Examples might include running the editorial board for the school magazine, representing the school in sports or games, organising clubs and conducting society meetings.

3.4.3.2 Emotional Engagement

Emotional engagement includes students' affective reactions in the classroom (Connell & Wellborn, 1991; Skinner & Belmont, 1993) and their identification with school (Finn, 1993). Students' affective reactions in the classroom refer to their interest, boredom, happiness, sadness and anxiety (Connell & Wellborn, 1991; Skinner & Belmont, 1993). Teacher-student relationship (Wentzel, 1998) and peer relationships influence how students show their emotions in the classroom (Russell et al., 2005). For example, when a BID student gets stuck with the preparation of materials and equipment for a particular task he/she is not ignored by the teacher but instead gets full attention, help, guidance and support from the teacher. This student feels that he/she is important to the teacher and this increases his/her interest in doing the task. Similarly, when a student feels that he/she is accepted by his/her classmates for instance and feels he/she belongs to the class, this may increase his/her interest in school generally and in the class particularly. In turn this may affect his/her

emotional well-being (Wentzel, 1991). Students who have friends and get along well with them will be happy to be in school and they perform well academically and socially as they experience less emotional distress in comparison to those who do not have any friendships (Wentzel et al., 2004).

Students' identification with school refers to their sense of belonging or the feeling of being important to the school as well as the value or appreciation of success in school-related outcomes (Finn, 1989). For example, a student who feels that he/she has to contribute to his/her school fame and reputation would try his/her best to achieve good academic grades and would definitely avoid behaving in ways that would shame the school. This strong sense of belonging to the school is developed through good relationships with the school environment, teachers and peers (Russell et al., 2006; Wentzel, 1998). Students' value or appreciation of success in school-related outcomes relates to how proud they feel of their school accomplishments. If their school wins the first place in a maths competition for instance, even though the students themselves did not participate, they still share the joy and pride of their friends' outstanding achievement which has brought fame to the school. They appreciate their friends' contributions and are pleased with them.

Further descriptions of the components of value include interest, attainment value, utility value or importance, and cost (Eccles et al., 1983). Interest refers to the enjoyment of the activity where students have great pleasure in doing certain tasks such as when they act out a play on stage. Next, is the attainment value which relates to the importance of doing well on the task for confirming aspects of one's self-schema (Eccles et al., 1983). This is obvious when students put their utmost effort in producing their school webpage for example, just to make sure that it reflects the school good image. The utility value refers to the importance of the task for future goals (Eccles et al., 1983). When students see a task as worthwhile doing for its own sake such as using the computer in writing their essays, then utility value is observed. Finally is the cost which refers to the negative aspects of engaging in the task (Eccles et al., 1983). This relates to the non-constructive features and outcomes of carrying out a task such as assigning too many students to group work, causing some to feel

redundant. Such a big group for an assignment would destroy the spirit of teamwork.

3.4.3.3 Cognitive Engagement

Cognitive engagement entails the inner psychological quality such as self-regulation or being strategic and psychological investment in learning (Fredricks, 2004). The investment in learning includes the desire to take up a challenging task that is beyond the requirements (Connell & Wellborn, 1991; Newmann et al., 1992; Wehlage et al., 1989) such as flexibility in problem solving, preference for hard work, and positive coping in the face of failure (Connell & Wellborn, 1991). In other words, students invest and put effort into learning, understanding, mastering the knowledge, skills, or crafts that are intended in an academic work (Newmann et al., 1992; Wehlage et al., 1989). These ideas are similar to those in the motivation literature such as motivation to learn (Brophy, 1987), learning goals (Ames, 1992; Dweck & Leggett, 1988) and intrinsic motivation (Harter, 1981). For example, students who set high standards for themselves in academic achievement would invest a lot of their time, energy and effort to learn in-depth any subject area that is required of them. They would strive hard persistently without fail in enriching their knowledge and skills in respective areas until they achieve the desired outcomes.

Self-regulation or being strategic involves students' use of metacognitive strategies to plan, monitor, and evaluate their cognition when accomplishing tasks (Pintrich & De Groot, 1990; Zimmerman, 1990). They use various learning strategies to acquire, organise (Corno & Madinach, 1983; Weinstein & Mayer, 1986), manage and control their learning and effort on tasks by persisting or suppressing distractions (Corno, 1993; Pintrich & De Groot, 1990). For instance, when students have to carry out a simple research on the interior design of a theatre, they have to plan a schedule for them to complete the task, evaluate the materials gathered from various sources, manage and organise relevant information and later decide the best way to present their findings. Such a task requires total cognitive commitment and involvement.

3.4.3.4 Competence-engagement Relationship

Just as competence has been found to be a complex and multifaceted construct so too has engagement. Its elements interact with each other in non-trivial ways, although the casual observer might not be able to identify an observed behaviour with clear purpose on the part of the individual. Nevertheless, engagement in learning is considered to be the mechanism for competence-promoting behaviour (Russell et al., 2005). This is to say that students have to be engaged actively with their learning in order to achieve desired outcomes. The relationship between competence (the underlying ideal to which we aspire for ourselves and for our students when we are teachers) and engagement (the enactment of intentional behaviour) is an important one. While the difficulties of the competence-performance distinction have been resistant to resolution, the competence-engagement relationship offers a more helpful conceptualisation of how to enable learning. A central part of this study is to establish a valid measure of learning in a particular domain and context, for which the competence-engagement relationship is fundamental.

3.5 Competence-based Assessment

Its concern with authenticity means that educational assessment aims to judge effective functioning in the actual or equivalent professional or vocational world of relevance (Gulikers et al, 2009). The fidelity of the assessment task demands to the conditions under which people are challenged in real-life contexts is what characterises the task as authentic; and what has given rise to competence-based or competency-based assessment (Berlak et al, 1992; Gulikers et al, 2006). However, it is important to bear in mind that authenticity (as discussed in Chapter 2) is of itself multi-dimensional with each of the dimensions having the potential to vary. For Gulikers et al. (2004) authenticity has five dimensions: the assessment task, the physical context, the social context, the assessment result or form, and the assessment criteria. Competence-based assessment thus assumes a much more nuanced concept of competence than was originally the case (Elliot & Dweck, 2005),

when it was construed as no more than what a 'good' intelligence test could evince (McClelland, 1973). Indeed rather than view competence-based assessment as judging competence using one method, instrument or procedure, the need for an integration of different assessment methods into a *Competency Assessment Programme (CAP)* is promoted by Baartman et al. (2006). The essential point in having different methods is that high-quality psychometric methods need not be discarded prematurely, since all manner of measures may be able to contribute to determining competence. However, the corollary of this is that traditional evaluation criteria, while possibly appropriate for individual instruments, are not properly aligned to the multi-dimensions and complexity of competence. Baartman et al. (2006; 2007) addressed this through validating a framework of quality criteria, first with an international panel of experts in assessment and in quality criteria for assessment and second with a sample of two hundred plus teachers most of whom were working in vocational education in areas such as personal and social services, health care, economics and technology. The purpose of the framework- which finds corroboration in other studies (Ploegh et al., 2009) - was to provide definition of all relevant criteria to enable their further operationalisation into instruments for schools and teachers to use in evaluating competence. Criteria related to quality assurance such as comparability, fairness, reproducibility of decisions and transparency were included as were those which have emerged in the more recent transitions to concepts of educational assessment such as authenticity, cognitive complexity, costs and efficiency, directness, educational consequences, and meaningfulness. Baartman et al. (2007) are at pains to point out that while no *single* method need meet all of the criteria, the programme of assessment of any one domain *as a whole* must.

Table 3.1 The Quality Criteria (adapted from Baartman et al., 2007)

Criterion	Short Description
Authenticity	The degree of resemblance of an assessment programme to the criterion situation, usually those competencies needed in the future workplace
Cognitive Complexity	The thinking processes and the fact that the assessment tasks should reflect the presence and level of required higher cognitive skills
Comparability	The conditions under which the assessment programme is carried out should be, as much as possible, the same for all learners, scoring should occur in a consistent way, and large sampling across the content and situations of the competency at stake is necessary
Costs and Efficiency	The time and resources needed to develop and carry out the programme need to be judged relative to the evidence that such expenditure improves learning and teaching
Directness	The degree to which assessors can immediately judge whether a learner can function (say in dealing with stress or with unexpected situations) in a certain domain, without having to deduce or infer this.
Educational Consequences	The effects of a programme of assessment on learning and teaching
Fairness	Assessment programmes should not show bias to certain groups of learners and should reflect the knowledge, skills and attitudes at stake, excluding irrelevant variance
Meaningfulness	Assessment programmes should have a significant value for teachers, learners, future employers and society as a whole
Reproducibility of Decisions	Decisions made on the basis of the results of an assessment programme should be accurate and constant over situations.
Transparency	Assessment Programmes should be clear and understandable to all stakeholders. Learners should know the scoring criteria, who the assessors are and what the purpose of the assessment is. External controlling agencies should be able to get a clear picture of the way in which an assessment programme is developed and carried out.

3.6 Research Gaps and Needs

Although the term employability is commonly used, there is a lack of delineation in the extant literature of employability in the context of CBA in general and CAMC in particular. Furthermore, such research as has been conducted relates to the

employability of graduates from colleges or universities and not to students at secondary school. In the current Malaysian context, with its keen need for relevant employability skills, the preparation of the skilled workforce should start as early as possible. The historical lack of concern for employability of secondary school students has meant an absence of relevant instrumentation for this particular. For this study the issue is one of how effective CAMC is in preparing students with relevant employability skills.

3.7 Conclusions

In this chapter, the researcher has argued that there is a need to effectively predict employability among students undertaking CAMC as the impact of employability affects not only the accessing of employment, but also on the success of a person's career. The literature on the competence-performance relationship offers better understanding of how employability could be acquired. From the discussion so far, the first research question and the first part of the second research question can be looked into for potential answers. The psychometric qualities of the measures will be examined in Chapter 6.

- **RQ1:** How can we define and describe employability in the context of CAMC?

We can describe employability as competence in the context of CAMC. Competence is characterised in terms of the constructive interactions between knowledge and skills which subsequently constitute operational engagement. Knowledge consists of declarative, procedural and conditional while skills comprise technical and non-technical. Student engagement includes the elements of behavioural, emotional and cognitive. The framework of employability in CAMC is as illustrated in Figure 3.5.

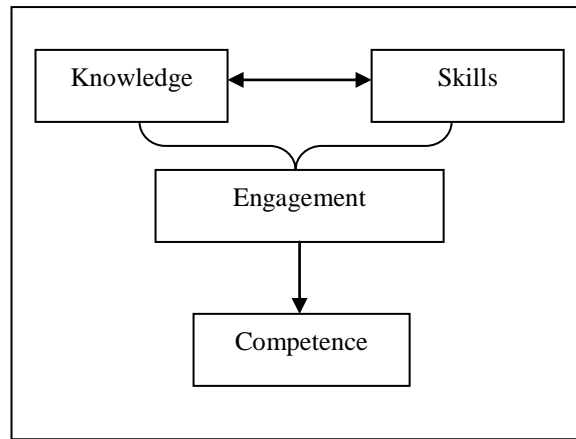


Figure 3.5: The Framework of Employability in CAMC of BID

- **RQ2:** How can we measure the employability of BID students and what are the psychometric qualities (reliability and validity) of the measure developed for this study?

Based on the framework of employability described in this study, the employability of BID students could be measured by assessing students' knowledge, skills and engagement in accomplishing BID tasks. Figure 3.6 illustrates the detailed aspects of the measures to be considered.

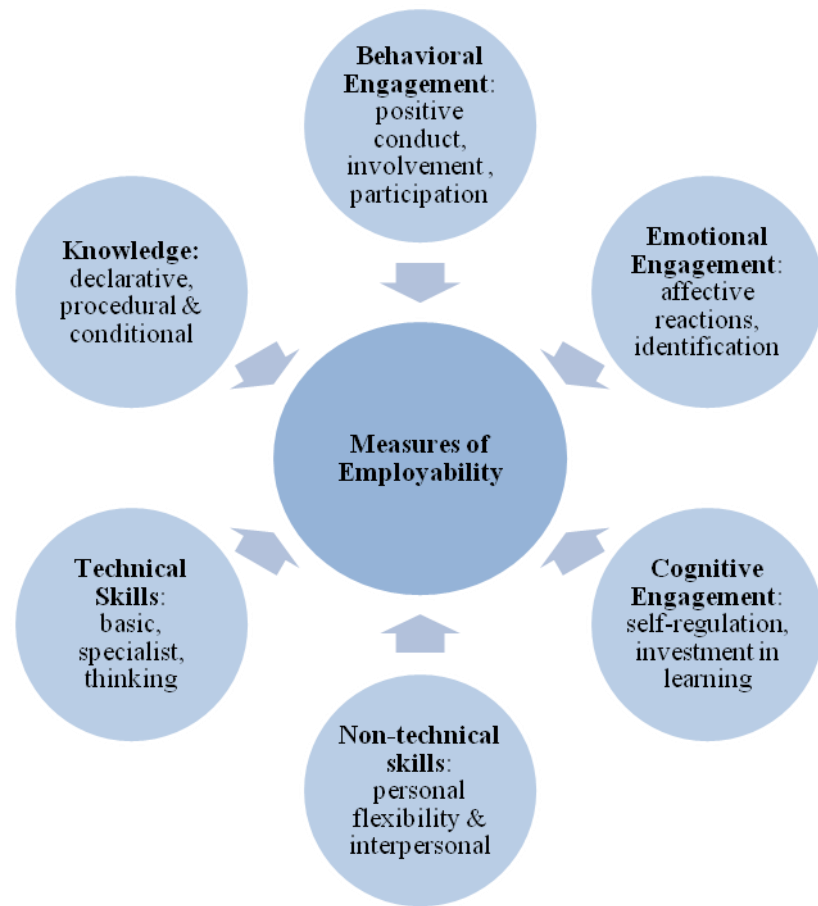


Figure 3.6: Possible Employability Measures to be Considered

Chapter 4 continues by examining the suitability of available methodology that could be used as a design for the study.

Chapter 4

Research Methodology

4.1. Introduction

This chapter introduces the research methodology employed in the study. The objective of this chapter is to demonstrate that a suitable approach was adopted in exploring the research problems raised. Therefore, the discussion starts exploring with the research questions and the philosophical issues related to the study which contributed to determining the research strategy and developing the model of how the research was to be conducted. The structure of this chapter is as shown in Figure 4.1.

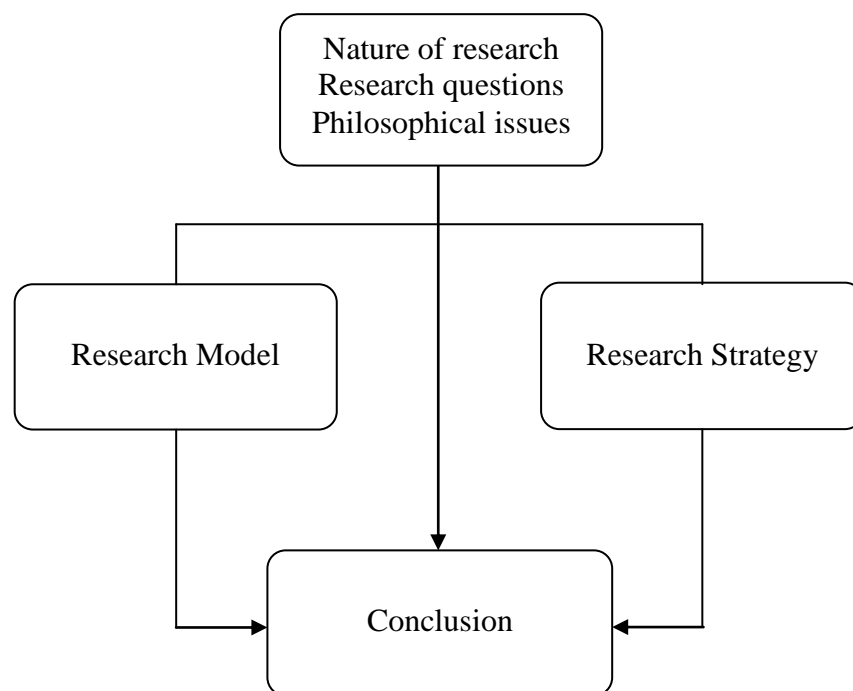


Figure 4.1: The Structure of Chapter 4

4.2. Research Purpose and Research Questions

Research questions are considered the backbone of the whole research design (Mason, 2002) and identifying the type of research questions being asked would determine to a great extent which research strategies were best suited for a study (Yin, 2003). Thus, formulating a clear set of research questions from the literature is fundamental (Mason, 2002). It is a challenging process which requires intellectual expertise, a great deal of preparation, extensive effort and a lot of patience (Creswell, 1998; Stake, 1995). The main purpose of this study was identified as constructing a protocol to predict/explore the employability of secondary school students in Malaysia after undertaking competence-based assessment in the subject of Basic Interior Decorations (BID). Subsequently, **eight** research questions were formulated:

- **RQ1:** How can we define and describe employability in the context of CAMC?
- **RQ2:** How can we measure the employability of BID students and what are the psychometric qualities (reliability and validity) of the measure developed for this study?
- **RQ3:** What are the dimensions of employability incorporated in CAMC of BID?
- **RQ4:** What are the factors that influence students' employability and are there any differences in the strength and pattern of the relations between these factors and the employability of students of different gender and race?
- **RQ5:** Are there any differences in perceptions of BID students' employability between the assessors and the BID students?

- **RQ6:** How do the interviews with assessors and BID students help explain any further contributions CAMC had on students' employability?
- **RQ7:** To what extent and in what ways do observations of BID students at work and reviews of their portfolios serve to contribute to a more comprehensive and nuanced understanding of the predictive relationship between students' success and students' employability?
- **RQ8:** In a proposed procedure, what measures are to be considered to determine students' employability effectively?

The key issue in the study was how to elicit and measure students' employability after undertaking competence-based assessment of BID. From the literature review as explained in detail in Chapter 3, clear definitions and descriptions are needed in order to understand employability in the context of competence-based assessment of BID. Thus, the first research question emerged: **RQ1: How can we define and describe employability in the context of CAMC?** The researcher developed a framework to define and describe employability in terms of competence. The second research question: **RQ2: How can we measure the employability of BID students and what are the psychometric qualities (reliability and validity) of the measure developed for this study?** The researcher adapted, modified and translated the measure into Malay language before using it in the study. The third and fourth research questions emerged to look at the dimensions of employability incorporated in CAMC and the factors influencing students' employability. Therefore, **RQ3: What are the dimensions of employability incorporated in CAMC of BID?** and **RQ4: What are the factors that influence students' employability and are there any differences in the strength and pattern of the relations between these factors and the employability of students of different gender and race?** were raised. The researcher then adapted five main aspects of employability that reflected the definition accepted in the study and three major factors which acted as the predictors

to students' employability. The researcher further identified the strength of influence those factors had on students' employability with respect to gender and race.

The fifth research question was raised to ascertain whether or not teachers who were also the assessors of CBA and BID students had any similarities in how they perceived students' employability. Hence, came **RQ5: Are there any differences in perceptions of BID students' employability between the assessors and the BID students?** The researcher then explored the use of qualitative approaches such as interviews, observations and reviews of students' portfolios to further enrich the study and hence emerged research questions six and seven; **RQ6: How do the interviews with assessors and BID students help explain any further contributions CAMC had on students' employability?** and **RQ7: To what extent and in what ways do observations of BID students at work and reviews of their portfolios serve to contribute to a more comprehensive and nuanced understanding of the predictive relationship between students' success and students' employability?**

The researcher carried out an in-depth literature review to map the competence components, i.e. knowledge, skills and student engagement in CBA of BID. She also evaluated the adapted instruments on assessing and measuring students' employability. The researcher wished to develop a procedure that could explore and predict students' employability and could learn from its applications and thus raised the last research question **RQ8: In a proposed procedure, what measures are to be considered to determine students' employability effectively?**

4.3. Nature of research

Research in the social and behavioural sciences has been categorized in various ways: basic and applied research (Mason, 2006) or qualitative-quantitative dichotomy, (Muijs, 2004), and the qualitative-mixed methods-quantitative continuum (Teddlie-Tashakkori, 2009). Easterby-Smith, et al. (2002), explain further that in

basic and qualitative research, new techniques, methods or ideas are created to deal with a particular problem. Qualitative research is often, but not always, exploratory in nature where information about the unknown aspects of a phenomenon is generated (Creswell, 2009) through inductive reasoning processes (Teddlie & Tashakkori, 2009). On the other hand, applied and quantitative research aims to gain knowledge not just for its own sake but to solve specific and practical questions to the identified problems (Easterby-Smith et. al., 2002) through deductive reasoning processes (Teddlie & Tashakkori, 2009). In other words, it is often confirmatory in nature and driven by theory and the current state of knowledge about the phenomenon under study (Teddlie & Tashakkori, 2009). Furthermore, theory in quantitative research often precedes the gathering of data and thus making it a priori in nature (Teddlie & Tashakkori, 2009). Mixed methods research is seen as a compromise of the two approaches to research where both qualitative and quantitative methods are combined to address a range of confirmatory and exploratory questions simultaneously (Teddlie & Tashakkori, 2009). It uses the inductive-deductive research cycle to infer, predict or confirm a phenomenon; either induction or deduction can come first depending on where one is in terms of studying the phenomenon of interest (Teddlie & Tashakkori, 2009).

These categorisations mainly refer to the different approaches that could be applied in determining the outcomes of a phenomenon under study but, a researcher may not necessarily choose only one of the categorisations (Teddlie & Tashakkori, 2009). Instead, a researcher often chooses only some characteristics of the different categories of research. The nature of research is one of the issues to be considered in determining the process involved as it addresses clearly the output features of a research. Furthermore, a researcher should take into account which elements in the categorisations when adopted would be most suitable to answer the research questions. In order to determine the fullest and most creative range of methods of data generation and data sources to answer the research questions, a researcher should also identify the appropriate research paradigm. Hence, the next section discusses the research paradigms concerned.

4.4. Paradigms of Research

Meterns (2003) defined paradigm as the ‘worldview, complete with the assumptions that are associated with that view’ while Morgan (2007) referred to paradigms ‘as systems of belief and practices that influence how researchers select both the questions and methods that they use to study them’. Generally, a paradigm is a worldview consisting of philosophical and sociopolitical issues (Teddlie & Tashakkori, 2009) as well as a basic set of beliefs that guide action (Denzin & Lincoln, 2000a). There are four distinctive features in understanding the paradigm issues in research:

- (i) *the what and how questions* in seeking evidence to justify the answers for the research questions
- (ii) *the what approach* in choosing the best fit characteristics of the research being investigated
- (iii) *what the limitations* of the chosen approach are
- (iv) *the how questions* in adapting the research design according to constraints of different subjects or knowledge structures

(Easterby-Smith et al., 2002)

A paradigm is basically a set of assumptions about how the issue of concern to the researcher should be studied and understood (Denzin & Lincoln, 2000b). These questions of paradigm are the fundamental foundation in guiding researchers with the research inquiry and should be considered before choosing the methods. It is a major issue as it impacts highly on research especially in the area of management (Amaratunga et al., 2001). The paradigm provides the basis on which the researchers build their verifiable knowledge even though the paradigm itself cannot be tested (Shkedi, 2005). It is more about the way the researcher understands and interprets these few questions:

- i) *Axiology/Ethics*: ‘How can a researcher be a moral person with values and quality in the world?’

- ii) *Ontology*: ‘What is the nature of reality? Does a researcher view the reality objectively or subjectively? Does reality have a single or multiple meanings? Do the meanings of reality depend on the researcher, the individuals being investigated and the audience interpreting the study?’
- iii) *Epistemology*: ‘What is the relationship of the researcher and those being researched?’ Should the researcher interact with those being studied, or should the researcher remain distant and independent of those being researched in an attempt to control for bias? Thus, epistemology is the study of the verification of knowledge. What is the form and nature of reality and, what is there that can be known about it?’
- iv) *Methodology* ‘What is the process of the research? Is the process of the research deductive (where theories and hypotheses are tested for causal relationships in order to develop generalisations that contribute to the theory and enable better prediction, explanation and understanding of some phenomenon) or inductive logic (where categories emerge from the research rather than being identified a priori by the researcher) or inductive-deductive research cycle (where grounded results through inductive inference move to general inferences, then from general inferences through deductive inference to prediction to the particular?).’
- v) *Methods* ‘How can the researcher go about finding out whatever that is believed can be known?’ What are the strategies and, procedures for implementing the research design, including sampling, data collection, data analysis, and interpretation of the findings?’

(Easterby-Smith et al., 2002; Denzin & Lincoln, 2000a; Teddlie & Tashakkori, 2009)

A variety of paradigms have been proposed by different authors. The axiomatic, logical positivism/empiricist and critical theory were used by Meredith et al. (1989) in their paradigms’ terminologies. However, recently, many authors classify the

paradigms into three categories: positivism and postpositivism, constructivism and social constructivism (Amaratunga et. al., 2001; Easterby-Smith et. al., 2002) and the pragmatism and transformative perspectives (Teddlie & Tashakkori, 2009). Thus, these three terms are used to compare the characteristics of the paradigms.

4.4.1. Positivism and Postpositivism

Pure positivists believe that the social world exists externally and its properties should be measured through objective methods (Easterby-Smith et al., 2002; Meredith et al., 1989). Their perception of the nature of knowledge is verified by hypotheses as facts and laws (Easterby-Smith et al., 2002). The key task of an explanation in positivism is to establish causal relationships between variables by establishing causal laws and linking them to a deductive or integrated theory. In order to be able to identify underlying '*laws*' by which the world and specifically the system under observation is governed, a researcher should focus on facts and look for causality. This paradigm can be economical and fast. It provides a wide coverage of different situations and relevance to decision-making, especially when statistics of large samples are involved (Easterby-Smith et al., 2002). Nevertheless, it is inflexible and looks artificial as the approach can be ineffective in understanding the process or people and it is inappropriate in generating theory since it focuses on theory-testing (Easterby-Smith et al., 2002). Moreover, as the phenomenon is isolated from the context, the values are excluded whereby the influence is denied (Meredith et. al., 1989). The training need for a researcher in this paradigm is technical and quantitative.

Postpositivism represents the thinking after positivism whereby the traditional notion of the absolute truth of knowledge is challenged (Philips & Burbules, 2000) while acknowledging the fact that being 'positive' about the claims of knowledge in studies of human behaviour and actions is impossible (Creswell, 2009). Postpositivism is currently the predominant philosophy for quantitative research in human sciences (Teddlie & Tashakkori, 2009) with its strong viewpoint that effects and outcomes are

probably determined by causes and making the need to identify and assess the causes that influence outcomes essential (Creswell, 2009). The postpositivism for example critical realism, is critical of our ability to know the reality with certainty, that theories about the world are revisable and, recognise that observations and measurement contain error. The postpositivists hold the following beliefs:

- i) *theory-ladenness of facts* - the theory or framework used by a researcher influences research
- ii) *fallibility of knowledge* – the verification issue on the absolute truth can never be found is addressed
- iii) *underdetermination of theory by fact* – data, evidence and rational considerations shape knowledge and in practice, the researcher collects information on instruments based on measures completed by the participants or by observations recorded by the researcher
- iv) *value-ladenness of facts* – the values of the researcher influence research and thus being objective is essential to avoid bias
- v) *nature of reality* – research seeks to develop relevant, true statements that explain the situation of concern or that describe the causal of relationships of interest

(Philips & Burbules, 2000; Teddie & Tashakkori, 2009)

This paradigm accepts that reality is difficult to ascertain objectively so as much effort as possible should be put into shaping that reality whilst realising one's own subjectivity (Muijs, 2004). Thus, the focus is on confidence rather than the absolute truth where the degree of reliance on the findings and the accuracy of predictions of certain outcomes are taken into consideration (Muijs, 2004). Similar to positivism, this paradigm can be cost-effective, expeditious and practical for large scale research. However, postpositivism has a different perception of the epistemological issues concerning the relationship between the knower and the known. Although both

perceive the relationship as being 'objective' with a dualism, postpositivists acknowledge the influence of values and thus, methods have been developed to reduce the influence and increase objectivity (Teddlie & Tashakkori, 2009). As it still focuses on theory-testing, and not theory-generating (Easterby-Smith et al., 2002), a researcher in this paradigm needs to acquire technical and quantitative training.

4.4.2. Constructivism and Social Constructivism

According to the constructivism, knowledge of the world is mediated by cognitive structures that result from the interactions of the mind and the environment (Schwandt, 1997, p.19). Furthermore, the understandings of reality are constructed both individually and socially (Teddlie & Tashakkori, 2009) with the emphasis on value laden observations and resounding understanding of those being studied.

According to the social constructivists' assumptions, individuals seek understanding of the world in which they live and work where they subsequently develop subjective meanings of their experiences through the interactions with their community (Crotty, 1998). In other words, the essence of social constructivism is that 'people determine reality' rather than objective or external factors. The central focus is on how people, whether individually or collectively, view a situation being studied based on the meanings they place on their historical and social perspectives (Crotty, 1998) and thus making communication between each other an essential consideration (Easterby-Smith et al., 2002). The paradigm understands the meanings people have about the world; it contributes to the evolution of new theories and it creates new issues to study (if there are any) and, it addresses the process of interactions among individuals (Creswell, 2009) and looks at the process of changes that take place over time (Easterby-Smith et al., 2002). Hence, the study is more on people rather than on inanimate objects where the overall context is included as part of the object being studied. However, the data collection is time consuming, analysis and interpretation can be difficult and its credibility is considered to be low (Easterby-Smith et al.,

2002). Training in re-socialisation, qualitative and quantitative history, values of altruism and empowerment is usually needed to carry out research which is based on this paradigm.

4.4.3. Pragmatism and Transformative Perspective

The pragmatists believe in finding a middle ground between philosophical dogmatism and scepticism to find a workable solution (Johnson & Obnwegbuzie, 2004). They reject the dogmatic either-or-choice between constructivism and postpositivism, and they look for practical answers to questions that have intrigued researchers (Teddlie & Tashakkori, 2009). Moreover, the pragmatists consider the existence of the epistemological issues to be on a continuum rather than on two opposing poles and thus, challenge the distinct contrast between the constructivists' subjectivity and the postpositivists' objectivity. Values play an important role in conducting research and in drawing conclusions from the studies. According to Cherryholmes (1992), the pragmatists perceive values and visions of human action and interaction as the basis that precedes a search for descriptions, theories, explanations and narratives. In short, the pragmatists decide what they want to study based on what is important within their personal value systems and conduct the study in a way that is congruent with their value system (Teddlie & Tashakkori, 2009). The pragmatists' viewpoint regarding reality consists of two parts; external reality exists independently of our minds (Cherryholmes, 1992) and the truth regarding reality cannot be determined (Teddlie & Tashakkori, 2009). They believe that truth is a normative concept and 'truth is what works', which is not seen as a theory or definition but as the pragmatists' attempt to say something interesting about the nature of truth and that knowledge claims are not to be abstracted solely from contingent beliefs, interests and projects (Howe, 1988). They also believe that there may be causal relationships that are transitory and difficult to identify while emphasising ideographic statements relating to issues of both external validity and transferability results in making generalisations (Teddlie & Tashakkori, 2009).

This paradigm can be practical and comprehensive as it allows the researcher to focus on the research problem whilst use all possible approaches available to understand the problem (Rossman & Wilson, 1985). The researcher has all the freedom in choosing the best suited method to answer the research questions that are of importance to his/her value system (Teddlie & Tashakkori, 2009) and thus making the research more meaningful. In addition, it allows the researcher to use both qualitative and quantitative methods simultaneously resulting in more holistic descriptions and explanations of the anticipated outcomes (Deacon et al., 1998). Despite its advantages, this paradigm can be time consuming, costly, demanding in nature and requires some systematic planning and organised execution of the research which makes it unlikely to be suitable for a novice researcher. Moreover, it requires technical and quantitative training as well as re-socialisation, values of humanity and qualitative training.

The transformative paradigm places central importance on the lives and experiences of marginalised groups such as women, ethnic/racial minorities, people with disabilities and those who are poor where the results of social inquiry are linked to wider questions of social inequity and social justice by analysing asymmetric power relationships and seeking ways to link the results to actions (Mertens, 2003). Like the pragmatists, the transformative scholars also reject the either-or choice regarding methods, but for different reasons; they would use research methods that produce results that promote greater social justice (Teddlie & Tashakkori, 2009). They also value objectivity and subjectivity with peculiar meanings such as objectivity would mean providing a balanced view so that bias is not interjected due to lack of understanding of key viewpoints while subjectivity would refer to researchers obtaining the understanding to appreciate participants' subjective experiences by being present in the communities concerned (Mertens, 2003). In comparison to pragmatism, values that guide research according to the transformative perspective function to enhance social justice rather than individual researcher interests (Teddlie & Tashakkori, 2009). Furthermore, transformative scholars believe that there are diversities of viewpoints regarding social realities (Mertens, 2003) and they choose alternative explanations that best promote social justice for oppressed groups

(Teddlie & Tashakkori, 2009). They also believe that the causal relationships that may exist should be understood within a social justice framework and, in making generalisations, they emphasise ideographic statements that attempt to link results from a specific study to broader issues of social justice (Teddlie & Tashakkori, 2009).

This transformative paradigm is similar to pragmatism in many ways except for its concerns about values where a researcher has to be more empathetic towards the participants in the study and that actually drives the need to conduct a study that will somehow enhance social justice (Teddlie & Tashakkori, 2009). Both qualitative and quantitative approaches could be used in this paradigm depending on how much these methods contribute to social justice at the end of the study. This paradigm nevertheless requires a lot of time, money, planning, patience, tolerance and understanding of the social group under study in order to obtain more collective and trustworthy findings. It also requires all the training needed in pragmatism paradigm with a special focus given to values of selflessness.

4.5. Strategies of Inquiry

Marshall and Rossman (1995) describe a research strategy as the road map of an overall plan for undertaking systematic exploration of the phenomenon of interest. Yin (2003:3) relates it to different ways of collecting and analysing empirical evidence, following its own logic while MacBryde and Mendibil (2003) consider it a general approach to or general type of investigation. Creswell (2009) expands the description of strategies of inquiry to more specific types of qualitative, quantitative and mixed methods designs or models that provide specific procedures in a research design. Some questions to address in determining the most suitable research strategy include: is it *exploratory or explanatory* (focusing on 'how and why' questions; is it *descriptive or predictive* (focusing on 'what, who and where' or 'how many' or 'how much' questions); is it both *confirmatory and exploratory*? (Teddlie & Tashakkori, 2009; Yin, 2003). However, Marshall and Rossman (1995) argue that description and

prediction are different: the descriptive purpose is invoked to document phenomena of interest, whilst the predictive purpose drives studies which aim to predict outcomes or to forecast events and behaviours. Other issues which might need to be addressed in determining the strategy are whether there is to be an intervention in which actual behavioural events are manipulated in the research and the extent of emphasis between contemporary and historical events. Table 4.1 indicates approaches that can be adopted in matching the research questions with strategies.

Table 4.1: Matching Research Purpose with Strategies

Purpose of the study	Research question	Potential research strategy
<p>Exploration Uncover areas for research and theory development</p>	Is there something interesting enough to justify research?	<p>Qualitative In-depth case studies Unfocused, longitudinal field study</p>
<p>Theory Building Identify/describe key variables Identify linkages between variables Identify 'why' these relationships exist</p>	<p>What are the key variables? What are the patterns or linkages between variables? Why should these relationships exist?</p>	<p>Few focused case studies In-depth field studies Multi-site case studies Best-in-class case studies</p>
<p>Theory testing Test the theories developed in the previous stages Predict future outcome</p>	<p>Are the theories we have generated able to survive the test of empirical data? Did we get the behaviour that was predicted by the theory or did we observe another unanticipated behaviour?</p>	<p>Quantitative Experiment Quasi-experiment Multiple case studies Large-scale sample of population</p>
<p>Theory extension/refinement To better structure the theories in light of the observed results</p>	<p>How generalisable is the theory? Where does the theory apply?</p>	<p>Experiment Quasi-experiment Case studies Large-scale sample of population</p>
<p>Confirmation and exploration Verifying and generating theory in the same study</p>	<p>Is there something interesting enough to justify research? Are the theories we have generated able to survive the test of empirical data?</p>	<p>Mixed methods Sequential Concurrent Transformative</p>

Source: Adopted from Voss et al., (2002:198); Creswell (2009); Teddlie & Tashakkori (2009)

Selecting the most appropriate strategies for a research is fundamental because some of the strategies or even one of the strategies might have different advantages compared to others (Yin, 2003). These research strategies can be suitable at different stages (Yin, 2003) whereas some strategies are exclusively valid for certain stages and are disposed hierarchically (Meredith et al., 1989). According to Meredith et al., (1989) there are three categories of mechanism to classify the strategies:

- *Direct observation of object reality* which occurs when the researcher him/herself examines and investigates the phenomenon as he/she gets the accessibility to study the real case. The researcher can either analyse it using a structured approach (quantitative) or interpretive approach.
- *People's perception of object reality* is where the research is carried out from other people's points of view or interpretations such as surveys and questionnaires. The main characteristic is that it depends on the perception of the person exposed to the reality.
- *Artificial reconstruction of object reality* is when identified key variables of the phenomenon under study are put in an artificial context and analysed under a controlled environment. It is appropriate for theory testing, rather than theory building and the examples of this category are computer simulation and analytical models.

4.6. Implications of Research Paradigm and Research Strategy on This Research

Based on the previous discussions in this chapter, the implications of the research, paradigm and research strategy, are looked into in the following sections.

4.6.1 Research Paradigm

The focus of this research is both objective and subjective where at one stage of the research it needs to assess and evaluate how teachers perceive their students with regard to their employability and also how students self-rate themselves, while at the other stage it needs an in-depth understanding of different terminologies such as competence-based assessment, employability and competence. Explaining the notions of employability and competence is difficult and trying to ascertain students' employability is even more challenging, because employability and competence are not easily observable and measurable but can be related to behaviours that represent both the qualities. Thus, a mixed methods paradigm is most appropriate for this type of research.

The fundamental argument for the paradigm driving this study is that it addresses a range of confirmatory and exploratory questions. It provides stronger inferences and opportunity for a greater assortment of divergent views and thus making it superior to the single approach designs (Teddlie & Tashakkori, 2009). Furthermore, as mixed methods research simultaneously asks confirmatory and exploratory questions, verification and generation of theories are made possible in the same study. In addition, divergent findings according to Ezberger and Prein (1997) could lead to a re-examination of the conceptual frameworks and the assumptions underlying each of the components. Although there may be a short-term inconvenience of this re-examination, Deacon et al. (1998) has pointed out the advantages of it being analytically rewarding in the long-term as researchers would be more aware of the possibilities of the issues being more multifaceted than they would initially have been expected of and thus offering opportunity to develop more convincing and robust explanations of the social processes being investigated, all of which this research would be very much interested in.

The second argument for this paradigm is that it overcomes the epistemological limitations of a positivist approach. While a positivistic approach could be adopted to derive objective measurements, the findings are likely to be much less rich if the

perspective of the individual is discounted or if the effects of social context are ignored. In order to retain the subjective experience, a qualitative approach is required. Hence, a mixed methods research is acceptable for this research as it has strengths that are complementary and weaknesses that are non-overlapping (Johnson & Turner, 2003). Green et al. (1989) further described the functions of mixed methods as being the triangulation and complementarity of inferences which would further enhance the research.

Mixed methods research which employs a combination of qualitative and quantitative approaches has gained popularity in recent years as it utilizes the strengths of both approaches which subsequently provide an expanded understanding of the research problems (Creswell, 2009). Furthermore, the interdisciplinary nature of the research addresses adequately the complexity of research problems raised by the social and health researchers in contrast to the use of either one of the approaches. Mixed methods research is enriching and advantageous as it incorporates both the interpretation of meanings in textual data and spoken word, as well as in numerical data through the use of statistical method. In addition, how the researcher perceives and explains the world within which this research is conducted could be described by the definitions of paradigm explained earlier. Therefore, it is necessary to consider the researcher's paradigm in order to understand how she perceives and explains the world.

Different environments, past experiences and different cultures have significantly influenced the researcher's paradigm. The researcher comes from a multicultural and multi-ethnic country where logic and rationalism often have to co-exist with multiple perceptions, may it be the objective or subjective realities. The researcher was brought up in this tradition of compromise and mutual understanding based on interaction with different perspectives from different cultures. Furthermore, the researcher always considers both the objectivism and subjectivism as important counterparts in the search for different 'truths' in this ironically objectivist world through the use of practical and workable solutions. Based on these arguments, this research falls into a pragmatic paradigm focusing on concurrent mixed methods.

4.6.2 Matching Research Purpose with Research Strategy

Based on the structure of matching research questions put forward by Voss et. al. (2002), Yin (2003), Marshall and Rossman (1995) and Teddlie & Tashakkori (2009), the researcher concluded that the purpose of this research led the research to fall into a ‘confirmatory’ and ‘exploratory’ research. There are six strategies in a mixed-methods approach that can be used to serve a combination of ‘confirmatory’ and ‘exploratory’ research; four strategies under the pragmatism paradigm (sequential explanatory, sequential exploratory, concurrent triangulation and concurrent embedded) while another two fall under a transformative perspective paradigm (sequential transformative and concurrent transformative) (Creswell, 2009; Teddlie & Tashakkori, 2009). However, as the research focused on BID students in secondary schools and they do not belong to a marginalised group, strategies in the pragmatic paradigm are more appropriate. The four strategies in Table 4.2 show the characteristics, strengths and weaknesses of each strategy.

Table 4.2: Mixed Methods Strategies in Pragmatism Paradigm

Mixed Methods Strategies	Characteristics	Strengths	Weaknesses
Sequential Explanatory	<p>Strong quantitative leanings</p> <p>Collection and analysis of quantitative data in the first phase</p> <p>Collection and analysis of qualitative data in the second phase to examine in detail any surprising quantitative results</p> <p>Mixing of data occurs when the initial quantitative results informs the secondary qualitative data collection</p>	<p>Straightforward nature of the design</p> <p>Easy to implement as the steps fall into clear, separate stages</p> <p>Easy to describe and to report</p> <p>Better at explaining and interpreting relationships</p>	<p>Length of time involved in data collection</p>
Sequential Exploratory	<p>Strong qualitative leanings</p> <p>Collection and analysis of qualitative data in the first phase</p> <p>Collection and analysis of quantitative data in the second phase to examine in detail any surprising qualitative results</p> <p>Mixing of data occurs when the initial qualitative results informs the secondary quantitative data collection</p>	<p>Straightforward nature of the design</p> <p>Easy to implement as the steps fall into clear, separate stages</p> <p>Easy to describe and to report</p> <p>Better at testing elements of an emergent theory</p> <p>A procedure of choice in developing instruments</p>	<p>Length of time involved in data collection</p>
Concurrent Triangulation	<p>Both quantitative and qualitative methods are given equal weight</p> <p>Collection of both qualitative and quantitative data is done concurrently in a single phase</p> <p>Data is compared to determine if there is convergence, difference or combination</p> <p>Data is merged, integrated or compared</p>	<p>Familiar to most researchers</p> <p>Can result in well-validated and substantiated findings</p> <p>Shorter data collection time period</p>	<p>Requires great effort and expertise</p> <p>Difficult to compare the results of two analyses using data of different forms</p> <p>Discrepancies that arise in comparing the results may be difficult to resolve</p>
Concurrent Embedded	<p>Collection of both qualitative and quantitative data is done concurrently in a single phase</p> <p>Primary method guides the project while a secondary method provides a supporting role in the procedures</p> <p>The secondary method (quantitative/qualitative) is embedded within the predominant method (qualitative/quantitative)</p> <p>The secondary method addresses a different question than the primary method or seeks information at different level of analysis</p> <p>Mixing of data is often to integrate the information and compare one data source with the other or reside side by side as two different pictures that provide an overall composite of the problem</p>	<p>Gain broader perspectives as a result of using different methods</p>	<p>Data need to be transformed so that they can be integrated within the analysis phase</p> <p>Discrepancies may occur in comparing the data and that need to be resolved</p> <p>May result in unequal evidence within a study when interpreting the final results as the methods are unequal in their priority</p>

Source: Adopted from Creswell (2009); Teddlie & Tashakkori (2009)

Moreover, based on the discussions in the previous sections, the researcher adapted a framework from various authors to locate the potential strategies for this research. After determining the research paradigm, the strategies have been narrowed into those in the **mixed-methods/pragmatist boxes** as illustrated in Table 4.3.

Table 4.3: Locating the Potential Strategies for this Research

	Paradigms/ categorizations of strategies	Direct observation of object reality	People's perceptions of object reality	Artificial reconstruction of object reality	
Quantitative Approach	Positivist/ Postpositivists	Field studies Field experiments	Structured interviewing Survey research	Reason/Logic/ Theorems Normative Modelling Physical Modelling Laboratory Experimentation Simulation	Researcher is independent Large samples Testing theories (Deductive) Experimental design Universal theory verification
Qualitative Approach	Constructivist	Action research Case studies Focus groups Constructive research Grounded research	Historical analysis Delphi Intensive interviewing Expert panels Futures/scenarios Focus groups	Conceptual modelling Hermeneutics	Researcher involved Small sample Generating theories (Inductive) Fieldwork methods Local knowledge Falsification
Mixed Methods	Pragmatists	Action research Case studies Focus groups Constructive research Grounded research Structured observation Unobtrusive measures	Survey research Historical analysis Delphi Intensive/ Structured interviewing Expert panels Futures/scenarios Focus groups	Reason/Logic/ Theorems Normative Modelling Physical Modelling Laboratory Experimentation Simulation Conceptual modelling Hermeneutics	Researcher independent & involved Small or large samples Testing & generating theories (deductive- inductive) Experimental design Universal theory verification Fieldwork methods Local knowledge Falsification

Source: Adopted from Meredith et. al., (1989); Easterby-Smith et. al., (2002);
Kasanen et al. (1993); Creswell (2009); Teddlie & Tashakkori (2009)

As mentioned earlier, the main research tasks are to construct a proper protocol to predict students' employability, to study the impact CBA had on students' employability and to identify the factors that influence students' employability. Therefore, it is more appropriate to choose a 'direct observation of object reality' and 'people's perceptions of reality' as gathering information directly from the sources which in this case would refer to the schools, BID teachers and BID students is necessary. Consequently this narrows to a concurrent-embedded strategy in the mixed methods pragmatism approach as illustrated in Figure 4.2 with quantitative method as the predominant method and qualitative as the secondary method techniques. Four data collection techniques in this strategy include questionnaires, interviews, structured observations and unobtrusive measures of document reviews as discussed in the following section.

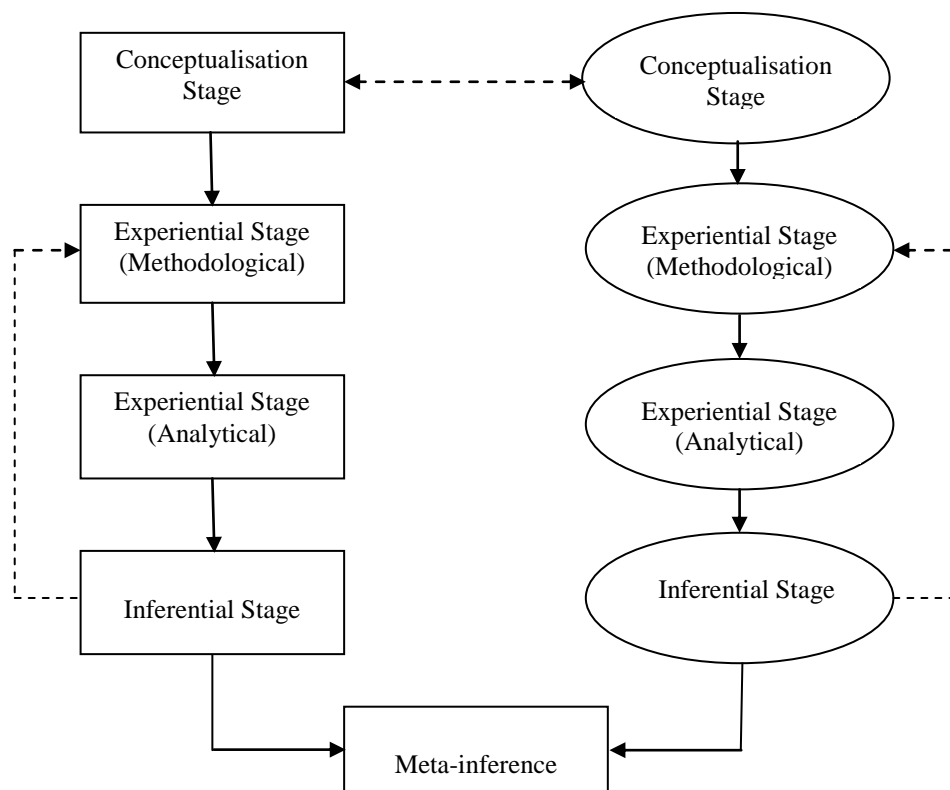


Figure 4.2: Graphic Presentation of Concurrent Mixed Methods Design

Source: Adopted from Teddlie & Tashakkori (2009, p.152)

4.6.3 Data Collection Techniques

Two main activities in data collection involve the preparation for data collection and the actual collection of the data where a research protocol was used to enhance the activities. Several sources of evidence are suggested to be essential in collecting data (Yin, 2003; Eisenhardt, 1989; Voss et. al., 2002) and thus the researcher looks into various techniques such as surveys, interviews, direct observations and document reviews. The researcher then presents four possible data collection techniques for this research in Table 4.4 indicating the options within the techniques, the strengths and weaknesses of each technique. Furthermore, the study also incorporates informal conversations, attendance at meetings and events to be part of the data collection technique (Voss et. al., 2002).

Table 4.4: Options, Strengths and Weaknesses in the Data Collection Techniques

Data collection techniques	Options within techniques	Strengths	Weaknesses
Questionnaires	<ul style="list-style-type: none"> • Postal questionnaires • Online questionnaires • Researcher conducts the survey 	<ul style="list-style-type: none"> • Economical yet considerable amount of data • Analysis is more about using software packages 	<ul style="list-style-type: none"> • Responses may sometimes be biased • Preparation of questionnaires is time-consuming • Little opportunity to check truthfulness
Interviews	<ul style="list-style-type: none"> • Face to face – one-on-one, in person interview • Telephone – researcher interviews by phone • Focus group – researcher interviews participants in a group • Email internet interview 	<ul style="list-style-type: none"> • Often provide in-depth data • Insightful • Opportunity to clarify ambiguity • High response rate • Simple equipment required 	<ul style="list-style-type: none"> • Potential for bias-if the interviewer is not consistent • Data analysis is time-consuming • Invasion of privacy • Little opportunity to check truthfulness
Direct observation	<ul style="list-style-type: none"> • Complete participant- researcher conceals role • Observer as participant – role of researcher is known • Participant as observer – observation role secondary to participant role • Complete observer – researcher observes without participating 	<ul style="list-style-type: none"> • Directly records observable behaviours • Useful in exploring topics that may be uncomfortable for participants to discuss • Researcher has a first-hand experience with participant • Means for collecting substantial amounts of data-relatively short span 	<ul style="list-style-type: none"> • Time-consuming • Sometimes disturbs the naturalness of the settings • Researcher needs to have good attending and observation skills • Potential for researcher bias
Documents	<ul style="list-style-type: none"> • Public documents; reports, minutes of meetings etc. • Private documents such as journals, diaries, letters 	<ul style="list-style-type: none"> • Cost effective of getting the data • Stable-it can be reviewed and repeated • Exact contents of data • An unobtrusive source of information – access any time convenient to researcher 	<ul style="list-style-type: none"> • Low reliability – materials may not be authentic or accurate • Sometimes difficult to get access

Sources: Adopted from Denscombe (2003), Marshall and Rossman (1995), Yin (2003), Stake (1995), Easterby-Smith et al. (2002), Silverman (2001), Meredith et al. (1989), Creswell (2009)

4.6.3.1 Data Collection Techniques for this Study

After evaluating all the strengths and weaknesses of the above discussed techniques, the researcher had to consider techniques that could appropriately correspond with the research purpose. The chosen techniques should be able to facilitate systematic approach to collect data, gain new insights and understanding of the phenomenon and be cost effective as there are limitations in terms of resources such as money and time for this PhD research. Furthermore, the chosen techniques should facilitate the efficiency of administering and managing the data.

After considerable evaluation of the characteristics, features, and the usability of the strategies and techniques available in the research milieu, the researcher decided to adopt the mixed methods approach for carrying out the development of procedures to explore and predict students' employability. As a result, the design for the four techniques selected is discussed: questionnaires, interviews, observation and document reviews. These multiple data collection techniques were employed to ensure the quality of data and to attempt to find new insights. Furthermore, these techniques could help ensure quality of the research by increasing the construct validity (Yin, 2003). In addition, the researcher decided to use a research protocol (discussed in Chapter 5) to provide the general rules and procedures that guide the research process which could increase the reliability of the study (Yin, 2003; Voss et al., 2002; Eisenhardt, 1989)

Many researchers use questionnaires in large-scale investigations (Easterby-Smith et al., 2002) and as this study included more than 300 participants (covering all the BID student population in Malaysia undertaking BID for MCE for that particular year), questionnaires are suitable to elicit their perceptions of the research problem addressed. Along with using closed questions in the questionnaires, this study included an open-ended question to get in-depth responses that will enhance the findings. Two questionnaires were adapted and developed in this study; students' self-rating and assessors' ratings. As the BID students self-rated themselves, there is a possibility of self-rating bias where students might have positive perceptions of

their employability. Therefore, the researcher used the assessor questionnaire to gather information of students' employability from the assessors' perceptions. In addition, the use of other qualitative approaches such as interviews, observation and document reviews would help counter check and validate students' claims of their employability.

Interview is one way of gathering large amount of data quickly (Marshall and Rossman, 1995) and it is often claimed as more critical approach needed to reflect at least potential difficulties with data gathering (Easterby-Smith et. al., 2003). There are six types of interviews: (i) structured interviews (ii) semi-structured interviews (iii) unstructured interviews (iv) one-to-one interviews (v) group interviews and (vi) focus group interviews (Denscombe, 2003). This study employed structured interviews as they are more appropriate in gathering specific information (Mendibil, 2003) that will get descriptions of an episode and explanations of events (Stake, 1995) which in this case will be the other effects of CBA on students and the detailed activities related to the development of employability skills which are not asked in the questionnaires. Both the assessors and a few students from all the nineteen schools offering the BID subject were interviewed.

In addition to the questionnaires and interviews, direct observation of students at work was carried out to directly record the behaviours (Creswell, 2009) that portray competence. The researcher had to follow two guidelines in adopting direct observation: keeping a good record of events being observed and careful advance planning (Yin 2003; Stake, 1995) in order to maintain the reliability and validity of the observation. One crucial issue in doing direct observational work is the reluctant optimising of the 'eyes' and 'ears' (Silverman, 2001) which may affect the quality of recording. Thus, a behaviour observation form with rating scale was developed and employed in the study.

As document review can be conducted without disturbing the setting in any way, an enormous amount of information is held and it is also a cost-effective method of getting data (Marshall and Rossman, 1995). In order to avoid bias and maintain the

truth of the contents, it is advisable to check the sources of data collection (Yin, 2003; Stake, 1995) and thus only documents provided by schools such as organisational records, lists of names, personal records (Yin, 2003), students' assessment modules and portfolios, assessment monitoring records, assessment moderation records and other relevant documents were reviewed. Finally, the study verified small details such as spelling and titles or names of organisations by corroborating information from other sources available in schools and made inferences that led to further investigation (Yin, 2003).

4.6.4 Data Analysis Techniques

As mentioned earlier, this study employed a mixed methods approach and thus the researcher adopted both quantitative and qualitative data analyses. The following sections will look into the different types of analysis in each of the approaches.

4.6.4.1 Quantitative Data Analysis

Quantitative data analysis consists of a variety of statistical techniques to analyse numeric data (Teddlie & Tashakkori, 2009). Quantitative data analysis strategies could be categorised into several different ways (Gravetter & Wallnau, 2007; Jaccard & Becker, 2002) but only three will be discussed in this section; descriptive and inferential statistics, univariate and multivariate and, parametric and non-parametric statistics.

Descriptive methods comprise procedures to summarise data in order to uncover trends and patterns, and to summarise results for better understanding and communication (Pallant, 2007; Creswell, 2009; Teddlie & Tashakkori, 2009). Descriptive statistics which include results such as frequency tables, means and correlations are the outcomes of descriptive methods (Pallant, 2007; Creswell, 2009; Teddlie & Tashakkori, 2009). Subsequently, inferential techniques are generated to

test hypotheses or to confirm the results obtained from the descriptive results (Teddlie & Tashakkori, 2009). Inferential statistics are more informative for research purposes than descriptive statistics and examples of these methods are the t test, which is used to test whether or not there is significant difference between two group means, and multiple regression analysis which is used to determine the degree of relationship between variables (Pallant, 2007; Creswell, 2009; Teddlie & Tashakkori, 2009). Teddlie & Tashakkori (2009) describe some details of the inferential statistics as the following;

- Tests of statistical significance provide information on whether the results are due to chance or 'true' relationship between variables with some degree of certainty.
- Statistically significant results indicate that we can be confident to some degree that the results did not occur by chance.
- Inferential statistics provide information about the extent of the relationship or effect.
- Alternative hypothesis denotes that there is a true difference between groups or relationship among variables. It is also quite often the hypothesis the researcher formulates and wants to explore.
- Null hypothesis suggests that there is no difference between group means or no relationship between variables. It is the one put under tests which help us determine whether we can accept or reject the null hypothesis. Based on that, we can proceed to discuss the alternative hypothesis.
- Alpha level which conventionally set at .05 represents statistical significance and is the maximum acceptable in most cases probability at which null hypothesis is rejected.

Univariate statistics are used to link the focal point of the analysis, one variable (a dependent variable, a predicted event), to another variable such as a predictor or an independent variable (Pallant, 2007; Creswell, 2009; Teddlie & Tashakkori, 2009). The inferential statistics discussed above are concerned with univariate statistics. Although univariate statistics are important, they do not really reflect the real world where more than one variable at a time are related to or shaped by others and so does most research in human sciences which commonly addresses the relationships among sets of variables simultaneously (Teddlie & Tashakkori, 2009). Thus, multivariate statistics are appropriate to deal with the real world multiple relationships among variables (Teddlie & Tashakkori, 2009). Multivariate statistics simultaneously link more variables to each other and look at the relationships between dependent variables such as predicted events and independent (predictors) variables (Pallant, 2007; Teddlie & Tashakkori, 2009). In a more refined analysis, multivariate analyses are usually following univariate analyses to help determine the more important relationships between variables or differences between groups (Pallant, 2007; Teddlie & Tashakkori, 2009).

Parametric statistics are considered powerful techniques but they require stringent assumptions about the data to be analysed such as independence, normality and homogeneity of variance (Pallant, 2007; Teddlie & Tashakkori, 2009). Furthermore, data gathered using interval or ratio measurement scales should be analysed in parametric statistics (Wiersma & Jurs, 2005; Pallant, 2007; Teddlie & Tashakkori, 2009). On the other hand, non-parametric statistics could be used to analyse data gathered using nominal (categorical) and ordinal (ranked) scales and data that do not meet the stringent assumptions of the parametric techniques (Wiersma & Jurs, 2005; Pallant, 2007; Teddlie & Tashakkori, 2009). However, non-purist researchers nowadays are willing to accept that non-parametric tests can be used with ordinal data provided that some assumptions are met. Among the assumptions to be considered in non-parametric techniques are the random samples and independent observations where each subject or case can be counted only once (Pallant, 2007). Non-parametric statistics are considered less powerful than parametric statistics (Pallant, 2007; Teddlie & Tashakkori, 2009).

4.6.4.2 Qualitative Data Analysis

Qualitative data analysis comprises the analysis of various forms of narrative data such as interviews, audio, video and other formats (Teddlie & Tashakkori, 2009) that is inductive in nature, iterative (Dey, 1993; Taylor & Bogdan, 1998; Patton, 2002) and eclectic as there is no particular data analysis for a particular qualitative data (Coffey & Atkinson, 1996). The main aspect of any types of qualitative data analysis is the search for themes (Miles & Huberman, 1994; Teddlie & Tashakkori, 2009). Table 4.5 shows three general types of qualitative data analysis.

Table 4.5: Types of Qualitative Data Analysis

	Characteristics	Examples
Categorical Strategies	<ul style="list-style-type: none"> - Narrative data broken down and rearranged into categories that facilitate comparisons leading to a better understanding of research questions - Constant comparative method is the frequently used categorical strategies - Different pieces of data are compared, categories tightened up, concepts refined, properties identified, relationships explored and coherent theory integrated continuously 	Latent and manifest analysis Constant comparative analysis Grounded theory techniques Developmental Research Sequence (Spradley, 1979, 1980)
Contextualizing Strategies	<ul style="list-style-type: none"> - Narrative data interpreted contextually, coherently and holistically where experience entirety is the focus - Data are understood based on interconnecting information - Suitable when the interrelated elements in data set are too complicated to be analysed using categorical strategies or when the context in the study is the emphasis 	Phenomenological analysis Narrative analysis Individual case studies Ethnographic analysis Artistic approaches Metaphorical analyses Critical theory approaches to qualitative data analysis
Qualitative Data Displays	<ul style="list-style-type: none"> - Qualitative data analysis is represented in visual presentations of the themes - Displays could represent summary of information from categorical or contextualising strategies or as a separate data analysis scheme 	Effect matrices Sociograms Concept of mental maps Figures & tables associated with Spradley's (1979, 1980) Developmental Research Sequence Taxonomic structures

Source: Moustakas, 1994; Spradley, 1979, 1980; Taylor & Bogdan, 1998; Glaser & Strauss; 1967; Lincoln & Guba, 1985; Teddlie & Tashakkori, 2009

4.6.4.3 Mixed Methods Data Analysis

Mixed methods data analysis combines and integrates both the quantitative and qualitative data analysis strategies in research studies (Teddlie & Tashakkori, 2009). There are various mixed methods data analysis strategies (Creswell & Plano Clark, 2007; Onwuegbuzie & Teddlie, 2003; Tashakkori & Teddlie, 1998) but generally they involve four phases of data analysis; data transformation, data correlation and comparison, analysis for inquiry conclusions and inferences, and application of analytical framework of one methodological tradition within the analysis of data from the other tradition (Greene, 2007; Teddlie & Tashakkori, 2009). Moreover, some preanalysis considerations (Onwuegbuzie & Teddlie, 2003; Teddlie & Tashakkori, 2009) as stated below should be looked into before deciding on a mixed methods data analysis strategy;

- Matching the purpose of research with particular mixed methods data analysis strategies. For example, if the purpose of mixed methods research is for complementarity, then one form of analysis should be used to complement the results of the same phenomenon. Parallel mixed designs and analyses are suitable for this purpose. However, if the purpose is for expansion, then one type of analysis will be used to expand on the initial understanding gained from the other analysis where sequential mixed designs will be appropriate.
- Determining whether the study is variable oriented or case oriented as the emphasis will be on quantitative analytic strategies for the former while qualitative analytic strategies for the latter which will also affect the assumptions made later on.
- Determining whether the study is exploratory, confirmatory or both to help plan effective analytic strategies.

- Considering the extent of both types of analyses in informing each other during the overall analytical process; whether they occur separately (parallel mixed analysis is appropriate) or one analysis follows up on the other one (sequential mixed data analysis is suitable).
- Making appropriate underlying assumptions of quantitative and qualitative data analysis techniques (e.g. assumption of normality for parametric analyses and triangulation for trustworthiness of qualitative data collection and analysis).
- Determining the data analysis tools to be used such as computer software.

Table 4.6 shows brief descriptions of each of the six different types of mixed methods data analyses suggested by Teddlie and Tasakkori (2009).

Table 4.6: Types of Mixed Methods Data Analysis

	Characteristics
Parallel mixed data analysis	<ul style="list-style-type: none"> - Consists of two separate processes based on two types of data collected independently but simultaneously: quantitative (descriptive/inferential statistics) and qualitative data analyses (thematic analysis of narrative data) - Each analysis provides an understanding of the phenomenon in the study; inferences regarding quantitative and qualitative research questions are generated respectively and then integrated or synthesized to form meta-inferences at the end of the study - Analyses can lead to convergent or divergent results
Conversion mixed data analysis	<ul style="list-style-type: none"> - Involves data conversion such as quantizing narrative data, qualifying numeric data or mixed data analysis techniques - Consists of only one original data source which is then converted into two types of data
Sequential mixed data analysis	<ul style="list-style-type: none"> - Comprises processes that are in chronological order where one type of analysis depends on the other type of analysis - The analyses could be in these orders; (i) quantitative followed by qualitative (explanatory design); (ii) qualitative followed by quantitative (exploratory design); (iii) iterative sequential mixed analysis (design with more than two phases)
Multilevel mixed data analysis	<ul style="list-style-type: none"> - Consists of different techniques that are used at different levels of analysis within a study to answer interrelated research questions - Designs are possible only in institutions that are hierarchically organized
Fully-integrated mixed data analysis	<ul style="list-style-type: none"> - Consists of interactive mixing of quantitative and qualitative analyses at all stages of the study - Analyses are characterized as iterative, reciprocal and interdependent
Application of analytical techniques from one tradition to the other	<ul style="list-style-type: none"> - Includes the use of analytical techniques in one research design into the other type of research design - Examples: matrices and graphs in quantitative research are used in qualitative research - The use of quasi-statistics – descriptive statistics are used to quantize thematic data generated from qualitative analyses

Source: Greene, 2007; Creswell & Plano Clark, 2007; Teddlie & Tashakkori, 2009

As the researcher had adopted the concurrent mixed methods design, it was wise to apply the parallel mixed data analysis in the study where both quantitative and qualitative data analyses were employed. Parallel mixed data analysis was found to

be the most suitable for this study as quantitative and qualitative data were collected simultaneously but separately in single phase or visit. The qualitative data complemented the quantitative data in answering the research questions and this matched the purpose of mixed methods research for complementarity (Teddlie & Tashakkori, 2009). In other words, the qualitative data analyses supported quantitative data analyses and were used to provide rich detail that had the potential of facilitating interpretation of the participants' perceptions of the BID students' employability. Both the quantitative and qualitative data analysis procedures were in parallel and separate manner where the quantitative data analyses would generate inferences related to quantitative oriented questions while the qualitative data analyses would generate inferences regarding qualitative oriented questions. Both types of analyses were then integrated at the end to generate meta-inferences of the study. The study was both exploratory and confirmatory. It was also variable and case oriented in which the emphasis was on quantitative analytic strategies and qualitative analytic strategies. Descriptive and inferential statistics were used in analysing quantitative data after taking into consideration the relevant assumptions. Hierarchical multiple regression analysis using SPSS 16 was conducted on the quantitative data to determine the degree of relationships between the predictors of employability, dimensions of employability and the dependent variables of students' success (Pallant, 2007; Creswell, 2009; Teddlie & Tashakkori, 2009) in this study.

Analysing qualitative data is a challenge as there is no clear or accepted classification for data analysis (Easterby-Smith et al., 2002). It is the most difficult and least codified but the most important part of a qualitative research (Eisenhardt, 1989). It is essential for the researcher to gain an overview and make sense of the data through building a structure of evidence within which the analysis can be seen (Spencer et al., 2009). It was also important to explore the understanding of an issue by exploring the connections between the explicit statements and implicit meanings in a conversation or text using a structured analytical tasks (Toulmin, 1958; Attride-Stirling, 2001) After taking these challenges into consideration, the researcher used the analytic process suggested by Spencer et al. (2009), Attride-Stirling (2001) and Lincoln & Guba (1985) for the qualitative data to enhance the understanding of the research

questions (Teddlie & Tashakkori, 2009). This mixed and matched analysis technique allows the researcher to develop concepts by continually and simultaneously coding and analysing different pieces of qualitative data.

The analytic process consists of three stages: data reduction, data exploration and integration of exploration (Attride-Stirling, 2001). Each stage comprises various steps involving interpretation at different levels. The first step in data reduction is identifying the initial themes. This is followed by the unitising process and the categorising process (Lincoln & Guba, 1985). The unitising process is the division of narrative data into units of information. These units of information are the smallest pieces of meaningful information such as phrases related to themes, words, paragraphs, characters, items and concepts (Berg, 2004) which should be associated with the source, the site and the data collection episode (Teddlie & Tashakkori, 2009). In other words, this unitising process was part of data reduction stage where raw data were reviewed, labelled, sorted and synthesised (Spencer et al., 2009). It was also at this stage that themes were refined from specific information in the data collected and the literature reviewed. The units of information were then grouped into provisional categories in the categorising process. This latter process which was still part of data reduction stage included the development of rules that describe category properties and were checked for similarities within the themes and contrasting characteristics across the themes (Teddlie & Tashakkori, 2009). All of the units of information that adhered to the same definition of a theme were then grouped together. Thus, internal consistency of each theme that was based on similarity principles could be observed. In order to ensure that each theme developed was distinctive from one another, the themes were then reviewed for mutual exclusivity which was based on contrast principles. Themes were further refined into *global themes*, *organising themes* and *basic themes* as outlined by Attride-Stirling (2001). The *global themes* encompass the main themes that summarise and make sense of the lower-order themes. The *organising themes* consist of main ideas proposed by several basic themes. Basic themes are the lowest-order themes which are simple characteristics of the original data and on their own tell the least about the text. Thematic networks were then constructed based on these themes. The

researcher used the actual words used by the research participants as much as possible to describe how employability was perceived, its significance and richness.

Subsequently, the researcher tried to describe and explore the thematic networks. This was followed by summarising the networks and developing explanations and interpretations based on the nature of the research, the emergent patterns within the data and the researcher's epistemological perspective. The aim was to explore the relationship of the themes to the research questions and the theoretical interests underpinning the study. Searching for the best fit explanations for the study was a difficult task as it involved a lot of reading through synthesized data, studying and understanding patterns and thinking around the data. These explanations could be made by using explicit reasons and accounts, inferring an underlying logic, using common sense, developing explanatory concepts, drawing from other empirical studies and using theoretical frameworks (Spencer et al., 2009). Figure 4.4 depicts the stages and processes involved in qualitative data analysis adopted in the study (responses to open-ended question, interviews and portfolio reviews) but further details are included in Chapter 8.

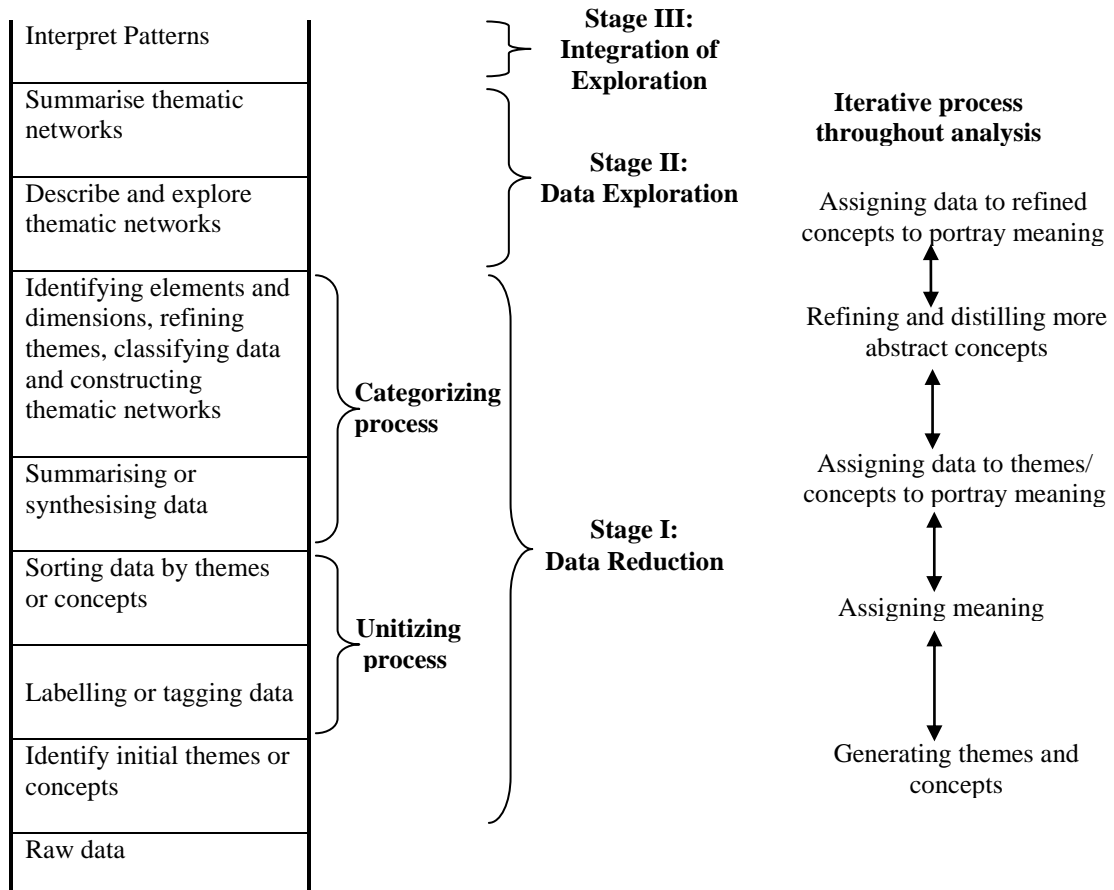


Figure 4.3: The analytic process of qualitative data

Adapted from Attride-Stirling, 2001: 391; Lincoln & Guba, 1985;
Spencer et al., 2009: p. 212.

4.8 Conclusions

In this chapter, the researcher has discussed essential issues in determining the methodology for this research. The researcher has also identified the paradigm as a pragmatist paradigm in a mixed methods approach. The fundamental argument is that this paradigm delivers an in-depth detail and understanding of the current phenomenon and its environment (Easterby-Smith et al., 2003, Meredith et al., 1989). The researcher concluded that the research falls into a confirmatory and exploratory approach, as it fulfilled the research purpose. The researcher has also

chosen her strategies in carrying out the research, which is the concurrent mixed methods strategy with data collection techniques of questionnaires, interviews, structured observation and document reviews. Parallel mixed data analysis was found to suit the analysis of this research and thus it was adopted. A research model was then adapted for this study. The next chapter discusses the specific research strategies and procedures undertaken in the implementation of the chosen research design.

Chapter 5

Research Procedures

5.1 Introduction

This chapter describes the appropriate strategies adopted and the associated various stages of the study: (i) ethical approval and permission to conduct research in Malaysia, (ii) recruitment of participants, (iii) development of instruments (iv) data collection and (v) data analysis and, (vi) the research quality criteria selected for evaluating and judging the thesis. Figure 5.1 shows the structure of this chapter.

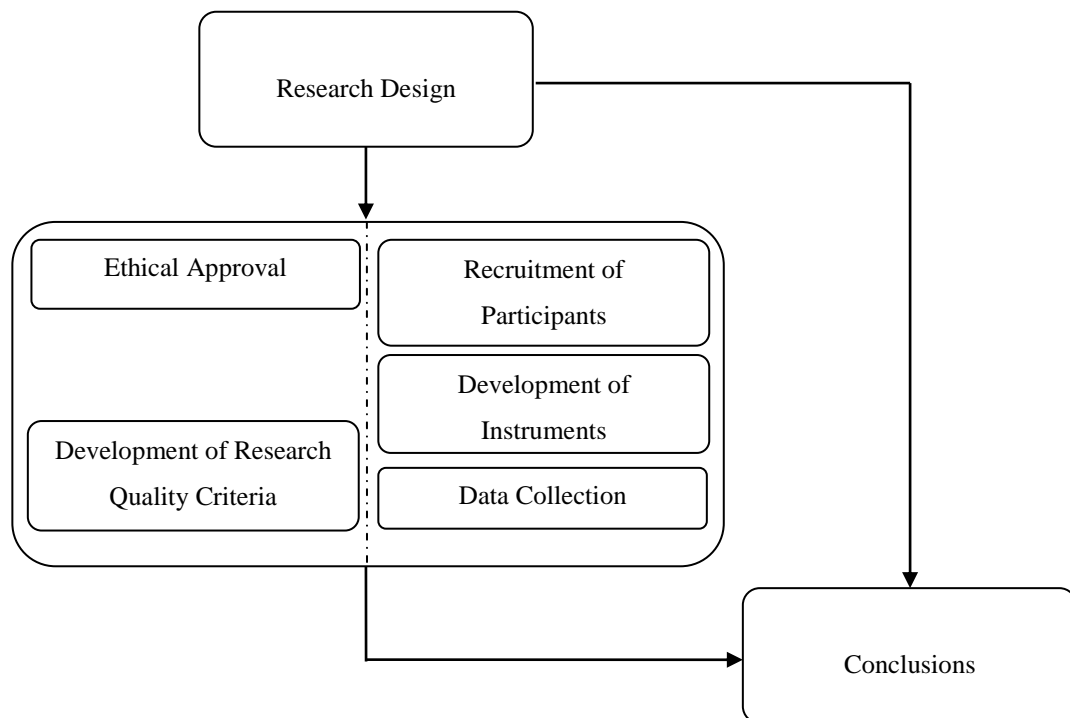


Figure 5.1: The Structure of Chapter 5

5.2 Ethical Approval and Research Permission

Ethical approval was obtained from the Educational and Professional Studies Departmental Ethics Committee, University of Strathclyde in June 2007 prior to the pilot study. Furthermore, permission to conduct research in Malaysia was received from the Economic Planning Unit (EPU), Department of Prime Minister, Malaysia, in November 2007, before data were collected. The approval letter was issued after EPU had received positive feedback and consent to conduct the study from the Education Policy, Research and Development Division (EPRD), Ministry of Education, Malaysia. Permission from fourteen State Education Departments in Malaysia was also obtained in June 2008.

The Ministry of Education (MoE) provided continuing professional development opportunity to the researcher in the area of educational assessment by funding the research, from which it is anticipated that the findings will enhance the nation's educational assessment system. Similarly, as an employee in the MoE, the researcher is keen to increase her knowledge and skills in educational research so that she can later contribute to the nation in developing research-based educational interventions. The aim of this study was to investigate the effectiveness of CAMC of BID in preparing students with relevant employability. The results could be important in contributing to the development and improvement of the educational assessment system in the country. Both the MoE and the researcher had the same interests in seeing the development of the educational assessment system and hence there were no conflicts of overall interest. The MoE did not at any point interfere in the research; nor did the MoE's funding of the study or researcher's earlier position in the MoE affect the context or manner in which the research was conducted.

The researcher took appropriate measures to resolve some ethical issues related to the adaptation and modification of the questionnaires employed in the study. First, the researcher personally sought the permission to adapt and modify the questionnaires used in the Indic@tor project from Professor Beatrice van der Heidjen

from University of the Netherlands who had developed the instruments in early 2007. Next, she received permission to use a scale of sense from the OECD officials in Paris in early 2008. Both permissions were obtained through email and telephone calls. The potential for intrusiveness was acknowledged and addressed appropriately in the development of the instruments and during data collection. Only behaviours that were included in the BID assessment modules were used for observation and interview protocols avoided overly sensitive questions.

Informed consent was established through the researcher explaining the purpose of the research, clarifying that participation in the study was entirely voluntary and that participants could withdraw from the study at any time without giving a reason. Furthermore, the participants were assured that the information provided by them would be held anonymously and confidentially where only the researcher and her supervisors had access to it. Consent is, however, more than a signature on a form (Newby, 2010) and participants must understand the basis of their involvement. The researcher tried to be sensitive to the possible concerns of the participants in an attempt to create a mature relationship between her and the participants. Subsequently, the participants were invited to take part in the research. Thus, after taking all the necessary steps in handling related ethical issues and only after obtaining the participants' voluntary written consent (Appendix A), was the research conducted. Although the student participants were under 18 years old, parents' assent was not an issue as the research was about regular educational activity - that of educational assessment - which had been granted permission by the EPU and EPRD. In addition, the management style of the MoE delegated to school principals the responsibility for the students' involvement in educational related research. The researcher's engagement with participants extended to issuing pencils for questionnaire completion and having informal discussions with the student participants on the importance of possessing relevant employability skills in order to be successful in their future undertakings as an attempt to show appreciation. At the end of her visit, the researcher gave souvenirs from Scotland to the assessor participants and the principals of the schools as token of appreciation for their

willingness to participate in the research. These gifts were not offered to participants beforehand (to avoid potential alteration of the researcher-participant relationship and the nature of the data provided) but were given as a surprise upon completion of data collection at each school; a practice considered appropriate by Oliver (2010). Such an approach aimed to promote a symbiotic relationship in which constructive gain was viable for both the researcher and participants (Oliver, 2010).

5.3 Recruitment of Participants and data Collection Schedule

The data collection was carried out in Malaysia between July and August 2008. There were two groups of participants in the study; the Form Five secondary school students who had undergone CAMC of BID and their BID teachers who had taught and assessed them during the past year.

The first group of participants, the Form Five students, were in their final year of compulsory education. They were the fourth cohort of students taking BID. They had been learning BID modules and their performances in these modules had been assessed via CAMC since the Fourth Form. These students took BID as an elective subject in their upper forms, Form Four and Form Five, for the Malaysian Certificate of Education (MCE) examination. MCE is awarded to students after completing their compulsory education and after sitting for the MCE examination at the end of their fifth form. These students had to complete their BID modules by July 31st of their Fifth Form, in this case the year 2008, before the MCE exam which started in November of the same year (LPM, 2002).

The second group of participants were the BID teachers who had been teaching and assessing the Form Five students. All except for one Form Five BID teachers had attended the assessors training programme conducted by the Malaysia Examinations Syndicate (MES) and had received first hand input on how to use the BID assessment modules in assessing students' performances. These two groups of

participants were recruited through their schools by telephone and electronic email in early 2008.

In short, all Form Five BID students and their BID teachers in year 2008 were selected to take part in the research. From these students, a simple random sampling was used to select students for observation. This was done by drawing names from the register book in schools where BID tasks were assessed on the day of the visit for data collection. This approach allowed each student who was present on that day to have equal chance of being included in the observation and the results could be generalised from the sample to the population (Form Five BID students) within a computable margin of error (Teddlie & Tashakkori, 2009). The same students' portfolios were also reviewed in order to collect comparative data. Furthermore, among the students who took part in the observation, four were randomly selected and asked if they would take part in an interview. In schools where no observation was carried out, a simple random sampling was used to select students for the interview and the portfolio review.

5.4 Organisations Involved

The organisations involved in the study were the public secondary schools in Malaysia offering the subject Basic Interior Decorations (BID) to the upper form students as an elective subject for the MCE. These schools were identified by each State Education Department to first implement the newly developed BID curriculum introduced by the Malaysian Curriculum Development Centre (MCDC). Criteria on which this implementation was based on included: the suitability of the location and school compound, the need to supply manpower with relevant skills in the area, and the opportunities for students who were not academic-inclined to acquire new skills. Four schools first started implementing BID in 2004, followed by another eight schools in 2005 and the remaining seven schools started in 2006. As the curriculum was based on modular approach which at that time was very new to the Malaysian

education system, CBA was introduced by Malaysia Examinations Syndicate (MES) for BID as it was the most appropriate form of assessment for the intended objectives of the introduction of the subject itself (LPM, 2002). The researcher obtained the final list of schools offering BID, the addresses, the contact numbers and the names of teachers teaching BID from MES. In addition, from the researcher's own experience working in MES, she had met most of the school principals during programmes conducted by MES. This was also true with all the BID teachers except for one, whom the researcher had met during relevant MES training programmes during the early stages of the implementation of CBA of BID.

There were only four schools located in the urban areas while the other fifteen schools were located in rural settings. Most of the schools were located in the peninsula of Malaysia which is also known as the West Malaysia. Twelve schools were in eight different states in the west coast of the peninsula of Malaysia while another four schools were located in three different states in the east coast of peninsula Malaysia. The other three schools were located in three different states in the East Malaysia; Sabah, Sarawak and Labuan which were situated in Borneo. The number of schools offering BID and which were involved in the study are as shown in the Table 5.1.

Table 5.1: Schools offering BID through which participants were recruited

Malaysia	Regions	States	Location	
			Urban	Rural
Peninsula Malaysia	West Coast	Kedah		1
		Pulau Pinang		2
		Perak		1
		Selangor	1	1
		W.P. Kuala Lumpur	2	
		Negeri Sembilan		2
	East Coast	Melaka		1
		Johor		1
		Kelantan		1
		Terengganu		2
		Pahang		1
		East Malaysia	Borneo	Sabah
Sarawak	1			
W.P. Labuan				1

5.5 Approaching the Organisations

In May 2008, letters were sent out to fourteen State Education Departments in Malaysia applying for permission to conduct research in the schools offering BID under their jurisdictions. Enclosed with the letters were copies of the approved letter from the Economic Planning Unit (EPU). The researcher then received replies from these departments in the form of telephone calls, letters and emails asking for further approval from the Education Planning and Research Division (EPRD), Ministry of Education. As the approval from EPRD was sent straight to EPU, the researcher was able to obtain and send it to the 14 State Education Departments a copy of the approval letter. The researcher also received a pass card to conduct research in Malaysia from EPU. Along with the approval letters from the State Education Departments, the researcher received a notification that copies of the letters had also been sent to the principals of the schools. Finally, letters were sent out to the nineteen schools that offer BID informing them the dates of visit for data collection, enclosing copies of the approval letters from the State Education Departments and EPRD.

5.6 Pilot Study

A pilot study was carried out in July 2007 in four schools offering BID subjects in Malaysia. Student Questionnaire and Assessor Questionnaire were piloted to ensure quality of actual data collection procedures. Although the four schools were among the 19 schools involved in the actual study, the participants were of a different cohort from those in the third cohort in 2007 and their teachers were not those who took part in the pilot study. Both questionnaires were piloted on a sample of 60 Form Five students and four Form Five teachers from four different schools in Malaysia offering the subject of Basic Interior Decorations (BID); two schools were located in the rural areas while the other two schools were in the urban areas. These schools were selected to represent the rural and urban schools as well as it was convenient. The Form Five students who participated in the pilot study were the third cohort

taking BID (while participants in the main studies were the 4th cohort) for Malaysian Certificate of Education (MCE), a certificate that is equivalent to an ordinary level of General Certificate of Secondary Education (GCSE). The Form Five BID teachers were also the assessors of BID competence-based assessment.

As a result of the pilot study, a few problems in the translation were identified in the questionnaires and they were subsequently corrected. The problems were mostly related to the wordings of the items in the questionnaire; the choice of words used was at a high level for students to understand, some words were understood for meanings which were different from the intended ones, and some phrases were vague. Thus, based on the feedback received, a few items were deleted, some words in the items were changed to suit students' level of understanding and some items were rephrased to enhance clarity. There were also some technical issues identified such as the need to provide enough space on the cover page of the questionnaire for students to write their index numbers and names so that their responses could easily be related to the teachers' responses on their perceptions of their students' employability. The surveys taken were timed and approximately 45 minutes were needed to complete the Student Questionnaire while 30 minutes to complete the Assessor Questionnaire. The researcher's experience in conducting the pilot study, the feedback received from teachers, students and the discussion with the experts from MES and supervisors contributed to the decision of using interviews, observation and portfolio review for gathering more data to enrich and potentially offer more in-depth exploration of the research questions raised.

5.7 Development of Instruments

The following sub-sections describe the instruments employed in the study: two questionnaires (Student Questionnaire and Assessor Questionnaire), two interview protocols (Student Interview Protocol and Assessor Interview Protocol), and a Behaviour Observation Form. The selection, adaptation, and development of these

instruments were based on the literature review carried out at the beginning of the study. The questionnaires and the interview protocols, originally developed in English were translated into the Malay language and they were then back-translated into English. The Behaviour Observation Form was developed in English for use by the researcher. The instruments were also developed based on a research model adapted from the Indic@tor project (The Indic@tor Consortium, 2005) as illustrated in Figure 5.2.

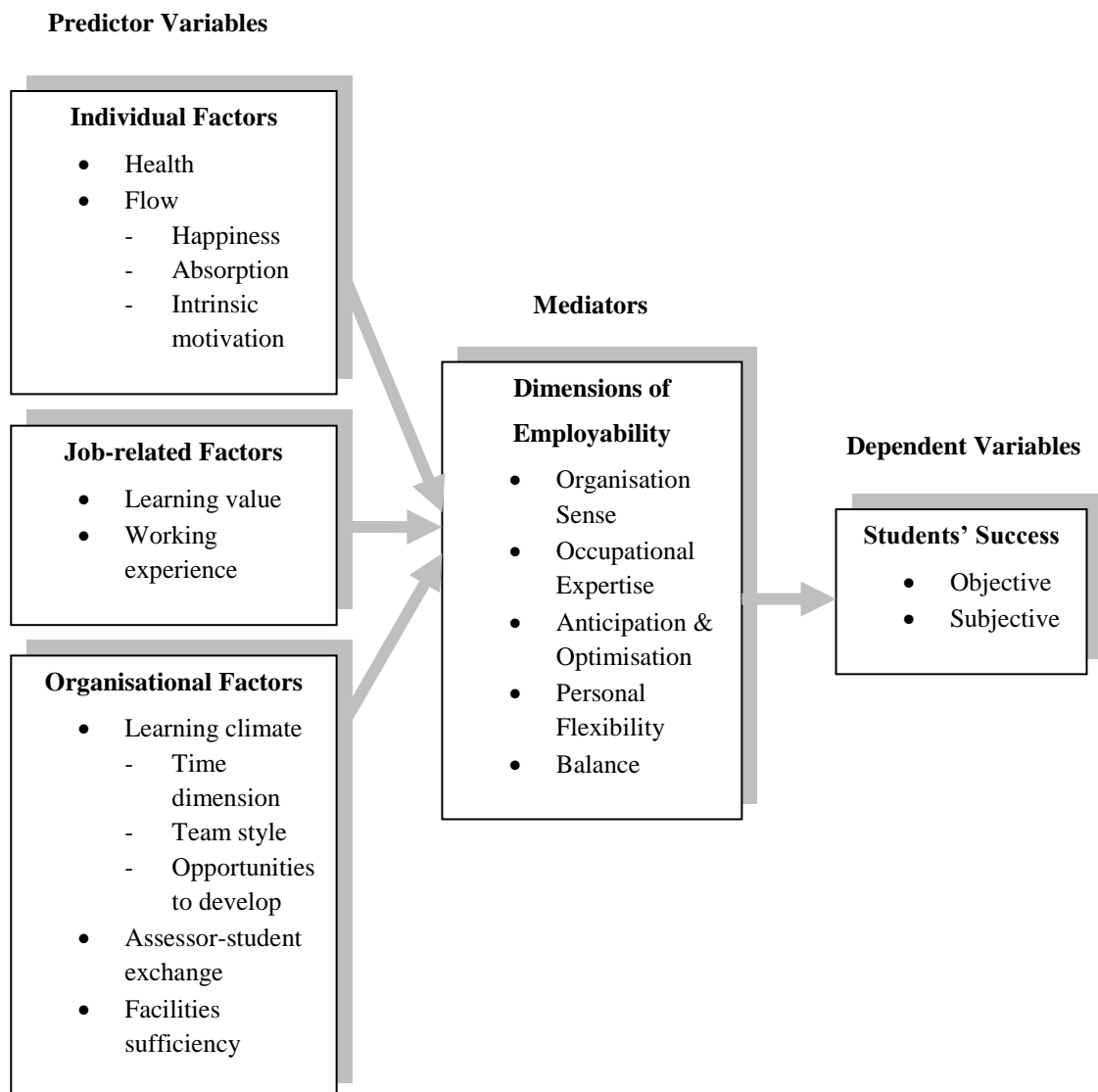


Figure 5.2: The Research Model (adapted from The Indic@tor Project, 2005)

5.7.1 Student Questionnaire (SQ)

The Student Questionnaire (see Appendix B) was designed to help explore the impact of CAMC on students' employability in relation to the BID tasks. It was adapted from the employees' self-rating scale used in the Indic@tor cross-cultural study on the measurement and enhancement of employability among ICT professionals working in small and medium-sized companies (The Indic@tor Consortium, 2005). It was modified to suit the participants who were young and still in school. The constructs adapted were considered relevant and pertinent to CAMC of BID. They were included after careful consideration, as they appeared to reflect some of the concepts of competence as defined in this study and described in Chapter 3. The questionnaire was also translated into the Malay language, the national language used by the participants in Malaysia. It was then back translated into English, for the purposes of this dissertation. The translations were made possible and were the results of the help from the experts in the Malay language and also competence-based assessment from Malaysia Examinations Syndicate (MES) in Malaysia.

The paper-and-pencil questionnaire comprised 5 printed pages, front and back of A4 paper, and based on the pilot, it required approximately 45 minutes to complete. The first page displayed general instructions on how to complete the questionnaire, space for them to write their names, exam index number, and school codes (information which was only used to link data during analysis and was not disclosed to anyone). To make it more appealing to participants, some graphical modifications were included on this page (pictures of students working on BID tasks). There were four sections in this questionnaire, as described below, each with specific instructions on how to fill it.

5.7.1.1 SQ - Section A: Students' Demographic Information

This section asked about students' gender, race and the location of the school. The demographic information provided by students was to profile the sample, and to explore the influence it had, if any, on students' employability. Students had to circle the relevant answers.

5.7.1.2 SQ - Section B: Self-ratings of Students in Relation to Predictors, Mediators and Dependent Variables

This section was the longest, and it contained 66 items representing the different predictors, mediators and dependent variables of success as used in this study and discussed below. Among the factors that influence students' employability, three were examined: individual, job-related and organisational. This study investigated whether or not these constructs could be contributing factors (directly or indirectly) to students' employability and provide the answer to the first part of **RQ4**: What are the factors that influence students' employability and are there any differences in the strength and pattern of the relations between these factors and the employability of students of different gender and race? The study also investigated whether the dimensions of employability were incorporated in CAMC of BID. The students were asked to rate themselves against each item using a 5 point Likert scale by putting a tick (✓) in one of the columns numbered ranging from 1 "strongly disagree to 5 "strongly agree".

SQ: Individual Predictors

The individual predictors were divided into two elements, health and flow. The health predictor comprised three items asking about students' health condition, how they stayed healthy and whether or not they had been absent from school in the past year due to illness. These items were thought to investigate the individual factors

influencing students' employability with regard to their health. Students' health was considered important in this study as it could influence students' performance in carrying out the BID tasks. Moreover, they had to be present at school in order for them to do the tasks and thus, their attendance was considered critical and could have an influence on their performance as well as employability. The items used to investigate the factors regarding students' health are as shown in Table 5.2. Furthermore, students' attendance was verified by reviewing official documents such as the BID class register books.

Table 5.2: Individual Predictors – Health

Health
In general, I am healthy.
I exercise to stay healthy.
I have not been absent from school due to illness for the past year.

The subsequent individual factor was the element of “flow”, which was divided into three sub-elements; happiness, absorption and intrinsic motivation. These items investigated whether or not the individual factor of flow had any impact on students' employability. Furthermore, these items elicited students' attitudes towards and perceptions of schooling as well as their participation in school activities (OECD, 2004), and the focus here was mainly on student's involvement in BID tasks at school. Basically, these items focused on student engagement (emotional, behavioural and cognitive) as discussed in Chapter 3 and the impact it had on students' employability.

There were two items on the sub-element happiness asking about students' feelings when doing the tasks. These items were thought to reflect students' affective reactions (as in the emotional engagement) in the classroom (Connell & Wellborn, 1991; Skinner & Belmont, 1993). The study examined whether students' happiness when doing BID tasks can be associated with their employability. It was thought that when students were happy to do the tasks, they would also perform well in the

CAMC of BID. Likewise, when they performed well, they would feel happy too. Two items on the sub-element absorption asked about students' state of mind while doing the BID tasks, or in other words, they referred to students' involvement in learning as discussed in the behavioural engagement (Birch & Ladd, 1997; Finn et al., 1995; Skinner & Belmont, 1993). Students' involvement in and the attention given to the BID tasks were looked into in the study as they can play important role in accomplishing BID tasks satisfactorily. Subsequently, students' involvement in learning could have an effect on students' employability. Three items on intrinsic motivation explored the levels of enthusiasm and motivation when students were doing the BID tasks. These items were believed to be able to elicit students' psychological investment in learning as described in the cognitive engagement (Newmann et al., 1992; Wehlage, 1989) particularly on the intrinsic motivation (Harter, 1981). Students who have strong intrinsic motivation are thought to be able to do BID tasks even when they encounter difficulties along the way. Such inner strength is thought to be vital in CAMC of BID and can influence students' employability in the future. The "flow"-related items are shown in Table 5.3.

Table 5.3: Individual Predictor - Flow

Flow
<p><i>Happiness</i></p> <p>I enjoy doing BID tasks.</p> <p>I feel cheerful when I am doing BID tasks.</p>
<p><i>Absorption</i></p> <p>When doing BID tasks, I tend to forget everything else around me.</p> <p>I get carried away by BID tasks.</p>
<p><i>Intrinsic Motivation</i></p> <p>I get the motivation to do BID tasks because of the good prospect the subject offers.</p> <p>I do BID tasks because I want to, not because I have to.</p> <p>I do BID tasks without asking what the results will be.</p>

SQ: Job-related Predictors

Job-related predictors had two elements. Only the first of the two elements of job-related predictors appeared in this section, mainly for the participants' convenience in giving their responses, since it had the same response scale as the rest of this section. The second element (students' working experience) was placed in Section C.

The element of a job-related predictor incorporated in this section was students' learning value comprising of three items. The items asked about the extent to which the BID tasks had helped students learn, primarily the procedural knowledge. Inclusion of these items, presented in Table 5.4, enabled the investigation of the potential impact of students' learning value on their employability.

Table 5.4: Job-related Predictor – Learning Value

Learning Value
Doing the tasks related to BID helps me learn more.
Doing the tasks related to BID further develops my talents.
I can completely utilise my capabilities when doing BID tasks.

SQ: Organisational Predictors

The organisational predictors contained three elements; learning climate, assessor-student exchange and facilities sufficiency. The element of learning climate included three sub-elements which were the time dimension, team style and opportunities to develop. These sub-elements described students' perceptions of the extent to which the organisations, in this case the schools, had put the effort into providing an environment that would encourage learning among the students. It was thought that organisations had important roles to play in ensuring students could learn in conducive environments and this study examined the impact such responsibility of the organisations had on students' employability. The time dimension comprised three items asking about whether or not ample time was provided for the students to

prepare and complete the BID tasks in school within the periods allotted for BID. The Malaysian Curriculum Development Centre (MCDC) allotted twelve periods of forty minutes each BID period per week and the schools had the autonomy to plan a schedule that best suited schools and students. Time was considered critical in CAMC as students had to accomplish the BID tasks during BID class period. So, it was essential to ascertain that schools had allotted workable timetable for BID students to perform satisfactorily in sufficient time. The team style consisted of three items asking about opportunities to work in an environment where help from peers was made available. Team-work was considered essential (Harvey & Green, 1994) and one of the desirable attributes which employers are looking for in potential employees. This study investigated whether or not students felt that schools had managed to provide environment that could promote team-work among students. The opportunities to develop sub-element comprised three items exploring whether students had the opportunity to do tasks and activities other than the BID tasks required of them in schools. The opportunity to do additional BID-related tasks was thought to have positive effect on students' learning therefore it was important that schools could provide such opportunity for students to further develop their knowledge and skills. Thus, the study examined students' perceptions on whether the organisations had undertaken necessary steps to do so and it also looked into the effect of it on students' employability. The learning climate-related items are shown in Table 5.5.

Table 5.5: Organisational Predictor – Learning Climate

Learning Climate
<p><i>Time Dimension</i></p> <p>I do not have enough time to learn new BID tasks before I have to do them.</p> <p>There is no time to get all the information I need in order to do my BID tasks well.</p> <p>I have no time to do my BID tasks properly.</p>
<p><i>Team Style</i></p> <p>My friends are willing to share information relevant to the BID tasks.</p> <p>If I have a question about BID tasks, my classmates will help answer it.</p> <p>There is no one willing to help if I get stuck with my BID tasks.</p>
<p><i>Opportunities to Develop</i></p> <p>I have the chance to do other BID tasks besides the required ones.</p> <p>I have the chance to develop my strengths by doing BID tasks.</p> <p>I can apply what I have learned in BID tasks in other situations.</p>

The second organisational predictor was the element of assessor-student exchange which contained five items tapping into the strength and effectiveness of the relationship between the assessors and students in enabling students' learning and performance in CAMC of BID. These items referred to students' affective reactions in the classroom primarily with regard to teacher-student relationship (Wentzel, 1998) which could influence how students show their emotions in the classroom (Russell et al., 2006) and how they perform BID tasks. A good teacher-student relationship was thought to have positive impact on students' performance in BID tasks. Thus, inclusion of these items enabled us to explore the impact of teacher-student relationship on students' employability. The items used in this organisational predictor are shown in Table 5.6.

Table 5.6: Organisational Predictor – Assessor-student Exchange

Assessor-student Exchange
My assessor/teacher recognises my potential in BID.
My assessor/teacher understands my problems and needs in BID.
My assessor/teacher would help me solve problems in BID.
My assessor/teacher is satisfied with what I do in BID tasks.
My relationship with my assessor/teacher is close (can communicate effectively).

As for the last element of facilities sufficiency, there were nine items investigating students' perceptions and satisfaction with the facilities provided by the schools for the implementation of BID. These items elicited the functions of the schools in providing relevant and adequate facilities for the implementation and success of CAMC of BID. The aim was to explore whether or not students' perceptions of and satisfaction with the facilities provided in the schools were associated with employability. Such items were not included in the original Indicator questionnaire, but were devised specifically for use in the current study. They were included after a thorough discussion with the experts in assessment from MES, based on the researcher's professional experience in carrying out the tasks of monitoring and moderation of CAMC of BID in schools as well as the feedback received from the teachers about the need to have a workplace that was well-equipped to ensure the effectiveness and success of the assessment. The items employed in this predictor are as shown in Table 5.7.

Table 5.7: Organisational Predictor – Facilities Sufficiency

Facilities Sufficiency
I am satisfied with the amount of equipment provided for my BID tasks.
I am satisfied with the condition of the equipment in the workplace.
My assessor/teacher provides enough materials for me to do my BID tasks.
The materials provided for BID tasks are in good condition.
The workplace is suitable for me to do my BID tasks.
I am satisfied with the condition of my workplace.
The water supply in the workplace is satisfactory.
I am happy with the location of the workplace.
There is no problem with the power supply in the workplace.

SQ: Mediators- Dimensions of Employability

The mediators consisted of five dimensions of employability: (i) balance, (ii) occupational expertise, (iii) anticipation and optimisation, (iv) personal flexibility and (v) organisation sense. These dimensions of employability were considered to be relevant to CAMC of BID and which students could have acquired from doing the BID tasks. Moreover, they were considered to have conformed to the concept of competence utilised in the study and which could be associated with the needs of employability in the Malaysian context that would fulfil the aspiration of the nation. The study investigated the impact these dimensions had on students' objective and subjective success, and thus became the predictive measures for students' employability. Furthermore these dimensions were examined to answer **RQ3**: What are the dimensions of employability incorporated in CAMC of BID?

(i) Dimension of Employability: Balance

As discussed in the literature review, anxiety was found to be one of the students' affective reactions in the emotional engagement (Connell & Wellborn, 1991; Skinner & Belmont, 1993). Balance as reflected in the items included was thought to have an influence on students' success in accomplishing the BID modules, getting good grades in the written exam and satisfying their feelings about BID. Thus, balance, was explored in the study to investigate students' levels of anxiety in accomplishing the BID assessment modules and their ability to stay away from anxiety in life. Balance consisted of three items eliciting the extent to which students could cope with their BID tasks without much stress or interferences in their daily lives. The first item in this construct brought forth the notion of whether or not the students felt stressed when doing the BID tasks. The second item drew out their views on the impact that doing BID tasks had on their lives. The third item explored whether or not students were able to relax after doing BID tasks. These items are as presented in Table 5.8.

Table 5.8: Dimension of Employability - Balance

Balance
I feel stressed when doing my BID tasks.
My doing of BID tasks does not interfere with the rest of my life.
After doing my BID tasks I am generally able to relax.

(ii) Dimension of Employability: Occupational Expertise

The next construct was the occupational expertise with six items eliciting students' ability and skills in carrying out BID tasks. This construct referred to the specialist skills which was discussed in Chapter 3 (Mulder et al., 2007; Sherer & Eadie, 1987) and considered important to BID students. In this case, students' BID job-related skills were the focus. Therefore, these items explored whether: students were able to perform BID tasks with few mistakes; felt confident in providing information on BID tasks that they had done; helped their classmates understand how to do BID tasks better; carried out BID tasks independently; felt confident in their ability to do BID tasks and acquired the required skills to complete BID tasks. Generally, these items showed if students had acquired the minimum required skills and knowledge in BID and they are shown in Table 5.9.

Table 5.9: Dimension of Employability – Occupational Expertise

Occupational Expertise
I have performed my BID tasks with only few mistakes.
I feel confident to provide information on the BID tasks that I have done.
I am able to help my classmates understand how to do the BID tasks better.
I have carried out my BID tasks independently.
I am confident of my ability to do BID tasks.
I have acquired the required skills to complete BID tasks.

(iii) Dimension of Employability: Anticipation and Optimisation

The dimension of employability called anticipation and optimisation had four items exploring improvement of their skills and further development, as well as application of existing knowledge and skills to new areas. This construct revealed students' psychological investment in learning, one of the components of cognitive engagement (Fredricks, 2004) which is often associated with a preference for hard work and positive coping in the face of failure (Connell & Wellborn, 1991). Students' hard work and motivation in increasing knowledge and skills in BID despite obstacles was considered to be important and a behaviour desirable to employers in the current labour market. This inner drive to succeed could help prepare students to face bigger challenges in their future undertakings. Thus, the items in the construct explored the extent to which students spent their free time improving their skills in BID, the initiative taken to learn how to overcome their weaknesses, their eagerness to apply the knowledge and skills learnt and acquired in BID class as well as their focus on continuous self development. These items are shown in Table 5.10.

Table 5.10: Dimension of Employability – Anticipation and Optimisation

Anticipation and Optimisation
I spend some of my free time improving my skills in BID.
I take the initiative to learn how to overcome my weaknesses.
I am eager to apply the knowledge and skills that I have learned and acquired in BID class.
I am focused on continuously developing myself.

(iv) Dimension of Employability – Personal Flexibility

The subsequent construct was personal flexibility with four items. These items unravelled the components of: (i) being adaptive or the ability to bring one's knowledge and skills into an organisation and as the ability to assimilate in the organisational culture and (ii) being adaptable, the ability to develop new knowledge

and skills in new situations (Harvey & Green 1994). This dimension of employability is essential and sought after by employers to help in the transformation of companies that could accommodate to the changing market needs (Gurvinder Kaur & Sharan Kaur, 2008). Thus, the relevant items explored the extent to which students were able to cope with and adapt to changes and developments in the workplace, and to feel comfortable doing BID tasks in the presence of their peers. The items in this dimension of employability are shown in Table 5.11.

Table 5.11: Dimension of Employability – Personal Flexibility

Personal Flexibility
I can easily adapt to changes in my BID workplace (eg: new storage, extended/renovated workplace, new equipment).
I adapt easily to developments within my BID workplace.
I can cope with changes in my BID class.
I feel comfortable doing my BID tasks in the presence of my classmates.

(v) Dimension of Employability – Organisation Sense

The final construct on the dimensions of employability was the organisation sense with four items which represented one of the components in the behavioural engagement: students' involvement in learning and academic tasks which include behaviours such as effort, persistence, attention, concentration and class participation (Birch & Ladd, 1997; Finn et al., 1995; Skinner & Belmont, 1993). This dimension taps into students' commitment towards BID class and is thus viewed as important in determining students' objective and subjective successes. Such behaviour of obligation and responsibility is also required in attaining success of companies in a competitive labour market. Hence, the items in the construct explored the extent to which students were able to get involved in achieving the mission of the BID class, to do the extra bit for their BID class apart from their direct responsibilities, to take the initiative to share responsibilities with their classmates and to share their experience and knowledge with others. These items are shown in Table 5.12.

Table 5.12: Dimension of Employability – Organisation Sense

Organisation Sense
I am involved in achieving the mission of my BID class.
I do that extra bit for my BID class apart from my direct responsibilities.
In my BID class, I take the initiative to share responsibilities with my classmates.
I share my experience and knowledge with others from outside my class.

In addition to the four items mentioned above, another six items eliciting students' identification with school were also included in this section. This was the second component of the emotional engagement and it referred to their sense of belonging or the feeling of being important to the school as well as the value or appreciation of success in school-related outcomes (Finn, 1989). The items therefore revealed the extent to which students were able to feel accepted in and belonged to the BID class, made friends and were accepted by friends. These items were adapted from a scale used in a study conducted by Organisation for Economic Co-operation and Development (OECD, 2004) and are as shown in Table 5.13.

Table 5.13: Sense of Belonging

Sense of Belonging
I feel like an outsider (or left out of things) in my BID class.
I make friends easily.
I feel like I belong to my BID class.
I feel awkward and out of place in my BID class.
My classmates seem to like me.
I feel lonely in my BID class.

SQ: Dependent Variable - Subjective Success

The dependent variable consisted of the element of subjective success with three items eliciting the positive outcomes of BID class, basically on whether or not students had the chance to learn new skills, had satisfaction in doing the tasks and

had earned respect from friends. These items were thought to reflect students' anticipated accomplishment in CAMC of BID, as a measure for students' subjective success that could be used to predict students' future subjective success in employment. Satisfaction was considered an important form of success in addition to observable and measurable success as reflected in grades and written exam. The relevant items are shown in Table 5.14.

Table 5.14: Dependent Variables - Subjective Success

Subjective Success
I am in a class that offers me the chance to learn new skills.
I am in a position to do mostly work that I really like.
I am respected by my friends.

5.7.1.3 SQ - Section C: Dependent Variable and Job-related Predictors

This section of the questionnaire contained items representing the dependent variables (two items) and the second element of the job-related predictors (two items). In this section, students were asked to circle only one of the provided response options for each question.

(i) Dependent Variable – Objective Success

In relation to the dependent variable of objective success, students had to indicate the number of assessment modules they had attempted in the past year (first item) and also the actual number of assessment modules they had accomplished at the time when the survey was conducted (second item). It was thought that this type of objective success could be used as a measure to predict students' future success in employment. The two questions are as shown in Table 5.15.

Table 5.15: Objective Success

Objective Success
How many assessment modules did you attempt to do in the past year?
How many assessment modules did you demonstrate competence in the past year?

Another form of objective success which was not asked in the questionnaire but was included in the data collection and analysis was students' BID grades obtained in the MCE exam. The researcher obtained the BID grades from the MES after the MCE results were announced and distributed to students in 2009. Their grades were also used as a measure of objective success in the future.

(ii) Job-related Predictor – Working Experience

With regard to the questions on their working experience, students had to circle the number of days in a week that they were engaged in working in BID related areas and the frequency of after-school further training they had in the past year. It was noted in the literature that skill develops over time with practice and thus, the questions as shown in Table 5.16, were used to identify whether or not students' working experience and training in BID related areas outside school hours had any impact on their employability.

Table 5.16: Job-related Predictor – Working Experience

Working experience
How often do you work after school in areas related to BID in a week?
How often have you been going for further training after school in areas related to BID in the past year?

5.7.1.4 SQ - Section D: Students' Perceptions of BID Assessment

This last section of the questionnaire included an open-ended question asking students to describe their thoughts of and feelings about the BID assessment that they had undertaken, in terms of the practical work it involved, effectiveness and relevance. Students provided their opinion and justifications in the space provided in the questionnaire. As noted, this was an open-ended question, aiming to elicit in-depth responses and provide us with rich data that could enhance the findings of this study. The responses could help understand and investigate whether or not CAMC of BID had been effective in preparing students with relevant employability skills. In short, the responses could be used to provide complementary answers to **RQ3**.

5.7.2 Assessor Questionnaire (AQ)

The Assessor Questionnaire (see Appendix C) collected information on the assessors' perceptions of the impact of competency-based assessment on the Form five students' employability with a special focus given to the BID tasks. Similar to the student questionnaire, this was adapted from the supervisors' rating scale used in the Indic@tor cross-cultural study on the measurement and enhancement of employability among ICT professionals working in small and medium-sized companies (The Indic@tor Consortium, 2005). It was then modified and translated into the Malay language. It consisted of four front and back A3 printed pages, and as the pilot study showed, it required approximately 30 minutes to complete. The first page displayed the instructions on how to complete the overall questionnaire while each section thereon included more specific instructions when appropriate.

The Assessor Questionnaire consisted of four sections comprised items tapping into the assessors' perceptions of/on:

- Section A: students' commitment towards BID tasks with regards to the employability dimensions.
- Section B: students' performance on the BID assessment modules

- Section C: the organisational factors influencing students' involvement in BID tasks

Finally, section D contained teachers' demographic information.

5.7.2.1 Section A: Mediator - Dimensions of Employability

This section asked the teachers who were also the assessors to name a total of twelve Form Five students in their class, based on the number of assessment modules they had completed: (i) 1-4 modules, (ii) 5-9 modules and (iii) 10-13 assessment modules (13 being the highest number of modules a student could have completed). The researcher aimed to use these categories when looking at whether or not students' performance (as reflected on their accomplishment in the assessment modules) had any relation with students' commitment towards BID tasks in the light of the five dimensions of employability, on students' subjective success and on their sense of belonging towards the BID class. In other words, the researcher wanted to see if assessors' perceptions match students' perceptions and whether they add anything more to the prediction of employability.

This section contained a total of thirty items with seven different constructs: five constructs on dimensions of employability (21 items), one construct on subjective success (3 items) and finally a construct on students' sense of belonging towards BID class (6 items). The items in all these constructs are similar to the items in Section B of the Student Questionnaire, only modified and rephrased to suit this group of participants (the assessors are asked to provide responses about their students). The assessors were asked to rate each student against each item using a 5-point Likert scale ranging from 1-“strongly disagree”, to 5-“strongly agree”. Emerging data can help us explore **RQ3** based on the assessors' perceptions. The items in Section A of the Assessor's Questionnaire are shown in Table 5.17.

Table 5.17: AQ - Dimensions of Employability

AQ - Balance
<p>This student feels stressed when doing his/her BID tasks.</p> <p>This student's doing of BID tasks does not interfere with the rest of his/her life.</p> <p>After doing his/her BID tasks, this student is generally able to relax.</p>
AQ - Occupational Expertise
<p>This student has performed his/her tasks with only a few mistakes.</p> <p>This student feels confident to provide information on the BID tasks that he/she has done.</p> <p>This student is able to help his/her classmates understand how to do BID tasks better.</p> <p>This student has carried out his/her BID tasks independently.</p> <p>This student is confident of his/her ability to do BID tasks.</p> <p>This student has acquired the required skills to complete BID tasks.</p>
AQ - Anticipation and Optimisation
<p>This student spends some of his/her time improving the skills in BID.</p> <p>This student takes the initiative to learn how to overcome his/her weaknesses.</p> <p>This student is eager to apply the knowledge and skills that he/she has learned and acquired in BID class.</p> <p>This student is focused on continuously developing him/herself.</p>
AQ - Personal Flexibility
<p>This student can easily adapt to changes in the BID workplace (eg; new storage, extended/renovated workplace, new equipment).</p> <p>This student adapts easily to developments within the BID workplace.</p> <p>This student can cope with changes in the BID class.</p> <p>This student is involved in achieving the mission of the BID class.</p>
AQ - Organisation Sense
<p>This student feels comfortable doing BID tasks in the presence of his/her classmates.</p> <p>This student does that extra bit for the BID class apart from his/her direct responsibilities.</p> <p>In the BID class, this student takes the initiative to share responsibilities with his/her classmates.</p> <p>This student shares his/her experience and knowledge with others from outside the BID class.</p>
AQ - Sense of Belonging
<p>This student feels like an outsider (or left out of things) in the BID class.</p> <p>This student makes friends easily.</p> <p>This student feels like he/she belongs to the BID class.</p> <p>This student feels awkward and out of place in the BID class.</p> <p>This student's classmates seem to like him/her.</p> <p>The student feels lonely in the BID class.</p>
AQ - Dependent variable - Subjective Success
<p>This student is in a class that offers him/her the chance to learn new skills.</p> <p>This student is in a position to do mostly work that he/she really likes.</p> <p>This student is respected by his/her friends.</p>

5.7.2.2 Section B: Dependent variables - Objective Success

This section of the questionnaire consisted of two items on the construct of objective success. It asked the teachers to record the number of assessment modules attempted and the number of assessment modules accomplished by each of the student named in Section A, for the past year. These items portrayed students' accomplishments in the BID assessment modules based on the teachers' documented evidence and were used as a measure of success. This objective success was also used as a measure to predict students' future success from the assessors' perceptions. The items are as shown in Table 5.18.

Table 5.18: AQ - Objective Success

AQ - Objective Success
This student has attempted to do assessment modules in the past year.
This student has demonstrated competence in assessment modules in the past year.

5.7.2.3 Section C: Organisational Predictors

This section included two constructs, the teacher-student exchange (five items) and the facilities sufficiency (nine items). These were similar to the items in Section B of the Student Questionnaire but rephrased accordingly. Teachers were asked to put a tick in the appropriate box for each item using a 5-point Likert scale from “strongly disagree” to “strongly agree” on how they perceived their relationship with the students and the adequacy of the facilities provided by the schools. These items were used to determine the extent to which these factors of assessor-student relationship and the facilities provided, from the teachers' view point, could contribute to students' employability. Thus, the responses provided could form part of the investigation of RQ4 based on assessors' perceptions. The items are shown in Table 5.19.

Table 5.19: AQ - Organisational Predictors

AQ - Assessor-Student Exchange
I am satisfied with what my students do in the BID tasks.
I understand my students' problems and needs in BID.
I recognise my students' potential in BID.
I would help my students solve problems in BID.
My relationship with my students is close (can communicate effectively).
AQ - Sufficient Facilities
I provide satisfactory amount of equipment for my students' BID tasks.
I am satisfied with the condition of the equipment in the workplace.
I provide sufficient materials for my students to do the BID tasks.
The materials provided are in good condition.
The workplace is suitable for my students to do their BID tasks.
There is no problem with the power supply in the workplace.
The water supply in the workplace is satisfactory.
I am happy with the location of the workplace.
I am satisfied with the condition of the workplace.

5.7.2.4 Section D: Assessors' Demographic Information

This section asked about teachers' background information such as gender, race, highest education qualification, major in first degree and teaching experience. They were also asked to provide the school code (a code consisting of alphabets and numbers provided by the State Education Department to represent a school under its authority) and location. The teachers had to either circle the relevant response option or write down their answers.

5.7.3 Student Interview Protocol (SIP)

The Student Interview Protocol (see Appendix D) further explored: students' involvement in specific activities other than the compulsory BID tasks (behavioural engagement); their perceptions of the BID assessment modules in preparing them for future employment; and their suggestions on how they could improve their knowledge and skills in BID. The questions posed were expansion of the items appearing in the questionnaire, in order to gather some more detailed and in-depth responses and explore further the factors which might influence students' employability. These questions were derived after extensive discussions with the MES officers and the supervisors, and it was hoped that they would enrich the findings of the study. The responses provided for these questions could offer detailed data towards **RQ5**: Are there any differences in perceptions of BID students' employability between the assessors and the BID students? and **RQ6**: How do the interviews with assessors and BID students help explain any further contributions CAMC had on students' employability? from the students' perceptions. The responses could also be used to further describe the concept of employability as posed in **RQ1**. The interview protocol was developed in English, then translated into the Malay language (to be used with the students) and back translated into English. Experts in the Malay language and CBA from the MES in Malaysia were involved in the process of the translation and back translation. The interviews with the students were conducted in the Malay language for easy communication.

The interview protocol comprised 3 printed pages, front and back, of A4 paper and it was anticipated that the interview would last for approximately ten minutes. Following the interview protocol, and while conducting the interviews, the researcher first explained to the students the purpose of the interview, the procedures on how it would be carried out and provided reassurance for confidentiality of the responses. Students' details (name and gender, school and date and time of the interview) were recorded on the first page by the researcher. The remaining part of the interview protocol contained four main questions and space for the researcher to record students' answers.

The first question and its three sub-questions dealt with students' participation in other BID-related activities in schools besides the compulsory BID tasks, the involvement of other parties in those activities and students' opinion on what the impact of such activities was on their knowledge and skills. These questions explored whether further opportunities to develop students' skills were provided in the schools and the potential impact on employability. In addition, specific activities and parties involved in organising these activities were identified to find out if they had any influence on students' employability. These questions particularly ascertained the notion that skills develop over time with practice (Proctor & Dutta, 1995).

Questions two and three addressed the perceived implications of the BID assessment modules on acquiring the relevant knowledge and skills as a preparation for students' future employment. These questions aimed to differentiate between specific assessment modules that had greater or smaller influence on students' employability. They further provided students' view points on the effects of the assessment modules on their employability.

Finally, question four elicited students' suggestions on how they could improve their knowledge and skills in BID. Students had to evaluate their performance and provide suggestions as to what approaches to be taken to enhance their skills and knowledge in BID. It showed one of the metacognitive strategies used in self-regulation; students evaluating their cognition when accomplishing tasks (Pintrich & De Groot, 1990; Zimmerman, 1990). The questions used in the interview are as shown in Table 5.20.

Table 5.20: Questions in Student Interview Protocol**SIP - Questions**

1. You have been doing BID tasks in school for almost two years now.
 - a. Apart from the BID tasks what other relevant activities have you taken part in?
 - b. Did any parties from outside of the school such as the industry or training colleges take part in these activities? If yes, name the parties.
 - c. How do you think these experiences have helped you gain knowledge and skills in BID?

 2. Now, tell me five specific assessment modules that you think you have acquired the most knowledge and skills in BID.
 - a. For each of the assessment module, how do you think it will help you in your future work?

 3. Now, tell me any assessment modules that you think contribute the least in preparing you for future work in BID and why do you think so?

 4. What are your suggestions to improve your knowledge and skills in BID?
-

5.7.4 Assessor Interview Protocol (AIP)

The Assessor Interview Protocol (see Appendix E) was used to obtain qualitative data on teachers' perceptions of their roles in providing essential BID-related activities, the BID assessment modules pertinent to preparing students for future employment, and their suggestions on other forms of assessments that have the potential to equip students with the required employability skills. It was hoped that some detailed and in-depth answers would be provided by the assessors and further used as supplementary data in a mixed-method concurrent embedded approach (Creswell, 2009). The first three questions put forward were the same as the questions included in the Student Interview Protocol with some rephrasing to suit the

participants, while the other two questions were on the teachers' propositions on new modules and modes of assessments that could enhance students' employability. These questions were set after a thorough scrutiny with the MES officers and the supervisors. The responses provided could offer in-depth answers to **RQ5**: Are there any differences in perceptions of BID students' employability between the assessors and the BID students? (since similar data from the students were also collected) and **RQ6**: How do the interviews with assessors and BID students help explain any further contributions CAMC had on students' employability? from the assessors' perceptions. In addition, the responses could provide further description of the concept of employability (**RQ1**). The interview protocol was developed in English, translated into the Malay language and was then back translated into English. As with SIP, this process involved the use of the expertise in the Malay language as well as CBA from MES in Malaysia. The interviews were conducted in the Malay language.

The interview protocol comprised 3 printed pages, front and back, of A4 paper and it was used for a 15-minute interview. Similar to the student interview protocol, the first page displayed the purpose of the interview, the procedures on how it would be carried out and the reassurance of its confidentiality, and the researcher also recorded teacher's details (name, gender, school, date and time of interview). The remaining of this instrument contained the five questions and space for the researcher to record responses.

Teachers were first asked to give examples of activities other than the BID tasks that they had organised, which would enhance their students' knowledge and skills in BID. On this first question which had three sub-questions, teachers were also asked to name any parties involved in those mentioned activities and to describe how they thought those experiences contribute to students' learning. These interrelated questions brought forth the opportunities made available to the students other than the BID tasks which they had to do in the workplace and their perceptions on whether or not such opportunities could influence students' employability.

Questions two and three were employed to help identify BID assessment modules with a great effect on students' employability and those that had the least contribution to students' knowledge and skills acquisition towards preparing them with employability skills (to teachers' perceptions at least). Questions four and five investigated teachers' ideas and suggestions about the necessary assessment modules and modes of assessment that could help increase students' employability skills. The questions included are shown in Table 5.21.

Table 5.21: Questions in Assessor Interview Protocol

AIP - Questions
<ol style="list-style-type: none"> 1. You have been teaching and assessing BID for some time now. <ol style="list-style-type: none"> a. Apart from the BID modules, what other activities have you carried out that will enhance learners' knowledge and skills in BID? b. Did any parties from outside of the school such as the industry or training colleges take part in these activities? If yes, name the parties. c. How do you think these experiences have contributed to learner's learning? 2. Now, tell me five specific assessment modules that you think learners have acquired the most knowledge and skills in BID. <ol style="list-style-type: none"> a. For each of the assessment module, how do you think it helps learners in their future work? 3. Now, tell me any assessment modules that you think contribute the least in preparing learners for future work in BID and why do you think so? 4. What other modules do you think should be assessed and give reasons to your answers. 5. Could you tell me what additional forms of assessment you think could help learners equip themselves with required employability skills?

5.7.5 Behaviour Observation Form (BOF)

The Behaviour Observation Form (see Appendix F) was used to gather data on student behavioural engagement: the positive conduct and the involvement in learning and academic tasks (Cunningham et al., 2006; Fletcher, 2006; Fredricks et al., 2004). The positive conduct consists of students' willingness to follow the rules and adhere to classroom norms as well as to avoid any misbehaviour in school, while students' involvement in learning includes students' active participation in the teaching and learning activities. The list of behaviours to be observed especially on positive conduct derived mostly from the workplace management list provided in the BID assessment modules which students had to abide by in every BID task before being considered as having demonstrated competence. The BID assessment modules (also consisting of the list of behaviours) were given to the students at the beginning of the school term to enable them to be familiar with what they were supposed to do and subsequently were able to monitor their own behaviours. The data gathered from the observation could be used to further enhance the description of the concept of employability in the context of CAMC (**RQ1**). Furthermore, they could provide insights in **RQ7**: To what extent and in what ways do observations of BID students at work and reviews of their portfolios serve to contribute to a more comprehensive and nuanced understanding of the predictive relationship between students' success and students' employability?

The BOF was developed in English with no need for translation, as it was only to be used by the researcher. It consisted of 2 printed pages on two separate pieces of A4 paper. At the top of the first page, the researcher recorded the name of school, the date the observation took place, start and end time of the observation, class attendance and the name of the module to be observed. There were three tables for three different phases in the observation: the beginning of the lesson, middle of lesson and the ending of lesson. Each table had the same list of students' behaviour to be observed and ten columns to record a numeric code for each student under observation. At the end of the observation cycle the researcher wrote the students' names for each numeric code for easy identification and to relate these with other

relevant data collected in the study. The key on how to record the observations appeared at the bottom of the first page. For the first three behaviours listed in each table, the researcher had to record the number of occurrences that took place within a 60-second observation window. For the remaining six behaviours, which were also conducted on a 60-second window, the researcher had to use a rating scale from 1 to 3 (1 = not at all or very little, 2 = some or moderate, and 3 = a great deal). The behaviours observed are as shown in Table 5.22.

Table 5.22: Observed Students' Behaviour

Students' Behaviour
1. Ask teacher questions about the task.
2. Discuss the task with teacher.
3. Discuss the task with classmates.
4. Prepare required materials and equipment for the task.
5. Handle equipment and machinery competently.
6. Carry out task neatly to maintain cleanliness and safety.
7. Clean (wash/scrub/polish) all used equipment.
8. Return all used equipment to its proper place.
9. Clean up the workplace after working.

5.7.6 Documentation Review

The documents that were excessively reviewed were the students' BID portfolios particularly the students' comments on their own performances for every accomplished BID assessment module. These comments were basically students' self-evaluations of how they felt about doing the tasks, their strengths and weaknesses in carrying out the BID tasks, the improvements to be made in the future and also their opinions on the tasks in general. These comments reflected cognitive engagement; one of the elements of self-regulation or being strategic which was to evaluate their thoughts when accomplishing tasks (Pintrich & De Groot, 1990; Zimmerman, 1990). The data collected from this review could be used to further explain **RQ1** and be part of the investigation of **RQ7**. The researcher wrote down the

names of the schools, the students' names and their comments for every accomplished module on blank sheets of paper which were then compiled in a folder.

The other documents reviewed were the BID class register books which recorded BID students' attendance from January to June 2008. The aim was to examine students' attendance from official document where the data could be used to relate to the data collected in the questionnaire regarding students' perceptions of their attendance that could have an influence on their employability. This could enhance the reliability of the data collected in the study.

5.8 Data Collection Procedures

The researcher personally contacted by phone all nineteen teachers from nineteen different secondary schools all over Malaysia to arrange the visits to the schools on a day when the Form Five students would have a BID lesson. Following the schedule of the visits (see Appendix G), the researcher carried out surveys, interviews, observation and reviews of students' portfolios. She would first meet the school principals once arrived at the schools and then visit the BID workplace with the BID teachers. All nineteen teachers were briefed on all the necessary procedures for data collection and a suitable and convenient sequence to be carried out in their schools was discussed with them. At this stage, the teachers received and signed the consent forms to take part in the study. The options of data collection sequence applied in the study are as shown in Table 5.23. Basically the researcher would brief the students on the purpose of the research and the importance and contribution of their participation before getting their consent. Towards the end of the session, the researcher had a discussion with the students on various BID-related topics such as job prospects, the opportunities in further training and education, and other motivational matters. The students showed much interest in the discussion.

Table 5.23: Options of Data Collection Sequence

Sequence	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Before BID Lesson	Briefing and getting assessors' consent					
	Assessors' Survey	Assessors' Survey	Assessors' Survey	Assessors' Survey	Assessors' Survey	Assessors' Survey
	Assessors' Interview	Assessors' Interview	Portfolio review	Portfolio review	Assessors' Interview	Assessors' Interview
During BID Lesson	Briefing and getting students' consent					
	Students' Survey	Students' Survey	Students' Survey	Observation	Observation	Observation
	Observation	Students' Interview	Students' Interview	Students' Interview	Students' Interview	Students' Interview
	Students' Interview	-	-	Students' Survey	Students' Survey	-
	Debriefing					
After BID Lesson	Portfolio review	Portfolio review	Assessors' Interview	Assessors' Interview	Portfolio review	Portfolio review
	-	-	-	-	-	Students' Survey (conducted by the assessors at another convenient time)

5.8.1 Administration of Surveys

Surveys were administered to the BID students (Student Questionnaire) and the assessors (Assessor Questionnaire). All of the necessary ethical issues as discussed in this thesis regarding anonymity and confidentiality were taken into consideration and dealt with carefully. 320 out of a total of 356 student questionnaires were completed, which gave a response rate of 89.9% and all targeted 19 assessor questionnaires with 228 named students and 214 matching students.

(i) Students

When the students came to the BID workplace for their lesson, the teachers introduced the researcher and allowed her to brief the students on the purpose of the visit. The researcher also took a few minutes to give out the consent form and went through it with them. The students then were given the chance to ask any questions related to the study. All students were happy to take part and returned the signed consent forms. The teachers would then proceed with their lesson plan for the day.

When all the students had completed their BID tasks for the day, the researcher gathered them in the BID tutorial room adjacent to the workplace, where the researcher administered the Student Questionnaire, and went through the instructions and every item with the students. Whenever needed, the researcher elaborated on the items, thus making sure that there was no ambiguity in the questions. Such approach was possible to be conducted in seventeen schools while for the other two schools due to time constraint as the students had to do demanding BID tasks, the researcher left the questionnaires to the teachers to conduct the survey at another time that was convenient to them. The researcher covered the postage expenses and requested that the completed questionnaires be returned to her. The same procedure was applied in two schools with poor student attendance on the day of the visit. The teachers were asked to conduct the survey with the students who were absent on their return. They

were first briefed on how to conduct the survey. The signed consent forms and the answered questionnaires were then posted to the researcher.

(ii) Assessors

The researcher gave the Assessor Questionnaire to the teachers and went through it as necessary providing clarifications if required. The teachers completed the questionnaire in their free time and returned it to the researcher on the same day, at the end of the visit. Thus, all the nineteen teachers returned the questionnaires giving 100% response rate.

5.8.2 Interviews

The researcher conducted one-to-one interviews with selected students and the assessors from each school. The interviews were carried out in an ethically appropriate manner as discussed elsewhere in the thesis to avoid potential intrusiveness.

(i) Students

As mentioned before, four students from each school were randomly selected from either the name list compiled for the observations (wherever observations were conducted) or from the portfolio review name list. With the BID teachers' permission, the researcher interviewed each student in their office which was located within the BID workplace for some privacy. The students were called for the interview when they had completed their BID task for the day and each session took approximately ten minutes. The researcher used the Student Interview Protocol (SIP) to record the answers provided by the students. In addition, the interviews were audio-recorded with the students' permission (the audio but not video recording

facility of a video camera was used for this reason- no images were recorded). A total of 76 students were interviewed from a total of 356 students spread across nineteen schools which offered the subject of BID.

(ii) Assessors

The researcher conducted one-to-one interviews with all 19 teachers using the Assessor Interview Protocol (AIP). These interviews were conducted either before or after their BID lessons. The interviews were recorded with the teachers' permission using a video camera but only the voice was recorded and not the image of the teachers.

5.8.3 Observation

When there was an observation to be done, the researcher selected ten students randomly from the name lists provided by the BID teachers. The researcher would then identify (by name) the students who had been selected, and even though it was quite difficult at first, the researcher managed to do so as the students wore name tags on their school uniforms. The researcher wrote the students' names on the behaviour observation form. The observation was also recorded using a video camera with the students' permission as a backup approach.

There were three phases in the observation: the beginning, the middle and the ending of a lesson. Each student was observed for one minute for every phase and the researcher would record it according to the observation protocol, as described in section 2.5. On the whole, the researcher observed 93 students performing eleven different BID tasks in ten schools. Among the BID tasks observed were the installation of rolled carpet, fixing of wall lights, fixing of door knob, fixing of curtain railings, sewing of curtains, construction of wooden wall framework, wall

painting, installation of wooden wall panel, installation of gypsum board ceiling, flower arrangement and a presentation of business proposal.

5.8.4 Review of Documents

Teachers provide photocopies of documents related to BID assessment such as the register book for students' attendance, Form Four BID scores for the end of the year exam, Form Five BID scores for the mid-term exam, MCE registration form for BID, external monitoring and moderation reports as supplementary resources for the study. A checklist of the required documents was given to the teachers to help them prepare the requested documents. All the teachers could provide all the relevant documents as requested, except for reports on the external monitoring and moderation. These documents were reviewed later whenever necessary at the researcher's own time.

The researcher asked for the portfolios of the ten students whom she had randomly selected for the observation to be made available for review. In schools where no observation was carried out, the researcher randomly selected ten students from the register book. The researcher went through and recorded the comments written by these students on every accomplished BID modules. The students' comments were their self-reflection on their performance in the accomplished BID modules; whether or not they had done well and were satisfied with their performance, any improvements to be made in the future, any difficulties encountered in accomplishing the modules and any other personal evaluations made on their own performance. The review of 190 portfolios was carried out by the researcher either before or after the BID lessons in the teacher's office. Students' attendance was later reviewed at the researcher's own time

5.9 Data Analysis Procedures

As this study is a concurrent mixed methods design, the researcher adopted the parallel mixed data analysis where both quantitative and qualitative data analyses were employed. The quantitative data were collected from the questionnaires while the qualitative data were gathered from the responses to the open-ended question in the Student Questionnaire, interviews and portfolio reviews. Hence, the researcher analysed both the quantitative and qualitative data at the same time but in separate manner. The researcher then integrated both types of data analyses to generate meta-inferences of the study.

The researcher saved the quantitative data collected in three separate files: Student Questionnaire, Assessor Questionnaire and Student-Assessor matching pairs. As these were adapted and modified instruments, the researcher evaluated and refined the scales in the instruments by conducting exploratory factor analysis to the data on Student Questionnaire to explore the interrelationships among the scales (Pallant, 2009). Factor analysis was done after considering the suitability of the data set with regard to the sample size which in this study was 320 (more than 300 as suggested by Tabachnick & Fidell, 2007) and the strength of the relationship among the variables was greater than the recommended value of .3 (Tabachnick & Fidell, 2007). Bartlett's test of sphericity (Bartlett, 1954) with a significant $p < .05$ and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1970, 1974) index ranges from 0 to 1, with .6 as the minimum value for good factor analysis (Tabachnick & Fidell, 2007) were used to assess the factor ability of the data. Orthogonal rotation approach was applied to obtain solutions that were easier to interpret and report but assumptions (might be incorrect) that the underlying constructs were independent (Tabachnick & Fidell, 2007) had to be made. Varimax method was used to minimise the number of variables that have high loadings on each factor (Pallant, 2009). The researcher then checked the reliability of the newly formed scales from the factor analysis. Cronbach's alpha coefficient was used as indicator for the internal consistency of the scales. Before checking for the reliability,

items in the scale which were negatively worded were reversed. After considering the parametric assumptions, descriptive (frequency, percentile, mean, standard deviation and correlation coefficient) and inferential statistics (t-test and analysis of variance) were used in analysing quantitative data in order to provide possible answers to most of the research questions. In order to determine the degree of relationships between the predictors of employability, dimensions of employability and the dependent variables of students' success (Pallant, 2007; Creswell, 2009; Teddlie & Tashakkori, 2009) in this study, various hierarchical multiple regression analyses using SPSS 16 was conducted on the quantitative data (detailed explanation in Chapter 6).

In order to enhance the understanding of the research questions, the researcher used the analytic process suggested by Spencer et al., Lincoln & Guba (1985) and Attride-Stirling (2001) for the qualitative data. The researcher developed concepts by continually and simultaneously coding and analysing different pieces of qualitative data. The researcher then reviewed, labelled, sorted and synthesised the raw data gathered from the responses in the open-ended question in the Student Questionnaire, interviews and portfolio reviews into units of meaningful information. Subsequently, themes were refined from specific information in the data collected, conceptual framework and the literature reviewed. The researcher grouped the units of meaningful information into provisional themes. These themes were further refined into *global themes*, *organising themes* and *basic themes*, and checked for internal consistency and mutual exclusivity (Teddlie & Tashakkori, 2009). Thematic networks were constructed, described and summarised. After reading through synthesized data, studying and understanding patterns and thinking around the data, the researcher tried to develop the best fit explanations for the study by providing explicit reasons and accounts, inferring an underlying logic, using common sense, developing explanatory concepts, drawing from other empirical studies and using theoretical frameworks (Ritchie & Lewis, 2009). The research analysis was an iterative and reflexive process although it was presented as a linear, step-by-step

procedure which Tobin & Begley (2004) described as overarching principle of ‘goodness’.

5.10 Development of Research Quality Criteria

This research employed concurrent embedded mixed methods approach. Thus, the quality criteria of this research had to be based on the research strategy adopted which were the quantitative approach using surveys and qualitative approach using interviews, behaviour observation and portfolio reviews. These criteria were developed to assess the quality of the research process and the final outcomes. Figure 5.3 shows the research quality framework used in this study.

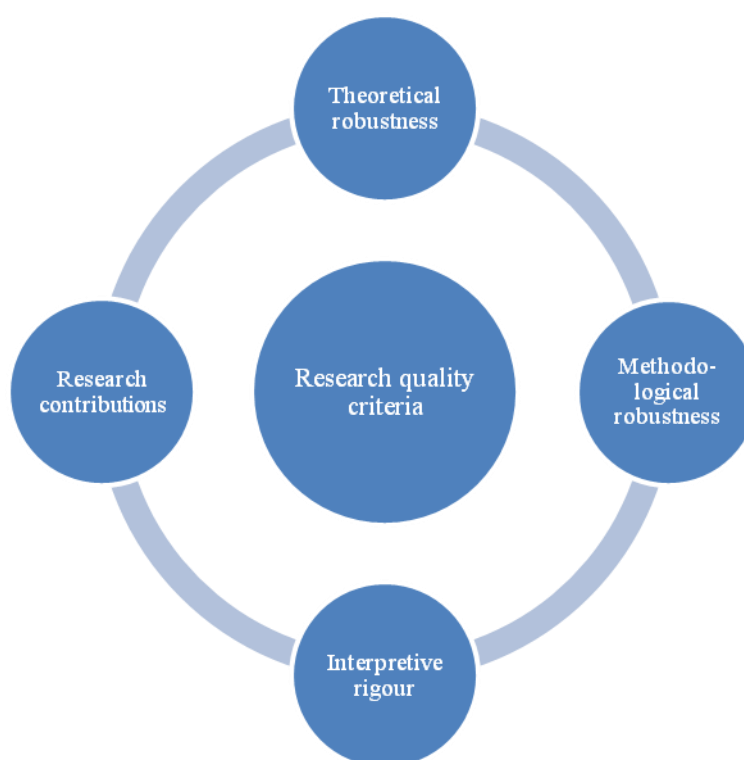


Figure 5.3: Research Quality Framework for this Research

Adapted from: NSW Department of Education and Training, n.d.;
Miles & Huberman, 1994; Furlong & Oancea, 2005; Thomas, 2007;
Teddlie & Tashakkori, 2009

All four dimensions of quality adapted in this study and the criteria included in each dimension are described below;

- Theoretical robustness refers to the adequacy of relevant conceptual and theoretical issues considered in the research (NSW Department of Education and Training, n.d.). The criteria that should be looked into would be whether or not the research was built on existing knowledge and has the ability to contribute to it by providing wider theoretical coverage, enhancing conceptual clarity in the field and invoking novelty (Furlong & Oancea, 2005).
- Methodological robustness denotes a well-constructed research design (NSW Department of Education and Training, n.d.) which includes design suitability, design fidelity, within-design consistency and analytic adequacy (Teddlie & Tashakkori, 2009) and that which can provide confidence in the research findings (NSW Department of Education and Training, n.d.). Moreover, the research design should also be assessed for its trustworthiness in the strength of the relationship between the research process and its representation of the world, reliability and validity, and the degree of ethical principles and legal regulations conformity (Furlong & Oancea, 2005).
- The interpretive rigour basically refers to the degree of credibility of the inferences and interpretations that have been made based on obtained results (Teddlie & Tashakkori, 2003). In other words, it consists of inferences that are consistently related to theory, knowledge and relevant findings, distinctively plausible, likely to match participants' constructions, efficiently integrated, and essentially correspond to purposes of the research (Teddlie & Tashakkori, 2009).
- Finally, research contributions would relate to theoretical and practical contributions that are of value for people and capacity building (Furlong &

Oancea, 2005). The criteria to look for would be the ability of the research to link to existing theory and novelty (Teddlie & Tashakkori, 2009) and the usefulness and functionality of the output of the research in serving the purposes (Miles & Huberman, 1994; Furlong & Oancea, 2005; Teddlie & Tashakkori, 2009).

5.11 Conclusions

This chapter has described a thought out research design which incorporated the quantitative and qualitative approaches to suit the purpose. The research design employed systematic procedures in order to effectively carry out the research. Legal regulations and ethical issues involving two countries, Scotland and Malaysia, were addressed judiciously and aptly. The chapter has also described in detail the development of all of the instruments that were used in data collection of this study; the questionnaires, the interview protocols, and the behaviour observation form. The recruitment of participants, the organisations involved and the steps taken in approaching these organisations were also described in detail. The chapter has also explained the step-by-step approach in data collection in all of the 19 schools offering BID in Malaysia. Furthermore, it has adapted and developed a research quality framework to be used in assessing the quality of this research. In conclusion, this chapter has described all the necessary steps and measures undertaken in this research in ensuring its credibility, reliability and validity. Further investigation of the instruments utilised in this research depicted some refinements to be made to suit the Malaysian context in the future. The development of the refined instruments will be discussed in the following chapter.

Chapter 6

Development of the Refined Instruments

6.1 Introduction

This chapter explains the development of the refined questionnaires and interview protocols in which the analyses were based on. The reliability and validity issues of the scales in the questionnaires and the other instruments used in gathering qualitative data are also addressed. The structure of this chapter is shown in Figure 6.1.

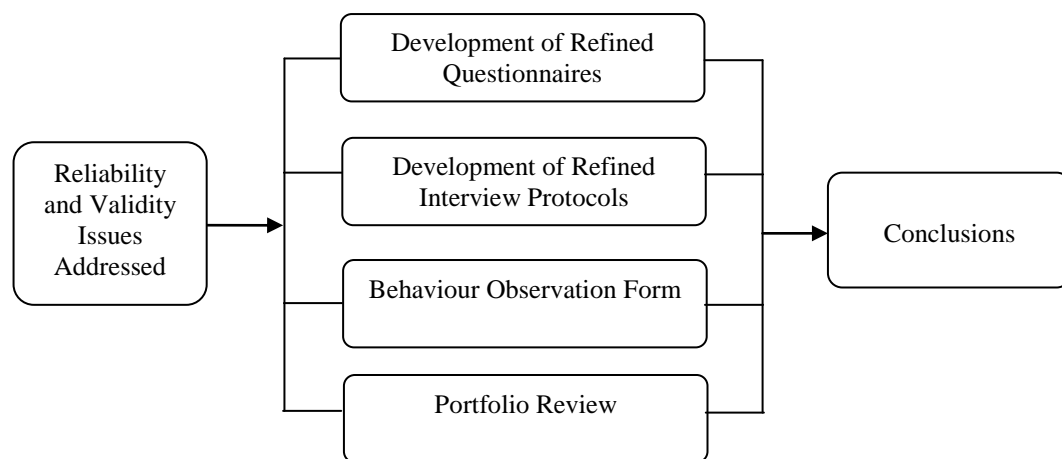


Figure 6.1: The Structure of Chapter 6

6.2 Reliability and Validity of Refined Instruments

Issues related to the reliability and validity of the refined instruments were identified and addressed in order to ensure the suitability and adequacy of the instruments to be employed for data analysis in this study.

6.2.1 Reliability and Validity of the Scales in the Refined Questionnaires

The scales of the Refined Student Questionnaire (RSQ) and Refined Assessor Questionnaire (RAQ) were assessed for reliability using SPSS 16 to compute the Cronbach's alpha values. The internal consistency Cronbach's alpha reliability coefficient of the fourteen subscales of the predictors, dimensions of employability and the measure of subjective success developed from the study for the Refined Student Questionnaire ranged from 0.593 to 0.872 as shown in Table 6.1.

Table 6.1: Cronbach's alpha values of the final version of the fourteen scales in the Refined Student Questionnaire

Scale	Alpha Values	No. of items
<i>Individual Predictors</i>		
- Flow	0.872	6
<i>Job-related Predictors</i>		
- Learning Value	0.598	4
- Working experience/Training	0.632	2
<i>Organisational Predictors</i>		
- Equipment and material sufficiency	0.858	4
- Workplace suitability	0.785	3
- Assessor-student exchange	0.759	5
- Learning climate: time dimension	0.732	3
- Learning climate: team-style	0.593	2
<i>Dimensions of employability</i>		
- Organisation sense	0.745	6
- Personal flexibility	0.736	5
- Affective reactions	0.768	4
- Anticipation and optimisation	0.724	6
- Occupational expertise	0.646	4
<i>Subjective success</i>		
- Satisfaction	0.651	4

Similarly, the other nine subscales of the organisational predictors, dimensions of employability and the measure of subjective success for the Refined Assessor Questionnaire as shown in Table 6.2 had reliability coefficients ranging from of 0.599 to 0.838. As both the student and assessor questionnaires dealt with psychological constructs values where diversity inevitably existed (Kline, 1999),

even a reliability coefficient below the acceptable value of 0.70 was used (Nunnally, 1978) in this study. Nine scales in the Refined Student Questionnaire and six scales in the Refined Assessor Questionnaire had alpha values that exceeded the acceptable value of 0.70 and thus, the scales could be considered reliable (Schmitt, 1996). Even though the remaining five scales in the Refined Student Questionnaire and three scales in the Refined Assessor Questionnaire had alpha values that fell below the minimum acceptable alpha coefficient, the alpha values were above 0.60 and as such, they could still be accepted for research use (Hui & Lee, 2000; Pierce, et al., 1993).

Table 6.2: Cronbach's alpha values of the final version of the nine scales of the Refined Assessor Questionnaire

Scale	Alpha Values	No. of items
<i>Organisational Predictors</i>		
- Equipment and material sufficiency	0.838	4
- Workplace suitability	0.822	3
- Assessor-student exchange	0.827	5
<i>Dimensions of employability</i>		
- Organisation sense	0.776	6
- Personal flexibility	0.671	5
- Affective reactions	0.819	4
- Anticipation and optimisation	0.599	6
- Occupational expertise	0.690	4
<i>Subjective success</i>		
- Satisfaction	0.709	4

The validity of the questionnaires was also addressed. The constructs in the questionnaires were to a great extent representatives of the real life problems that could occur within the content domain (CAMC of BID) being measured and reflected adequately the cognitive complexity required by an expert working in the domain. The constructs were conscientiously considered for relevance, transparency, comprehensibility and congruence with CAMC of BID. They reflected to some

extent students' behaviour and performance in the authentic context of CAMC of BID thereby sufficiently establishing criterion validity. In addition, how the constructs might have subsequent impact on the participants were also considered to a large extent to ensure consequential validity. As there was a range of diversity amongst the participants (assessor, student, ethnicity, sex), both the phenomena of the questionnaire and the participants had to be understood considerably in the context in which the participants were required to give their responses (Blaine, 2007). Moreover, the constructs were written in language accessible to the participants.

Furthermore, an examination of the agreement between the student and assessor ratings on the dimensions of employability also provided an indication of validity (see Table 6.3). Although the correlations between the ratings were low, they were positive correlations indicating a reasonable level of agreement between two sets of ratings.

Table 6.3: Paired-samples t-test and Pearson correlation for the Student and Assessor Employability Dimensions Ratings

Dimensions of Employability	Student Self-ratings		Assessor Ratings					
	n = 214		n = 214		Paired t-test	Sig (2-tailed)	<i>r</i>	<i>p</i> (2-tailed)
	Mean	SD	Mean	SD				
Organisation sense	4.17	.345	4.09	.453	2.221	.027*	.102	.180
Occupational expertise	4.04	.431	4.01	.534	.640	.523	.130	.057
Anticipation & optimisation	3.95	.430	3.98	.392	-.862	.390	.294	.000**
Personal flexibility	4.08	.353	4.11	.397	-.624	.533	.192	.771
Affective reactions	3.06	.551	3.61	.453	11.455	.000**	.201	.000**

* $p < .05$

** $p < .001$

Note: This analysis was performed using only student-assessor paired data (n=214)

As employability was assumed to be a predictor of students' success, examining the relationships between these variables was relevant to the predictive validity of the measurement instrument. Using data from students' self-ratings, the researcher regressed three indicators of success (students' BID MCE grades, number of BID modules accomplished and subjective success) on the five dimensions of employability while controlling all regression equations for gender and ethnicity. In the case of subjective success, four dimensions of employability were significant predictors while two dimensions were significant predictors in the case of the BID MCE grades. The number of BID modules accomplished was found to be predicted by two dimensions of employability. In addition, the researcher repeated a similar regression analysis on the assessors' ratings and found that two dimensions of employability were significant predictors of students' accomplishment of BID assessment modules, BID MCE grades and subjective success. Details of these regression analyses are in Chapter 7. These findings provided some evidence that employability was related to students' success and, tentatively, showed some degree of predictive validity.

6.2.2 Credibility and Trustworthiness of the Qualitative Instruments

Researcher bias is a potential threat to the validity of qualitative studies: selective observation and recording of information, selective reporting of information and personal views can affect data collection and interpretations. To counter this, the researcher engaged in critical self-reflection about potential for bias and documented her thoughts during the research process in an attempt to reduce researcher bias. In order to demonstrate credibility and trustworthiness of the data collected from the qualitative instruments, the researcher kept a trail of evidence throughout the research process (Koch, 1994) to allow the verification of descriptions. Furthermore, the researcher enhanced the credibility of the inquiry by adequately identifying and describing participants and their views. The process of member checks is one of the methods to validate participants' responses to a researcher's interpretations about them (Cutcliffe & McKenna, 2002). But the validity of this process is questioned by others as the participants' responses could be interpreted as new phenomena by the

researcher (Sandelowski, 2002). Nevertheless, this process of member checks was not possible to be carried out as the researcher had limited time and could only see the participants once during data collection in Malaysia. Alternatively, during the interviews, the researcher repeated the responses provided by the participants to get confirmation and better understanding of the participants' perspectives before recording. This step was undertaken to enhance to a large extent participant corroboration of data and their interpretation. The researcher presented data interpretations at conferences which allowed opportunities for further comments by the audiences of educational assessment and vocational education. These comments might be considered peer review strategy to check on the methodological adequacy of the study and subsequently enhance plausibility. The researcher also included negative responses (negative case sampling) to reduce bias of data supporting anticipated claims but the final explanation reflected as much as possible the majority of the participants by looking at the frequency of the matter discussed by the participants.

6.3 Development of the Refined Student Questionnaire (RSQ)

The Student Questionnaire (SQ) used in the study was adapted from the employees' self-rating scale used in the Indic@tor cross-cultural study on the measurement and enhancement of employability among ICT professionals working in small and medium-sized companies (The Indic@tor Consortium, 2005). It was also modified and translated into the Malay language to suit the young participants who were still in school. It was designed to investigate the factors that would impact students' employability in relation to the CAMC of BID tasks. It was further refined and developed after conducting factor analyses to the existing scales in the questionnaire.

The Refined Student Questionnaire retained the items seeking demographic information but had minor changes to the scales of the predictors and the dimensions of employability. The individual, job-related and organisational factors were examined for their contributing effects to students' employability in an attempt to

provide possible answers to partial of **RQ4**: What are the factors that influence students' employability and are there any differences in the strength and pattern of the relations between these factors and the employability of students of different gender and race? Thus, exploratory factor analyses were conducted on both the predictors (individual, job-related and organisational predictors) and the dimensions of employability in the initial Student Questionnaire to test the structure of each scale and the dimensionality of the questionnaire. The model explored was that of the scale as a latent factor with each item as an indicator.

The KMO is 0.820 and the communality for each item is quite high; from 0.525 to 0.779. Bartlett's test of sphericity examines the adequacy of the correlation matrix and yields a value of 4731.569 at a stringent level of significance ($p < .001$). The Total Variance Explained presents the number of common factors extracted, the eigenvalues associated with these factors, the percentage of total variance accounted for by each factor and the cumulative percentage of total variance accounted for by the factors. Using the criterion of retaining only factors with eigenvalues of 1 or above, eight factors were retained for orthogonal rotation with varimax rotation. These eight factors accounted for 20.24%, 11.81%, 8.13%, 7.18%, 5.42%, 4.40%, 3.58 and 3.206% of the Total Variance respectively, and for a total of 63.95%. These eight distinctive factors correspond to eight scales and 3 factors representing individual items; while 2 factors were discarded as they did not correspond to any of the scales in the study.

Another factor analysis was conducted on the dimensions of employability and subjective success. The KMO is 0.843 and the communalities ranging from 0.306 to 0.677. Bartlett's test of sphericity yields a value of 3073.875 and an associated level of significance of .000, smaller than .001. There were six factors corresponding to six scales retained for orthogonal rotation with varimax method. The factors accounted for 23.39%, 10.90%, 8.10%, 7.94%, 5.76% and 4.07% of the Total Variance respectively, and for a total of 60.16%. The results of the factor analyses of the Refined Student Questionnaire are explained in the following sections.

6.3.1 Scales of the Individual Predictors in the Refined Student Questionnaire

The final individual predictors consisted of an item on health, another item on school attendance and six items on the scale of flow. The values of Cronbach's alpha if item is deleted, communalities and factor loadings of the scales in the individual predictors are shown in Table 6.4. The factors of students' health and attendance were considered important as they might have an influence on students' performance in BID tasks. The item *I exercise to stay healthy* was discarded as it became a single factor which did not correspond to any of the scales in the initial questionnaire and was found not to be that important to be a predictor on its own.

Table 6.4: Values of Cronbach's alpha if item is removed, communalities and factor loadings for the scales in the Individual Predictors of the Refined Student Questionnaire

Individual Predictors	α if item removed	Communality	Factor loadings
Health			
In general, I am healthy.		0.682	0.422
School Attendance			
I have not been absent from school due to illness for the past year.		0.825	0.878
Flow			
I feel cheerful when I am doing BID tasks.	0.831	0.761	0.785
When doing BID tasks, I tend to forget everything else around me.	0.839	0.710	0.754
I enjoy doing BID tasks.	0.839	0.741	0.747
I get carried away by BID tasks.	0.853	0.620	0.718
I get the motivation to do BID tasks because of the good prospect the subject offers.	0.857	0.671	0.703
Doing the tasks related to BID helps me learn more.	0.876	0.691	0.671

Instead of having three sub-scales, the flow predictor now had a scale with the three elements of happiness, absorption and intrinsic motivation incorporated. Thus, the scale of flow consisted of six items and had a high reliability of 0.872, a mean of 4.33 and a standard deviation of 0.562. The total variance explained was 11.814%. The scale elicited students' attitudes towards, and perceptions of BID and their

participations in BID tasks at school. The scale further explored students' feelings, state of mind and involvement in learning BID. The scale was designed to investigate whether or not students' attitudes towards BID had any impact on their employability. Although this scale might seem volatile, it was important to find out whether or not it had effects on students' performance and employability. The items included in this scale might reflect the personal well-being looked for in individuals as stated in the national education philosophy. Thus, it was necessary to investigate if students might have internalised this personal well-being quality through CAMC of BID and if it might have an impact on students' employability.

6.3.2 Scales of the Job-related Predictors in the Refined Student Questionnaire

There were two scales developed for the job-related predictors: the learning value scale and the working experience scale. The learning value scale comprised four items with a moderate reliability of 0.598, a mean of 4.24 and a standard deviation of 0.378. The scale examined the extent to which the BID tasks had helped students learn, particularly in acquiring the procedural knowledge.

There was no change to the working experience scale as it retained the two items of the original scale. The reliability of the scale was 0.632. The scale had a mean of 0.31 and a standard deviation of 0.643. The purpose of the scale was to identify whether or not students' working experience and training in BID related areas outside school hours had any impact on their employability. Table 6.5 shows the alpha values if item is removed, the communality and factor loading of the scales in the job-related predictors.

Table 6.5: Values of Cronbach's alpha if item is removed, communalities and factor loadings of the scales in the Job-related Predictors of the Refined Student Questionnaire

Job-related Predictors	α if item removed	Communality	Factor loadings
Learning Value			
I can apply what I have learned in BID tasks in other situations.	0.457	0.578	0.714
I have the chance to develop my strengths by doing BID tasks.	0.510	0.593	0.669
Doing the tasks related to BID further develops my talents.	0.525	0.575	0.488
I can completely utilise my capabilities when doing BID tasks.	0.580	0.663	0.473
Working experience			
How often do you work after school in areas related to BID in a week?		0.779	0.820
How often have you been going for further training after school in areas related to BID in the past year?		0.706	0.739

6.3.3 Scales of the Organisational Predictors in the Refined Student Questionnaire

The organisational predictors in the Refined Student Questionnaire retained the scales of learning climate and assessor-student exchange but the items in the sub-scales were slightly different from the actual questionnaire used in the study. Moreover, based on the factor loading analysis conducted, the scale of facilities sufficiency was divided into two new scales; equipment/material sufficiency and workplace suitability. Hence, there were four scales included in the final organisational predictors. The first scale, learning climate, had two sub-scales and a factor consisting of an individual item. They were the sub-scales of time dimension, team style and a factor on opportunities to develop. The scale of learning climate examined the extent to which the schools had taken the necessary steps to provide an encouraging learning environment for the students. This included the time factor which involved the allocation of sufficient number of BID periods to enable students to accomplish their BID tasks and the opportunities for them to develop team-spirit as well as to further improve their skills in BID. The sub-scale of time dimension

consisted of three items with a satisfactory reliability of 0.732, a mean of 2.45 and a standard deviation of 0.728. The next subscale, the team style, comprised two items with a slightly low but still an adequate reliability of 0.593, a mean of 4.20 and a standard deviation of 0.505. The individual item that was included in the scale of learning climate was the opportunities to develop and it comprised the item *I have the chance to do other BID tasks besides the required ones*.

Two new scales emerged from the original facilities sufficiency scale: the equipment/material sufficiency and workplace suitability. The equipment/material sufficiency scale consisted of four items with a high reliability of 0.858. The scale had a mean of 4.0 and a standard deviation of 0.648. The scale elicited the functions of the schools as perceived by the students in providing relevant and adequate equipment and materials for students to accomplish the BID tasks successfully which subsequently would contribute to the success implementation of CAMC of BID. The scale further explored the effects the equipment and materials had on students' employability. The newly developed scale of workplace suitability comprised three items with an acceptable reliability of 0.785, a mean of 4.16 and a standard deviation of 0.477. The scale aimed to investigate the appropriateness of the workplaces with regard to the locations and the condition for BID tasks to take place. The scale further examined the impact of the workplaces on students' employability.

The final scale in the organisational predictors was the assessor-student exchange which consisted of five items. It had a reliability of 0.759, a mean of 4.22 and a standard deviation of 0.402. The scale examined the strengths and effectiveness of the relationship between the assessors and the students as well as the effect of the relationship on students' employability as perceived by the students. The alpha value if item is removed, the communality and factor loading of the scales in the organisational predictors are as shown in Table 6.6.

Table 6.6: Values of Cronbach's alpha if item is removed, communalities and factor loadings of the scales in the Organisational Predictors of the Refined Student Questionnaire

Organisational Predictors	α if item removed	Communality	Factor loadings
Learning climate:			
<i>Time Dimension</i>			
There is no time to get all the information I need in order to do my BID tasks well.	0.544	0.760	0.823
I do not have enough time to learn new BID tasks before I have to do them.	0.574	0.761	0.809
I have no time to do my BID tasks properly.	0.787	0.685	0.600
<i>Team Style</i>			
If I have a question about BID tasks, my classmates will help answer it.		0.776	0.850
My friends are willing to share information relevant to the BID tasks.		0.615	0.588
<i>Opportunities to Develop</i>			
I have the chance to do other BID tasks besides the required ones.		0.715	0.701
Equipment/Material Sufficiency			
I am satisfied with the condition of the equipment in the workplace.	0.813	0.723	0.806
I am satisfied with the amount of equipment provided for my BID tasks.	0.813	0.758	0.802
My assessor/teacher provides enough materials for me to do my BID tasks.	0.802	0.711	0.725
The materials provided for BID tasks are in good condition.	0.830	0.698	0.624
Workplace Suitability			
I am happy with the location of the workplace.	0.769	0.743	0.749
I am satisfied with the condition of my workplace.	0.615	0.760	0.663
The workplace is suitable for me to do my BID tasks.	0.727	0.715	0.604
Assessor-student Exchange			
My assessor/teacher would help me solve problems in BID.	0.689	0.688	0.754
My assessor/teacher understands my problems and needs in BID.	0.666	0.754	0.714
My assessor/teacher is satisfied with what I do in BID tasks.	0.735	0.680	0.713
My relationship with my assessor/teacher is close (can communicate effectively).	0.749	0.655	0.521
My assessor/teacher recognises my potential in BID.	0.722	0.525	0.515

Thus, three factors were examined; individual, job-related and organisational. This study investigated whether or not these constructs could be contributing factors to students' employability and provide possible answer to the first part of **RQ4**: What are the factors that influence students' employability and are there any differences in

the strength and pattern of the relations between these factors and the employability of students of different gender and race?

6.3.4 Scales of the Dimensions of Employability in the Refined Student Questionnaire

There were four scales of the dimensions of the employability retained (Organisation Sense, Personal Flexibility, Anticipation & Optimisation and Occupational Expertise), one scale (Balance) eliminated and a new scale (Affective Reactions) emerged from the factor analysis conducted on the dimensions of employability in the actual Student Questionnaire used in the study. Some of the items in each scale remained the same but some items were different from the original scales. The items in the original Balance scale were dispersed; one item was included in the organisation sense scale, another item was in the Personal Flexibility scale and the other item was in the Affective Reactions scale.

These dimensions of employability were to some extent reflective of the concept of competence employed in the study and were considered to be relevant to CAMC of BID. Students might be able to develop these dimensions of employability from doing the BID tasks thereby meeting substantially the needs of employability in the Malaysian context and subsequently fulfilling to a great extent the aspiration of the nation. The study investigated the predictive measures of these dimensions on students' employability by examining the contributing effects each dimension had on students' objective and subjective success. Furthermore, these dimensions were examined to provide possible answer to all of the research questions raised in the study particularly **RQ3**: What are the dimensions of employability incorporated in CAMC of BID? Table 6.7 shows the alpha value if item is removed, the communality and factor loading of the scales in the dimensions of employability.

Table 6.7: Values of Cronbach's alpha if item is removed, communalities and factor loadings for the scales in the Dimensions of Employability of the Refined Student Questionnaire

Dimensions of Employability	α if item removed	Communality	Factor loadings
Organisation Sense			
I am able to help my classmates understand how to do the BID tasks better.	0.711	0.545	0.641
I am involved in achieving the mission of my BID class.	0.720	0.462	0.632
I am eager to apply the knowledge and skills that I have learned and acquired in BID class.	0.681	0.573	0.616
In my BID class, I take the initiative to share responsibilities with my classmates.	0.700	0.415	0.543
I take the initiative to learn how to overcome my weaknesses.	0.695	0.479	0.537
After doing my BID tasks I am generally able to relax.	0.728	0.306	0.330
Personal Flexibility			
I can easily adapt to changes in my BID workplace (eg: new storage, extended/renovated workplace, new equipment).	0.616	0.658	0.751
I can cope with changes in my BID class.	0.617	0.587	0.718
I adapt easily to developments within my BID workplace.	0.644	0.559	0.659
My doing of BID tasks does not interfere with the rest of my life.	0.743	0.366	0.512
I have acquired the required skills to complete BID tasks.	0.672	0.471	0.503
Affective Reactions			
I feel awkward and out of place in my BID class.	0.675	0.685	0.809
I feel like an outsider (or left out of things) in my BID class.	0.651	0.662	0.803
I feel lonely in my BID class.	0.675	0.677	0.796
I feel stressed when doing my BID tasks.	0.806	0.540	0.552
Anticipation & Optimisation			
I do that extra bit for my BID class apart from my direct responsibilities.	0.616	0.631	0.682
I spend some of my free time improving my skills in BID.	0.691	0.494	0.676
I am in a position to do mostly work that I really like.	0.698	0.476	0.571
I feel comfortable doing my BID tasks in the presence of my classmates.	0.650	0.550	0.509
I am focused on continuously developing myself.	0.675	0.468	0.479
I have performed my BID tasks with only few mistakes.	0.710	0.365	0.445
Occupational Expertise			
I feel confident to provide information on the BID tasks that I have done.	0.563	0.606	0.665
I have carried out my BID tasks independently.	0.588	0.543	0.614
I share my experience and knowledge with others from outside my class.	0.579	0.486	0.600
I am confident of my ability to do BID tasks.	0.541	0.478	0.537

The Organisation Sense scale in the Refined Student Questionnaire consisted of six items with a reasonable reliability of 0.745, a mean of 4.16 and a standard deviation of 0.358. This scale to some extent reflected one of the components of the behavioural engagement, students' participation in school-related activities. This scale also examined students' behaviour of obligation, responsibility and commitment towards BID class in achieving the objective and subjective success. As noted in the literature, companies are looking for such qualities in potential employees to help companies attain success in this competitive labour market. Thus, it was appropriate to investigate if CAMC of BID might have prepared students with the qualities required for future employment.

There were five items under the scale of personal flexibility with an acceptable reliability of 0.736, a mean of 4.10 and a standard deviation of 0.347. The personal flexibility scale examined students' non-technical skills of being adaptive and adaptable as proposed by Harvey & Green (1994). Employers in Malaysia are looking for potential employees who are flexible in order to help companies with the transformation required by changing market needs (Gurvinder Kaur & Sharan Kaur, 2008). Hence, it was essential to look into the effectiveness of CAMC of BID in equipping students with this non-technical skill.

The newly formed scale of Affective Reactions comprised four items with a satisfactory reliability of 0.768, a mean of 1.99 and a standard deviation of 0.625. This scale investigated students' feelings about being in the BID class. Students' interest, boredom, happiness, sadness and anxiety in the classroom (Connell & Wellborn, 1991; Skinner & Belmont, 1993) might have an influence on their performance in academic and social contexts (Wentzel et al., 2004). Students often experience less emotional distress from good peer relationships; they are usually happy to be in school and they perform well academically and socially (Wentzel et al., 2004). These feelings of being contented, calm, composed, reassured and relaxed, although seeming trivial, may have some impact on students' performance in BID and subsequently their future undertakings. Therefore, it was essential for the

researcher to investigate if CAMC of BID had managed to develop students who might be emotionally balanced as outlined in the national education philosophy.

The Anticipation & Optimisation scale retained two of its original items and incorporated four items from other scales. The scale had a fair reliability of 0.724, a mean of 3.98 and a standard deviation of 0.413. This scale elicited to a great extent students' cognitive engagement particularly their psychological investment in learning. In other words, the scale looked into students' motivation and effort put into enhancing their learning, understanding, knowledge and skills in BID. Such behaviour could be beneficial to students not only in accomplishing difficult BID tasks but also in dealing with challenges faced in the future. Furthermore, employers in the current labour market are in favour of employees who possess strong motivation and willingness to work. So, it was appropriate to examine whether or not CAMC of BID had been effective in developing students with such desired behaviour for employability.

Finally, the Occupational Expertise scale which consisted of four items retained three of its original items and an item from the original organisation sense scale. The scale had a slightly low but acceptable reliability of 0.646, a mean of 4.05 and a standard deviation of 0.393. The scale looked into students' knowledge and technical skills, primarily the specialist skills acquired in CAMC of BID. Generally, the scale examined the extent of students' acquisition of the minimum required skills and knowledge in BID. These vocational knowledge and skills are important in entering or making transitions in the labour market (Hillage & Pollard, 1998) and in becoming knowledgeable and competent citizens of Malaysia who could contribute to the prosperity of the nation (MoE, n.d.).

6.3.5 Dependent Variables in the Refined Student Questionnaire

The dependent variables which acted as the measures of success consisted of the objective success and subjective success. These dependent variables were used to

provide possible answer to **RQ7**: To what extent and in what ways do observations of BID students at work and reviews of their portfolios serve to contribute to a more comprehensive and nuanced understanding of the predictive relationship between students' success and students' employability? The objective success comprised individual item of the number of modules accomplished. The item *How many assessment modules did you demonstrate competence in the past year?* was used as a measure of objective success to predict employability instead of the item *How many assessment modules did you attempt to do in the past year?* as it is more comprehensive and reflective of students' ability to perform. The satisfaction scale in the subjective success comprised five items, two of which were from the original scale while the other three were from the sense of belonging scale. The scale had a fair reliability of 0.675. The mean of the scale was 4.07 and the standard deviation was 0.412. The scale examined students' satisfaction of being in BID class which was then used to predict students' employability. Satisfaction was considered an important form of success as it might relate to students being capable of having personal well-being as desired by the national education philosophy (MoE, n.d.). The alpha value if item is removed, the communality and factor loading for the satisfaction scale in the dependent variables are as shown in Table 6.8.

Table 6.8: Values of Cronbach's alpha if item is removed, communalities and factor loadings for the scales in the Dependent Variables of the Refined Student Questionnaire

Dependent Variables (Success)	α if item removed	Communality	Factor loadings
Subjective success: Satisfaction			
My classmates seem to like me.	0.660		0.687
I am respected by my friends.	0.607		0.622
I feel like I belong to my BID class.	0.592		0.611
I make friends easily.	0.581		0.472
I am in a class that offers me the chance to learn new skills.	0.645		0.344
Objective success: Accomplished BID Assessment Modules			
How many assessment modules did you demonstrate competence in the past year?			

6.3.6 The Open-ended Question in the Refined Student Questionnaire

The open-ended question *Describe what you think of and how you feel about the assessment of BID in terms of its practical work, effectiveness and relevance to you as a student* is retained in the Refined Student Questionnaire as it provided the opportunity for students to express their feelings about CAMC of BID in three different categories freely using their own words. The item, further, brought out students' perceptions of the significance and the impact of CAMC of BID on them. The responses were qualitative in nature and thus provided more detailed information on the implications of CAMC of BID in students' lives to provide possible answers to **RQ1, RQ3, RQ4** and **RQ5**.

6.4 Development of the Refined Assessor Questionnaire (RAQ)

Similar to the Student Questionnaire used in the study, the Assessor Questionnaire was an adaptation of the supervisors' rating scale used in the Indic@tor cross-cultural study on the measurement and enhancement of employability among ICT professionals working in small and medium-sized companies (The Indic@tor Consortium, 2005). The development of the scales in the Refined Assessor Questionnaire then was based on the scales developed from the Refined Student Questionnaire. However, only the dimensions of employability and three scales of the organisational predictors were used in the Refined Assessor Questionnaire as they were relevant in predicting students' employability and were appropriate for the assessors to perceive and give response to. Thus, the Refined Assessor Questionnaire gathered the information on the assessors' perceptions of the impact of CAMC of BID on the Form Five students' employability.

The demographic information of the assessors was retained although it was not used in the analysis of the study. The demographic information was not analysed when it was realised that all the assessors had the same qualifications of a bachelor's degree and a diploma in education and an equivalent number of years of teaching experience.

6.4.1 Scales of the Dimensions of Employability in the Refined Assessor Questionnaire

Five scales on dimensions of employability (Organisation Sense, Personal Flexibility, Anticipation & Optimisation, Affective Reactions and Occupational Expertise) were developed in the Refined Assessor Questionnaire based on the scales developed in the Refined Student Questionnaire. A reliability analysis was conducted on these scales to ascertain the internal consistency and the alpha values are as shown in Table 6.1. These scales were examined to provide possible answers to all of the research questions raised in the study, specifically **RQ3**: What are the dimensions of employability incorporated in CAMC of BID?

The Organisation Sense scale had a satisfactory reliability of 0.776, a mean of 4.08 and a standard deviation of 0.463. There were six items in this scale which examined the assessors' perceptions of their students' participations in school-related activities. This scale to a great extent reflected students' behavioural engagement as perceived by their assessors. The next scale was the Personal Flexibility scale which comprised four items. The scale had a reasonable reliability of 0.671, a mean of 4.10 and a standard deviation of 0.413. The scale looked into the assessors' points of view on their students' ability and skills in dealing with the BID tasks and class. The subsequent scale was the Affective Reactions scale with four items. The scale had a high reliability of 0.819, a mean of 1.39 and a standard deviation of 0.456. The scale investigated the students' feelings about BID class as perceived by the assessors. The scale further examined the assessors' perceptions of students' emotional engagement. The fourth scale was Anticipation & Optimisation scale which had four items. The scale had a fair reliability of 0.599, a mean of 3.98 and a standard deviation of 0.392. The scale explored the assessors' perceptions of students' motivation and investment in learning which denoted their cognitive engagement. The final scale in the dimensions of employability was the Occupational Expertise scale which had an adequate reliability 0.690, a mean of 4.0 and a standard deviation of 0.538. The scale looked at the assessors' views of the students' knowledge and skills in doing BID

tasks. The items in each scale of the dimensions of employability in the Refined Assessor Questionnaire are as shown in Table 6.9.

Table 6.9: Scales of Dimensions of Employability Developed in the Refined Assessor Questionnaire

Organisation Sense	$\alpha = .776$
This student is able to help his/her classmates understand how to do BID tasks better.	
This student is involved in achieving the mission of the BID class.	
This student is eager to apply the knowledge and skills that he/she has learned and acquired in BID	
In the BID class, this student takes the initiative to share responsibilities with his/her classmates.	
This student takes the initiative to learn how to overcome his/her weaknesses.	
After doing his/her BID tasks, this student is generally able to relax.	
Personal Flexibility	$\alpha = .671$
This student can easily adapt to changes in the BID workplace (eg; new storage, extended/renovated	
This student adapts easily to developments within the BID workplace.	
This student can cope with changes in the BID class.	
This student has acquired the required skills to complete BID tasks.	
Affective Reactions	$\alpha = .819$
This student feels awkward and out of place in the BID class.	
This student feels like an outsider (or left out of things) in the BID class.	
The student feels lonely in the BID class.	
This student feels stressed when doing his/her BID tasks.	
Anticipation & Optimisation	$\alpha = .599$
This student does that extra bit for the BID class apart from his/her direct responsibilities.	
This student spends some of his/her time improving the skills in BID.	
This student is in a position to do mostly work that he/she really likes.	
This student feels comfortable doing BID tasks in the presence of his/her classmates.	
This student is focused on continuously developing him/herself.	
This student has performed his/her tasks with only a few mistakes.	
Occupational Expertise	$\alpha = .690$
This student feels confident to provide information on the BID tasks that he/she has done.	
This student has carried out his/her BID tasks independently.	
This student shares his/her experience and knowledge with others from outside the BID class.	
This student is confident of his/her ability to do BID tasks.	

6.4.2 Scales of the Organisational Predictors in the Refined Assessor Questionnaire

There were only three scales developed in the organisational predictors of the Refined Assessor Questionnaire. The learning climate scale developed in the Refined Student Questionnaire was not included in the Refined Assessor Questionnaire as it was quite difficult for the assessors to observe what was in the students' minds. Therefore, three scales which the assessors could give their opinions on the students' behaviour were developed based on the scales found in the Refined Student Questionnaire. The first scale was the equipment/material sufficiency scale which had four items with a high reliability of 0.838, a mean of 3.43 and a standard deviation of 0.794. The scale looked into the assessors' perceptions of the sufficiency of the equipment and materials provided for the students to do the BID tasks. The second scale was the workplace suitability scale which had a high reliability of 0.822, a mean of 3.46 and a standard deviation of 0.951. The three-item scale examined the assessors' opinions on the suitability of the BID workplaces for the students to carry out the tasks. The third scale was the assessor-student exchange which had five items. The scale had a high reliability of 0.827, a mean of 4.27 and a standard deviation of 0.477. The scale explored the relationship between the assessors and the students as perceived by the assessors and thus could potentially contribute to answering **RQ4**: What are the factors that influence students' employability and are there any differences in the strength and pattern of the relations between these factors and the employability of students of different gender and race? Table 6.10 shows the items in the scales in the organisational predictors of the refined Assessor's Questionnaire.

Table 6.10: Scales in the Organisational Predictors of the Refined Assessor Questionnaire

Equipment/Material Sufficiency	$\alpha = .838$
I provide satisfactory amount of equipment for my students' BID tasks.	
I am satisfied with the condition of the equipment in the workplace.	
I provide sufficient materials for my students to do the BID tasks.	
The materials provided are in good condition.	
Workplace Suitability	$\alpha = .822$
I am happy with the location of the workplace.	
I am satisfied with the condition of the workplace.	
The workplace is suitable for my students to do their BID tasks.	
Assessor-Student Exchange	$\alpha = .827$
I am satisfied with what my students do in the BID tasks.	
I understand my students' problems and needs in BID.	
I recognise my students' potential in BID.	
I would help my students solve problems in BID.	
My relationship with my students is close (can communicate effectively).	

6.4.3 Dependent Variables in the Refined Assessor Questionnaire

The dependent variables in the Refined Assessor Questionnaire were similar to the dependent variables in the Refined Student Questionnaire. The dependent variables consisted of the objective success and subjective success which were used to provide possible answer to **RQ7**. The satisfaction scale in the subjective success developed in the Refined Assessor Questionnaire was the same as the one developed in the Refined Student Questionnaire. There were four items and the scale had a satisfactory reliability of .709, a mean of 4.30 and a standard deviation of 0.323. The scale examined the assessors' opinions on the students' evaluation of themselves, classmates and BID class itself. The objective success was represented by an individual item denoting the assessors' point of view on the students' performance in accomplishing the BID assessment modules based on their record. The item was *This student has demonstrated competence in ____ assessment modules in the past year.*

The items of the scales in the dependent variables of the Refined Assessor Questionnaire are as shown in Table 6.11.

Table 6.11: Scales in the Dependent Variables of the Refined Assessor Questionnaire

Subjective Success: Satisfaction	$\alpha = .709$
This student's classmates seem to like him/her.	
This student is respected by his/her friends	
This student feels like he/she belongs to the BID class.	
This student makes friends easily.	
This student is in a class that offers him/her the chance to learn new skills.	
Objective Success: BID Assessment Modules	
This student has demonstrated competence in ____assessment modules in the past year.	

6.5 Development of the Refined Student Interview Protocol (RSIP)

The responses of 76 students in the interviews conducted in 19 secondary schools offering BID subject in Malaysia were analysed in the study. The responses from questions one, sub-question two and question four in the actual Student Interview Protocol were analysed in the study extensively. These responses were found to be relevant to the research as they provided in-depth explanations of the factors and activities that might influence students' employability from the students' point of view. The responses from the first sub-question of question one gave the insights of students' behaviour engagement in relation to their participations in other BID-related tasks conducted in schools. The responses explained detailed tasks and activities such as small school projects on painting, floor tiling, hall decorations and exhibitions where students were given the opportunity to do to develop their knowledge and skills besides the BID-tasks of the assessment modules. The responses to the second sub-question described the parties involved in those activities and the extent to which they contributed to students' employability. The responses to the third sub-question revealed students' opinion on what the impact of such

activities had on their knowledge and skills. Furthermore, the responses ascertained the notion that skills develop over time with practice (Proctor & Dutta, 1995) and provided possible in-depth answers to **RQ1 – RQ6**.

The responses from the first part of question two and question three were not included in the analysis at this point as they were found to be not that important in describing students' employability. The responses provided detailed information about the BID assessment modules which students claimed that they had acquired knowledge and skills in and those assessments modules which they thought had contributed the least to their employability. The responses were more suitable for use for improvement or amendment of the BID syllabus rather than for prediction of employability. The responses to the fourth question were analysed in the study. The responses were students' suggestions on how they could improve their knowledge and skills in BID. These responses reflected to a great extent students' ability to evaluate their own performance by looking at their strengths and weaknesses, and subsequently making suggestions on the improvements that could help them. Moreover, the responses to some extent tackled students' cognitive engagement; both the metacognitive strategy of evaluating one's own cognition when accomplishing tasks (Pintrich & De Groot, 1990; Zimmerman, 1990) as in self-regulation and the investment in learning. Finally, the responses to the questions posed in the Refined Student Interview Protocol as shown in Table 6.12 were used in the study.

Table 6.12: Developed Questions in the Refined Student Interview Protocol

RSIP – Developed Questions
<ol style="list-style-type: none"> 1. You have been doing BID tasks in school for almost two years now. <ol style="list-style-type: none"> a. Apart from the BID tasks what other relevant activities have you taken part in? b. Did any parties from outside of the school such as the industry or training colleges take part in these activities? If yes, name the parties. c. How do you think these experiences have helped you gain knowledge and skills in BID? 2. For each of the assessment module, how do you think it will help you in your future work? 3. What are your suggestions to improve your knowledge and skills in BID?

6.6 Development of the Refined Assessor Interview Protocol (RAIP)

The assessors' responses in the interviews were analysed in the study. However, not all the responses to all the questions were analysed. The first two questions analysed were the same as the questions developed in the Refined Student Interview Protocol but with some rephrasing to suit the assessor participant. The responses showed the assessors' perceptions of their roles in providing essential BID-related activities, the parties involved in the activities and the benefits of each of the BID assessment module in preparing students for future employment. In other words, these responses revealed to some extent the assessors' perceptions of students' behaviour engagement which were related to their participation in BID-related activities aside from the BID tasks which they had to do in the workplace and whether or not such opportunities when provided appropriately could influence students' employability. Furthermore, the assessors' views on the contributions of such experiences which students gained from these activities were also looked into thoroughly. Thus, the responses provided detailed information that might be useful to explain **RQ1 – RQ6**.

The responses to the first part of question two and question three in the actual Assessor Interview Protocol were disregarded as they were found to be irrelevant to the study. The responses were more appropriate to be discussed for the purpose of improvising the BID syllabus or the assessment modules. Furthermore, the responses to the following two questions on the assessors' suggestions on other BID assessment modules that should be assessed and other forms of assessments that could equip students with the required employability skills were not included in the analysis. Although it could determine the necessary BID assessment modules and modes of assessment that could help increase students' employability skills, it was not utilised in the study as it did not contribute to possible answers to the research questions. The questions developed in the Refined Assessor Interview Protocol were as shown in Table 6.13.

Table 6.13: Developed Questions in the Refined Assessor Interview Protocol**RAIP – Developed Questions**

1. You have been teaching and assessing BID for some time now.
 - a. Apart from the BID modules, what other activities have you carried out that will enhance learners' knowledge and skills in BID?
 - b. Did any parties from outside of the school such as the industry or training colleges take part in these activities? If yes, name the parties.
 - c. How do you think these experiences have contributed to learner's learning?
 2. For each of the assessment module, how do you think it helps learners in their future work?
-

6.7 Retained Behaviour Observation Form

The data gathered from the Behaviour Observation Form (BOF) was analysed to determine two elements of student behavioural engagement; the positive conduct and the involvement in learning and academic tasks (Cunningham et al., 2006; Fletcher, 2006; Fredricks et al., 2004). Students' positive conduct consisted of students' willingness to follow the rules and adhere to classroom norms as well as to avoid any misbehaviour in school. These behaviours on positive conduct derived mostly from the workplace management list provided in the BID assessment modules and they were listed in the Behaviour Observation Form as the last six behaviours in all the three phases of the observation. Students were found to be following the rules in the workplace especially when working on the BID tasks and towards the end when they had to clean up the workplace.

The first three behaviours listed in all the three phases in the BOF were analysed for student behavioural engagement particularly their active participation in the teaching and learning activities. The behaviours demonstrated at three different phases varied

with students' involvement in discussion was found to be very active at the beginning of the lesson, slightly moderate in the middle of lesson and quite active again at the end of the lesson. The BOF was found to be adequate in eliciting the desired behaviours and thus it could be retained for future use with just slight improvement in its layout. BOF could provide supplementary information to strengthen the answers to all of the research questions except for **RQ6**.

6.8 Retained Portfolio Reviews

Students' comments on their own performances in every accomplished BID assessment module as stated in the students' BID portfolios were analysed. The comments were found to be short but precise in most cases where students wrote how they felt about the BID tasks, their strengths and weaknesses as well as the improvements that could be made in the future. Basically, the comments were students' self-evaluation of and reflection on how they had performed in the BID assessment modules.

In addition to students' comments of their performance, students' work schedules, tools/materials checklist and cost estimation for each module were looked into. Students' planning of work before starting to work on the BID tasks might indicate that students had somewhat applied the first process of self-regulation. The information gathered from these portfolio reviews might further enhance the answers to all of the research questions except for **RQ6**.

6.9 Conclusions

This chapter has described the development of the refined instruments from the adapted instruments employed in the study; student and assessor questionnaires, student and assessor interview protocols. Among the five dimensions of

employability included in the adapted questionnaires, Balance was found to be irrelevant to the study as it could not prevail as an evident scale on its own. Affective Reactions on the other hand, emerged as a perceptible scale in the dimensions of employability. Thus, this dimension of employability is unique to this study as it has evolved from its adapted version into a scale that is considerably relevant to elicit students' employability in the context of competence as discussed in Chapter 3. The reliability and the validity of the scales in the questionnaires have been addressed and to a great extent ascertained. The results and the findings of this study were based on the analysis of data gathered in these refined and retained instruments and will be discussed in detail in the following chapters.

Chapter 7

Quantitative Data Analysis and Results

7.1 Introduction

This chapter discusses the analysis and results of the quantitative data. It consists of two parts with the first part describing the participants in the study. The second part displays the results of the surveys and observation. The structure of this chapter is as shown in Figure 7.1.

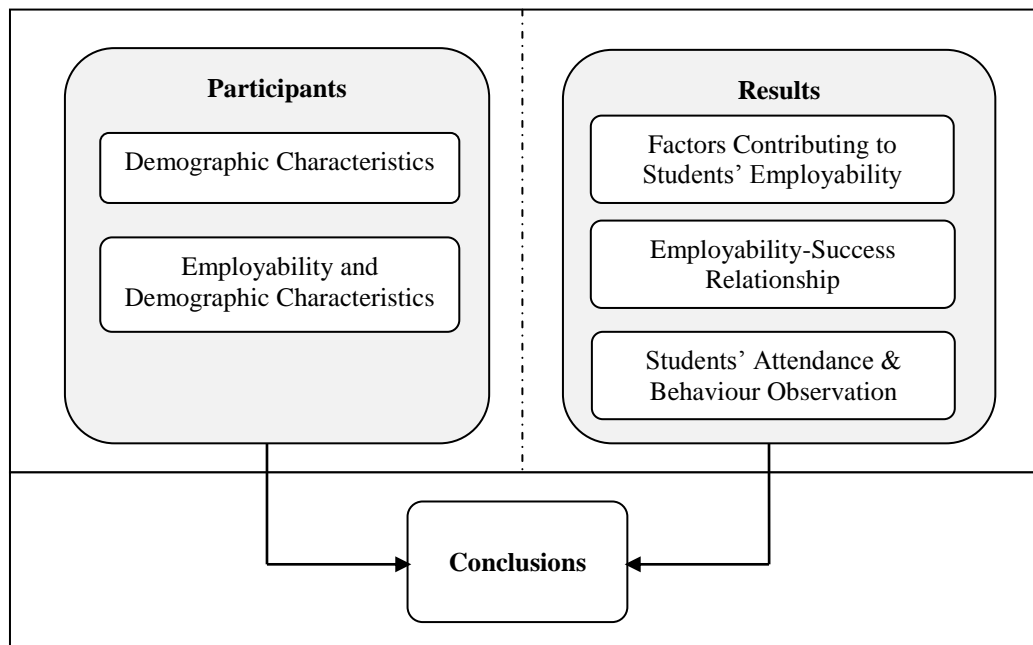


Figure 7.1: The Structure of Chapter 7

7.2 Demographic Characteristics

320 out of 356 Form Five BID students and 19 Form Five BID assessors from all 19 schools offering BID subject in the country took part in the surveys, giving a response rate of 90% and 100% respectively. Table 7.1 shows the distribution of participants in the surveys according to school location, gender and ethnicity. The majority of the BID students were Malays (84%) with 66.3% of them from the rural

schools. The reason could be that most Malays lived in the rural areas and 79% of the schools offering BID were located in the rural areas. The purpose was to provide BID opportunities to students in rural areas where exposure to such discipline was very limited. Table 7.2 shows the distribution of participants between school location and ethnicity. Another point to be noted is that there were more male students (62.8%) than female students (37.2%) undertaking BID as shown in Table 7.3 which presents the distribution of participants between gender and ethnicity. The nature of the BID tasks which requires extensive hands-on activities could be of more interest to the male students than the female students. Majority of the male students (47.5%) unsurprisingly were in the rural schools as shown in Table 7.4 that presents the distribution of participants between school location and gender. Turning to the demographics of the assessors, all 19 of them had a first degree in various areas but obtained a Postgraduate Diploma of Education (PGDE) in Basic Interior Decorations. All of them had less than five years of teaching experience and they were among the only two cohorts of teacher trainees to have been specially trained to teach BID when it was first introduced.

Table 7.1: Survey - Distribution of Participants According to School Location, Gender and Ethnicity

	Form Five BID Students		Form Five BID Assessors	
	n	%	n	%
School location				
Rural	251	78.0	15	79.0
Urban	69	22.0	4	21.0
Gender				
Male	201	62.8	6	31.6
Female	119	37.2	13	68.4
Ethnicity				
Malay	269	84.0	18	95.0
Chinese	19	6.0	-	
Indian	16	5.0	-	
Others	16	5.0	1	5.0

Table 7.2: Surveys - Distribution of Participants between School Location and Ethnicity

	Form Five BID Students				Form Five BID Assessors			
	Rural		Urban		Rural		Urban	
	n	%	n	%	n	%	n	%
Ethnicity								
Malay	212	66.3	57	17.8	15	79.0	3	16.0
Chinese	8	2.5	11	3.4	-	-	-	-
Indian	15	4.7	1	0.3	-	-	-	-
Others	16	5.0	-	-	-	-	1	5.0
Total	251	78.5	69	21.5	15	79.0	4	21.0

Table 7.3: Surveys - Distribution of Participants between Gender and Ethnicity

	Form Five BID Students				Form Five BID Assessors			
	Male		Female		Male		Female	
	n	%	n	%	n	%	n	%
Ethnicity								
Malay	166	51.9	103	32.1	5	26.3	13	68.4
Chinese	17	5.3	2	0.6	-	-	-	-
Indian	10	3.1	6	2.0	-	-	-	-
Others	8	2.5	8	2.5	1	5.3	-	-
Total	201	62.8	119	37.2	6	31.6	13	68.4

Table 7.4: Surveys - Distribution of Participants between School Location and Gender

	Form Five BID Students				Form Five BID Assessors			
	Rural		Urban		Rural		Urban	
	n	%	n	%	n	%	n	%
Gender								
Male	152	47.5	49	15.3	4	21.0	2	10.5
Female	99	31.0	20	6.2	11	58.0	2	10.5
Total	251	78.5	69	21.5	15	79.0	4	21.0

Four Form Five BID students who were randomly selected from each of the 19 schools took part in the interview, making it a total of 76 students. All of the 19 assessors were also interviewed. Table 7.5 shows the distribution of both participants in the interviews between school location and gender.

Table 7.5: Interviews - Distribution of Participants between School Location and Gender

	Form Five BID Students				Form Five BID Assessors			
	Rural		Urban		Rural		Urban	
	n	%	n	%	n	%	n	%
Gender								
Male	30	39.5	8	10.5	4	21.0	2	10.5
Female	30	39.5	8	10.5	11	58.0	2	10.5
Total	60	79.0	16	21.0	15	79.0	4	21.0

93 students from 10 schools were observed while carrying out BID tasks. These 93 students' portfolios together with 10 portfolios from each of the other nine schools were also reviewed, totalling 190 portfolios. Table 7.6 shows the distribution of Form Five BID Students in behaviour observation and portfolio reviews between school location and gender. Table 7.7 shows the distribution of the students in behaviour observation between gender and, school location and ethnicity while Table 7.8 shows the distribution of students in portfolio reviews between gender and, school location and ethnicity.

Table 7.6: Distribution of Form Five BID Students in Observation and Portfolio Reviews between School Location and Gender

	Form Five BID Students				Form Five BID Students			
	Behaviour Observation				Portfolio Reviews			
	Rural		Urban		Rural		Urban	
	n	%	n	%	n	%	n	%
Gender								
Male	43	46.2	22	23.7	93	49.0	28	14.7
Female	20	21.5	8	8.6	57	30.0	12	6.3
Total	63	67.7	30	32.3	150	79.0	40	21.0

Table 7.7: Distribution of Form Five BID Students in Behaviour Observation between Gender, School Location and Ethnicity

	Form Five BID Students							
	Male		Female		Rural		Urban	
	n	%	n	%	n	%	n	%
Ethnicity								
Malay	51	55.0	24	25.8	52	56.0	23	24.7
Chinese	6	6.5	1	1.0	1	1.0	6	6.5
Indian	7	7.5	2	2.2	8	8.6	1	1.0
Others	1	1.0	1	1.0	2	2.2	-	-
Total	65	70.0	28	30.0	63	67.8	30	32.2

Table 7.8: Distribution of Form Five BID Students in Portfolio Reviews between Gender, School Location and Ethnicity

	Form Five BID Students							
	Male		Female		Rural		Urban	
	n	%	n	%	n	%	n	%
Ethnicity								
Malay	104	54.7	60	31.7	131	69.0	33	17.3
Chinese	6	3.2	2	1.0	2	1.0	6	3.2
Indian	8	4.2	2	1.0	9	4.8	1	0.5
Others	3	1.6	5	2.6	8	4.2	-	-
Total	121	63.7	69	36.3	150	79.0	40	21.0

7.3 Perceptions of Employability

The following section provides a description of the survey results for the five dimensions of employability which were proposed as the mediators in the adapted research model (see Figure 5.2). Firstly, the relationship between the student and assessor ratings on each of the five dimensions was examined. Thus, the analysis could provide evidence to support the answers to **RQ5: Are there any differences in perceptions of BID students' employability between the assessors and the BID students?** The analysis was based primarily on data collected from student self-ratings and assessor ratings. In order to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity, preliminary analyses were conducted. Next is the description of the differences in employability by demographic variables – gender and ethnicity. In this demographic analysis, only responses from the student self-ratings were used.

7.3.1 Employability as Perceived by Students and Assessors

Based on the comparison of means and standard deviations, it was found in this study that assessors' ratings of their students on all five dimensions of employability (organisation sense, occupational expertise, anticipation & optimisation, personal flexibility and affective reactions) were generally similar to the corresponding ones

made by the students themselves. Both the assessors and the students perceived positively about students' employability. The comparison of means (M) and standard deviations (SD) between the student ratings and the assessor ratings is shown in Table 7.9.

Table 7.9: Means and Standard Deviations of the Dimensions of Employability

Dimensions of Employability	Student Self-ratings		Assessor Ratings	
	n = 320		n = 228	
	Mean	SD	Mean	SD
Organisation sense	4.16	.358	4.08	.463
Occupational expertise	4.05	.393	4.00	.538
Anticipation & optimisation	3.98	.413	3.98	.392
Personal flexibility	4.10	.347	4.10	.413
Affective reactions	4.01	.625	4.61	.456

Response scale: 1 'Strongly Disagree' – 5 'Strongly Agree'

However, when further examination of the data for student-assessor matching pairs was made and a paired-samples t-test was conducted, pair-wise comparisons of each employability dimension showed significant differences in only two t-tests between students' and assessors' ratings (see Table 7.10). There was a statistically significant difference in the perceptions of the organisational sense scale between students ($M = 4.17$, $SD = .345$) and assessors ($M = 4.09$, $SD = .453$), $t(213) = 2.221$, $p < .05$ (two-tailed). The mean decrease in perceptions of the organisation sense scale was .083 with 95% confidence interval ranging from .009 to .156. The effect size, calculated using eta squared, was .02 indicating a small effect size. According to Cohen (1988), the eta squared value of .01 is considered small effect, .06 is medium and .14 a large effect. A statistically significant difference was also found in the perceptions of the affective reactions between students ($M = 3.06$, $SD = .551$) and assessors ($M = 3.61$, $SD = .453$), $t(213) = 11.455$, $p < .001$ (two-tailed). The mean increase in affective reactions scale was .539 with 95% confidence interval ranging from .446 to .631. The eta squared value of .38 indicated a large effect size.

Table 7.10: Pair-wise Comparisons between Student Self-ratings and Assessor Ratings

Dimensions of Employability	Student Self-ratings		Assessor Ratings			
	n = 214		n = 214			
	Mean	SD	Mean	SD	Paired t-test	Sig (2-tailed)
Organisation Sense	4.17	.345	4.09	.453	2.221	.027*
Occupational Expertise	4.04	.431	4.01	.534	.640	.523
Anticipation & Optimisation	3.95	.430	3.98	.392	-.862	.390
Personal Flexibility	4.08	.353	4.11	.397	-.624	.533
Affective Reactions	3.06	.551	3.61	.453	11.455	.000**

*p < .05

**p < .001

Response scale: 1 'Strongly Disagree' – 5 'Strongly Agree'

7.3.2 Employability and Demographic Characteristics

Demographic characteristics are often used in researches to correlate findings, and gender seems to be the mostly highly researched demographic correlate of career success (The Indicator Consortium, 2005). Women in the professional and managerial sectors for instance, often face glass-ceiling or an invisible barrier that limits their progress to top management (Adler, 1993). Therefore, it is relevant for this study to consider the possibility of gender and ethnicity differences among the BID students in employability. Thus, the following section looks into the possibilities of answering the last part of **RQ4: and are there any differences in the strength and pattern of the relations between these factors and the employability of students of different gender and race?** The analysis tested for significant gender and ethnicity differences in all of the dimensions of employability for the student self-ratings only.

7.3.2.1 Employability and Students' Gender

A one-way between-groups analysis of variance was conducted to explore the impact of gender on all five dimensions of employability. There was no statistically significant difference in any of the dimensions of employability between male and female students among student self-ratings as indicated in Table 7.11. There are hardly any differences evident in the student self-ratings and these outcomes might indicate that the differentiating power of the self-reported employability scales is not limited by gender-related bias nor could the glass-ceiling effect be found. Such self-reported employability ratings do not appear to be influenced by gender-related stereotyping phenomena. A detailed discussion on this gender issue is included in Chapter 9.

Table 7.11: Student Self-ratings of Employability by Gender

Dimensions of Employability	Male (n = 201)		Female (n = 119)		F	Sig
	Mean	SD	Mean	SD		
Organisation sense	4.16	.388	4.15	.293	.097	.756
Occupational expertise	4.05	.434	4.06	.323	.028	.866
Anticipation & optimisation	3.96	.464	4.03	.318	2.536	.112
Personal flexibility	4.08	.378	4.10	.281	.090	.764
Affective reactions	3.00	.671	3.02	.608	.488	.485

p < .05

Response scale: 1 'Strongly Disagree' – 5 'Strongly Agree'

7.3.2.2 Employability and Students' Ethnicity

The impact of ethnicity on all five dimensions of employability was explored using a one-way between-groups analysis of variance. Among student self-ratings of employability, significant statistical difference at the p < .05 level was found in all but one dimension of employability, the Occupational Expertise, for the four groups of ethnicity. Despite reaching statistical significance for four dimensions of employability, the actual difference in mean scores between the groups was quite small. Table 7.12 shows the means and standard deviations for the ethnicity groups

and the dimensions of employability. The effect size, calculated using eta squared, was .035 for Organisation Sense scale, .05 for Anticipation & Optimisation scale, .12 for Personal Flexibility scale and .16 for Affective Reactions scale. Thus, the eta squared value obtained in this study would be considered a small effect size for Organisation Sense scale and Anticipation & Optimisation scale, medium effect for Personal Flexibility scale and large effect for Affective Reactions scale.

Table 7.12: Student Self-ratings of Employability by Ethnicity

		Organisation Sense	Occupational Expertise	Anticipation & Optimisation	Personal Flexibility	Affective Reactions
Malay (n = 269)	Mean	4.13	4.04	4.00	4.05	3.07
	SD	.336	.355	.380	.316	.540
Chinese (n = 19)	Mean	4.17	4.12	3.71	4.19	2.82
	SD	.423	.669	.595	.356	.740
Indian (n = 16)	Mean	4.25	4.17	3.83	4.20	2.27
	SD	.405	.389	.497	.435	.779
Others (n = 16)	Mean	4.42	4.20	4.23	4.53	3.37
	SD	.455	.572	.512	.399	.608
	F	3.590	1.445	5.409	11.712	16.754
	Sig	.014*	.230	.001*	.000**	.000**

*p < .05

**p < .001

Response scale: 1 'Strongly Disagree' – 5 'Strongly Agree'

Post-hoc comparisons using the Tukey HSD test were used in all dimensions of employability. The mean score for Malay students was found to be significantly different from the 'Others' students for the Organisation Sense scale. As for the Anticipation & Optimisation scale, the mean score for the Chinese students was significantly different from the Malay and the 'Others' students. Relatively, for Personal Flexibility scale, the mean score for the 'Others' students differed significantly from the Malay, Chinese and Indian students. The mean score for the Chinese students differed significantly from the Malay, the Indian and the 'Others'

students for the Affective Reactions scale. The comparisons of employability between the ethnicity groups are shown in Table 7.13.

Table 7.13: Comparisons of Employability between Ethnicity

		Organisation Sense	Occupational Expertise	Anticipation & Optimisation	Personal Flexibility	Affective Reactions
		Significance				
Malay	Chinese	.979	.814	.018*	.283	.000**
	Indian	.677	.675	.529	.412	.179
	Others	.010*	.354	.120	.000**	.401
Chinese	Malay	.979	.814	.018*	.283	.000*
	Indian	.917	.987	.846	1.000	.047*
	Others	.155	.921	.001*	.015*	.000**
Indian	Malay	.677	.675	.529	.412	.179
	Chinese	.917	.987	.846	1.000	.047*
	Others	.599	.995	.055	.048*	.045*
Others	Malay	.010*	.354	.120	.000**	.401
	Chinese	.155	.921	.001*	.015*	.000**
	Indian	.599	.995	.055	.048*	.045*

* $p < .05$

** $p < .001$

Generally, it seems that the employability ratings for all employability scales and for all of the ethnicity groups in this research were influenced by ethnicity-related experiences and backgrounds. Nevertheless, the degree of difference between the ethnicity varies for all dimensions of employability. Further discussion on this matter is in Chapter 9.

7.4 Factors Contributing to Students' Employability

Among the objectives of this research was to identify the factors that could have contributed to students' employability. This was stated in the first part of **RQ4: What are the factors that influence students' employability.....?** In order to explore this issue, the researcher examined both the students' and the assessors' perceptions of the impact the investigated factors had on students' employability:

responses from student self-ratings became the primary data while responses from assessor ratings became the secondary data. The factors looked into were individual, job-related and organisational. Prior to testing the effect of these factors on employability and students' success, means, standard deviations of the variables were computed as shown in Table 7.14.

Table 7.14: Means and Standard Deviations (SD) of the Predictor Variables

	Student Self-ratings		Assessor Ratings	
	n = 320		n = 228	
	Mean	SD	Mean	SD
Individual Predictors				
Health	4.51	.525	-	-
Attendance	3.41	1.073	-	-
Flow	4.33	.562	-	-
Job-related Predictors				
Learning value	4.24	.378	-	-
Working experience	.31	.643	-	-
Organisational Predictors				
Time dimension	3.55	.728	-	-
Team style	4.20	.505	-	-
Opportunity	3.87	.754	-	-
Assessor-student exchange	4.22	.402	4.27	.465
Equipment-material sufficiency	4.00	.648	3.43	.775
Workplace suitability	4.16	.477	3.46	.928

Response scale: 1 'Strongly Disagree' – 5 'Strongly Agree'

In order to test the adapted model, six hierarchical regression analyses were conducted; one for each of the employability dimensions and one for the total employability. The scores on the five employability dimensions (Organisation Sense, Occupational Expertise, Anticipation & Optimisation, Personal Flexibility and Affective Reactions) and on total employability scale were regressed on the three factors – individual, job-related and organisational. The individual factors comprised health, attendance and flow while the job-related factors consisted of learning value and working experience. The organisational factors in the student self-ratings encompassed time dimension, team style, opportunity, assessor-student exchange,

equipment- material sufficiency and workplace suitability. Only the last three variables were included in the assessor ratings.

7.4.1 Factors Contributing to Organisation Sense

Hierarchical multiple regression was used to assess the ability of the factors to contribute to the dimension of employability of Organisation Sense. The Individual, Job-related and Organisation factors were entered at Steps 2, 3 and 4 after controlling for the influence of students' demographic characteristics. The total variance explained by the model as a whole was 46.4 % [$F(10, 308) = 15.88, p < .001$]. Students' demographic characteristics were entered at Step 1, explaining 4.9% of the variance in Organisation Sense. The Individual factors explained 8.6% of the variance in Organisation Sense, after controlling for the students' demographic characteristics [$\Delta R^2 = .086, F \text{ change}(3, 308) = 9.621, p < .001$]. When the Job-related factors were entered, they explained a further 18.5% of the variance in Organisation Sense [$\Delta R^2 = .185, F \text{ change}(2, 306) = 38.923, p < .001$]. The Organisational factors were entered in the last block and they accounted for an extra 14.4% of the variance in Organisation Sense [$\Delta R^2 = .144, F \text{ change}(5, 301) = 14.784, p < .001$]. Based on the responses from student self-ratings, two of the Individual factors were found to be making statistically significant contribution to predicting Organisation Sense, health ($\beta = .170, t = 3.089, p < .05$) and flow, recording a beta value ($\beta = .227, t = -.733, p < .001$) at entry and also in the final model. Although only one of the Job-related factors was statistically significant predictor of Organisation Sense, learning value ($\beta = .429, t = 8.202, p < .001$) at entry, both learning value and working experience were significant predictors of Organisation Sense in the final model. The Organisational factors that contributed significantly to the prediction of Organisation Sense were team style ($\beta = .103, t = 2.124, p < .05$), assessor-student exchange ($\beta = .225, t = 3.870, p < .001$) and workplace suitability ($\beta = .228, t = 3.182, p < .001$). Tables 7.15 and 7.16 show the regression analyses depicting predictors of Organisation Sense based on student-self ratings.

Table 7.15: Hierarchical Multiple Regression Analysis Depicting Predictors of Organisational Sense Based on Student Self-ratings

	R^2	Adjusted R^2	ΔR^2	F	β	t-value
Demographics	.049	.044	.049	5.291		
School location					.132	2.359**
Gender					-.007	-.132
Ethnicity					.187	3.355*
Individual Predictors	.135	.117	.086	7.865		
Health					.170	3.089**
Attendance					-.040	-.733
Flow					.227	4.130*
Job-related Predictors	.320	.281	.185	16.159		
Learning value					.429	8.202*
Working experience					.088	1.728
Organisational Predictors	.464	.400	.144	15.876		
Time dimension					-.074	-1.476
Team style					.103	2.124**
Opportunity					.063	1.253
Assessor-student exchange					.225	3.870*
Equipment-material sufficiency					.001	.012
Workplace suitability					.228	3.812*
				15.876		

* $p < .001$ ** $p < .05$

Table 7.16: Hierarchical Multiple Regression Analysis Depicting Predictors of Organisational Sense Based on Student Self-ratings (β values)

	Step 1		Step 2		Step 3		Step 4	
	β	t-value	β	t-value	β	t-value	β	t-value
Demographics		41.400*		11.886*		6.663*		4.079**
School location	.132	2.359*	.139	2.579	.046	.910*	.007	.135
Gender	-.007	-.132	.015	.272	.044	.894	.049	1.074
Ethnicity	.187	3.355**	.183	3.393	.160	3.270**	.075	1.615
Individual Predictors								
Health			.170	3.089*	.112	2.222**	.031	3.089**
Attendance			-.040	-.733	-.022	-.451	-.022	-.733
Flow			.227	4.130**	.079	1.511	.028	4.130*
Job-related Predictors								
Learning value					.429	8.202*	.297	8.202*
Working experience					.088	1.728	.094	1.728**
Organisational Predictors								
Time dimension							-.074	-1.476
Team style							.103	2.124**
Opportunity							.063	1.253
Assessor-student exchange							.225	3.870*
Equipment-material sufficiency							.001	.012
Workplace suitability							.228	3.812*

* $p < .001$ ** $p < .05$

Turning to the assessor ratings now, among the Organisational factors, only the assessor-student exchange ($\beta = .649$, $t = 10.265$, $p < .001$) was found to be predictive of Organisation Sense. Nevertheless, the Organisational predictors as a whole accounted for 40.9% of the variance in the dimension of employability of Organisation Sense, which was significant [$F(4, 224) = 38.68$, $p < .001$]. Table 7.17 shows the regression analysis depicting predictors of Organisation Sense based on the assessor ratings.

Table 7.17: Regression Analysis Depicting Predictors of Organisation Sense Based on Assessor Ratings

	ΔR^2	R^2	F	β	t-value
Organisation sense	.399	.409			
Assessor-student exchange				.649	10.265*
Equipment-material sufficiency				.009	.137
Workplace suitability				.008	.130
			38.679		

*p < .001

7.4.2 Factors Contributing to Occupational Expertise

Hierarchical multiple regression was used to assess the ability of the Individual, Job-related and Organisational factors to influence Occupational Expertise, after controlling for students' demographic characteristics. Students' demographic characteristics which were entered at Step 1 explained 1.8% of the variance in Occupational Expertise. The total variance explained by the model as a whole was 23.3%, [$F(10, 308) = 6.47, p < .001$]. The Individual factors when entered in the second block and after controlling for the students' demographic characteristics, explained an extra 5.4% of the variance in Occupational Expertise [$\Delta R^2 = .054, F$ change (3, 308) = 5.895, $p < .001$]. The Job-related factors explained another 9.3% of the variance in Occupational Expertise [$\Delta R^2 = .093, F$ change (2, 306) = 16.772, $p < .001$]. The Organisational factors accounted for 6.8% of the variance in Occupational Expertise [$\Delta R^2 = .068, F$ change (5, 301) = 5.217, $p < .001$]. The Individual factor, flow ($\beta = .239, t = 4.200, p < .001$), was the only one found to be predictive of Occupational Expertise for the student self-ratings right from entry to the final model. Likewise, learning value ($\beta = .320, t = 5.589, p < .001$) was the only Job-related factor that was significantly predictive of Occupational Expertise right from entry to the final model. The only Organisational factors that were contributing significantly to the prediction of Occupational Expertise were equipment-material sufficiency ($\beta = -.257, t = -3.45, p < .001$) and workplace suitability ($\beta = .273, t = 3.95, p < .001$). The regression analyses depicting predictors of Occupational Expertise based on student self-ratings are shown in Tables 7.18 and 7.19.

Table 7.18: Hierarchical Multiple Regression Analysis Depicting Predictors of Occupational Expertise Based on Student Self-ratings

	R²	Adjusted R²	ΔR²	F	β	t-value
Demographics	.018	.005	.018	1.483		
School location					.024	.420
Gender					.010	.181
Ethnicity					.118	2.084**
Individual Predictors	.072	.053	.054	3.919		
Health					.032	.566
Attendance					-.064	-1.135
Flow					.239	4.200*
Job-related Predictors	.165	.137	.093	7.187		
Learning value					.320	5.589*
Working experience					-.049	-.869
Organisational Predictors	.233	.198	.068	6.474		
Time dimension					-.053	-.915
Team style					.087	1.545
Opportunity					.107	1.853
Assessor-student exchange					.058	.858
Equipment-material sufficiency					-.257	-3.450**
Workplace suitability					.273	3.950*
				6.474		

*p < .001

**p < .05

Table 7.19: Hierarchical Multiple Regression Analysis Depicting Predictors of Occupational Expertise Based on Student Self-ratings (β values)

	Step 1		Step 2		Step 3		Step 4	
	β	t-value	β	t-value	β	t-value	β	t-value
Demographics		36.738*		11.682*		7.025*		5.946*
School location	.024	.420	.028	.507	-.016	-.284	-.108	-1.838**
Gender	.010	.181	.005	.091	.015	.269	.039	.727
Ethnicity	.118	2.084**	.132	2.355*	.107	1.986**	.057	1.072
Individual Predictors								
Health			.032	.566	-.004	-.076	-.065	-1.137
Attendance			-.064	-1.135	-.041	-.756	-.039	-.739
Flow			.239	4.200*	.145	2.509**	.136	1.953**
Job-related Predictors								
Learning value					.320	5.589*	.223	3.641*
Working experience					-.049	-.869	-.043	-1.785
Organisational Predictors								
Time dimension							-.053	-.915
Team style							.087	1.545
Opportunity							.107	1.853
Assessor-student exchange							.058	.858
Equipment-material sufficiency							-.257	-3.450**
Workplace suitability							.273	3.950*

* $p < .001$ ** $p < .05$

The Organisational factor for the assessor ratings, assessor-student exchange ($\beta = .574$, $t = 8.298$, $p < .001$), was found to be contributing significantly to the prediction of Occupational Expertise. The Organisational predictors as a whole explained 28% of the variance in Occupational Expertise, which was significant [$F(4, 224) = 23.04$, $p < .001$]. Table 7.20 shows the regression analysis depicting predictors of Occupational Expertise based on assessor ratings.

Table 7.20: Regression Analysis Depicting Predictors of Occupational Expertise Based on Assessor Ratings

	ΔR^2	R^2	F	β	t-value
Occupational expertise	.277	.280			
Assessor-student exchange				.574	8.298*
Equipment-material sufficiency				.135	-1.836
Workplace suitability				.085	1.25
			23.037		

*p < .001

7.4.3 Factors Contributing to Anticipation and Optimisation

After entry of the Individual, Job-related and Organisational factors at Steps 2, 3 and 4 in a hierarchical multiple regression, the model as whole explained a total variance of 41.2% [$F(10, 308) = 14.85, p < .001$]. Students' demographic characteristics were entered at Step 1, explaining 1% of the variance in the dimension of employability of Anticipation & Optimisation. After controlling for the students' demographic characteristics, the Individual factors explained 14.3% of the variance in Anticipation & Optimisation [$\Delta R^2 = .143, F \text{ change}(3, 308) = 17.087, p < .001$]. The Job-related factors when entered at step 3, explained a further 12.1% of the variance in Anticipation & Optimisation [$\Delta R^2 = .121, F \text{ change}(2, 306) = 25.170, p < .001$]. The Organisational factors explained another 13.8% of the variance in Anticipation & Optimisation [$\Delta R^2 = .138, F \text{ change}(5, 301) = 9.058, p < .001$]. With respect to Anticipation & Optimisation, flow ($\beta = .369, t = 6.795, p < .001$), was the only Individual factor that was predictive based on the responses from the student self-ratings at entry but not in the final model. The Job-related factor, learning value ($\beta = .382, t = 7.204, p < .001$), was predictive of scores on Anticipation & Optimisation at entry and in the final model. The following Organisational factors were predictors of Anticipation & Optimisation; time dimension ($\beta = -.199, t = -3.915, p < .001$), opportunity ($\beta = .161, t = 3.185, p < .05$) and assessor-student exchange ($\beta = .277, t = 4.69, p < .001$). Tables 7.21 and 7.22 show the regression analyses depicting predictors of Anticipation & Optimisation based on student self-ratings.

Table 7.21: Hierarchical Multiple Regression Analysis Depicting Predictors of Anticipation & Optimisation Based on Student Self-ratings

	R²	Adjusted R²	ΔR²	F	β	t-value
Demographics	.010		.010	.922		
School location					.000	-.007
Gender					.090	1.573
Ethnicity					.028	.491
Individual Predictors	.153	.136	.143	9.157		
Health					.045	.820
Attendance					.018	.342
Flow					.369	6.795*
Job-related Predictors	.274	.258	.121	14.486		
Learning value					.382	7.204*
Working experience					-.024	-.468
Organisational Predictors	.412	.384	.138	14.849		
Time dimension					-.199	-3.915*
Team style					.014	.292
Opportunity					.161	3.185**
Assessor-student exchange					.277	4.690*
Equipment-material sufficiency					.025	.389
Workplace suitability					.062	1.022
				14.849		

*p < .001

**p < .05

Table 7.22: Hierarchical Multiple Regression Analysis Depicting Predictors of Anticipation & Optimisation Based on Student Self-ratings (β values)

	Step 1		Step 2		Step 3		Step 4	
	β	t-value	β	t-value	β	t-value	β	t-value
Demographics		34.118*		9.113*		4.195*		2.882**
School location	.000	-.007	.014	.267	-.046	-.892	-.080	-1.540
Gender	.090	1.573	.086	1.582	.101	1.992**	.111	2.371**
Ethnicity	.028	.491	.053	.985	.025	.502	-.041	-.875
Individual Predictors								
Health			.045	.820	-.001	-.020	-.027	-.547
Attendance			.018	.342	.043	.858	.040	.853
Flow			.369	6.795*	.252	4.710*	.094	1.548
Job-related Predictors								
Learning value					.382	7.204*	.267	4.975*
Working experience					-.024	-.468	-.006	-.117
Organisational Predictors								
Time dimension							-.199	-3.915*
Team style							.014	.292
Opportunity							.161	3.185**
Assessor-student exchange							.277	4.690*
Equipment-material sufficiency							-.199	-3.915
Workplace suitability							.014	.292

* $p < .001$ ** $p < .05$

Based on the responses from the assessor ratings, the Organisational predictors as a whole accounted for 20.2% of the variance in Anticipation & Optimisation, which was significant [$F(4, 224) = 15.361, p < .001$]. However, only the assessor-student exchange ($\beta = .455, t = 6.424, p < .001$), was predictive of Anticipation & Optimisation as shown in Table 7.23.

Table 7.23: Regression Analysis Depicting Predictors of Anticipation & Optimisation Based on Assessor Ratings

	ΔR^2	R^2	F	β	t-value
Anticipation & optimisation	.200	.202			
Assessor-student exchange				.455	6.424*
Equipment-material sufficiency				.021	.276
Workplace suitability				-.023	-.337
			15.361		

*p < .001

7.4.4 Factors Contributing to Personal Flexibility

After entry of the Individual, Job-related and Organisational factors at Steps 2, 3 and 4, the total variance explained by the model as a whole was 44.3% [$F(10, 308) = 14.95, p < .001$]. Students' demographic characteristics which were entered at Step 1 explained 9.7% of the variance in Personal Flexibility. After controlling for the students' demographic characteristics, the Individual factors explained a further 10% of the variance in Personal Flexibility [$\Delta R^2 = .100, F \text{ change}(3, 308) = 11.461, p < .001$]. When the Job-related factors were entered, they explained 8.3% of the variance in Personal Flexibility [$\Delta R^2 = .083, F \text{ change}(2, 306) = 15.525, p < .001$]. The Organisational factors which were entered in the last block explained another 15.6% of the variance in Personal Flexibility [$\Delta R^2 = .156, F \text{ change}(5, 301) = 14.168, p < .001$].

Based on the responses from the student self-ratings, all Individual predictors, health ($\beta = .213, t = 4.024, p < .001$), attendance ($\beta = -.111, t = -2.122, p < .05$) and flow ($\beta = .196, t = 3.706, p < .001$), were contributing significantly to predicting Personal Flexibility at entry but only attendance was significant in the final model. Both Job-related factors were predictive of Personal Flexibility; learning value ($\beta = .270, t = 5.062, p < .001$) and working experience ($\beta = -.111, t = 2.134, p < .05$) at entry but only working experience was significant in the final model. The following Organisational factors contributed significantly to predicting Personal Flexibility; opportunity ($\beta = .253, t = 5.002, p < .001$), assessor-student exchange ($\beta = .246,$

$t = 4.170$, $p < .001$), equipment-material sufficiency ($\beta = -.230$, $t = -3.526$, $p < .001$), and workplace suitability ($\beta = .455$, $t = 6.424$, $p < .05$). The regression analyses depicting predictors of Personal Flexibility based on student self-ratings could be seen in Tables 7.24 and 7.25.

Table 7.24: Hierarchical Multiple Regression Analysis Depicting Predictors of Personal Flexibility Based on Student Self-ratings

	R^2	Adjusted R^2	ΔR^2	F	β	t-value
Demographics	.104	.096	.104	11.963		
School location					.000	-.007
Gender					.090	1.573
Ethnicity					.028	.491
Individual Predictors	.204	.182	.100	12.500		
Health					.213	4.024*
Attendance					-.111	-2.122**
Flow					.196	3.706*
Job-related Predictors	.287	.253	.083	14.138		
Learning value					.270	5.062*
Working experience					.111	2.134**
Organisational Predictors	.443	.386	.156	14.946		
Time dimension					-.007	-.128
Team style					.068	1.394
Opportunity					.253	5.002*
Assessor-student exchange					.246	4.170*
Equipment-material sufficiency					-.230	-3.526*
Workplace suitability					.137	2.268**
				14.946		

* $p < .001$

** $p < .05$

Table 7.25: Hierarchical Multiple Regression Analysis Depicting Predictors of Personal Flexibility Based on Student Self-ratings (β values)

	Step 1		Step 2		Step 3		Step 4	
	β	t-value	β	t-value	β	t-value	β	t-value
Demographics		42.619*		12.410*		8.262*		6.832*
School location	.093	1.718	.094	1.823	.024	.463	-1.09	-2.114**
Gender	.022	.402	.050	.958	.075	1.483	.100	2.137**
Ethnicity	.316	5.837*	.303	5.815*	.292	5.840*	.232	4.962*
Individual Predictors								
Health			.213	4.024*	.173	3.380**	.093	1.873
Attendance			-.111	-2.122**	-.105	-2.082	-.127	-2.738**
Flow			.196	3.706*	.096	1.784	.093	1.539
Job-related Predictors								
Learning value					.270	5.062*	.095	1.769
Working experience					.111	2.134**	.092	1.903**
Organisational Predictors								
Time dimension							-.007	-.128
Team style							.068	1.394
Opportunity							.253	5.002*
Assessor-student exchange							.246	4.170*
Equipment-material sufficiency							-.230	-3.526*
Workplace suitability							.137	2.268**

* $p < .001$ ** $p < .05$

As for the assessor ratings, the Organisational factors that were predictors of Personal Flexibility were assessor-student-exchange ($\beta = .720$, $t = 11.297$, $p < .001$) and equipment-material sufficiency ($\beta = -.238$, $t = -3.520$, $p < .001$) which are as shown in Table 7.26. The total variance explained by the model as a whole was 39%, $F(4, 224) = 37.275$, $p < .001$.

Table 7.26: Regression Analysis Depicting Predictors of Personal Flexibility Based on Assessor Ratings

	ΔR^2	R^2	F	β	t-value
Personal flexibility	.364	.390			
Assessor-student exchange				.720	11.297*
Equipment-material sufficiency				-.238	-3.520**
Workplace suitability				-.019	-.317
			37.275		

*p < .001

**p < .05

7.4.5 Factors Contributing to Affective Reactions

Based on the student self-ratings, the scores on the dimension of employability, Affective Reactions, were regressed on the demographic characteristics and the three factors – Individual, Job-related and Organisational. After controlling for the students' demographic characteristics, the total variance explained by the model as a whole was 19.9% and was significant [$F(10, 308) = 6.095, p < .001$]. Students' demographic characteristics which were entered at Step 1 explained 0.6% of the variance in Affective Reactions. The Individual factors when entered at step 2, they accounted for a further 8.6% of the variance in Affective Reactions [$\Delta R^2 = .086, F$ change (3, 308) = 9.719, $p < .001$]. The Job-related factors explained only 1.5% of the variance in Affective Reactions [$\Delta R^2 = .015, F$ change (2, 306) = 2.536, $p < .05$]. The Organisational factors explained an extra 9.2% of the variance in Affective Reactions [$\Delta R^2 = .092, F$ change (5, 301) = 2.974, $p < .001$]. Scores on Affective Reactions from student self-ratings were predicted by only one of the Individual factors, flow ($\beta = -.273, t = -4.862, p < .001$) at entry but not in the final model. One Job-related factor, working experience ($\beta = -.123, t = -2.138, p < .05$), was found to be predictive of Affective Reactions at entry and in the final model. Time dimension ($\beta = .280, t = 4.794, p < .001$) and workplace suitability ($\beta = -.163, t = -2.342, p < .05$), were the only Organisational factors that were contributing significantly to predicting Affective Reactions which could be seen in Tables 7.27 and 7.28.

Table 7.27: Hierarchical Multiple Regression Analysis Depicting Predictors of Affective Reactions Based on Student Self-ratings

	R^2	Adjusted R^2	ΔR^2	F	β	t-value
Demographics	.006	.004	.006	.668		
School location					.032	.560
Gender					-.037	-.656
Ethnicity					.065	1.133*
Individual Predictors	.092	.074	.086	5.133		
Health					-.094	-1.666
Attendance					.059	1.054
Flow					-.273	-4.862*
Job-related Predictors	.107	.088	.015	4.743		
Learning value					-.081	-1.373
Working experience					-.123	-2.138**
Organisational Predictors	.199	.187	.092	6.095		
Time dimension					.280	4.794*
Team style					-.047	-.825
Opportunity					-.075	-1.291
Assessor-student exchange					-.101	-1.494
Equipment-material sufficiency					-.033	-.434
Workplace suitability					-.163	-2.342**
				6.095		

*p < .001

**p < .05

Table 7.28: Hierarchical Multiple Regression Analysis Depicting Predictors of Affective Reactions Based on Student Self-ratings (β values)

	Step 1		Step 2		Step 3		Step 4	
	β	t-value	β	t-value	β	t-value	β	t-value
Demographics		11.647*		8.824*		7.890*		8.124*
School location	.032	.560	.026	.464	.067	1.168	.056	.935
Gender	-.037	-.656	-.043	-.766	-.060	-1.075	-.072	-1.330
Ethnicity	.065	1.133	.055	1.001	.052	.949	.109	2.033**
Individual Predictors								
Health			-.094	-1.666	-.076	-1.348	-.081	-1.420
Attendance			.059	1.054	.065	1.161	.046	.855
Flow			-.273	-4.862*	-.232	-3.900*	-.029	-.422
Job-related Predictors								
Learning value					-.081	-1.373	-.036	-.576
Working experience					-.123	-2.138**	-.170	-3.066**
Organisational Predictors								
Time dimension							.280	4.794*
Team style							-.047	-.825
Opportunity							-.075	-1.291
Assessor-student exchange							-.101	-1.494
Equipment-material sufficiency							-.033	-.434
Workplace suitability							-.163	-2.342**

* $p < .001$ ** $p < .05$

Based on the assessor ratings, only assessor-student exchange ($\beta = -.535$, $t = -8.482$, $p < .001$) was the Organisational factor that was predictive of Affective Reactions and this is shown in Table 7.29. The model as a whole explained a total variance of 40.2% [$F(4, 224)$, $p < .001$].

It is interesting to note that when looking at the regression analyses based on the assessor ratings, the total variance explained was much higher than the total variance explained by the model based on the student self-ratings. This observation is done with the acknowledgement of the different factors included.

Table 7.29: Regression Analysis Depicting Predictors of Affective Reactions Based on Assessor Ratings

	ΔR^2	R^2	F	β	t-value
Affective reactions	.316	.402			
Assessor-student exchange				-.535	-8.482*
Equipment-material sufficiency				-.111	-1.652
Workplace suitability				.075	1.282
			39.079		

*p < .001

7.5 Contributions of Factors to Students' Employability

The following sections will look at the extent to which the factors (Individual, Job-related and Organisational) included in the study contributed to BID students' employability. Tables 7.30 and 7.31 show the hierarchical regression analyses of the total employability that are referred to in the following discussion. The demographic characteristics were entered as controls at the first step; the Individual factors were entered at the second step; the Job-related factors were entered at the third step and the Organisational factors were entered at the final step.

Table 7.30: Hierarchical Multiple Regression Analysis Depicting Predictors of Total Employability Based on Student Self-ratings

	R ²	Adjusted R ²	ΔR ²	F	β	t-value
Demographics	.053	.004	.053	5.801		
School location					.032	.560
Gender					-.037	-.656
Ethnicity					.065	1.133*
Individual Predictors	.097	.079	.044	5.472		
Health					.087	1.552
Attendance					-.028	-.499
Flow					.186	3.309**
Job-related Predictors	.226	.205	.129	11.029		
Learning value					.389	7.080*
Working experience					-.028	-.520
Organisational Predictors	.287	.253	.061	8.528		
Time dimension					.011	.196
Team style					.059	1.084
Opportunity					.072	1.088
Assessor-student exchange					.218	3.390*
Equipment-material sufficiency					-.135	-1.874
Workplace suitability					.126	1.892**
				8.528		

*p < .001

**p < .05

Table 7.31: Hierarchical Multiple Regression Analysis Depicting Predictors of Total Employability Based on Student Self-ratings (β values)

	Step 1		Step 2		Step 3		Step 4	
	β	t-value	β	t-value	β	t-value	β	t-value
Demographics		53.007*		17.694*		11.900*		9.665*
School location	.087	1.559	.092	1.683	.032	.604	-.059	-1.026
Gender	.019	.341	.028	.495	.043	.814	.047	.911
Ethnicity	.220	3.962*	.224	4.055*	.196	3.790*	.142	2.739**
Individual Predictors								
Health			.087	1.552	.041	.777	-.044	-.814
Attendance			-.028	-.499	-.002	-.046	-.013	-.246
Flow			.186	3.309**	.067	1.205	.109	1.645
Job-related Predictors								
Learning value					.389	7.080*	.227	3.202**
Working experience					-.028	-.520	-.046	-.859
Organisational Predictors								
Time dimension							.011	.196
Team style							.059	1.084
Opportunity							.072	1.088
Assessor-student exchange							.218	3.390*
Equipment-material sufficiency							-.135	-1.874
Workplace suitability							.126	1.892**

* p < .001

** p < .05

7.5.1 Contributions of Individual Factors to Students' Employability

Table 7.32 summarises the results presented in Tables, 7.16, 7.19, 7.22, 7.25 and 7.28 focusing on the Individual factors and their contributions to all five dimensions of employability. Careful observation of these analyses suggested that among the Individual predictors, the dimension of flow was related to all five dimensions of employability; Organisation Sense, Occupational Expertise, Anticipation & Optimisation, Personal Flexibility and Affective Reactions at entry but only related to two of them in the final model (Organisational Sense and Occupational Expertise). Health was related to Organisation Sense and Personal Flexibility at entry but only

Organisation Sense in the final model. Attendance was found to be related to Personal Flexibility only.

Table 7.32: Summary of The Contributions of The Individual Factors to The Five Dimensions of Employability

Dimensions of Employability	Step 2			Step 3			Step 4		
	Health	Attend.	Flow	Health	Attend.	Flow	Health	Attend.	Flow
Organisation Sense	✓	-	✓	✓	-	×	✓	-	✓
Occupational Expertise	-	-	✓	-	-	✓	-	-	✓
Anticipation & Optimisation	-	-	✓	-	-	✓	-	-	×
Personal Flexibility	✓	✓	✓	✓	×	×	×	✓	×
Affective Reaction	-	-	✓	-	-	✓	-	-	×

Note: ✓: Sig; - : Non-sig.; ×: was Sig at entry but dropped

Turning to the hierarchical regression analysis that utilised scores on the total employability scale (Tables 7.30 and 7.31), some of these deductions appeared to have been affirmed. The demographic characteristics were entered as controls in the first step and the Individual factors were entered in the second step. Students' demographic characteristics accounted for 5.3% of the variance in total employability. The amount of the total variance accounted for by the model after entry of the Individual factors was 9.7% [$F(6, 313) = 5.472, p < .001$]. The Individual factors explained 4.4% of the variance in total employability, after controlling for demographic characteristics [$\Delta R^2 = .044, F \text{ change}(3, 305) = 4.922, p < .001$]. Although the Individual predictors seem to explain low percentage of variance in perceived employability when the effect of demographic characteristics were controlled for, it still appeared to be a statistically significant contribution in this study. Among the Individual factors, the dimension of flow made the strongest contribution to scores on the total employability scale at entry. However, after Job-related and Organisational factors were entered into the model, the contribution of flow was no longer significant.

7.5.2 Contributions of Job-related Factors to Students' Employability

Table 7.33 summarises the results presented in Tables, 7.16, 7.19, 7.22, 7.25 and 7.28 focusing on the Job-related factors and their contributions to all five dimensions of employability. A thorough examination of the five regression models on the dimensions of employability suggested that the Job-related factor, learning value, made relatively consistent contribution to all of the dimensions of employability except for Affective Reactions at entry. In the final model, learning value was a significant predictor of Organisation Sense, Occupational Expertise and Anticipation & Optimisation. Working experience on the other hand, contributed only to Personal Flexibility and Affective Reactions at entry. Similar patterns were found for the final model where working experience was also found to be a significant predictor of Organisation Sense. The learning value prospect of CBA of BID appeared to have quite an impact on students' employability at entry and to some extent in the final model whereas working experience appeared to have less impact when taking β values into consideration.

Table 7.33: Summary of The Contributions of The Job-related Factors to The Five Dimensions of Employability

Dimensions of Employability	Step 3		Step 4	
	Learning Value	Working Experience	Learning Value	Working Experience
Organisation Sense	✓	-	✓	✓
Occupational Expertise	✓	-	✓	-
Anticipation & Optimisation	✓	-	✓	-
Personal Flexibility	✓	✓	×	✓
Affective Reaction	-	✓	-	✓

Note: ✓: Sig; - : Non-sig.; ×: was Sig at entry but dropped

This finding was further confirmed by the results of a hierarchical regression analysis that used scores on the total employability scale as the criterion (Tables 7.30 and 7.31). The demographic characteristics were entered as controls in the first step, the individual factors in the second step and the job-related factors were entered in the

third step. In comparison to working experience ($\beta = -.028$, $t = -.520$, $p = .604$), learning value ($\beta = .389$, $t = 7.08$, $p < .001$) contributed significantly to the total employability scale. The total variance explained by the model after entry of the Job-related factors was 22.6% [$F(8, 311) = 11.029$, $p < .001$]. The Job-related factors accounted for 12.9% of the variance in total employability [$\Delta R^2 = .128$, $F \text{ change}(2, 303) = 25.102$, $p < .001$].

7.5.3 Contributions of Organisational Factors to Students' Employability

Table 7.34 summarises the results presented in Tables, 7.16, 7.19, 7.22, 7.25 and 7.28 focusing on the Organisational factors and their contributions to all five dimensions of employability. Careful observation of the five regression models on the dimensions of employability for student self-ratings, suggested that most Organisational factors had some kind of impact on students' employability but the degree of contributions of each factor differed. Among the Organisational factors, the suitability of workplace contributed the most to employability as it was related to four dimensions of employability; Organisation Sense, Occupational Expertise, Personal Flexibility and Affective Reactions. Next was the quality of relationship between assessor and students which related to three dimensions of employability; Organisation Sense, Anticipation & Optimisation and Personal Flexibility. Time dimension, opportunity and sufficiency of equipment and material contributed fairly to employability by relating to two dimensions of employability respectively. Time dimension was related to Anticipation & Optimisation and Affective Reactions, opportunity was related to Anticipation & Optimisation and Personal Flexibility while equipment-material sufficiency was related to Occupational Expertise and Personal Flexibility. Team-style contributed the least as it was related to only one dimension of employability, Organisation Sense.

Based on assessor ratings (Tables 7.17, 7.20, 7.23, 7.26, 7.29), the quality relationship between assessor and student contributed the most as it was related to all five dimensions of employability, sufficiency of equipment and material was related

to Personal Flexibility only while workplace suitability was not related to any of the dimensions of employability and thus making the least contribution. The assessors perceived the assessor-student exchange as having considerable influence on students' employability.

Table 7.34: Summary of The Contributions of The Organisational Factors to The Five Dimensions of Employability

Dimensions of Employability	Step 4					
	Time Dimension	Team Style	Opportunity	Assessor-student Exchange	Equipment/material Sufficiency	Workplace Suitability
Organisation Sense	-	✓	-	✓	-	✓
Occupational Expertise	-	-	-	-	✓	✓
Anticipation & Optimisation	✓	-	✓	✓	-	-
Personal Flexibility	-	-	✓	✓	✓	✓
Affective Reaction	✓	-	-	-	-	✓

Note: ✓: Sig; -: Non-sig.;

Turning to the investigation of the total employability, the demographic characteristics were entered as controls at the first step and the Organisational factors at the fourth step after entering the Individual factors at the second step and the Job-related factors at the third step. The total variance explained by the model as a whole after entry of the Organisational factors was 28.7% [$F(9, 310) = 8.528, p < .001$]. The Organisational factors explained 6.1% of the variance in total employability [$\Delta R^2 = .061, F \text{ change}(6, 297) = 4.248, p < .001$]. The quality of relationship between assessor and students ($\beta = .218, t = 3.390, p < .001$) made the strongest contribution to scores on the total employability scale, followed by workplace suitability ($\beta = .135, t = 1.874, p < .05$) and equipment-material sufficiency ($\beta = -.126, t = -1.892, p < .05$). Dimensions of learning climate (time dimension, team style and opportunity), made small/insignificant contributions to employability.

7.5.4 Relative Contributions of Employability Predictors

To summarise the investigation of the total employability, a hierarchical regression analysis utilising the scores on the total employability scale as the criterion was conducted. The demographic characteristics were entered as controls in the first step. The Individual factors were entered at the second step, the Job-related factors at the third step and the organisational factors at the fourth step. Students' demographic characteristics accounted for 5.3% of the variance in perceived employability. The amount of total variance accounted for by the model after entry of the Individual factors was 9.7%, and significant [$F(6, 313) = 5.472, p < .001$]. The Individual factors explained 4.4% of the variance in perceived employability [$\Delta R^2 = .044, F \text{ change } (3, 305) = 4.922, p < .001$]. The total variance explained by the model after entry of the Job-related factors was 22.6% [$F(8, 311) = 11.029, p < .001$]. The Job-related factors accounted for 12.89% of the variance in perceived employability [$\Delta R^2 = .128, F \text{ change } (2, 303) = 25.102, p < .001$]. The total variance explained by the model as a whole after entry of the Organisational factors was 28.7% [$F(9, 310) = 8.528, p < .001$]. The Organisational factors explained 6.1% of the variance in perceived employability [$\Delta R^2 = .061, F(6, 297) = 4.248, p < .001$]. While acknowledging that other factors that were not considered in this study might have some impact on employability, it appears that Job-related factors and some Organisational factors were among the most significant contributors to students' total employability in comparison to the Individual factors.

7.6 The Relationship of Employability to Students' Success

In order to examine whether employability relates to BID students' success, both the objective and subjective success were regressed on the five dimensions of employability for data collected from student self-ratings and assessor ratings. The results of this procedure would identify which of the employability dimensions contribute most to BID students' success and thus provide knowledge on which dimensions of employability students need to concentrate on the most.

7.6.1 The Relationship of Employability to Students' Objective Success: Number of BID Assessment Modules Accomplished

Students' objective success in accomplishing BID assessment modules in this study was operationalised with the number of accomplished BID assessment modules. In all regressions for the student self-ratings, demographic variables were entered into the equations in the first step as the control variables and the five dimensions of employability were entered into the second step. Students' demographic characteristics explained 1.4% of the variance in the number of accomplished BID assessment modules. The total variance explained by the model as a whole after entry of the dimensions of employability was 19% [$F(19, 300) = 12.810, p < .001$]. The dimensions of employability explained 17.6% of the variance in students' accomplishment of BID assessment modules after controlling for students' demographic characteristics [$\Delta R^2 = .176, F \text{ change}(5, 299) = 4.844, p < .001$]. The results of these regressions are presented in Table 7.35.

Table 7.35: Regression Analysis Depicting the Contribution of Five Dimensions of Employability to Students' Objective Success (Number of BID Assessment Modules Accomplished) Based on Student Self-ratings

	R^2	Adjusted R^2	ΔR^2	F	β	t-value
Step 1 (Constant)	.014	.097	.014	6.789		30.909*
School Location					-.222	-4.034
Gender					.089	1.628
Ethnicity					-.038	-.692
Step 2 (Constant)						8.819*
School Location					-.179	-3.520*
Gender					.020	.440
Ethnicity					.069	1.437
Employability dimensions	.190	.146	.176	12.810		
Organisation Sense					-.021	-.300
Occupational Expertise					-.142	-2.236**
Anticipation & Optimisation					.210	3.061**
Personal Flexibility					-.022	-.337
Affective Reactions					-.153	-2.827**

* $p < .001$

** $p < .05$

As for the assessor ratings, three Organisational factors were entered at the first step and the dimensions of employability were entered at the second step. After controlling for the organisational factors, the model as a whole accounted for 39% of the total explained variance in students' accomplishment of BID assessment modules [$F(8, 219) = 17.483, p < .001$]. The employability dimensions explained 16% of the variance in students' accomplishment of BID assessment modules [$\Delta R^2 = .160, F \text{ change}(5, 219) = 11.451, p < .001$]. The results of these regressions are presented in Table 7.36.

Table 7.36: Regression Analysis Depicting the Contribution of Five Dimensions of Employability to Students' Objective Success (Number of BID Assessment Modules Accomplished) Based on Assessor Ratings

	R^2	Adjusted R^2	ΔR^2	F	β	t-value
Step 1 (Constant)	.230	.220	.230	22.329		10.602*
Assessor-student exchange					-.181	-2.542**
Equipment-material					-.062	-.809
Workplace suitability					.528	7.863*
Step 2 (Constant)						7.233*
Assessor-student exchange					-.413	-4.814*
Equipment-material					-.081	-1.102
Workplace suitability					.560	9.152*
Employability dimensions	.390	.367	.160	17.483		
Organisation Sense					-.073	-.782
Occupational Expertise					-.005	-.063
Anticipation & Optimisation					.290	3.600*
Personal Flexibility					.028	.290
Affective Reactions					-.275	-4.321*

* $p < .001$

** $p < .05$

Based on student self-ratings, only three dimensions of employability were found to be significantly contributing to students' accomplishment of BID assessment modules: Occupational Expertise ($\beta = -.142, t = -2.236, p < .05$), Anticipation & Optimisation ($\beta = .210, t = 3.061, p < .05$), and Affective Reactions ($\beta = -.153, t = -23.827, p < .05$).

The two dimensions of employability that contributed significantly to students' accomplishment of BID assessment modules based on assessor ratings, were Anticipation & Optimisation ($\beta = .290$, $t = -3.600$, $p < .001$), and Affective Reactions ($\beta = -.275$, $t = -4.321$, $p < .001$). Therefore, it appears that both the assessors and the students had similar view of two dimensions of employability that were determinant of students' objective success; the Anticipation & Optimisation and Affective Reactions. Students who possessed strong motivation and felt comfortable in the BID class were more likely to succeed in accomplishing BID assessment modules. These two qualities are nevertheless the strong drives within cognitive engagement and emotional engagement that would encourage students to perform successfully in their BID tasks. Thus, it could be concluded that students' inner well being, determination and happiness might have contributed the most to their accomplishment of BID assessment modules.

7.6.2 The Relationship of Employability to Students' Objective Success: BID MCE Grades

Another form of students' objective success in this study was operationalised with students' BID grades achieved in MCE. In all regressions for the student self-ratings, demographic variables were entered into the equations at the first step as the control variables and the five dimensions of employability were entered at the second step. Students' demographic characteristics accounted for 4.8% of the variance in students' BID grades in MCE. The total variance explained by the model as a whole in students' BID grades in MCE after entry of the dimensions of employability was 20% [$F(19, 300) = 9.459$, $p < .001$]. The dimensions of employability explained 15.2% of the variance in students' BID grades in MCE [$\Delta R^2 = .152$, F change (5, 293) = 11.531, $p < .001$]. As for the assessor ratings, three organisational factors were entered into the first step and the dimensions of employability were entered into the second step. The Organisational factors accounted for 7.5% of the variance in students' BID grades in MCE. The model as a whole accounted for 19.3% of the total explained variance in students' BID grades in MCE, after controlling for the Organisational factors [$F(8, 219) = 6.551$, $p < .001$]. The employability dimensions

explained 11.8% of the variance in students' BID grades in MCE [$\Delta R^2 = .118$, F change (5, 219) = 6.401, $p < .001$]. The results of these regressions are presented in Tables 7.37 and 7.38.

Table 7.37: Regression Analysis Depicting the Contribution of Five Dimensions of Employability to Students' Objective Success (BID MCE Grades) Based on Student Self-ratings

	R^2	Adjusted R^2	ΔR^2	F	β	t-value
Step 1 (Constant)	.048	.038	.048	5.129		10.835*
School Location					.022	.392
Gender					-.197	-3.522*
Ethnicity					.091	1.634
Step 2 (Constant)						4.136*
School Location					.016	.311
Gender					-.171	-3.286**
Ethnicity					.084	1.522
Employability dimensions	.200	.179	.152	9.459		
Organisation Sense					-.019	-.273
Occupational Expertise					.054	.867
Anticipation & Optimisation					-.150	-2.224**
Personal Flexibility					-.041	-.629
Affective Reactions					.329	6.198*

* $p < .001$

** $p < .05$

Table 7.38: Regression Analysis Depicting the Contribution of Five Dimensions of Employability to Students' Objective Success (BID MCE Grades) Based on Assessor Ratings

	R²	Adjusted R²	ΔR	F	β	t-value
Step 1 (Constant)	.075	.063	.075	6.069		5.243*
Assessor-student exchange					-.160	-2.043**
Equipment-material					-.030	-.363
Workplace suitability					.290	3.937*
Step 2 (Constant)						2.677**
Assessor-student exchange					.096	.968
Equipment-material					-.018	-.215
Workplace suitability					.268	3.807*
Employability dimensions	.193	.164	.118	6.551		
Organisation Sense					.063	.556
Occupational Expertise					-.067	-.619
Anticipation & Optimisation					-.218	-2.254**
Personal Flexibility					.042	.380
Affective Reactions					.201	2.617**

*p < .001

**p < .05

Based on student self-ratings, only two dimensions of employability were found to be significantly contributing to students' BID MCE grades; Anticipation & Optimisation ($\beta = -.150$, $t = -2.224$, $p < .05$) and Affective Reactions ($\beta = .329$, $t = 6.198$, $p < .001$). Likewise, the two dimensions of employability that contributed significantly to students' BID MCE grades based on assessor ratings, were Anticipation & Optimisation ($\beta = -.218$, $t = -2.254$, $p < .05$), and Affective Reactions ($\beta = .201$, $t = 2.617$, $p < .05$). Therefore, it appears that both the assessors and the students had similar view of two dimensions of employability that were determinant of students' BID MCE grades; the Anticipation & Optimisation and Affective Reactions. It seems that students who were constantly in high spirit and motivated and, emotionally unwavering had the potential to succeed in BID MCE exam. These two qualities were found to be significantly contributing to students' success in BID MCE exam. It appears that students' emotional and cognitive well-being had stronger influence on the BID MCE grades than their skills.

7.6.3 The Relationship of Employability to Students' Subjective Success

Students' contentment and satisfaction denote the subjective success in this study. In all regressions for the student self-ratings, demographic variables were entered into the equations at the first step as the control variables and the five dimensions of employability were entered at the second step. Students' demographic characteristics explained 5.6% of the variance in students' subjective success, satisfaction. The total variance explained by the model as a whole was 35.3% [$F(19, 300) = 14.072$, $p < .001$]. The dimensions of employability explained 29.7% of the variance in students' subjective success or satisfaction [$\Delta R^2 = .297$, F change (5, 300) = 6.119, $p < .001$]. As for the assessor ratings, three Organisational factors were entered at the first step and the dimensions of employability were entered at the second step. The Organisational factors explained 41.5% of the variance in students' satisfaction. The model as a whole accounted for 59.6% of the total explained variance in students' subjective success, after controlling for the Organisational factors [$F(8, 219) = 40.425$, $p < .001$]. The employability dimensions explained 18.1% of the variance in students' satisfaction [$\Delta R^2 = .509$, F change (5, 219) = 19.659, $p < .001$]. The results of these regressions are presented in Tables 7.39 and 7.40.

Table 7.39: Regression Analysis Depicting the Contribution of Five Dimensions of Employability to Students' Subjective Success Based on Student Self-ratings

	R^2	Adjusted R^2	ΔR^2	F	β	t-value
Step 1 (Constant)	.056	.047	.056	6.127		36.546*
School Location					.171	3.070**
Gender					-.058	-1.042
Ethnicity					.161	2.907**
Step 2 (Constant)						2.121**
School Location					.152	3.006**
Gender					-.039	-3.286**
Ethnicity					-.015	1.522
Employability dimensions	.353	.322	.297	14.072		
Organisation Sense					.251	4.028*
Occupational Expertise					.109	1.925**
Anticipation & Optimisation					.094	1.536
Personal Flexibility					.164	2.760**
Affective Reactions					-.165	-3.417**

* $p < .001$

** $p < .05$

Table 7.40: Regression Analysis Depicting the Contribution of Five Dimensions of Employability to Students' Subjective Success Based on Assessor Ratings

	R²	Adjusted R²	ΔR	F	β	t-value
Step 1 (Constant)	.415	.407	.415	52.972		15.476*
Assessor-student exchange					.691	11.110*
Equipment-material					-.174	-2.614**
Workplace suitability					.101	1.721
Step 2 (Constant)						11.257*
Assessor-student exchange					.382	5.470*
Equipment-material					-.167	-2.807**
Workplace suitability					.132	2.644**
Employability dimensions	.596	.581	.181	40.425		
Organisation Sense					-.062	-.816
Occupational Expertise					.033	.474
Anticipation & Optimisation					.225	3.438*
Personal Flexibility					.118	1.513
Affective Reactions					-.302	-5.841*

*p < .001

**p < .05

Based on student self-ratings, four dimensions of employability contributed significantly to students' subjective success; Organisational Sense ($\beta = .251$, $t = 4.028$, $p < .001$), Occupational Expertise ($\beta = .109$, $t = 1.925$, $p < .05$), Personal Flexibility ($\beta = .164$, $t = 2.760$, $p < .05$), and Affective Reactions ($\beta = -.165$, $t = -3.417$, $p < .001$). There were only two dimensions of employability that contributed significantly to students' subjective success according to the responses in the assessor ratings; Anticipation & Optimisation ($\beta = .225$, $t = 3.438$, $p < .001$) and Affective Reactions ($\beta = -.302$, $t = -5.841$, $p < .001$). Thus, it appears that both the students and the assessors again perceived Affective Reactions to be the determinant of students' subjective success. The assessors seemed to be ascertained about the effect of Anticipation & Optimisation and Affective Reactions had on students' success in general.

7.7 The Relationship of Students' Attendance to Students' Success

An analysis of students' attendance from January to June 2008 based on BID class register book was carried out. Basically, students were present at school most of the time. 88.4% of the BID students had attendance of more than 80% of the school days from January to June 2008. Only 4.8% of the students had attendance of 69% and below. Table 7.41 shows the distribution of students' attendance according to gender.

Table 7.41: Students' Attendance According to Gender (January-June 2008)

	BID Students' Attendance in Percentile									
	50-59		60-69		70-79		80-89		90-100	
	n	%	n	%	n	%	n	%	n	%
Gender										
Male	3	.8	10	2.8	20	5.6	76	21.3	120	33.7
Female	2	.6	2	.6	4	1.2	25	7.0	94	26.4
Total	5	1.4	12	3.4	24	6.8	101	28.3	214	60.1

Further analysis to compare the means of students' success with students' attendance of each school was conducted. Table 7.42 shows the comparison between students' attendance and the means and standard deviations of students' achievements. Fourteen (73.7%) schools recorded quite encouraging attendance of BID students that is more than 80% of the school days from January to June 2008. Four (21.1%) schools recorded a moderate attendance of BID students within the range of 70% of the school days while only one (.05%) school recorded quite low attendance of just above 60%. As students had quite good attendance, they were able to accomplish BID assessment modules, achieve satisfactory BID grades in MCE and attain overall satisfaction. Students' achievements in general were not affected by their attendance.

Table 7.42: The Relationship of Students' Attendance to Students' Success

School	Students' Attendance (%)	N	BID MCE Grades (1 – 8)		Number of BID Modules Accomplished (1 – 13)		Subjective Success (Scale: 1 – 5)	
			Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
A	92.0	15	3.47	.743	12.67	.488	3.92	.224
B	62.5	11	3.91	.831	12.68	.252	3.91	.138
C	82.0	13	4.92	1.441	10.42	.732	4.12	.342
D	77.6	13	3.62	.768	12.00	.000	4.06	.443
E	90.8	12	3.00	.953	11.42	.515	4.40	.435
F	90.0	15	5.53	1.598	7.00	.000	4.31	.384
G	88.0	21	2.81	1.167	10.41	.490	4.26	.420
H	77.3	19	3.00	1.563	10.40	.699	3.84	.469
I	85.0	12	3.83	1.115	12.33	.246	3.98	.217
J	93.0	14	3.64	.842	11.00	.000	4.17	.597
K	94.4	11	4.18	1.168	10.41	.917	4.20	.358
L	91.2	19	3.00	.816	10.55	.621	3.95	.584
M	77.0	24	2.17	.963	10.00	.000	4.08	.317
N	90.6	24	3.54	.833	9.00	.000	4.08	.228
O	82.4	12	4.50	1.000	11.00	.000	4.00	.000
P	91.0	17	3.65	1.320	12.18	.466	4.09	.530
Q	78.0	21	3.38	.805	12.02	.109	3.98	.352
R	81.0	22	2.55	.739	12.50	.000	4.17	.377
S	85.0	17	4.53	2.065	11.74	.257	4.15	.250

7.8 Results of the Behaviour Observation

The observation conducted at three different stages of a BID lesson using a Behaviour Observation Schedule managed to elicit students' behavioural engagement: involvement in learning and positive conduct. Students were observed to have been actively involved in discussion with teachers and classmates at the beginning and in the middle of a BID lesson. They asked a lot of questions to get a better picture of the task for the day. Fewer questions were asked towards the end of the lesson as they had already gathered sufficient information earlier. The common

questions posed at this stage were merely about getting the assessors' feedback on and approval of their work. Students were observed to be willingly following the rules and regulations of the workplace while doing as well as after completing BID tasks. They behaved in manners that were expected of them in accomplishing BID tasks. This positive conduct of behavioural engagement was demonstrated by students voluntarily in the attempt to accomplish BID tasks successfully. Table 7.43 shows the means and the standard deviations of the observed behaviours.

Table 7.43: Means and Standard Deviations of the Observed Behaviours

	Engagement	Observed Behaviour	Mean	SD
Beginning	Involvement in learning	Ask teacher questions about the task	.48	.583
		Discuss the task with teacher	.82	.625
		Discuss the task with classmates	1.30	.734
Middle	Involvement in learning	Ask teacher questions about the task	.24	.452
		Discuss the task with teacher	.45	.500
		Discuss the task with classmates	1.00	.608
	Positive conduct	Prepare required materials and equipment for the task	2.96	.204
		Handle equipment and machinery competently	2.98	.146
		Carry out task neatly to maintain cleanliness and safety	3.00	.000
End	Involvement in learning	Ask teacher questions about the task	.31	.466
		Discuss the task with teacher	.60	.492
		Discuss the task with classmates	.85	.706
	Positive conduct	Clean (wash/scrub/polish) all used equipment	3.00	.000
		Return all used equipment to its proper place	3.00	.000
		Clean up the workplace	3.00	.000

Note: Involvement in learning – frequency: 0 – 3

Positive conduct – scale: 1 = not at all/very little 2 = some/moderate 3 = a great deal

7.9 Conclusions

In conclusion, this chapter has tried to present the demographic characteristics and results of the quantitative data analysis. The study has attempted to refine the concept of employability in the context of CAMC of BID and adapted a scale to measure it. Five dimensions of employability were looked into thoroughly and the contributions each dimension had on students' success were examined. Factors contributing to

these dimensions of employability were also explored; individual, job-related and organisational. Students' attendance was further explored and it was found out that it did not have much effect on students' achievements as majority students had good attendance. The behaviour observation revealed that students were actively involved in discussions at the beginning and in the middle of the lesson. Students were also observed to be abiding by the rules and regulations in the workplace to accomplish BID tasks satisfactorily. The qualitative data analysis and results will be presented in the following chapter.

Chapter 8

Qualitative Data Analysis and Results

8.1 Introduction

This chapter explores the impact of CAMC of BID on students' employability based on the analysis of qualitative data gathered from responses to open-ended questions in the Student Questionnaire, the Student Interview Protocol, the Assessor Interview Protocol and the Portfolio Review. The qualitative approach was complementary and embedded in a concurrent mixed methods design employed in the study. The first part describes the step-by-step guide to the analytic process utilised in this study. This is followed by a presentation of the analyses of each set of qualitative data undertaken. The overriding conclusion to the qualitative data analyses is that both students and assessors find the assessment programme to be an unreservedly positive experience.

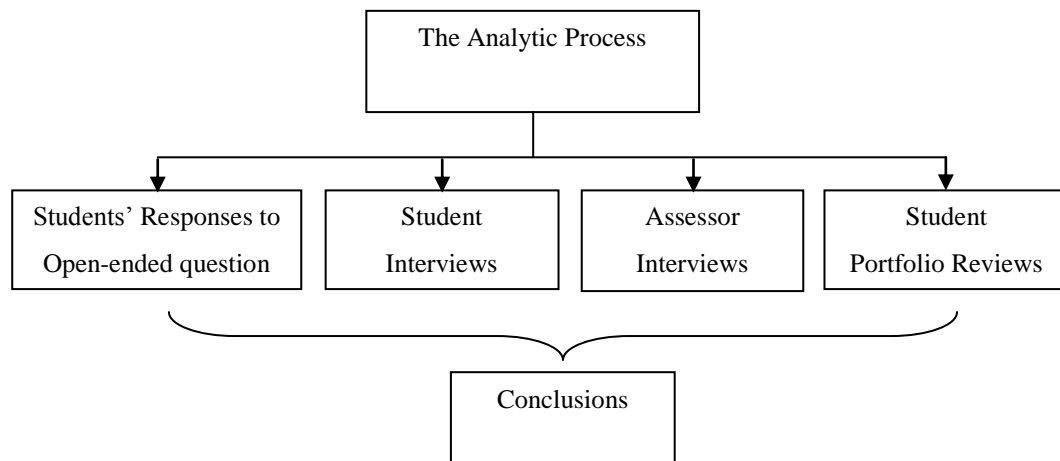


Figure 8.1: The structure of Chapter 8

8.2 The Analytic Process of the Study

This study utilised the analysis techniques suggested by Spencer et al. (2009), Lincoln & Guba (1985) and Attride-Stirling (2001) in the attempt to further enhance the understanding of the research questions (Teddlie & Tashakkori, 2009) and participants' subjective meanings of experience in CAMC of BID. These subjective meanings were substantially the basis for interpretations. In order to demonstrate transparency of how the researcher formulated the themes and categories from the initial participant data, a step-by-step process of analysis is outlined. Furthermore, excerpts from the raw data are included to support the formulated themes in the attempt to ensure that participants' words were directly linked to data interpretations.

Following data collection from 319 students' responses to an open-ended question in the Student Questionnaire, 76 student interviews, 19 assessor interviews and 190 portfolio reviews, data were analysed manually. Data were managed and labelled according to schools and types of data. The analytic process was undertaken after data collection. Each set of data was first analysed separately according to the steps in the adapted analytic process suggested by Spencer et al. (2009), Attride-Stirling (2001) and Lincoln & Guba (1985). The process of analysis as shown in Figure 8.2 consisted of two stages: data reduction and data exploration. The third stage comprising the integration of exploration which is not shown in the figure but was applied in the study will be discussed in Chapter 9. Each stage consisted of various steps which involved interpretations at various levels of abstraction. Although presented as a linear, step-by-step procedure, the analysis was an iterative and reflexive process.

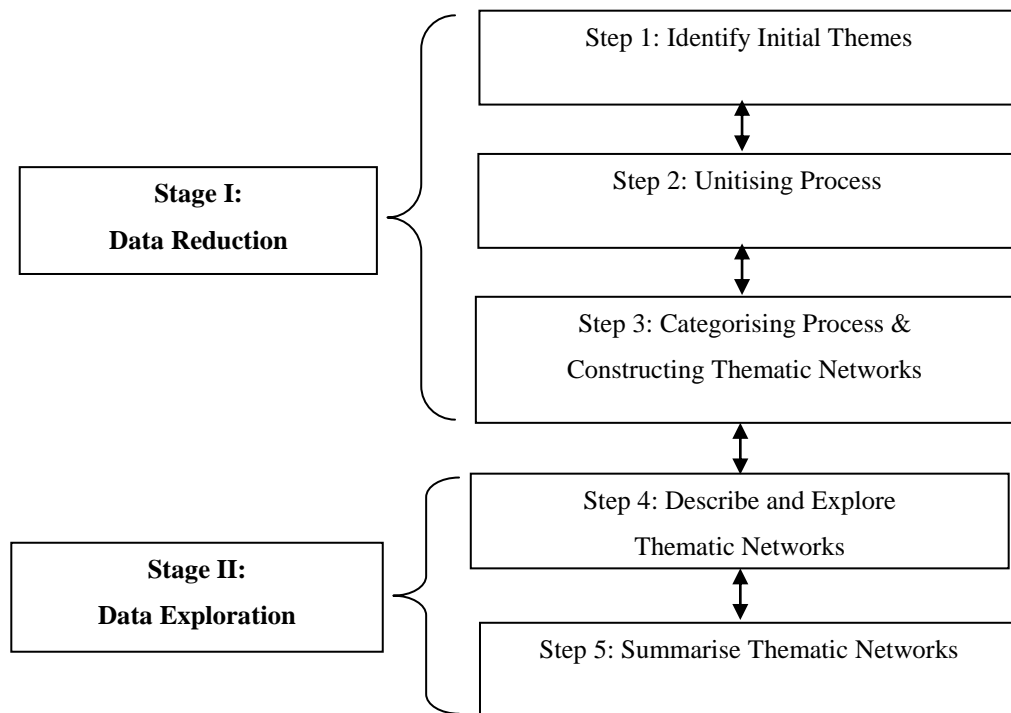


Figure 8.2: Steps undertaken to analyse qualitative data

Adapted from Spencer et al., 2009; Attride-Stirling, 2001; Lincoln & Guba, 1985

Step 1: Identify Initial Themes

Data reduction is an essential part of qualitative data analysis. In this study, identifying initial themes was the first step in the data reduction process. In general, the initial themes were generated from specific information in the data collected, the conceptual framework, the questions raised and the literature review. The process of familiarisation with data took place first before the process of identifying the initial themes. This step was taken to ensure the integrity of the foundation of data analysis (Ritchie & Lewis, 2009). Next, a careful selection of data from each set of raw data was reviewed till the range of characteristics within the data set could be understood sensibly (Ritchie & Lewis, 2009). Subsequently, recurring themes and ideas identified from reviewing these selected data were grouped under a smaller number of broader main themes. These themes were then used in the unitising process. The initial themes retrieved from the responses to the open-ended question in the Student

Questionnaire were based on the gist of question posed and thus three themes emerged: BID practical tasks, effectiveness of the tasks and relevance. The initial themes for the student interviews were elicited from the questions in the Refined Student Interview Protocols: BID-related activities, parties involved, benefits of BID-related activities, benefits of CAMC BID and suggestions for improvements. Similarly, the initial themes retrieved from the assessor interviews were based on the questions in the Refined Assessor Interview Protocol: BID-related activities, the parties involved, benefits of BID-related activities and benefits of CAMC BID. The initial themes for the portfolio reviews were based on students' reflection in the comments and the work schedules prepared before starting a BID task: work planning and self-reflection.

Step 2: Unitising Process

Following the identification of the initial themes, each set of raw data was reviewed, labelled, sorted and synthesised into units of information. These units of information were the smallest pieces of meaningful information in the form of words, phrases, paragraphs, characters, items, concepts, passages and quotations (Berg, 2004; Attride-Stirling, 2001) that might be associated with the initial themes. Subsequently, the units of information were grouped into provisional categories for each set of data. These units of information were labelled according to school, type of data and participant. These labels were devised for easy identification and retrieval of data at any level of analytic process. For example, data from an interview of Student 1 from school A would be labelled as A-SI1, responses to open-ended question of student 3 from school M would be labelled as M-OQ3 and, text from an interview of assessor 19 from school S would be labelled as S-AI19. These labelled units of information were sorted by the initial themes.

Step 3: Categorising Process and Constructing Thematic Networks

Once the relevant units of information were put under the appropriate initial themes, they were then checked for similarities within the themes and contrasting characteristics across the themes (Teddlie & Tashakkori, 2009). After carefully re-reading and reframing the reading of the units of meaningful information within the context they were grouped, and underlying patterns and structures were identified. Thus, relevant and significant themes were further extracted. These emerging themes were moulded to accommodate to the content and the conceptual framework of this study, particularly to the concept of competence. These themes were further refined into broad themes that could sum up ideas contained in different units of information and discreet themes. This procedure of identifying refined themes required considerable interpretive work and was demanding but it allowed data to be reduced into more manageable set of important themes that summarised the text (Attride-Stirling, 2001).

In general, three themes as suggested by Attride-Stirling (2001) were identified; *global*, *organising* and *basic*. *Global Themes* were the broad themes consisting of main ideas of the context under study and they presented an argument, a proposition, or an assertion about a given issue in the text which could be summarised and made sense of. *Global themes* were formed from several *organising themes*. The *organising themes* comprised middle-order themes which organised the basic themes into clusters of similar issues. They were more abstract and more revealing as they consisted of principal assumptions of a group of *basic themes* which were of significance. The original sets of themes evident in the text were the *basic themes*. These *basic themes* were the lowest-order themes and simple in characteristics. Following the identification of these different themes, they were arranged into similar and coherent groupings that could become the thematic networks. Thematic networks were constructed for each set of qualitative data. They were revised several times to be verified and refined before sent to the supervisors for further refinement.

Step 4: Describe and Explore Thematic Networks

As suggested by Attride-Stirling (2001), the constructed thematic networks were each described by providing text segments from the original data. As such, original data were revisited and re-read through the three themes constituted in the networks. Each network was then explored to identify the underlying patterns and became the tool for analysis and interpretation. This process of describing and exploring the networks facilitated the understanding of the meaning of the texts, the themes and the underlying patterns.

Step 5: Summarise the Thematic Network

The principal themes that began to emerge in the description of the network were summarised and the patterns emerging in the exploration made explicit. Each thematic network was first summarised separately. The summaries of all of the thematic networks emerged in each set of qualitative data and the relevant theory were then deduced to explore the significant themes, concepts, patterns and structures that arose in the texts (Attride-Stirling, 2001). This interpretation of patterns in the thematic networks is further discussed in Chapter 9. An example of the overall analytic process undertaken in the study for a set of qualitative data (students' responses to open-ended question) is described in this chapter while only summaries are provided for the other three sets of qualitative data.

8.3 Analysis of Responses to Open-ended Question

Three initial themes were developed after reviewing selected students' responses to the open-ended question based on the gist of the question: BID practical tasks, effectiveness of BID and relevance. An example of the initial themes developed from the gist of the open-ended question is shown in Table 8.1.

Table 8.1: An Example of the Initial Themes Developed from the Gist of Open-ended Question

Gist of Question	Units of meaningful information
BID practical tasks	<ul style="list-style-type: none"> - Happy with the BID tasks - Satisfied with the BID tasks - BID tasks are not stressful - Appreciate teacher's guidance in doing BID tasks
Effectiveness of BID tasks	<ul style="list-style-type: none"> - Gain skills in BID - Gain knowledge in BID - Become confident and responsible - Become independent
Relevance of BID	<ul style="list-style-type: none"> - Suitable for those interested in BID - Provides opportunities in the future

Note: The source of data was School A – Students' responses to open-ended question

319 out of 320 students provided responses to the open-ended question in the Student Questionnaire. Only one student (.003%) did not provide any response to the open-ended question. Perhaps this student did not have enough time to complete the questionnaire but was shy to admit it and thus, did not ask for any extra time from the researcher. These 319 responses were labelled according to school, type of data and student identification. By going through each response and comparing them constantly, the text was dissected and placed under the appropriate initial themes which had been refined into *global themes* and *organising themes*. These themes were identified from the data and also the conceptual framework developed in the study. The themes were checked so that they were discreet enough to avoid redundancy and broad enough to be meaningful. Table 8.2 illustrates the provisional themes developed from the open-ended question.

Table 8.2: Provisional Themes Developed from the Responses to Open-ended Question

Global Themes	Organising Themes	Summary of Labelled Units of Information
BID tasks	practical Character Building	C-OQ2: Able to apply good values such as being helpful, trustworthy, independent and friendly E- OQ3: Need to be diligent to do the tasks H- OQ1: Thankful to teachers for their guidance
Effectiveness of BID tasks	Knowledge Acquisition	C- OQ2: Gain understanding of BID tasks and procedures E- OQ3: Learn how to use the tools and materials Q- OQ4: Able to learn new things
	Skills Acquisition	C- OQ2: Able to measure accurately E- OQ3: Need to be creative to do BID tasks H- OQ1: Able to adapt to changes and needs in BID class Q- OQ4: Gain skills in doing BID tasks
Relevance of BID	Opportunities	E- OQ3: Further training and education H- OQ1: Open small business Q- OQ4: Work

Note: C-OQ2 = School C – Open-ended Question – Student 2
E-OQ3 = School E – Open-ended Question – Student 3
H-OQ1 = School H – Open-ended Question – Student 1
Q-OQ4 = School Q – Open-ended Question – Student 4

These provisional themes were further refined by focusing on the common, homogeneous themes that were of specific interest of the study. Four *global themes* and eighteen *organising themes* were identified eventually. The *global themes* consisted of components of competence as discussed in Chapter 3. Subsequently, the *organising themes* comprised the elements of the discussed components of competence. The *basic themes* were the lowest-order themes which derived from the students' responses. Table 8.3 shows the development of the themes from global to organising to basic.

Table 8.3: From Global to Organising and to Basic Themes

Global Themes	Organising Themes	Basic Themes
Knowledge acquisition	Declarative knowledge	<ul style="list-style-type: none"> - Gain knowledge - Gain understanding of BID tasks and procedures - Able to identify tools and materials - Able to learn new things
	Procedural Knowledge	<ul style="list-style-type: none"> - Learn the right procedures to do BID tasks - Learn how to use the tools and materials
	Initial doubts about BID tasks	<ul style="list-style-type: none"> - Thought BID tasks were boring - Thought BID was humiliating - Felt unprepared for BID - Thought BID was only good for students who are weak in academic
Skills acquisition	Technical skills: Specialist skills	<ul style="list-style-type: none"> - Gain skills in doing BID tasks - Able to accomplish BID tasks according to the procedures - Able to measure accurately
	Technical skills: Thinking skills	<ul style="list-style-type: none"> - Creativity is enhanced - Could develop new ideas and talent for future success
	Non-technical skills: Personal flexibility (adaptive)	<ul style="list-style-type: none"> - Able to adapt to changes and needs in BID class
	Interpersonal skills (communication & transformative)	<ul style="list-style-type: none"> - Able to cooperate with friends - Able to share ideas - Able to improve communication skills
	Gender issues	<ul style="list-style-type: none"> - Boys and girls could do the BID tasks - Girls could also learn what used to be a man's job
Student Engagement	Behavioural Engagement: Positive conduct	<ul style="list-style-type: none"> - Able to apply good values such as being helpful, trustworthy, independent and friendly - Could develop self-discipline - Become more responsible and confident
	Behavioural Engagement: Involvement in learning	<ul style="list-style-type: none"> - Full attention was given to BID tasks - Need to be diligent to do the tasks - Have the spirit to personally do the tasks
	Emotional Engagement (Affective reactions)	<ul style="list-style-type: none"> - Happy and enjoy to do BID tasks - Interested in doing BID tasks - Thankful to teachers for their guidance - Grateful to god for the opportunity to do BID tasks
	Development of Emotional Engagement (Sense of belonging)	<ul style="list-style-type: none"> - Feel lucky to be in BID class - Proud to be in BID class - Feel respected by friends for the ability developed in BID
	Cognitive Engagement (Self-regulation)	<ul style="list-style-type: none"> - Able to evaluate own strengths - Able to identify own weaknesses
	Cognitive Engagement (Investment in learning)	<ul style="list-style-type: none"> - Tried real hard to manage and accomplish them - Could have done difficult tasks with perseverance - Motivated to do the tasks

Table 8.3: continued

Global Themes	Organising Themes	Basic Themes
Opportunities	Work	- Part-time job - BID-related job
	Further training and education	- BID-related training - Further education
	Open small business	- Joint-venture BID-related business - Specialised small business like painting or tiling

8.3.1 *Global Theme: Knowledge Acquisition*

The first *global theme* in Table 8.3: “knowledge acquisition” constitutes one thematic network comprising three *organising themes* and ten *basic themes*. This network represents an exploration of students’ perceptions of knowledge acquisition in the context of the outcomes or effectiveness of CAMC of BID. The discussion of knowledge acquisition highlighted some conflicting issues about students’ initial thoughts of BID and the perceived outcomes of BID. The thematic network in Figure 8.3 illustrates the key themes on which knowledge acquisition was ascribed: declarative and procedural. This generated an interesting discussion in which acquisition of knowledge was perceived by students to be a positive outcome of CAMC of BID despite the negative perceptions they had about it in the beginning. Students had preconceived ideas about BID which were transformed into constructive ideas about it by the time they had accomplished BID tasks.

The *organising theme* “declarative knowledge” pertains to the understanding of the principles that govern BID and the interrelations between pieces of knowledge in BID as characterised by the students. Declarative knowledge was perceived as one of the consequential effects of doing BID tasks: something inevitably learnt whilst doing BID tasks. According to this *organising theme*, knowledge is fundamental in BID; it is essential for completing BID tasks. Students’ experiences in doing BID tasks allowed them to gain knowledge on the facts, tools and materials, procedures and new things in BID.

Siti: “I got to learn about the right tools and materials to use in BID tasks such as floor tiling....”

Chan: “.... from my experience of doing BID tasks, I managed to understand the tasks and procedures much better”

Yazid: “....there is always something new that I got to know about every time I do BID tasks....”

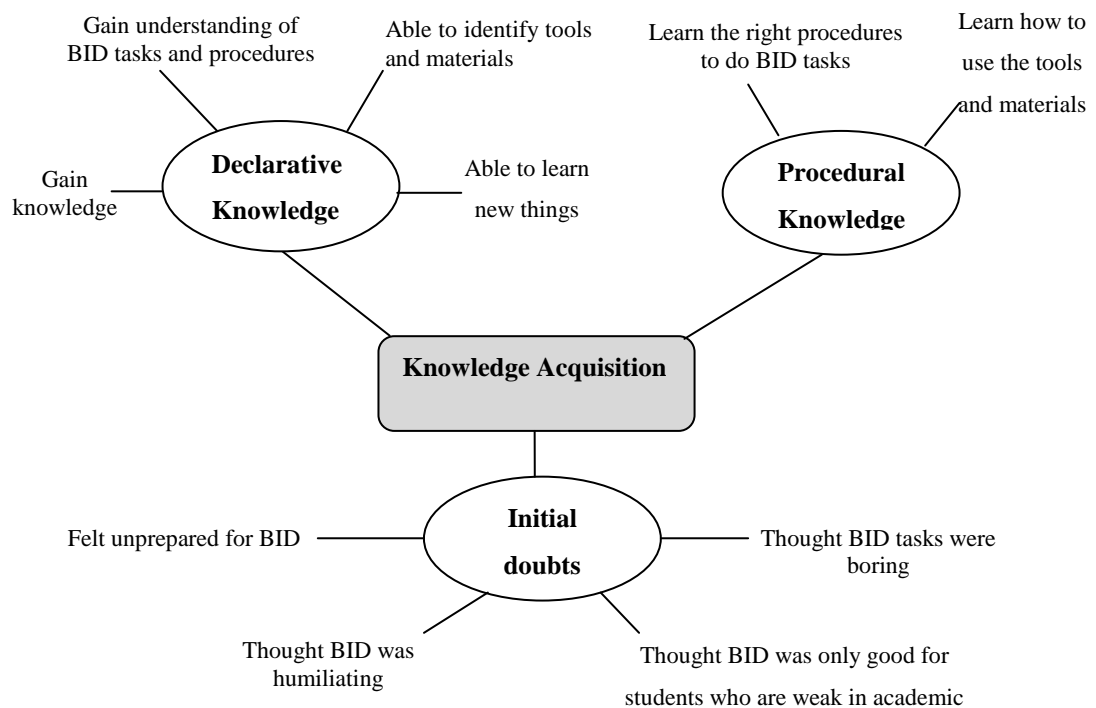


Figure 8.3: Thematic Network for Knowledge Acquisition

Knowledge acquisition not only derived from formal reading of books and teachings but in this context, it was based on students’ experiences in carrying out the BID tasks. The experiential information and the episodes of doing the BID tasks that had taken place were meaningful and valuable to students in the attempt of acquiring knowledge in more relaxing and informal environment. Students perceived themselves as having the ability to further understand the facts, concepts and

procedures of BID tasks when actually doing the hands-on BID tasks. The hands-on experience of doing BID tasks even when they did not get it right in the beginning could still contribute to students' understanding of the tasks.

Noor: "I like doing the hands-on BID tasks because I could actually learn to do the tasks the right way even after making mistakes the first time around"

The *organising theme* "procedural knowledge" includes the knowledge of how to perform a BID task or how to operate a piece of equipment based on certain steps, or processes. Students perceived themselves as having the ability to acquire this type of knowledge which incorporates actions that are in sequences to accomplish BID tasks. They believed that they had acquired relevant knowledge on how to carry out BID tasks appropriately and how to use the tools and materials properly. Students' experience in doing BID tasks once again allowed them to gain knowledge, particularly this procedural knowledge.

Ali: "Now that I've done quite a number of BID tasks, I'm well aware of the right procedures to do the tasks"

Mimi: "After doing BID tasks, I learn how to use the tools properly, like the carpet stretcher which I had no idea of how to use it before"

Procedural knowledge has always been associated with competence-based assessment (LPM, 2002). Likewise, students undertaking CAMC of BID acknowledged procedural knowledge as one of the positive outcomes of it. They thought that they had acquired relevant procedural knowledge by doing BID tasks as they had better understanding of the procedures and, the proper tools and materials to use in BID tasks. The hands-on experience in doing the BID tasks helped students to gain knowledge on how to access and utilise what they had learnt in theory (declarative knowledge) effectively. Students were able to know the right connected steps between actions in accomplishing the BID tasks.

The third *organising theme* “initial doubts” portrays the negative thoughts students had in the beginning of CAMC of BID. Students seemed to be pessimistic about CAMC of BID as they had limited knowledge about it and its benefits. Furthermore, the academic qualification oriented society they grew up in had somehow influenced their perceptions. Vocational programmes such as CAMC of BID were usually seen as second class education and were only suitable for those who did not wish to further study at higher level of education. However, such negative perceptions were absolutely changed after students had undertaken CAMC of BID. From their own experiences in doing BID tasks, students could see the benefits of CAMC of BID and the potentials it offered.

Ravi: “At first I was ashamed to be in BID class but now I know that I have learnt a lot from doing BID tasks”

Lina: “I thought that BID tasks were not interesting at all but after doing the tasks I found out that they were not that bad and they had taught me in many ways”

Lee: “My experience of doing BID tasks has changed my perception of BID from feeling unprepared to more confident”

Kamil: “My first impression of BID was that it was only suitable for students who were not bright enough and I didn’t want to be one of them. But I’m glad to be in BID class now as I’ve gained knowledge that I’ve never thought I would have acquired before, elsewhere.”

Despite having initial doubts about CAMC of BID, students eventually perceived it positively after doing BID tasks. Students felt that they had acquired relevant declarative and procedural knowledge by doing BID tasks. The tension between students’ preconception ideas of BID and their experiences in doing BID tasks was disentangled. Knowledge acquisition was perceived by students to be one of the encouraging effects of CAMC of BID. 58.75% of the students thought that they had

attained BID-related knowledge in general and specifically on how to perform BID tasks successfully.

8.3.2 Global Theme: Skills Acquisition

The thematic network illustrated in Figure 8.4 consists of the second *global theme* “skills acquisition” with five *organising themes* and eleven *basic themes*. This network elicits students’ perceptions of another contribution of CAMC of BID, skills acquisition. Students not only acknowledged that they had acquired technical skills which involved their psychomotor abilities and cognitive abilities such as thinking skills, but also the non-technical skills which consisted of personal flexibility and interpersonal skills. Furthermore, they managed to identify a very common issue related to the acquisition of skills in BID tasks: ability differences between genders.

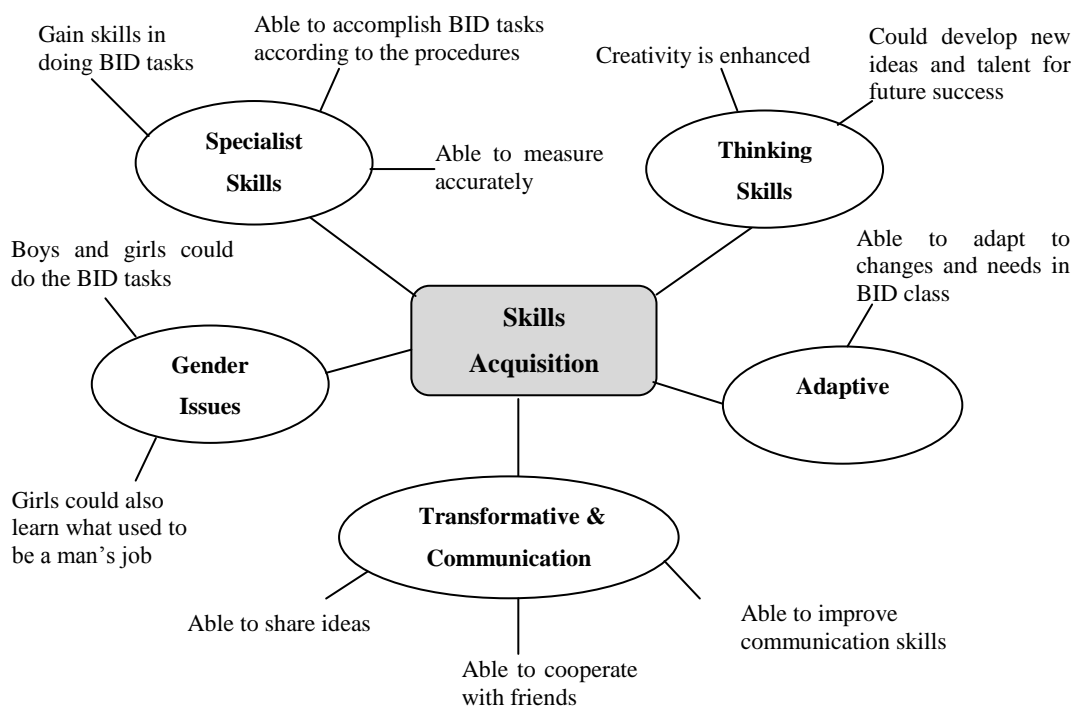


Figure 8.4: Thematic Network for Skills Acquisition

The *organising theme* “specialist skills” relates to students’ explicit skills in BID which they possessed and built upon preparation and foundation skills. Students seemed to have developed this skill through practice and over time. They perceived skills acquisition in the context of specialist skills of BID as an important and appealing outcome of doing BID tasks. They recognised the significance of acquiring the specialist skills to accomplish BID tasks and conversely they increase their skills by doing BID tasks.

Amir: “I’m able to the markings in floor tiling correctly now that I’ve had a lot of practice.....”

Shila: “I could complete BID tasks according to the procedures....”

Alia: “I need to have certain skills to do BID tasks and I gained the skills by doing BID tasks”

Mark: “Feedback given by my teacher has helped improve the way I do BID tasks”

The *organising theme* “thinking skills” draws attention to students’ ability to use thinking skills in accomplishing BID tasks. Acquiring thinking skills was acknowledged by students to be essential outcome of CAMC of BID. Students perceived thinking skills as necessary in ensuring that they were able to do and cope with BID tasks effectively and efficiently in order to increase their performance. Thinking skills particularly creativity was perceived by students to be essential in doing BID tasks but similarly by doing BID tasks, creativity was enhanced. Students perceived creativity as important in their current and future success.

Fitri: “Creativity is needed for me to do BID tasks...”

Khair: “By doing BID tasks I could develop new ideas and talent for future success”

Bala: “....when arranging flowers, I could enhance my creativity”

The *organising theme* “adaptive” depicts the non-technical skills, personal flexibility in particular, that had been acquired by students after doing BID tasks. This generated exciting notion of skills acquisition among BID students as they perceived themselves as having the ability to bring their knowledge and skills into BID class and the ability to assimilate the BID class culture. They felt that they were able to adapt to changes taking place in BID class and such experience could be beneficial in their future.

Rina: “.....when there are changes and needs in BID class, I’m able to adapt and cope with them”

Daud: “I was able to accommodate to the changes taking place in BID class such as when a new electric saw was installed and I had to use it instead of the hand saw, I was able to do it”

The *organising theme* “transformative and communication” portrays the interpersonal skills acquired by students after accomplishing BID tasks. Students perceived communication skills (oral or written) as valuable and significant in restoring good relationships with friends apart from being able to express and share their ideas with other people effectively. Transformative skill which was another form of interpersonal skill was perceived to be vital to promote teamwork among students and beneficial for their future undertakings where working around people is unavoidable. Students noticed that they had developed these interpersonal skills through CAMC of BID.

Wong: “I think my communication skill has improved since I started CAMC of BID. This is probably due to the many discussions I had with friends and teacher about BID tasks”

Sarah: “I am able to share my ideas with friends much easily nowadays compared to the time before I was in BID class”

Lan: "...whenever there is group project, I am able to cooperate with friends to complete it"

The *organising theme* "gender issues" unravels the misconceptions many had about the different abilities between girls and boys in accomplishing BID tasks. The common perception was that BID was more suitable for boys than girls as it required a lot of energy, strength and effort to do the tasks. Boys were thought to have performed better than the girls in doing BID tasks. However, most students perceived BID tasks as being suitable for boys and girls. Most of the students did not think that BID tasks were burdensome for girls to do as the girls were as capable as the boys. This realisation of indifference between genders in accomplishing BID tasks among most of the students was unique as it was not anticipated that even the boys could have been so open to the idea of girls successfully completing BID tasks. Nevertheless, there was one student, a girl, who mentioned that the ceiling tasks were inappropriate for girls to do as the tasks were thought to be troublesome where carrying heavy tools and materials were required. Ceiling tasks were the only ones perceived to be not suitable for girls.

Jamal: "... boys and girls could do BID tasks satisfactorily"

Farid: "Seeing the girls in my class do the BID tasks, I realise that even girls could learn and do what used to be a man's job"

Raina: "Girls are capable of doing tasks which are often associated with boys"

Skills acquisition was fundamental in CAMC of BID and students perceived themselves as having the ability to acquire relevant skills whilst doing BID tasks. 69.37% of the students stated that they had acquired BID practical or hands-on skills. They thought that they were able to acquire not only the technical skills but also the non-technical skills. These psychomotor abilities and cognitive abilities together with personal flexibility and interpersonal skills were perceived to have contributed to

students' successful performance in CAMC of BID. Students perceived the non-technical skills as important as the technical skills in carrying out BID tasks effectively. The gender issue that was commonly raised was perceived as irrelevant to most of the students. All of the students except for one thought that there was no difference in the ability to do BID tasks between the boys and the girls. They recognised girls as having similar capabilities as the boys in doing BID tasks.

8.3.3 *Global Theme: Student Engagement*

Figure 8.5 illustrates the thematic network for the third *global theme* “student engagement” which comprises six *organising themes* and eighteen *basic themes*. Student engagement was one of the outcomes of CAMC of BID which students perceived as rewarding. Students considered student engagement important in developing their behaviour and character as students and individuals. Student engagement in relation to behaviour, emotion and cognition was perceived as fundamental in the context of CAMC of BID as it could contribute to students' performance and achievement.

The first *organising theme* in this network “positive conduct” uncovers students' effort to behave in ways which were acceptable in school particularly and in public generally. Students perceived willingness to behave well and adhere to classroom norms as necessary. They believed that they had developed positive values, good behaviour and so forth through doing BID tasks. They found themselves more disciplined in comparison to before undertaking BID class as they had to follow procedures and be accurate when doing BID tasks. They also thought that BID had managed to inculcate a sense of responsibility in them and that they were confident in doing BID tasks.

Malik: “I found myself as being able to apply good values such as trustworthy and helpful when doing BID tasks”

Goh: “BID tasks have positive impact on students and help them to be disciplined”

Seri: “I think that I’ve become responsible, independent and confident now”

Latif: “BID could develop self-discipline in students as it requires us to be attentive and follow the procedures correctly to complete a task”

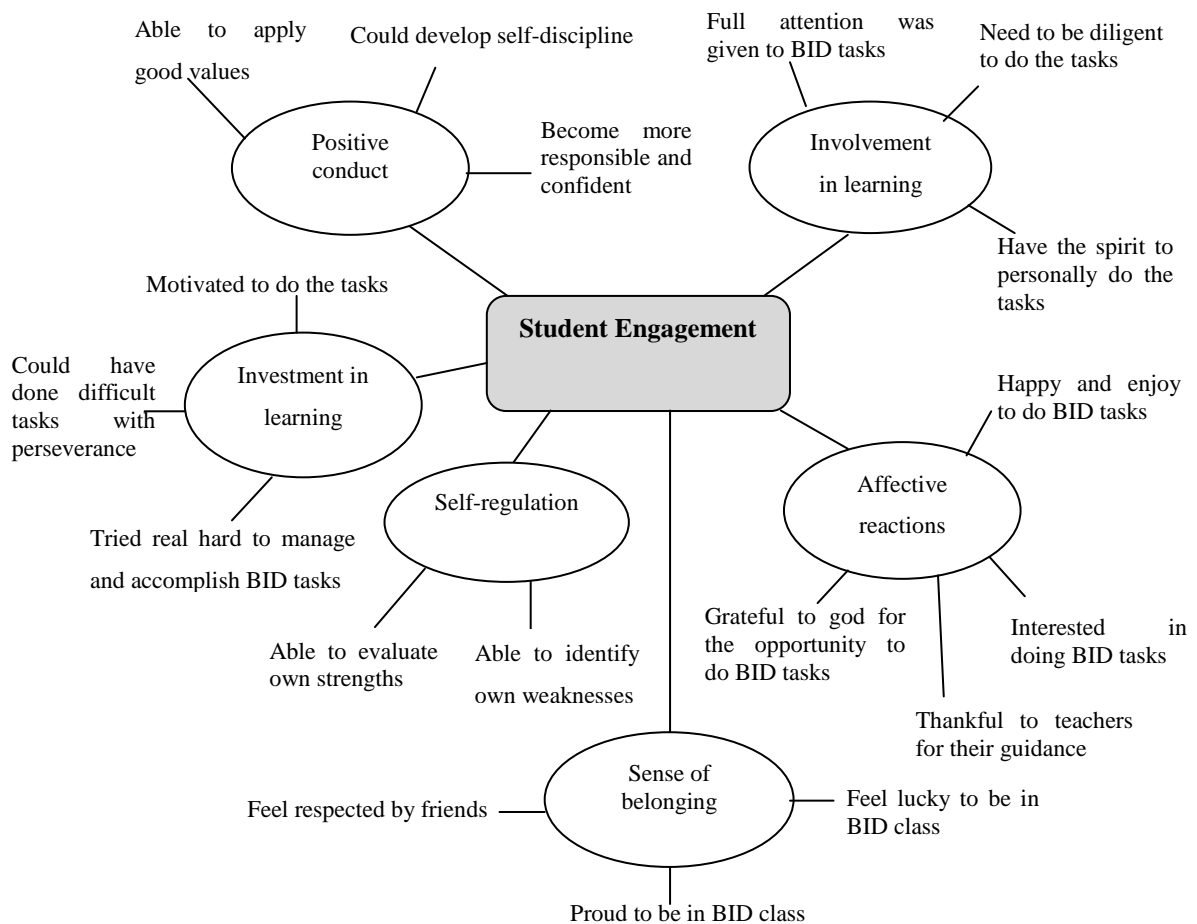


Figure 8.5: Thematic Networks for “Student Engagement”

The *organising theme* “involvement in learning” elicits another form of behavioural engagement in students. Students thought that they had been actively involved in doing BID tasks where a lot of effort, attention, persistence and concentration had been put into ensure successful completion of the tasks. Students showed a lot of interest in BID and took part in discussions held in the class. They considered their

involvement in BID learning important in accomplishing BID tasks and likewise, these tasks had created interest in them to be involved in the learning process.

The *organising theme* “affective reactions” reveals an interesting outcome of CAMC of BID that was the development of emotional engagement. Students’ state of emotion in BID class was found to be positive as they seemed to be happy and enjoyed doing BID tasks. They perceived themselves as having interest in BID and were grateful to teachers and also god for the opportunities to do BID tasks. Teacher-student relationship and peer relationship had somehow influenced how students showed their emotions in the BID classroom. Students had a lot to say about affective reactions but the main ideas were about their interest, happiness, excitement and satisfaction in accomplishing BID tasks.

Nita: “I’m very happy to be in BID class and enjoy doing the tasks”

Talib: “I like BID tasks very much and I’m interested in doing them”

Wan: “.... somehow or rather I find peace in doing BID tasks....”

Afif: “BID tasks keep me occupied during class so that time is not wasted and I like it that way”

Hui: “BID tasks are not boring as there are a lot of movements taking place”

Mina: “I’m so grateful to god for this opportunity to do BID tasks as I find them exciting”

Rosie: “Although it is tiring to do BID tasks, it releases stress. And I thank my teachers for their guidance”

The *organising theme* “sense of belonging” describes another form of emotional engagement developed in students through BID tasks. Students found themselves to

be belonging to BID class and were proud of being BID students. They felt proud to have learnt and acquired relevant experience in doing BID tasks. They also felt respected by friends for being able to accomplish BID tasks satisfactorily. They perceived themselves to be very lucky to be in BID class. This feeling of being important to the school as well as the value or appreciation of success in BID tasks was perceived as an important outcome of CAMC of BID.

Johan: “I feel lucky to be in BID class and I’m proud of it”

Hasan: “I’m proud to have learnt and acquired the experience to do BID tasks”

Aina: “I feel that my friends respect me for the ability I’ve developed in BID”

The *organising theme* “self-regulation” represents one of the forms of cognitive engagement where students perceived themselves as having the ability to use metacognitive strategies to plan, monitor, and evaluate their cognition when accomplishing BID tasks. Students thought that they were able to identify their strengths and weaknesses in doing BID tasks as the first step to further improve their knowledge and skills in BID. This inner psychological quality was seen as critical in helping the students to plan appropriate learning strategies to increase their abilities in doing BID tasks.

Bahar: “... I’m able to evaluate my strengths and weaknesses in BID”

Mona: “I’m able to identify my own weaknesses in doing BID tasks and hope that I can improve them”

The last *organising theme* in this network “investment in learning” reflects another form of cognitive engagement which students perceived to have developed by doing BID tasks. Students perceived themselves as having the desire to take up challenging BID tasks, preference for hard work, and positive coping in the face of difficulty. Students invested and put effort into learning, understanding, mastering the

knowledge, skills that were intended in BID tasks. Such psychological investment in learning was seen to be useful and beneficial for students to complete BID tasks successfully.

Edry: “Sometimes the BID tasks are difficult but I try real hard to manage and accomplish them”

Rahim: “Difficult BID tasks could be done with perseverance and I just did that”

Zetty: “I am surprised at myself because I am willing to do the BID tasks although I have to get my hands dirty”

Naqib: “I think challenging BID tasks make me more matured and I’m motivated to do the tasks”

Bibi: “Sometimes BID tasks seem so difficult and challenging but I never give up doing the tasks”

Student engagement was perceived as imperative to CAMC of BID as it was considered a mechanism for competence-promoting behaviour. Students recognised the importance of behavioural, emotional and cognitive engagement in accomplishing BID tasks and achieving the desired outcomes. Similarly, they thought that they had developed student engagement through BID tasks. They perceived themselves as having the ability to behave positively and self-disciplined to do BID tasks with full attention, enthusiasm and commitment. They felt happy to be in BID class as they found BID tasks to be interesting and de-stressing. They appreciated their teachers’ guidance, felt lucky to be in BID class and were grateful to god for providing the opportunities to do BID tasks. However, two students (.006%) wrote that they disliked BID practical work while another two (.006%) said that some of the BID tasks were not interesting enough. Otherwise, the majority of the students thought that they had also developed the ability to plan strategically for

their own learning and were very motivated to invest in learning BID. In general, the development of student engagement in this context is in-line with the aspiration of the national education philosophy to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonic, based on a firm belief in and devotion to God as well as are responsible and capable of achieving high level of personal well-being.

8.3.4 Global Theme: Opportunities

The fourth thematic network as illustrated in Figure 8.6 is for the *global theme* “opportunities” which consists of three *organising themes* and six *basic themes*. Students perceived CAMC of BID as capable of providing them with opportunities for their future. They realised that they had acquired necessary knowledge and skills as well as desirable behaviour through BID tasks which could be beneficial for their future undertakings.

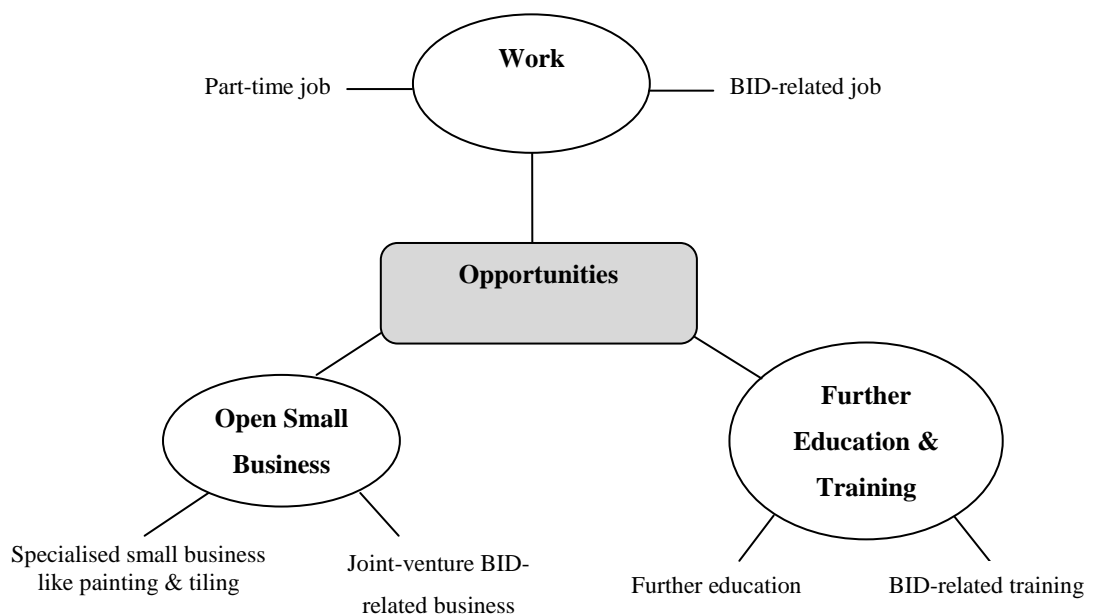


Figure 8.6: Thematic Networks for “Provide Opportunities”

The *organising theme* “work” portrays the opportunity that students perceived they might have in getting posted in part-time jobs or any BID-related jobs. They thought that they had acquired sufficient knowledge and skills that were required for work. They also felt that they had developed characteristics that were desired by employers. They perceived CAMC of BID as having the ability to prepare them with the necessary qualities for employment.

Fatin: “I think I could get a part-time job with my experience in BID”

Zul: “I’m working for my uncle in a BID-related job during school holidays”

Choy: “I could use my knowledge and skills in BID to apply for relevant jobs”

The *organising theme* “further education and training” elicits students’ perceptions of the opportunities available to further their education and training after taking CAMC of BID. Students felt that they were well-equipped and ready for further training in BID-related areas.

Azri: “If I could get good grades for BID in MCE, I could apply for further study”

Shah: “.... I think I’m ready to go for further training in BID-related areas at Malaysia Construction Academy ”

The *organising theme* “open small business” shows how students perceived CAMC of BID as preparing them for opportunities to open small businesses. They felt that they had the ability to be in a joint-venture BID-related business or businesses that specialised in certain areas such as painting or floor tiling.

Mus: “I’m looking forward to start a small business in floor tiling with a friend after the MCE exam as we are quite good at doing the job”

Ros: “... with my experience of doing BID tasks, I’m interested in providing small construction maintenance services such as wall painting and so forth”

In general, students felt that they were well-equipped to venture into small business, go for further education and training or be employed in BID-related jobs. They felt quite comfortable and confident with their abilities to pursue further in various opportunities available.

8.4 Analysis of Student Interviews

76 students participated in the interview. Five initial themes based on the questions addressed in the Student Interview Protocol were identified: BID-related activities, parties involved in the activities, benefits of BID-related activities to learners’ learning, benefits of BID and suggestions to increase knowledge and skills in BID. These themes were then refined into four *global themes*: BID-related activities, benefits of BID-related activities and student suggestions, benefits of CAMC of BID. The thematic network for “BID-related activities” consists of four *organising themes* and twelve *basic themes* as shown in Table 8.4.

Table 8.4: Thematic Network for BID-related Activities from Student Interviews

<i>Global Theme: BID-related Activities</i>			
<i>Organising Theme: School mini projects</i>	<i>Organising Theme: Seminars, talks, demonstrations</i>	<i>Organising Theme: Field trips</i>	<i>Organising Theme: Exhibition, Exposition, competition</i>
<i>Basic Themes</i>	<i>Basic Themes</i>	<i>Basic Themes</i>	<i>Basic Themes</i>
- wall finishing (painting, wall paper, wall tiling etc)	- training colleges	- training colleges	- School level
- floor finishing (tiles, carpet)	- industries	- universities	- District/State
- ceiling	- former BID students	- industries	
		- schools offering BID	

Students reported that apart from the BID tasks that they had to do, they were also involved in various BID-related activities organised by their teachers, school and industry. The school mini projects included wall finishing such as painting, wall paper and tiling in the library, audio-visual room and language lab. Some students did floor tiling for a gazebo and laid a carpet in the praying room while some plastered the ceiling in the counselling room. Students thought that they could increase their skills when doing these projects as they got more hands-on practice in real life situations. The other activities either organised by the school, industry or relevant parties were seminars, field trips, exhibitions, expositions and competitions. People from the training colleges and industry usually came to give talks and information about the opportunities available for the students in the future. Sometimes these people and also former BID students came to demonstrate how to do certain BID tasks. Students could learn from these experienced people in doing BID tasks. Students went for field trips to relevant training colleges, universities, industry and other schools offering BID subject, to be exposed to wider prospects of having BID competence. Students could gain a lot of experiences when taking part in BID-related competitions, exhibitions and expositions at various levels. In general, students perceived these BID-related activities as interesting, at times challenging but beneficial for them.

Jasin: “I didn’t know that there are many opportunities in BID-related areas until I listened to talks by people from the training colleges and industry”

Rosni: “I was so happy to be taking part in the Vocational Exhibition held in Kuala Lumpur. The Minister of Education shook hands with me and congratulated me for a good demonstration on flower arrangement”

In relation to BID-related activities, there is another thematic network for *global theme* “benefits of BID-related activities” as shown in Table 8.5. This network consists of three *organising themes* and seven *basic themes*.

Table 8.5: Thematic Network for Benefits of BID-related Activities from Student Interviews

<i>Global Theme: Benefits of BID-related Activities</i>		
<i>Oraginising Theme: Knowledge acquisition</i>	<i>Oraginising Theme: Skills acquisitions</i>	<i>Oraginising Theme: Student Engagement</i>
<p>Basic Theme: Declarative knowledge</p> <ul style="list-style-type: none"> - Increase understanding - Learn from other people's experience - Learn from feedback provided - Acquire new knowledge - Exposed to wider scope of BID - Exposed to students' lives in university 	<p>Basic Theme: Technical Skills: Specialist skills</p> <ul style="list-style-type: none"> - Get more practice - Gain experience working on tasks in real life situations - Gain more skills working on bigger scale projects - Able to apply what has been learnt in BID class - Able to develop potentials 	<p>Basic Theme: Behavioural Engagement Positive conduct</p> <ul style="list-style-type: none"> - Become more disciplined
<p>Basic Theme: Procedural Knowledge</p> <ul style="list-style-type: none"> - Learn how to do BID tasks from other people's experience 	<p>Basic Theme: Non-technical Skills Personal flexibility – adaptive</p> <ul style="list-style-type: none"> - Able to apply what has been learnt in class <p>Interpersonal skills– communication</p> <ul style="list-style-type: none"> - Gain communication skills <p>Interpersonal skills – transformative</p> <ul style="list-style-type: none"> - Learn team-working 	<p>Basic Theme: Emotional Engagement</p> <ul style="list-style-type: none"> - Able to reduce stress and enjoy working - Able to reduce fear of working on tasks - Feel happy to be around helpful friends and teachers
		<p>Basic Theme: Cognitive Engagement Investment in learning</p> <ul style="list-style-type: none"> - Increase motivation - Increase confidence

Students expressed their satisfaction and approval of these BID-related activities. They thought that they had acquired relevant knowledge and skills and developed good characteristics through these activities. Many of the students said that they had gained a lot of knowledge and experience working on larger scale tasks in real situations where they could apply what they had learnt in the BID class. They perceived the practice they had in doing these BID-related activities as enriching and

fruitful. They seemed not only able to increase knowledge and technical skills but also able to develop non-technical skills such as personal flexibility and interpersonal skills. They thought they had been adaptive and developed communication skill and transformative skill whereby they were able to cooperate and work in teams. In addition, they said they also learnt from other people's experiences and were exposed to wider range of BID-related areas and prospects. Another distinctive outcome of these activities to the students was the ability for them to be disciplined, motivated and happy to work on BID tasks.

Rosli: "I could really learn how to do BID tasks from other people's experience especially when people from the industry came to my school...."

Sam: "..... how glad I am that I went on a field trip to the university the other day. I realise now that I may have the chance to take up courses in Interior Design"

Dilah: "I'm happy and enjoy working around helpful friends and teachers...."

Eddie: "... I think the activities could reduce my fear on working BID tasks and I feel less stress ..."

The third thematic network emerged from the student interviews is the benefits of CAMC of BID. This network comprises four organising themes and nine basic themes as shown in Table 8.6. Students revealed that they had acquired necessary knowledge and skills in BID. They were able to acquire declarative, procedural and also conditional knowledge through doing BID tasks. They claimed that they were able to learn when to use certain equipment or materials for certain BID tasks. It seems that when conditional knowledge was incorporated, students were able to use declarative or procedural knowledge appropriately and accordingly to ensure the tasks were performed satisfactorily. In addition to the acquisition of knowledge and skills, students asserted that they had developed good qualities in their behaviour such as being responsible, trustworthy, disciplined, attentive and diligent and having positive attitudes. In other words, students perceived themselves as having the ability to develop positive conduct and involvement in learning BID through BID tasks.

Students said that they were able to plan their work and were encouraged to complete BID tasks without being pressured by anyone. Students appeared to have developed cognitive engagement where they could apply self-regulation and investment in learning BID. Students expressed their confidence in BID tasks to sufficiently prepare them for opportunities in the future. They said that the knowledge and skills acquired accompanied by the engagement developed through BID could equip them to be employed, go for further education or even open small businesses.

Table 8.6: Thematic network for Benefits of CAMC of BID from Student Interviews

<i>Global Theme</i>	Benefits of CAMC of BID			
Organising Themes	Knowledge acquisition	Skills acquisition	Student Engagement	Opportunities
Basic Themes	Declarative knowledge -Gain knowledge in BID -Learn about the equipment and materials used	Technical skills -Gain skills in doing BID tasks -Gain experience	Behavioural Engagement Positive conduct: - responsible - trustworthy - disciplined - positive attitude - independent Involvement in learning: - attentive - focused - diligent	Work - BID_related jobs
Basic Themes	Procedural Knowledge -Learn about procedures of BID tasks -Learn about how to use the equipment		Cognitive Engagement Self-regulation - Able to plan BID work schedule Investment in learning - patient - encouraged	Further training and education -BID-related training -BID-related higher education
Basic Themes	Conditional Knowledge -Learn about which and when to use the equipment and materials for BID tasks			Open small business -BID-related business

The final thematic network which emerged from the student interviews was “student suggestions” which consists of three organising themes and six basic themes as shown in Figure 8.7. Students had a lot of constructive suggestions to improve their knowledge and skills in BID.

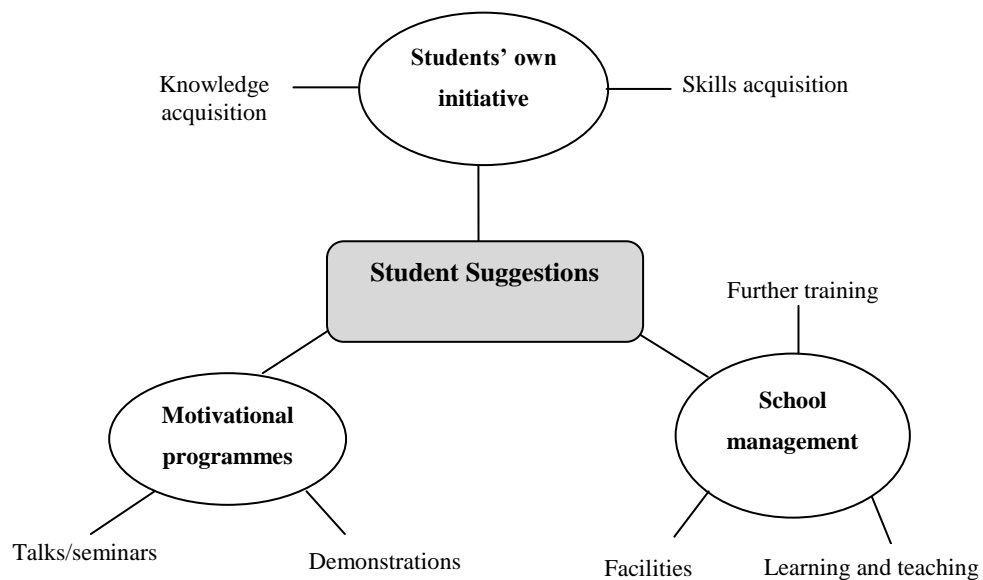


Figure 8.7: Thematic network for Student Suggestions

Students realised that they had to use their initiative to improve themselves in BID. They understood that they were the ones who should first put a lot of effort in developing their skills and increasing their knowledge. They acknowledged the importance of reading books, magazines and other relevant materials on BID in improving their knowledge. Some students said that they could also learn from browsing the internet for BID-related information and watching BID-related programmes on television. Some students said that they could increase knowledge by doing scrap books on BID.

Devi: “.... sometimes I read magazines related to BID....”

Fila: “... whenever I have the time I will browse the internet to gather relevant BID information. There’s a lot of stuff related to BID on the internet”

Madi: “I like watching Eric Leong decorating houses in his TV programme - *Casa Impian*. I get a lot of ideas from the show.....”

Farah: “I’ve started doing a scrap book on BID and I find it enjoyable and informative”

Students once again acknowledged the importance of their own initiative to increase their skills in BID. They realised that the more practice they could get, the better they could become and thus they thought going for BID-related part-time jobs or trainings at training colleges or industry during school holidays would be beneficial. Some students said that they could decorate their own rooms or houses to gain more hands-on practice. Some students who were quite confident with their abilities said that they could also decorate friends’ or family members’ houses.

Fakri: “.... I work part-time in small building constructions during school holidays

Leela: “I painted my room and helped decorate my house before the *hari raya (eid)* celebration....”

Sauki: “I think we could gain more skills by going for industrial training at training colleges....”

Apart from their own initiative, students thought that school management had a role to play in providing better learning and teaching, facilities and further trainings to students to increase their skills. They said that longer learning hours for BID and more interesting teaching techniques could help students increase their skills. They also thought that schools should provide better facilities such as bigger workplace and quality equipment and materials. The interesting suggestion by students was for schools to provide some sort of industry training through a partnership with the industry so that they could have more practice in different environment.

Chew: “... the school should build bigger workplace for us....”

Husin: “It’ll be good if the school could provide training after school hours and outside of school, perhaps something like a partnership with the industry....”

Mila: “BID class hours should be longer”

Ghaz: “... interesting teaching techniques will also help students....”

It could be elicited from the student interviews that they perceived BID-related activities as beneficial and could contribute to the enhancement of their acquisition of knowledge and skills as well the development of student engagement. Their suggestions were also seen as contributing to the positive outcomes of CAMC of BID. Collectively, these elements were perceived by students to have equipped them to some extent with relevant knowledge, skills, attitudes and behaviour for them to grab the opportunities available. Figure 8.8 summarises the relationships of the thematic networks elicited in the student interviews.

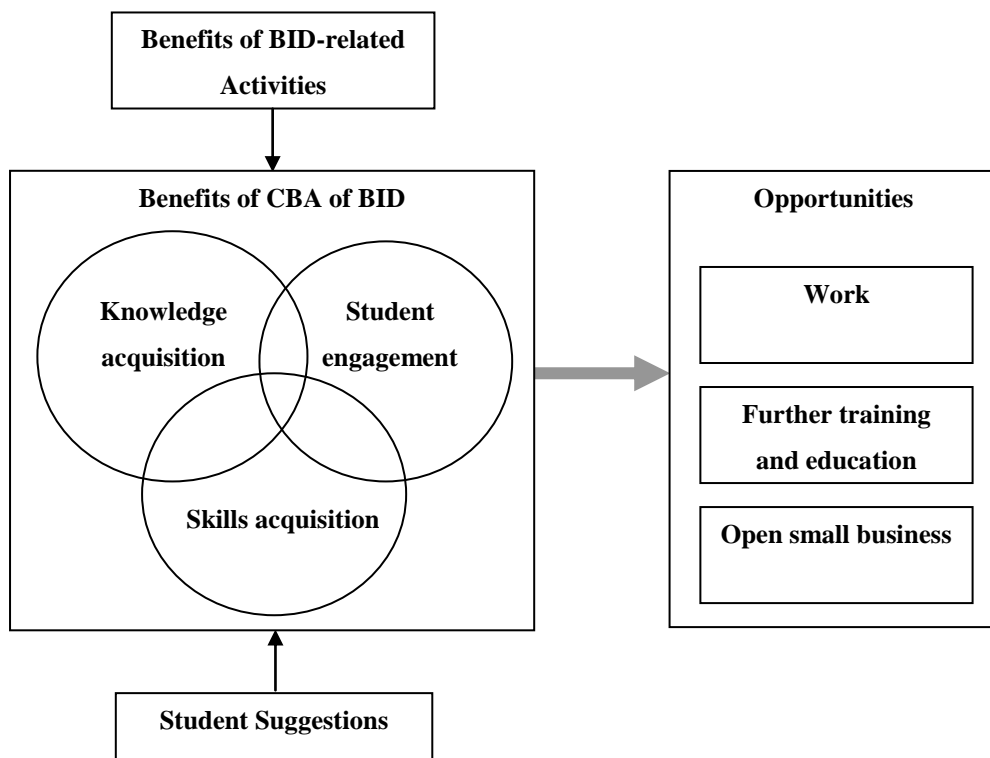


Figure 8.8: Relationships of the Thematic Networks in Student Interviews

8.5 Analysis of the Assessor Interviews

All 19 assessors from 19 schools offering BID subject took part in the interview. Similar to the student interviews, questions in the Assessor Interview Protocol were used to generate initial themes: BID-related activities, parties involved, benefits of BID-related activities to learners' learning, and benefits of CAMC of BID. These themes were refined and reduced to three *global themes*: BID-related activities, benefits of BID-related activities and benefits of CAMC of BID. The first *global theme* "BID-related activities" comprised four *organising themes* and twelve basic themes which are similar to the themes in the student interviews. The thematic network is as shown in Table 8.7. The assessors said that they had provided other BID-related activities to students with the help from the school management, district and state education departments, training colleges, higher education institutions and industry. These activities were in the forms of school mini projects, seminars and the like, field trips, exhibitions and competitions. The assessors thought that these activities had helped broaden students' view in BID, increased their knowledge and skills as well as exposed them to various opportunities.

Table 8.7: Thematic Network for BID-related Activities from Assessor Interviews

<i>Global Theme: BID-related Activities</i>			
<i>Organising Theme: School mini projects</i>	<i>Organising Theme: Seminars, talks, demonstrations</i>	<i>Organising Theme: Field trips</i>	<i>Organising Theme: Exhibition, Exposition, competition</i>
<i>Basic Themes</i>	<i>Basic Themes</i>	<i>Basic Themes</i>	<i>Basic Themes</i>
<ul style="list-style-type: none"> - wall finishing (painting, wall paper, wall tiling etc) - floor finishing (tiles, carpet) - stage decorations 	<ul style="list-style-type: none"> - training colleges - industries - former BID students 	<ul style="list-style-type: none"> - training colleges - higher education institutions - industries - schools offering BID 	<ul style="list-style-type: none"> - School level - District/State

The thematic network for the *global theme* “benefits of BID-related activities” consists of four *organising themes*, six *basic themes*. The network is as shown in Table 8.8. The assessors perceived the BID-related activities as beneficial to students in the acquisition of knowledge and skills, and the development of behavioural engagement. The assessors acknowledged students’ ability to gain knowledge and skills from doing tasks in real life situations. In other words, students could gain experience working on authentic tasks where they could apply what they had learnt in BID class. Students were seen as being able to get more practice and become more skilful. Furthermore, students seemed to have acquired non-technical skills such as personal flexibility and transformative. The assessors thought that students were able to be independent and helpful with each other. Students were also perceived as having good behaviour in the sense that they had become more responsible.

Table 8.8: Thematic Network for the Benefits of BID-related Activities from Assessor Interviews

Global Theme	Organising Themes	Basic Themes
Benefits of BID-related Activities	Knowledge acquisition	Declarative knowledge <ul style="list-style-type: none"> - Students are exposed to prospects in BID related areas - Students acquire in-depth knowledge related to BID
	Procedural Knowledge	Students gain better knowledge of how to do BID tasks
	Skills acquisition	Technical skills: Specialist skills <ul style="list-style-type: none"> - Students get more practice - They become more accurate in measuring - They could increase skills - Students gain experience doing authentic tasks in real life situations - They could apply what they’ve learnt in class - They could use new techniques and equipment - They gain confidence of their ability
		Non-technical skills: Personal flexibility (adaptive & adaptability) <ul style="list-style-type: none"> - Students are more independent - Students could apply what they’ve learnt in class
Behavioural Engagement	Non-technical skills: Interpersonal skills: transformative <ul style="list-style-type: none"> - Students are able to help other students 	
		Positive conduct <ul style="list-style-type: none"> - Students become more responsible

The following thematic network in the assessor interviews as shown in Table 8.9 consists of *global theme* “benefits of CAMC of BID”, four *organising themes* and fifteen *basic themes*. Assessors were aware of students’ ability in acquiring knowledge and skills and, developing student engagement through doing BID tasks. Assessors realised that CAMC of BID had managed to some extent prepare students with relevant knowledge, skills, attitudes and behaviour for employment, further education and training or business. They could observe the changes that took place in students’ behaviour, from those who did not have that much interest in school to those who were dedicated and committed to their BID tasks. Students who were once perceived as being slightly mischievous and playful became responsible, reliable, tolerant, patient, concerned, diligent, careful and cooperative. Students were noticed to be present at school most of the time to do BID tasks and thus, their attendance had improved tremendously. They seemed to be much neater and tidier in their appearance and also work. Students appeared to be happy in school and enjoyed doing BID tasks. In addition, they showed much interest in BID and put a lot of effort into ensuring that they accomplished the BID tasks satisfactorily. They seemed to be creative and motivated to accomplish BID tasks and invest in further training. These obvious constructive transformations in students were perceived by the assessors as positive outcomes of CAMC of BID. The assessors believed that CAMC of BID had in some ways contributed to the positive changes in students.

Hasli: “... students are able to apply accuracy in measurement....”

Maz: “My students understand BID tasks substantially and if they don’t, they’ll ask immediately.....”

Hans: “... students are creative, they could come up with beautiful patterns for the wall tiles”

Pete: “Students always come to school to do their BID tasks.....”

Rusdi: “I’m so glad to see such big changes in my students’ attitudes and behaviour. Last year, there’s this student who was always disturbing other students and could

not stay put for a second. But now he has become responsible and reliable. Instead of disturbing, he's now helping his friends. It's a 180° change but for the better....”

Nuri: “.....students are happy and motivated to do BID tasks. They have developed good attitudes and characters for the past one and a half years....”

Table 8.9: Thematic Network for the Benefits of CAMC of BID from the Assessor Interviews

<i>Global Themes</i>	<i>Organising Themes</i>	<i>Basic Themes</i>
Benefits of CAMC of BID	Knowledge acquisition	Declarative knowledge <ul style="list-style-type: none"> - Students understand BID tasks - Students are able to identify tools and materials Procedural Knowledge <ul style="list-style-type: none"> - Students know the right procedures to do BID tasks - Students know how to use the tools and materials
	Skills acquisition	Technical skills: Specialist skills <ul style="list-style-type: none"> - Students are able to apply accuracy in measurement - Students have strong belief in their ability Technical skills: Thinking skills <ul style="list-style-type: none"> - Students are more creative Non-technical skills: Personal flexibility (adaptive) <ul style="list-style-type: none"> - Students could apply skills in new situations - Students become more independent Non-technical skills: Interpersonal skills (communication & transformative) <ul style="list-style-type: none"> - Students could develop communication skills - Students become more cooperative - Students are patient - Students are more open-minded - Students are more tolerant - Students develop team-working spirit
	Student Engagement	Behavioural Engagement: Positive conduct <ul style="list-style-type: none"> - Students become more concern and careful - Students are tidier and neater in their work and appearance - Students have good attendance – sense of belonging - Students become more diligent - Students become more responsible and reliable - Students develop good attitudes and characters Behavioural Engagement: Involvement in learning <ul style="list-style-type: none"> - Full attention was given to BID tasks - Need to be diligent to do the tasks - Have the spirit to personally do the tasks

Table 8.9: continued

	Emotional Engagement (Affective reactions)
	- Students could increase interest in BID
	- Students are patient
	Emotional Engagement (Sense of belonging)
	- Feel lucky to be in BID class
	- Proud to be in BID class
	- Feel respected by friends for the ability developed in BID
	Cognitive Engagement (Self-regulation)
	- Students could plan their work strategically and become creative
	- Students become more competitive to increase their skills
	- Students have strong belief in their ability
	Cognitive Engagement (Investment in learning)
	- Students become more enthusiastic
	- Students get motivated to invest in further training
Opportunities	Work
	- BID-related job
	Further education & training
	- Further education
	- Further training
	Open small business

8.6 Analysis of Portfolio Reviews

190 portfolios were reviewed and all of these students had prepared relevant work schedules for each completed BID assessment module. However, 16 (.08%) students did not write any comments except for their initials after completing each one of the BID assessment modules. Two initial themes were generated from the reviews of the students' portfolio based on evidence of work planning before starting a BID task such as work flow chart prepared by students and also what they wrote in the comment section of each of the accomplished BID assessment modules: work planning and self-reflection. Later, these themes were refined to just one *global theme* "benefits of CAMC of BID", four *organising themes* and twelve *basic themes*. Table 8.10 illustrates the thematic network.

Table 8.10: Thematic Network for Benefits of CAMC of BID from Portfolio Reviews

<i>Global Themes: Benefits of CAMC of BID</i>		
<i>Organising Themes: Knowledge acquisition</i>	<i>Organising Themes: Skills acquisition</i>	<i>Organising Themes: Student Engagement</i>
<p>Basic Themes: Declarative knowledge</p> <ul style="list-style-type: none"> - Gain knowledge - Gain better understanding of BID - Able to identify tools and materials - Understand how to do BID tasks - Able to understand what has been taught <p>Basic Themes: Procedural Knowledge</p> <ul style="list-style-type: none"> - Learn the right procedures to do BID tasks - Learn how to do the suspended ceiling properly 	<p>Basic Themes: Technical skills Specialist skills</p> <ul style="list-style-type: none"> - Gain skills in doing BID tasks - Gain experience - Able to accomplish BID tasks competently - Complete the tasks according to the procedures - Able to follow the specified procedures in doing the tasks - Able to decorate effectively - Need to be accurate in measurement <p>Thinking skills</p> <ul style="list-style-type: none"> - Need to have creativity to do BID tasks 	<p>Basic Themes: Behavioural Engagement Involvement in learning:</p> <ul style="list-style-type: none"> - Full attention was given to BID tasks - Need to be diligent to do the tasks <p>Basic Themes: Emotional Engagement Affective reactions</p> <ul style="list-style-type: none"> - Happy to do BID tasks - Happy to have accomplished the tasks - Happy to be BID student - Enjoy doing BID tasks - Like BID modules very much - Interested in doing BID tasks - It was a great pleasure to do BID tasks - Satisfied with own performance - Thankful to teachers - Grateful to god for the opportunity to do BID tasks - Very satisfied with the products/outcomes of the tasks - Very happy with the products - Feel satisfied though it was tiring and exhausting - BID tasks are interesting <p>Sense of belonging</p> <ul style="list-style-type: none"> - Proud of the ability to do BID tasks successfully - Proud to be in BID class - Proud to have completed the tasks according to the procedures - Proud to have learnt BID - Proud to have accomplished the tasks satisfactorily - Proud to be a knowledgeable person in BID <p>Basic Themes: Cognitive Engagement Self-regulation</p> <ul style="list-style-type: none"> - Able to prepare work schedules, tools and materials checklist and cost estimation - Able to be aware of own work and try to increase the effort - Able to identify weaknesses to be improved

Table 8.10: continued

		Investment in learning <ul style="list-style-type: none"> - Need to have patience to do the tasks - Tasks are challenging but give a lot of experience - Motivated to excel in the following modules
<i>Organising Themes</i>		
Future plans		
<i>Basic Themes</i> Work	<i>Basic Themes</i> Further training and education	<i>Basic Themes</i> Open small business

Students seemed to have realised the impact of CAMC of BID on their learning and behaviour. They perceived themselves as developing positive attitudes and character through BID tasks. They also noticed that they had acquired relevant knowledge and skills in accomplishing the BID tasks competently according to the prescribed criteria. They said that they were happy and had great time doing BID tasks as they found the tasks to be interesting and challenging. Although tired and exhausted after completing the tasks, they still felt satisfied with their performance. They thought that they had accomplished BID tasks satisfactorily and for that they were grateful to their teachers. Some students were also grateful to god for the opportunity to do BID tasks successfully. Furthermore, students perceived themselves as being proud of being knowledgeable people in BID and had the ability to accomplish BID tasks effectively. They realised that their hard work, attention and effort put into accomplishing BID tasks had paid off remarkably. Students were aware of their own ability and were able to evaluate their strengths and weaknesses. Moreover, they said that they were motivated to do other BID tasks. It seems that these good qualities had been inculcated in students through doing BID tasks. Students perceived CAMC of BID as having positive effects on them especially their state of emotions. They saw themselves as happy students who enjoyed doing BID tasks despite encountering some difficulties along the way. They thought that with the knowledge and skills acquired as well as good characteristics developed through BID tasks, they could pursue further with their future plans in employment, further education and training,

or business. They felt quite confident of their abilities in BID and were looking forward to progress in their future undertakings.

Abby: “I’m able to understand what has been taught by my teacher...”

Hasan: “... finally I learn how to do the suspended ceiling properly...”

Zai: “... sometimes, we need to have creativity to do BID tasks. I’m glad I’m able to decorate the reading corner effectively”

Omar: “It was a great pleasure to do BID tasks and I’m satisfied with my own performance....”

Tan: “I’m so proud of my ability to do BID tasks successfully and I’m motivated to excel in the following modules...”

8.7 Conclusions

This chapter has presented the qualitative data analysis undertaken in the study. Four sets of qualitative data were analysed manually using an adapted analytic process suggested by Spencer et al. (2009), Attride-Stirling (2001) and Lincoln & Guba (1985). The analyses showed that both the students and the assessors perceived CAMC of BID as a positive experience for the students. They believed that CAMC of BID had managed to develop students’ favourable attitude and behaviour in addition to the apparent acquisition of knowledge and skills. They thought that this assessment programme to some extent had succeeded in providing interesting, encouraging and stimulating learning environment in which competence might have been promoted inevitably. Despite having some difficulties with some students in its initial implementation, CAMC of BID was perceived to be the driving force for the changes taking place in students. Students who were in the beginning seen as

annoying and incapable of doing BID tasks were noticed to have made tremendous changes in their attitudes, behaviour and appearance after undertaking BID for the past one and a half years. They had become responsible, reliable, trustworthy and diligent which came as a surprise to the assessors. The assessors did not anticipate such enormous transformations could have taken place in such short time. Nevertheless, the assessors were pleased to see the positive changes. Both students and assessors had positive views of CAMC of BID in preparing students for future prospects. They thought that the students were well-equipped with relevant knowledge, skills and attitudes to pursue further in BID-related areas: employment, further education and training or business. Further discussion on the findings of this study is in the following chapter.

Chapter 9

Research Findings

9.1 Introduction

This chapter discusses the findings of the study and the proposals emerging from the study. The first part discusses the impact of CAMC of BID on employability, the factors influencing employability, issues related to gender and ethnicity, perceptions of employability and competence as perceived in CAMC of BID. The second part looks at the methodology and the proposed Predictive Employability Profile (PEP). The chapter ends with some possible implications of the findings. The structure of this chapter is as shown in Figure 9.1.

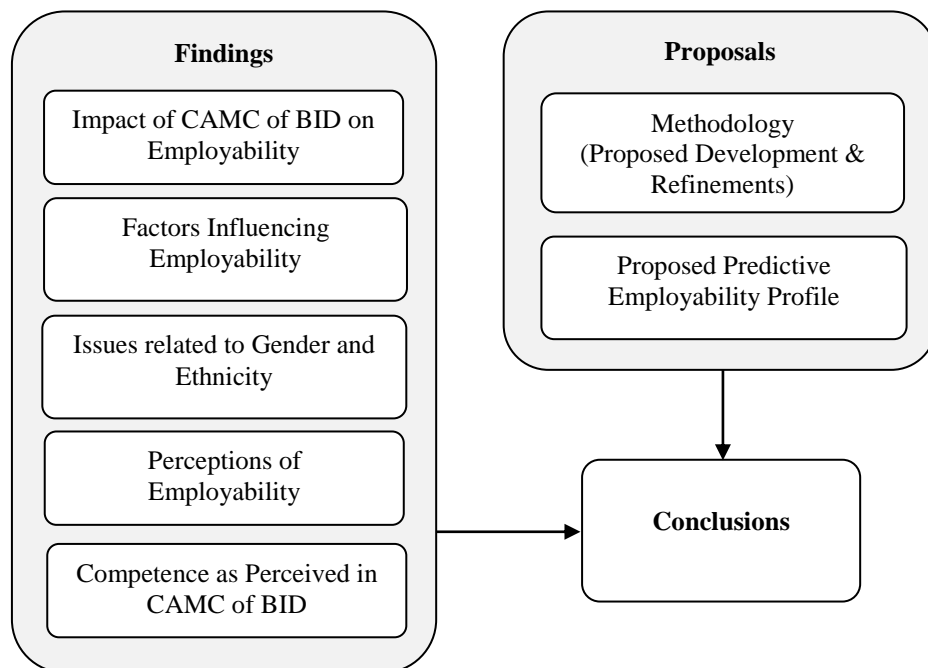


Figure 9.1: The Structure of Chapter 9

9.2 The Impact of CAMC of BID on Students' Employability

As introduced in an early part of the thesis, employability is the capability to obtain and maintain employment which depends on an individual's knowledge, skills and attitudes and how these are deployed to best effect. Employability is influenced by such knowledge and understanding, skilled practice, beliefs and motivations that the individual brings to the task (Knight & Yorke, 2004). In this study five dimensions of employability were derived: Organisation Sense, Occupational Expertise, Anticipation & Optimisation, Personal Flexibility and Affective Reactions; and their respective contributions to students' achievement are the primary focus of this chapter. Figure 9.2 illustrates the contributions of the dimensions of employability to students' success as perceived by the students and the assessors.

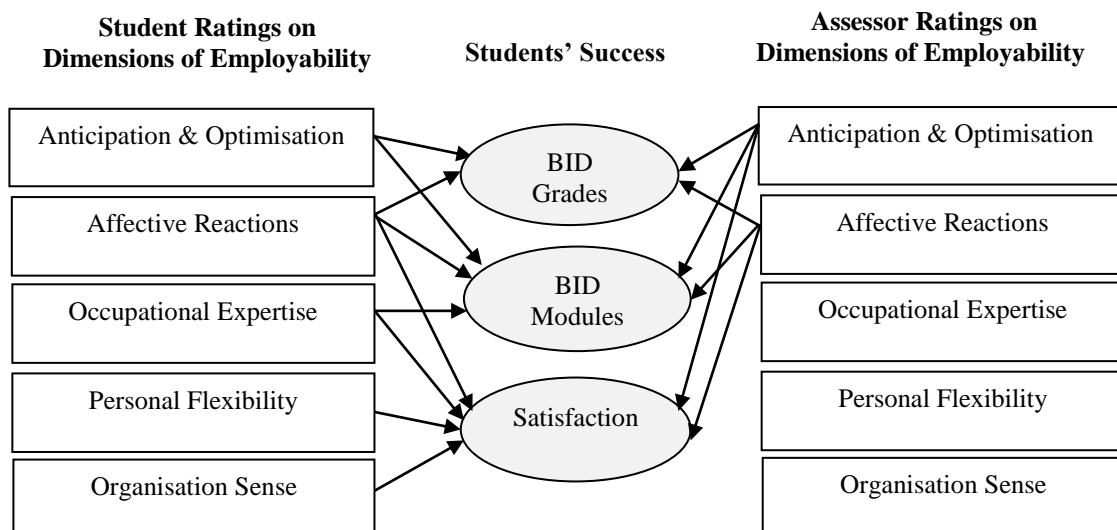


Figure 9.2: Contributions of Dimensions of Employability to Students' Success

9.2.1 The Impact of Occupational Expertise

The results of this study indicated that students perceived Occupational Expertise as an important contributor to the accomplishment of the BID assessment modules (Table 7.25) and their satisfaction (Table 7.29). This finding was partially in agreement with the findings of the Indic@tor project (2005) which showed that

Occupational Expertise had contributed to objective success. The likely explanation for this is that students perceived these job-specific and hands-on skills which also incorporated knowledge and understanding to be essential in making sure that BID tasks were carried out properly. This is evidenced in the responses to the open-ended question, student interviews and portfolio reviews where students acknowledged the need to have necessary knowledge and skills to do BID tasks and how, at the same time, they had acquired relevant knowledge and skills from doing BID tasks. But contrary to the Indic@tor project (2005), what is noteworthy in this study is that the students also perceived Occupational Expertise as contributing to their feelings of satisfaction in accomplishing the BID tasks satisfactorily: they saw themselves as able to acquire relevant knowledge and skills during the completion of the BID tasks.

The assessors' collective view seems ambiguous. On the one hand they claimed (in the interviews) that the students' acquisition of knowledge and skills was essential for accomplishment of the BID tasks and yet their responses in the survey suggested otherwise (Tables 7.26, 7.28 and 7.30). There are at least two explanations for this anomaly. One is that the research instrumentation was insufficiently insensitive. Specifically, one well-established shortcoming of interviewing is the social desirability response which may or may not be induced by the cultural similarity of the interviewer and the interviewee (Oppenheim, 1992). On the other hand, that there can be a disjunction between what people actually do and what they say they do is another well-established phenomenon (Argyris & Schön, 1974). Nevertheless, the overall finding that Occupational Expertise is important is consistent with the wealth of literature which attests to the inculcation of expertise in whatever domain to be desirable (Feldon, 2007; Schraw, 2005). This dimension of employability reflects competence in perceptual, cognitive and motor skills (Carlson et al., 1990; Salthouse, 1986) and is consistent with findings of other studies (Gurvinder Kaur & Sharan Kaur, 2008; Mohamad et al., 2009; Ramlee, 2002); suggesting that BID students are potential employees who have acquired sufficient and relevant technical skills required by the employers.

9.2.2 The Impact of Anticipation & Optimisation

Students in this study perceived Anticipation & Optimisation to be contributing significantly to the accomplishment of BID assessment modules and passing the BID MCE exam (Tables 7.25 and 7.27), which contrasts with findings in the Indic@tor project (2005). The students perceived Anticipation & Optimisation as the driving force to keep working on the BID tasks till completed regardless of any problems encountered along the way. They believed that perseverance and considerable effort resulted in successful task accomplishment, even when tasks were very challenging. The results of their determination and diligence appeared to increase their self-efficacy beliefs; of itself a non-surprising finding given the considerable evidence for the mastery of knowledge and skills motivating and encouraging further endeavour (Bandura, 1977; Liem, Lau, & Nie, 2008; Usher & Pajares, 2006; Zimmerman, 2000). Indeed in a study of more than 100 apprentices in Switzerland (Breuer & Eugster, 2006), in vocational education programmes which positioned learners in comprehensively authentic situations, statistically significant effects over time in the development of self-monitoring and self-regulation were found. While the students in this current study did not perceive Anticipation & Optimisation as contributing significantly to their subjective success, although the assessors did (Tables 7.26, 7.28 and 7.30), it is important to distinguish between finding a task satisfying and finding a task enjoyable. In other words while satisfied with their achievements, they didn't essentially find the experience enjoyable. The growing literature on the importance of worthwhile learning being understood as effortful (Bereiter, 2002) means that tasks which are perfectly appropriate may not be enjoyable, and whether or not the students found the tasks immediately enjoyable is probably less important than that they develop personal interest in the BID tasks, which then sustains them in the face of difficulty (Hidi, 2006; Krapp, 2005). Their investments in learning, together with their mastery of knowledge and skills (Newmann et al., 1992; Wehlage et al., 1989), were found to impact positively on their achievements. Such a positive personal attribute was perceived to be important by both employers and employees in Malaysia (Latisha & Surina, 2010), indicating students' potential to be employable.

9.2.3 The Impact of Affective Reactions

Students' Affective Reactions, a dimension of employability emerging from this study, contributed to their accomplishment of BID tasks, to their exam achievements and to their feelings of satisfaction. Students perceived emotional well-being and stability in BID classes as important (Tables 7.25, 7.27 and 7.29) as did the assessors (Tables 7.26, 7.28 and 7.30). Interest is a likely explanation, as mentioned above, which may well stimulate the excitement and enjoyment they reported (Tsai, Kuntera, Lüdtkea, Trautweina, & Ryan, 2008; Van Yperen, 2003). They realised that they could reduce stress and fear of working on tasks through doing BID-related activities as well as developing team skills. Since emotional health and well-being are considered important personal qualities (Connell & Wellborn, 1991; Skinner & Belmont, 1993; Wentzel et al, 2004) it is not surprising that they would be desired in prospective employees (Latisha & Surina, 2010).

9.2.4 The Impact of Personal Flexibility

Personal Flexibility (the ability to be adaptive and adaptable) was also seen to contribute significantly to students' satisfaction only (Table 7.29), as evidenced in the analysis of the qualitative data. This finding was similar to the Indic@tor project (2005) in the contribution of Personal Flexibility to subjective success but did not conform to its contribution to objective success. It may be that students perceived their ability to be adaptive and adaptable as essential only in ensuring their satisfaction and not their objective success. Initially, students thought that they had acquired technical skills but later realised that they had also acquired non-technical skills through doing BID tasks as they felt that they were able to apply the knowledge and skills acquired in BID class to other BID-related activities. The assessors recognised Personal Flexibility as having substantial influence on students' performance in BID but did not perceive it as significantly contributing to any one of students' achievements. However, they acknowledged students' ability to apply what they had learnt in BID class to new situations such as the BID-related activities.

Personal Flexibility can be thought of as a tacit skill, the effects of which are context dependent (Evans, Kersh, & Kontiainen, 2004; Gokuladas, 2010). It is therefore not surprising that it may be regarded by some as of trivial importance (Lai & Lo, 2008). However, as a theoretical issue, it does need to be explored in order to highlight its importance (Budría & Telhado-Pereira, 2009). Methodologically, in this study, the lack of clarity may be a function of instrumentation which was insufficiently probing along the lines of the ideas offered by Harvey & Green (1994) and Haskell (2001). Nevertheless, such evidence as there was of Personal Flexibility suggested it to be a valuable dimension.

9.2.5 The Impact of Organisation Sense

Like Personal Flexibility, Organisation Sense was perceived by students to be contributing significantly to students' satisfaction only. This finding was slightly different from the findings of the Indic@tor project (2005) where corporate sense was seen to be contributing the most to the employees' career success. This rather contradictory finding may be due to students' perception of their participation in school-related activities as not being important in determining their objective success. However, further examination of student interviews explained that participation in BID-related activities had a lot of benefits for students: acquiring relevant knowledge and skills, developing good characteristics, gaining more hands-on practice through the activities which could increase their skills. The assessors too acknowledged the experiential benefits to students of their organisational sense though, like the students, did not see it as contributing to successful task completion or exam performance. The realisation that embracing the perspectives of the organisation can bring individual benefits is consistent with other studies such as those of Al-Emadi & Marquardt (2007) and Halm (2011). Rather like Personal Flexibility, it seems that Organisational Sense does not yet have the recognition that it appears to deserve and which studies are cumulatively highlighting as important (Latisha & Surina, 2010; Gurvinder Kaur & Sharan Kaur, 2008; Mohamad et al., 2009; Ramlee, 2002)

9.2.6 The Overall Impact

These findings suggested that all five dimensions of employability had contributed significantly to students' success. Anticipation & Optimisation and Affective Reactions were significant contributors to all of students' success (accomplishment of BID assessment modules, BID MCE grades and satisfaction) but particularly, to objective success. It can therefore be assumed that students who had fairly developed cognitive and emotional engagement were more likely to succeed in achieving the objective success. It also implies that sound inner well-being, strong determination and reasonable happiness may help students to perform well. These two seemingly volatile dimensions of employability somehow appeared to be overriding the other three dimensions of employability. Even Occupational Expertise was perceived only by students as contributing significantly to students' accomplishment of BID assessment modules and satisfaction. These findings confirm the suspicion that the hitherto non-emphasised matters of Personal Flexibility and Organisation Sense do require further research. It is possible that students and assessors, although acknowledging the important of these attributes, do not consider them as crucial in ensuring students' success. We therefore need to better understand the nature and facilitation of students' ability to be more adaptive, adaptable, and cooperative. While possible future research is implied by this conclusion it is nevertheless possible to claim that all five dimensions of employability had some roles to play in students' acquisition of knowledge and skills and development of student engagement at various levels of importance. This finding, while preliminary, suggests that CAMC of BID to some extent has been able to prepare students with relevant employability portfolio asset as described by Hillage & Pollard (1998), and provides a possible answer to **RQ3: What are the dimensions of employability incorporated in competence-based assessment of BID?**

By way of summarising the validity of the dimensions of employability, it is useful to invoke the quality criteria proposed by Baartmen et al. (2007) who emphasise that it is the validity of the assessment as a whole, rather than as an assemblage of parts, that needs to be considered in competence-based assessment. Table 9.1 shows the matching of the findings of the study with the quality criteria.

Table 9.1: Matching the Findings of the Study with Quality Criteria

Criterion	Findings of the Study
Authenticity	Students and assessors perceived BID task as representing the actual tasks where students were required to apply relevant knowledge and skills to accomplish them. Students had to do finishing of interior space: floor, wall and ceiling. Furthermore, students had to do some decorations such as flower arrangement, table set up and so forth. These tasks required certain level of competence which would be used in building and interior design.
Cognitive Complexity	Students and assessors acknowledged that students needed to have declarative, procedural and conditional knowledge to do BID tasks. Both also recognised the need for the students to be creative at times and students demonstrated creativity in some of the tasks.
Comparability	Students and assessors believed that BID tasks were carried out as much as possible under suitable conditions where equipment and material were sufficiently provided and the workplace was suitable enough for all students to work in.
Costs and Efficiency	The time allocated (organisational factor - time dimension) for BID was found to be sufficient for students to accomplish the tasks. Likewise, the facilities provided in terms of equipment, materials and workplace (organisational factor – equipment/material sufficiency, workplace suitability) were seen by both the students and assessors as adequate. Both the students and assessors perceived students as having the ability to learn and do BID tasks successfully.
Directness	Assessors expressed satisfaction with students’ ability to demonstrate competence through observable and measurable behaviours. Students showed interest in BID by paying attention to the teacher in BID classes and putting a lot of effort in accomplishing the tasks. Students demonstrated positive conduct by carefully following the safety rules and regulations in the workplace. Students demonstrated creativity through the product of their work. Thus, assessors assessed students on demonstrated behaviour, using low-level inference.
Educational Consequences	Students and assessors perceived CAMC as beneficial for students as they could acquire relevant knowledge and skills and develop student engagement that might also be useful in their future undertakings.
Fairness	CAMC of BID was perceived by students as suitable for boys and girls. It has been implemented in rural and urban schools where students of different ethnicity groups were given the opportunity to learn BID. Students and assessors were aware of the main concern of CAMC of BID and that is students’ knowledge, skills and attitudes that should be looked into for development
Meaningfulness	Students and assessors felt that CAMC of BID had been beneficial to the students as the knowledge and skills acquired and the engagement developed had prepared them for future opportunities such as employment, further education and training, and business.

Table 9.1: continued

Reproducibility of Decisions	This study did not explore in-depth the reliability of the assessors' decision and judgement on students' performance. However, from the responses provided by the students in the open-ended question, interviews and portfolio reviews, it could be deduced that students were satisfied with the assessors' judgement to the extent that they appreciated their assessors' guidance.
Transparency	The assessors received training on how to use the BID assessment modules from MES. Students were aware of the scoring criteria in CAMC of BID as they were given the pre-determined criteria of each BID assessment module before starting to work on the tasks. The assessors would explain the purpose of CAMC of BID and the criteria to the students until they really understood what to do. Based on the adapted model of CAMC (Figure 1.2), the school administration and MES with its monitoring system, CAMC of BID should have the appropriate transparency.

In summary, it seems that CAMC of BID can be effective in preparing students with adequate and relevant knowledge, skills and attitudes for their future employment, further education and training, or business. The authenticity of the BID tasks appeared to make the tasks more interesting and meaningful to the students, and the tasks were perceived as useful in creating a context to develop relevant knowledge and transferable skills. The cognitive complexity of BID tasks seemed to induce more strategic planning by the students. They showed interest in doing BID tasks, perceiving them as motivating and challenging and perceiving themselves as having the ability to evaluate and identify their strengths and weaknesses in BID. They seemed to be aware of the improvements to be made in the following BID modules. As students seemed to experience the consequences of CAMC of BID positively, it is suggested that the consequential validity of the tasks and instruments was good. It is also implicit in the foregoing discussion that criterion-related validity was at least adequate. However, this study represents only a start in understanding the relationship between CAMC of BID and students' employability.

9.3 Factors Influencing Students' Employability

Three factors (individual, job-related and organisational) influencing students' employability were explored in the study. The job-related factors (Learning Value

and Working Experience) contributed most to the dimensions of employability followed by organisational factors (Time Dimension, Opportunity, Assessor-Student Exchange and Workplace Suitability), and individual factors (Flow). This finding differed from the Indic@tor project (2005) where individual factors contributed most followed by organisational factors and job-related factors. Unlike the ICT employees who exercised substantial control over their employability, BID students seemed to depend on schools to provide proper and adequate learning and working environment, facilities, opportunities and services in order to foster students' development of relevant employability skills. BID students who still seem immature might need support from teachers and school to nurture personal responsibility for learning and subsequently to develop essential employability skills. Nevertheless, students did not deny that they too had some role to play in developing their employability which could be seen in their suggestions for improvement, in the interviews.

9.3.1 The Influence of Individual Factors

Figure 9.3 illustrates the influence of the Individual factors on the dimensions of employability. Among the Individual factors, Flow was found to be related to all of the dimensions of employability at entry (Organisation Sense, Occupational Expertise, Anticipation & Optimisation, Personal Flexibility and Affective Reactions) and to two dimensions of employability in the final model (Organisation Sense, Occupational Expertise). This finding was consistent with the Indic@tor project (2005) where flow was found to make the strongest contribution to, and had greatest impact on, employability dimensions. Flow may explain the relatively good correlation between students' attitudes and their employability. It may be that these students had benefitted from CAMC of BID and developed positive attitudes that somewhat affected their cognitive and emotional engagement, knowledge, technical and non-technical skills and behavioural engagement. Another possible explanation for this might be that students possessed personal qualities that enabled them to perceive CAMC of BID positively.

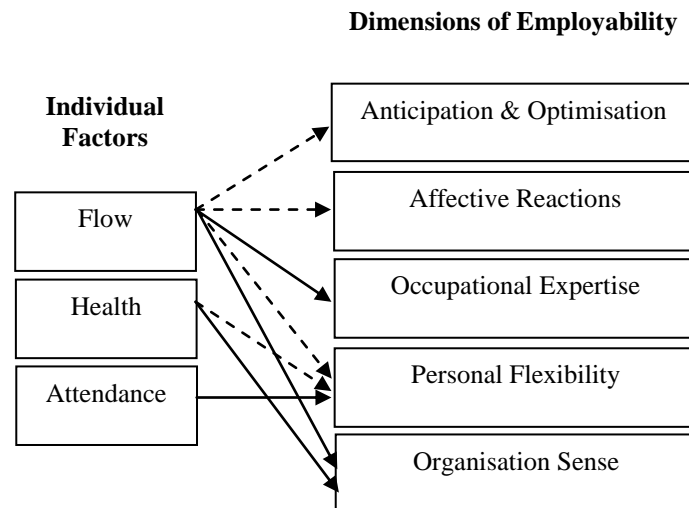


Figure 9.3: The Influence of Individual Factors on Dimensions of Employability

--▶ significant at entry

—▶ significant in the final model

Health was related to Organisation Sense and Personal Flexibility at entry while only with former in the final model. It appears that health had some moderate impact on students' employability and this finding was similar to the Indic@tor project (2005). Students perceived health as contributing to behavioural engagement and non-technical skills. They felt that being healthy influenced their participation in school related activities and their ability to be adaptive and adaptable in the class. A possible explanation for this might be that students were able to actively participate in the activities and be adaptive and adaptable when they were physically healthy and not being sick. However, health was not perceived as having influence on students' cognitive and emotional engagement, knowledge and technical skills. It may be that students felt that they could be in control of these aspects of employability regardless of their health condition.

Attendance was found to be related only to Personal Flexibility which means that it had the least effect on students' employability. Students perceived their attendance as affecting only their ability to be adaptive and adaptable. It would be inaccurate to interpret this as meaning that school attendance had no effect on engagement as students did attend school for most of the time (Table 7.41). It seems possible that whenever students were present at school, they were able to accomplish the BID

tasks which could have helped them pass the BID exam and made them feel satisfied without realising it. However, one school with attendance of 90% had students completing fewer than nine BID assessment modules while another school with attendance of 62.5% had students completing twelve BID assessment modules (Table 7.42). These results were slightly contrary to expectations and there may be various reasons for it. One likely reason for students in school with attendance of 62.5% accomplishing twelve BID assessment modules was that they might have been absent from school on the days when they did not have BID. Being present on the days when BID was taught, would allow them to accomplish the tasks. It seems that students' attendance which was taken daily did not show accurately the influence it had on students' employability. It might have been more accurate to look at students' attendance in BID class only but such record was not available in school as students' attendance was recorded only once every day. Students who attended school for the day were expected to be present in school for the rest of the day unless in case of emergencies where the parents or the guardians could take them home before school ended. A possible explanation for students in school with attendance of 90% were unable to accomplish many assessment modules was that there was probably no replacement assessor to carry out the assessment even when there might be a replacement teacher when the BID teacher was on a long leave such as maternity. The replacement teacher might not have relevant and required qualification to assess BID and therefore was not appointed as the assessor.

9.3.2 The Influence of Job-related Factors

It was found in the study that Learning Value had to some extent influenced all of the dimensions of employability except for Affective Reactions. This finding was in agreement with the findings of the Indic@tor project (2005) which showed that Learning Value contributed consistently to the dimensions of employability. It was perceived to have had some effects on students' cognitive and behavioural engagement, knowledge, technical and non-technical skills but not so much effect on their emotion. On the other hand, Working Experience was perceived to be

influencing only the Affective Reactions. Figure 9.4 shows the influence job-related factors had on the dimensions of employability.

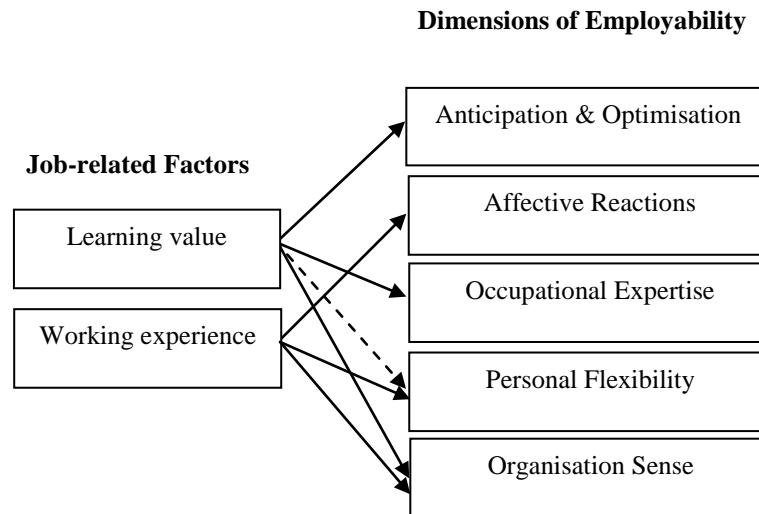


Figure 9.4: The Influence of Job-related Factors on Dimensions of Employability

-- ► significant at entry

— ► significant in the final model

This study found that Learning Value was essential in developing the capability to be employable and this was acknowledged by the students. It is possible therefore, that students had attained valuable knowledge and skills through BID tasks which subsequently contributed to their employability. In general, therefore, it seems that students were more motivated, knowledgeable and skilful, adaptable and adaptive, and participative when they adequately possessed some values of learning. This may imply that students' understanding and experiences gained in CAMC of BID had to some extent enabled them to acquire relevant employability skills. Students' Working Experience outside BID class was found in this study to be influencing students' state of emotions, personal flexibility and organisation sense. It seems that students had the ability to be more accepted in BID classes when they had acquired more experience working on BID-related tasks. It is difficult to explain this result, but it might be related to the effect that Working Experience had on students' level of confidence in doing BID tasks which had enabled them to be comfortable around people. However, this study has been unable to demonstrate that students' Working

Experience influences their motivation, knowledge and skills. A possible explanation for this might be that students were socialised through their Working Experience. Working Experience may seem to be contributing to some extent to students' employability as students who had some external working experience related to BID could be perceived to be employable for their emotional stability as they could relate themselves to their friends much better, feel they belonged to the group and were happy with their surroundings.

9.3.3 The Influence of Organisational Factors

Generally, students perceived most organisational factors as having some impact on their employability. The influence of organisational factors on the dimensions of employability as perceived by the students is shown in Figure 9.5. Among the organisational factors, Workplace Suitability was perceived by the students to be influencing their employability most as it was related to four dimensions of employability; Affective Reactions, Occupational Expertise, Personal Flexibility and Organisation Sense. The assessors on the other hand, did not perceive Workplace Suitability as important or necessary contributor to employability. Figure 9.6 shows the influence of the organisational factors on the dimensions of employability as perceived by the assessors. There are several possible explanations for this difference in views between the students and the assessors. One is that students felt comfortable when working in a workplace that was appropriate which could perhaps promote students' learning, increased ability to be adaptive and adaptable, and enhanced attachment and commitment towards BID class. Moreover, a learning environment that facilitated team work among students might have also helped enhance students' commitment towards the organisation's demands. Students even suggested in the interviews that school should provide more suitable workplaces for them to improve their employability. Another possible explanation might be that the assessors perceived students' inner driver to be more important in promoting their employability rather than the physical workplace as BID tasks could also be carried out elsewhere besides the workplace. Nevertheless, their motivation was somehow

seen as not affected by the suitability of the workplace. The reason might be that the BID tasks were perceived as interesting enough to motivate students.

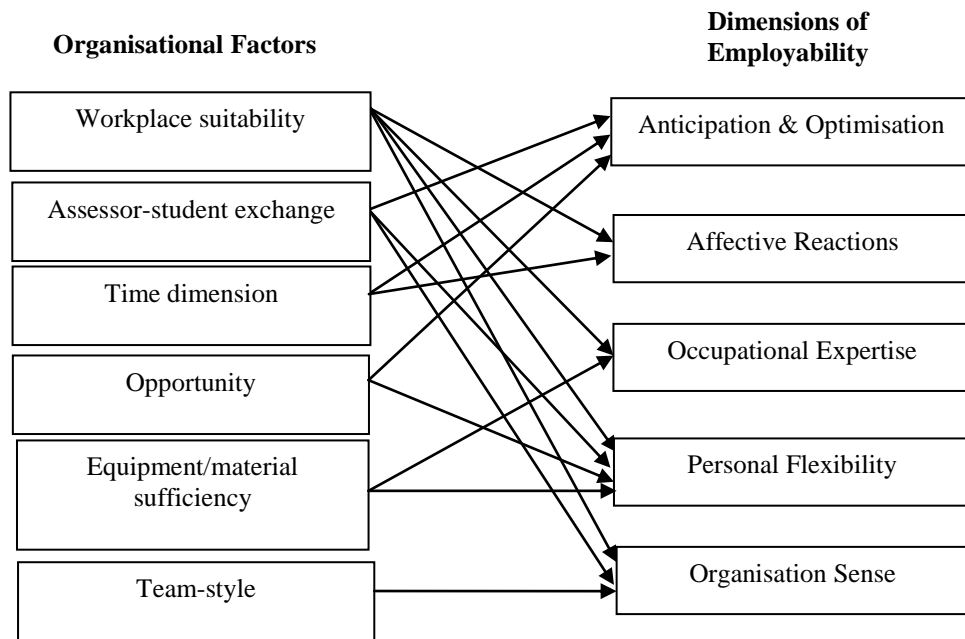


Figure 9.5: The Influence of Organisational Factors on Dimensions of Employability as Perceived by Students

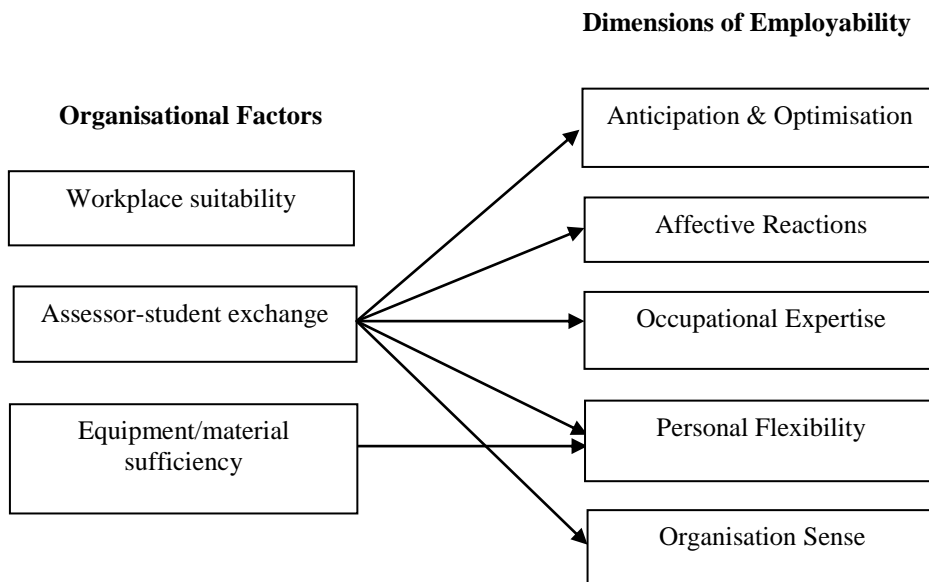


Figure 9.6: The Influence of Organisational Factors on Dimensions of Employability as Perceived by Assessors

The quality of the relationship between assessor and students was perceived by both as influential. Students perceived it as influencing three dimensions of employability: Anticipation & Optimisation, Personal Flexibility and Organisation Sense while the assessors perceived it as influencing all five dimensions of employability. Students who had good rapport with their teachers who were also their assessors appeared to have high perceived employability. This finding was consistent with the findings in the Indic@tor project where the quality of the relationship with the supervisor made the strongest contribution to the employability scale. Students felt that they were motivated to do BID tasks, be adaptive and adaptable, and be cooperative when they had good relationship with their teachers. Likewise, the assessors perceived such strong and healthy relationship to some extent as enabling the students to retain high motivation, enjoy teaching and learning, acquire relevant knowledge and skills, be adaptive and adaptable, and develop team-work spirit. This finding may be explained by the fact that teacher-student relationship was still perceived as virtuous and highly regarded in Malaysian culture. Both students and assessors perceived such reciprocated relationship conducive to a learning environment in which students were able to do BID tasks successfully. It may also be that the BID students benefitted from a good relationship with their teachers as they were able to discuss/seek guidance and feedback from the teachers without hesitation. Consequently, the students gained confidence and were motivated to do BID tasks. Although students might be able to acquire relevant employability skills without having a good relationship with their teachers, this study found it to contribute to students' perceived employability.

In contrast to the Indic@tor project, Time Dimension was perceived by students to be influencing Anticipation & Optimisation and Affective Reactions. Sufficient allocation of time for BID class was seen to improve student motivation and feelings of accomplishment. The reason for this difference is not clear but it may have something to do with students being in school environment and their feelings of reassurance of completing BID tasks within the BID periods as they perceived the time allocated as sufficient. They seemed to be calm and relaxed to do BID tasks

within the timeframe provided and subsequently had the motivation to accomplish the tasks.

Students perceived opportunities provided by school as influencing Anticipation & Optimisation and Personal Flexibility. There were similarities between the influence of opportunity on students' employability in this study and those described in the Indic@tor project (2005). This consistency may be due to the positive views both students and the ICT employees had on the opportunities provided by the organisations to enhance their employability. Students thought that when they had the chance to do other BID-related activities in school, they might be motivated. This was evinced in the interviews where students acknowledged the effect of such opportunity on students' motivation. They perceived themselves as being highly motivated when given the opportunity to do other BID-related activities. Furthermore, both students and assessors recognised the impact BID-related activities had on students' Personal Flexibility. Students were seen to be independent and able to apply what they had learnt in class in new situations. This may indicate that when schools could provide further opportunities to do BID-related tasks, students might be able to further develop motivation and personal flexibility.

Equipment-Material Sufficiency was perceived by students to be influencing Occupational Expertise and Personal Flexibility. It may be that students had benefitted from the sufficient supply of quality equipment and material provided by schools in developing their specialist skills and Personal Flexibility, a point which the student interviews acknowledged. In other words decent facilities in real life working situations, allow students to develop knowledge, technical and non-technical skills in BID. However, the assessors did not perceive an adequate supply of equipment and materials as critical in influencing students' employability. A possible explanation might be that the assessors perceived sufficiency of equipment and material as affecting only students' ability to apply what they had learnt through the use of proper equipment and materials in the BID tasks in new situations. Team-style was perceived by students as contributing the least to their employability as it was only related to Organisation Sense. This finding seems to be consistent with the

Indicator project (2005) which found team-style as making the least contribution to the ICT employees' employability. Nevertheless, students perceived working as a team to be important in the development of their Organisation Sense. The team-style might have been acquired by students through doing BID tasks. This is evidenced in all sets of qualitative data where students and assessors perceived students as having acquired these transformative skills. Although perceived as least contributing to students' employability, team-style still had some importance in developing one of the interpersonal skills.

Generally, these findings suggest that students and schools have roles to play in developing relevant employability skills among students undertaking CAMC of BID. The factors explored and identified in this study were perceived to be contributing to the dimensions of employability utilised in this study. The job-related and organisational factors were perceived to be influencing students' employability more than the individual factors. An implication of this is that students relied on the assessors and schools to provide learning environment that could enhance their employability. These results provide some evidence to answer the first part of **RQ4: What are the factors that influence students' employability** while the second part of the question, **are there any differences in the strength and pattern of the relations between these factors and the employability of students of different gender and race** is discussed in the following sections.

9.4 Gender Issues Related to Students' Employability

Although the female enrolment in occupationally-specific vocational programmes has improved over the years (Vetter & Hickey, 1985), male students still seem to have better opportunity in classroom interactions at all grade levels and in all subject areas (Sadker & Sadker, 1985; Francis, 2000; Stromquist, 2007). Similarly, many might perceive BID as being more suitable for male than female students as the tasks required vigour, strength and physical exertion. Male students somehow had always been associated with these seemingly exhaustive and strength related tasks (Connell, 1996; Valvidia, 2006; Stromquist, 2007). Furthermore, they had always been seen as

capable of performing better than the female students in the hands-on and heavy duty tasks (Connell, 1996; Valvidia, 2006; Stromquist, 2007). Similarly, as BID tasks involved such requirements, many might think that male students might have performed better than female students (Connell, 1996; Valvidia, 2006; Stromquist, 2007). Subsequently, better performance was commonly perceived as contributing to better employability. The same misconceptions might have been perceived in students undertaking CAMC of BID. Contrary to expectations, this study did not find a significant difference in the ability to accomplish BID tasks between male and female students.

In this study gender was not perceived as affecting students' employability (Table 7.11). Perhaps students now have positive perceptions of employability that are somewhat free from gender-related stereotyping phenomena. This is evidenced in the responses provided to the open-ended question in the Student Questionnaire where most students perceived BID tasks as being suitable for both male and female students. Most of them thought that female students were as capable as the male students in accomplishing BID tasks. Furthermore, they thought that BID tasks were not burdensome for female students to do. However, there was one student who said that BID tasks on the ceiling might not be suitable for female students to do as carrying heavy tools and materials were required. This difference may be due to the student's own inability to do the task and thus reflected in her view. Other than that, most students believed that gender was not really an issue in accomplishing BID tasks. This is evinced in students' responses to the open-ended question in the Student Questionnaire.

Jamal: "... boys and girls could do BID tasks satisfactorily"

Farid: "Seeing the girls in my class do the BID tasks, I realise that even girls could learn and do what used to be a man's job"

Raina: "Girls are capable of doing tasks which are often associated with boys"

In addition, the assessors did not discriminate between students according to gender when giving responses in the interviews. The responses about the students and their ability were generally positive. The lack of difference between male and female students in accomplishing BID tasks was surprising as construction courses have always been dominated by male students and under represented by female students due to occupational segregation (GEO, 2010), but was reassuring in terms of the instrumentation. This finding suggests that students regardless of their gender might have acquired relevant employability skills related to BID. It can therefore be assumed that CAMC of BID is suitable for both male and female students and has been effective in preparing them with relevant knowledge and skills.

9.5 Ethnicity Issues and Students' Employability

Work ethic among different ethnicities is various in Malaysia (Hirschman, 1986; Abdullah and Pedersen, 2003; Omar, 2005; Guinee, 2005) and thus the study explored this issue among students undertaking CAMC of BID whilst taking into consideration the sensitivity of this issue in Malaysia. In general, it seems that ethnicity-related experiences and backgrounds of the students had to some extent influenced the employability scales. The degree of difference between ethnicities nevertheless varies for all dimensions of employability (Table 7.13). Firstly, all students, regardless of ethnicity, felt that they had acquired sufficient knowledge and skills in BID tasks to contribute to the development of Occupational Expertise. In other words, students' development of knowledge and specialist skills was not influenced by their ethnicity-related experiences. They perceived themselves as being able to acquire relevant knowledge and skills related to BID through BID tasks and BID-related activities. Similarly, the assessors acknowledged students' ability to gain knowledge and skills in BID tasks as well as BID-related activities as mentioned in the interviews. The assessors did not mention students from any specific ethnic group but provided responses that represented all of them in general. Secondly, all students developed Organisation Sense to some degree, but there was a small difference between the Malay and the 'Others'. It may be that the close-knit social upbringing and background of Malay students (Marger, 2008; Peoples & Bailey,

2006) generated common cultural patterns and complacency (Hirschman, 1986; Guinee, 2005). Thirdly, there was a small difference for Anticipation & Optimisation between the Chinese, Malay and 'Others' students, suggesting that students of these three groups have different levels of motivation to do BID tasks. Possible reasons include levels of interest, levels of effort and perceptions of school (Hirschman, 1986; Abdullah and Pedersen, 2003; Omar, 2005; Guinee, 2005). Fourthly, the development of Personal Flexibility among students from all four groups of ethnicity differed. A medium effect of difference in students' ability to be adaptive and adaptable among all four groups of ethnicity was identified in the study. Perhaps students' social background inhibited their ability to adapt to necessary changes (Hirschman, 1986; Abdullah & Pederson, 2003). There is challenge in getting accustomed to adjustments involving other ethnic groups while practices confined to one's own culture and traditions are less complex to accommodate. This finding has important implications for developing non-technical skills among BID students as team work, interactions and relationships have already been shown to be important.

Fifthly, all the four ethnic groups developed Affective Reactions at different levels. A large effect of difference in students' Affective Reactions was identified. The reasons discussed previously might apply to this context as well. Students might have difficulties getting along, and trying to fit in, with friends who were from different ethnic and social backgrounds (Hirschman, 1986; Hefner, 2001). Lack of trust and confidence might cause feelings of isolation, at least occasionally, giving rise to anxiety, boredom and lack of interest. That each ethnic group was concerned about, and emphasised the importance of, their state of emotions in the acquisition of employability suggests that interethnic collaboration and cooperation needs to be enhanced in order to reduce the presence of ethnocentrism. Further research is recommended to investigate the issues related to ethnicity and employability in order to understand the relationship between ethnicity and employability better. Because of the multiple perspectives at which ethnicity (and gender) operate, more penetrating analyses of the phenomena are needed to uncover the fundamental structures of both (Collins & Dressler, 2008). Nevertheless, the discussions on issues related to gender

and ethnicity among students undertaking CAMC of BID so far may provide possible answers to the second part of **RQ4**.

9.6 Perceptions of BID Students' Employability

This study found that both students and assessors perceived students' employability positively. It is interesting to note that students and assessors had similar perceptions in three out of five dimensions of employability investigated in this study: Anticipation & Optimisation, Occupational Expertise and Personal Flexibility. There are several possible explanations for this result. One is that students realised the need for them to be motivated to do BID tasks by taking up challenging BID tasks, being hardworking and coping with difficulties positively. It may be that the BID students benefitted from such investment in learning, encouragement and patience in completing BID tasks and also for their future undertakings. Likewise, the assessors perceived Anticipation & Optimisation as essential for students to accomplish BID tasks and also for their future undertakings. Another possible explanation for this is that students acknowledged the importance to be adaptive and adaptable in order to work independently and this was affirmed by the assessors. It also seems possible that students took responsibility of the attainment of knowledge and acquisition of skills seriously in ensuring that BID tasks were performed successfully and this was also confirmed by the assessors.

However, this study has been unable to demonstrate that both students' and assessors' perceptions of students' Organisation Sense and Affective Reactions were similar. It may be that students perceived Organisation Sense more positively than the assessors. It may be argued that, since the students rated themselves, there is a possibility of self-rating bias (similar to the Indic@tor project) where students had the perception that they were well equipped in Organisation Sense. On the other hand, the assessors rated the students much lower and this might be due to assessors' having reasonably high expectations of their students in this particular dimension of employability. The assessors seemed to perceive students' Affective Reactions more positively than the students perhaps because of their sensitivity to 'emotional tone'

while students, on the other hand, might not be aware of their own feelings and might have been a bit less confident in expressing their feelings (Russell et al., 2006). However, students seemed to be more open in giving responses to the open-ended question, interviews and the portfolio reviews where they indicated that they had the interest in BID, enjoyed doing BID tasks, satisfied with BID tasks, and were appreciative of the teaching they experienced. This study produced one result which corroborates the finding of the previous Indic@tor project: the similarity of perceptions of Occupational Expertise between supervisors and sub-ordinates. It seems possible that this is due to the fact that every participant realised and acknowledged how important it was for an individual to have relevant knowledge and skills in accomplishing assigned tasks in any given situations.

These results – that assessors and students have similar perceptions of three of the five dimensions of employability should be interpreted cautiously. As there was good inter-rater agreement (between two different groups of raters) a claim for reliability can be made, though further studies which take these variables into account need to be undertaken. The somewhat limited availability of well-theorised studies on employability (as a foundational rather than a parasitic construct) mean that it is difficult to unravel its complexities; a finding which is consistent with the work of Sosu, McWilliam & Gray (2008) when they investigated teachers' commitment to environmental education. Nevertheless, the findings of this study suggest answers to **RQ5: Are there any differences in perceptions of BID students' employability between the assessors and the BID students?**

9.7 Competence as Perceived in CAMC of BID

This study set out to explore competence as the key construct of employability in relation to CAMC of BID. In reviewing the literature, competence was characterised in terms of the constructive interactions between knowledge and skills which constitute the operational engagement as discussed in Chapter 3. In general, the findings of this study confirm the concept of competence to underpin employability,

though there was (marginal) disparity in the extent to which each one of the elements of competence impacted on students. This study has confirmed that the interactions between knowledge and skills inform cognitive and emotional engagement more than they do behavioural engagement. The emphasis placed on the greater importance of cognitive and emotional engagement, while a particular characteristic of this study, does not deny the important role played by behavioural engagement in contributing to students' competence. Competence can now be better understood as the interactions of knowledge and skills to constitute cognitive and emotional engagement predominantly and behavioural engagement partially.

9.7.1 Knowledge as Perceived in CAMC of BID

As rehearsed in the literature review, knowledge is evinced when students are able to make sense of the information gathered through their experiences in order to make decisions (Awad & Ghaziri, 2004). In this study, knowledge which was incorporated into the dimension of Occupational Expertise was found to contribute to accomplishment of BID assessment modules and student satisfaction. The results of this study show that students' experiences in doing BID tasks had allowed them to gain knowledge of the facts, tools and materials, concepts and procedures relevant for BID. This does not mean that students discounted learning about BID from other sources like books, magazines and the internet. They realised that they needed information before actually doing the BID tasks but also realised that the hands-on experiences in doing the BID tasks helped them gain knowledge. Likewise, the assessors felt that students had learned connected procedural steps for BID tasks. Knowledge acquisition was thus a positive outcome of CAMC of BID. This finding corroborates the ideas of Garner (1990), Reynolds (1992) and Jones (2007), who suggested that appropriate use of declarative and procedural knowledge is achievable regardless of which type of knowledge precedes the other through incorporating conditional knowledge. But the relationship between relevant knowledge and successful task completion needs to be better understood since, in this study, students' initial perceptions of CAMC of BID changed from negative to constructive

and positive, after undertaking CAMC of BID. It is unclear why students' preconceptions about BID changed, although it is reasonable to speculate that the benefits and opportunities BID has induced positive perceptions of vocational education. This would be consistent with Gokuladas (2010).

9.7.2 Skills as Perceived in CAMC of BID

In reviewing the literature, skills were described as the demonstrated performance in accomplishing tasks through the efficient use of psychomotor and cognitive abilities (Cox, 1934; Eraut, 1994). The employability dimension of Occupational Expertise, which incorporated knowledge and the specialist skills, contributed to successful and satisfying accomplishment of BID assessment modules. The finding showed that students had acquired BID practical skills and necessary thinking skills, particularly creativity, and enhanced them through practice in other BID-related activities. This finding is consistent with Proctor's and Dutta's (1995) definition of skill as goal-directed, well-organised behaviour acquired through practice and performed with economy of effort. Therefore, acquisition of these skills could be a major factor contributing to successful accomplishment of BID tasks.

Personal Flexibility, as mentioned in the literature review, was found to be contributing significantly to students' satisfaction. Students gained confidence and independence when they were able to adapt to changes taking place in BID classes and apply what they had learnt to new situations, further contributing to feelings of satisfaction. Assessors acknowledged students' ability to apply knowledge and skills acquired in BID class to other situations. There are similarities between the characteristics of Personal Flexibility elicited in this study and those described by Harvey and Green (1994) as being adaptive and adaptable. This finding suggests that acquisition of personal skills was integral in CAMC of BID.

Another important finding was that students had acquired interpersonal skills such as communication and transformative skills as described in the literature review,

through doing BID tasks. It seems possible that this was due to the frequent practice students had in expressing and sharing their ideas with friends and teachers during BID class. Furthermore, the study found that students were able to cooperate with friends, be tolerant and open-minded, and develop team-work spirit. This finding further supports the descriptions of interpersonal skills by Harvey and Green (1994) and Posner (2008) as mentioned in Chapter 3. It is therefore likely that CAMC of BID had provided the opportunity for students to develop these interpersonal skills.

While the entire area of the nature and importance of skills is a lively topic of debate in vocational education, the study's findings do suggest that the skills in CAMC of BID are comparable to the concept of skills described in this study where both technical and non-technical skill utilised together enhance desired accomplishment of tasks (Roger et al., 1995; Harvey & Green, 1994).

9.7.3 Student Engagement as Perceived in CAMC of BID

A strong relationship between engagement and competence has been reported in the literature where engagement in learning has been found to be a complex and multifaceted construct, and it is considered to be the mechanism for competence-promoting behaviour (Russell et al., 2005). It was noted that in order to achieve desired outcomes, students have to engage actively with their learning. In this study, two elements of student engagement were perceived by both students and assessors to have significant impact on students' success: the cognitive engagement that was elicited from the Anticipation & Optimisation scale and the emotional engagement that was obtained from the Affective Reactions scale. Behavioural engagement as elicited from the Organisation Sense scale, however, did not have significant impact on students' success. Nevertheless, the qualitative data analyses drew attention to the importance of behavioural engagement. These analyses complemented the results from the quantitative data for cognitive and emotional engagement.

9.7.3.1 Perceived Emotional Engagement

As discussed in Chapter 3, students' affective reactions in the classroom (Connell & Wellborn, 1991; Skinner & Belmont, 1993) and their identification with school (Finn et al, 1995) are components of emotional engagement. The findings of this study showed that Affective Reactions was a significant predictive contributor to students' success, discussed earlier as being due to students being positive through interest, happiness, excitement and experiences of success in doing BID tasks. This is consistent with the finding that students perform well academically and socially when they are happy (Wentzel et al., 2004). Another form of emotional engagement was sense of belonging; feelings of being proud to be BID students, to be important to the school and to be appreciated by the school, confirming the findings of Russell et al. (2006), Wentzel (1998) and Finn (1989) who emphasised the importance of inculcating sense of community and belonging. These findings suggest that CAMC of BID had managed to create a learning environment to foster Affective Reactions. This combination of findings provides some support for the conceptual premise that emotional engagement is essential in determining students' success.

9.7.3.2 Perceived Cognitive Engagement

Anticipation & Optimisation was another employability dimension which was found to contribute significantly to students' success. Students were motivated to invest in their own learning through taking up challenging BID tasks, engaging in hard work, and persisting in the face of difficulty. There is a wealth of literature which attests to the importance of student motivation (Eccles, 2005; (Eccles, 2005; Järvelä, Järvenoja, & Veermans, 2008; Tormala, Rucker, & Segers, 2008). Students also developed self-regulation, another form of cognitive engagement, through doing BID tasks: they were able to identify their strengths and weaknesses in doing BID tasks and to plan, monitor, and evaluate their thinking. Their portfolios showed the preparation of proper work schedules, cost estimations and lists of equipment and materials to be used in BID tasks. They wrote comments in the portfolio expressing

their feelings about the tasks, identifying strengths and weaknesses, and suggesting improvement. This inner psychological quality was seen as critical in helping the students to plan appropriate learning strategies to increase their abilities in doing BID tasks. This finding is consistent with the established (Pintrich & De Groot, 1990; Zimmerman, 1990) and developing (Artino & Stephens, 2009; Efklides, 2008; Liem, et al., 2008; Usher & Pajares, 2006) self-regulation literature. It is therefore claimed that the developments of investment in learning and of self-regulation are positive outcomes of CAMC of BID.

9.7.3.3 Perceived Behavioural Engagement

Although the behavioural engagement elicited from the Organisation Sense scale did not have significant impact on students' success, analyses of the qualitative data pointed to a more elaborate explanation. Students seemed to be actively participating in BID-related activities, perhaps because they found the activities beneficial. Students and assessors acknowledged students' ability to take responsibility and work cooperatively. It seems possible that students developed some degree of Organisation Sense through BID-related activities, corroborating research (Finn, 1993; Russell et al. 2005) which suggests participation in extracurricular activities to be a component of behavioural engagement.

The current study found that students seemed to behave in an acceptable manner, having values and attitudes consistent with the aims and vision of the policies for improving vocational education in Malaysia. The students were disciplined, responsible, reliable, trustworthy, concerned and careful in completing BID tasks. They took care over their physical appearance and were tidy, clean and neat in their work habits following the health and safety rules and regulations in the workplace. They prepared required materials and equipment for tasks before beginning work, handled equipment and machinery competently, cleaned all used equipment, and returned it to its proper place before cleaning up the workplace. Assessors were surprised by the positive changes taking place in students' behaviour but were glad

and happy at the same time. This change in behaviour confirms what was noted in the literature reviewed earlier (Cunningham et al., 2006; Fletcher, 2006; Fredricks et al., 2004). It is possible therefore that CAMC of BID had succeeded in developing positive conduct in students.

Involvement in learning, another form of behavioural engagement, was perceived to develop in students, as they were actively involved, put a lot of effort, attention, persistence and concentration into, and were clearly interested in BID tasks. They engaged in discussions with teachers and friends and also took part in question and answer session with the teachers; 68% (beginning of lesson), 50% (middle of lesson) and 53% (end of lesson). There are some similarities between the meaning of involvement in learning found in this study and the one described by Birch & Ladd (1997), Finn et al. (1995) and Skinner & Belmont (1993) as being behaviours such as effort, persistence, attention, concentration and class participation. In general, therefore, it seems that CAMC of BID had provided the opportunity for students to be actively involved in their learning which contributed to the successful accomplishment of BID tasks.

In summary, perceived behavioural engagement as theorised found manifestation in this study and was not unlike that in other studies (Cunningham et al., 2006; Fletcher, 2006; Fredricks et al., 2004). Although behavioural engagement was found not to be a significant contributor to students' success, the students' observed behaviour suggests this result should be interpreted with caution.

9.7.4 Perceived Competence

The results of this study indicate that knowledge acquisition and skills acquisition were inter-related activities in CAMC of BID, a non-surprising finding given that knowledge and skills operate interactively (Alexander, 2005; Säljö, 1995; Sternberg, 2005). Knowledge plays a major role in the acquisition of skills which are then demonstrated in skilled performance, indicating engagement. In the context of

CAMC of BID, student engagement comprised the intensity and quality of students' involvement in initiating and carrying out BID tasks whilst utilising appropriate knowledge and skills. In this study, student engagement in BID tasks was considered to be the mechanism for competence-promoting behaviour (Russell et al., 2005). It can thus be suggested, competence in CAMC of BID be described in terms of the constructive interactions between knowledge and skills which constituted student engagement. This account of perceived competence generally conforms with competence as theorised in this study.

However, cognitive and emotional engagement was more clearly emphasised in CAMC of BID than was behavioural engagement. This is a slightly surprising finding given the history of vocational education being understood in almost exclusively Behaviourist terms. But perhaps the influences of participants' culture and backgrounds together with more up-to-date accounts of the functioning and role of knowledge (Marzano & Kendall, 2007) draw attention to any behavioural manifestation being understood as complex performance (Landy & Conte, 2004). While cognitive and emotional engagement were of primary concern to the participants, behavioural engagement was not unimportant. It was merely (one of three components) less emphasised in CAMC of BID. Otherwise, behavioural engagement was considered important in CAMC of BID. This finding has important implications for developing appropriate, comprehensive and competence generating vocational education and training programmes for the nation. Figure 9.7 illustrates the perceived competence in CAMC of BID and related contextual opportunities.

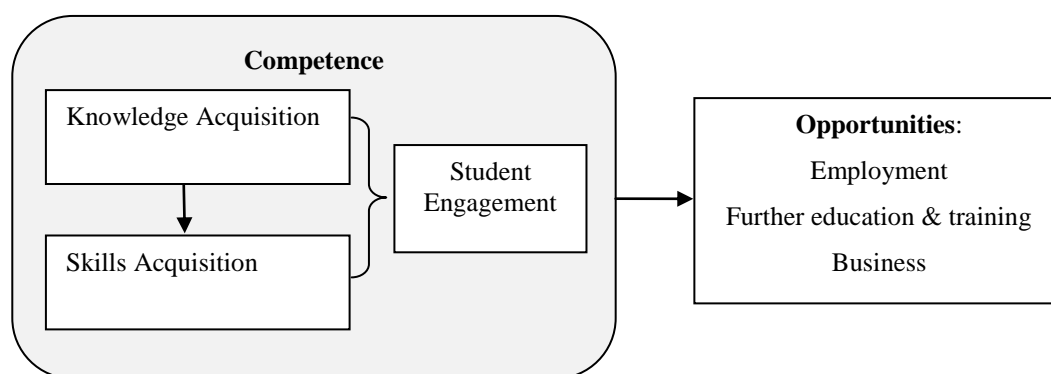


Figure 9.7: Perceived Competence in CAMC of BID and Relevant Opportunities

9.8 Methodology

This study utilised a mixed methods approach that included multiple sources in the measurement of variables; with a clear sense that the different components coalesced into a coherent whole. While the study was strongly quantitative in orientation, there was a clear qualitative strand included, not so much to embellish the quantitative findings but to address a topic - the design of an edumetrically sound assessment instrument - which involves rigorous statistical analyses and also recognises social and psychological processes. The different methods deployed were each felt suited to specific parts of the problem being researched, and in combination were seen as addressing a meaningful group of questions and thereby giving a better sense of the whole. A mixed methods approach can be very suited to educationally informed assessment issues (Kramer, 2011; Lee & Greene, 2007; Seifert, Goodman, King, & Baxter-Magolda., 2010).

Besides the questionnaires, interviews, portfolio reviews, behaviour observation and responses from the open-ended question provided data. The analyses of these various qualitative data have contributed to the understanding of the predictive values of the ascribed dimensions of employability in relation to students' success, thus answering **RQ6:** How do the interviews with the assessors and BID students help explain any further contributions CAMC had on students' employability and **RQ7:** To what extent and in what ways do observations of BID students at work and reviews of

their portfolios serve to contribute to a more comprehensive and nuanced understanding of the predictive relationship between students' success and students' employability?

However while the *integration*, rather than the co-presence, of qualitative and quantitative approaches is the essence of mixed methods research (Yin, 2006), the extent to which integration can be evinced is undoubtedly challenging (Bryman, 2007; Creswell, Shope, Plano Clark, & Greene, 2006). Many researchers report considerable difficulty in intertwining the two for a number of reasons: the audience at whom the research findings are intended; the type and availability of data gathered; and the researcher's methodological skills and preferences are just some. For Bryman (2007), the key issue is whether in a mixed methods project, the end product is more than the sum of the individual quantitative and qualitative parts. This, in turn, invokes the challenging issue of the validity of mixed methods research (Onwuegbuzie & Burke Johnson, 2006). Before a full discussion of this issue (which is developed as one strand of Chapter 10), a practical application, emanating from the research study, is described below. From the overall experience of engaging in the study, the researcher is proposing the development of a Portfolio Form and a refinement of the Behaviour Observation Form. These are anticipated to enhance the manageability of data collection and analyses though, for confirmations, do need to be trialled. Further, because the analyses of the data imply some elaboration of the conceptual underpinnings of the study, a refined research model that will be more suitable for the Malaysian context is proposed.

9.8.1 Proposed Portfolio Review Form

The analyses of students' comments in the portfolios revealed certain patterns which could be categorised as knowledge attainment, skills acquisition, affective reactions, task evaluation, and future prospects. In the review, students often wrote about how they could learn about new tools, equipment, materials and the procedures of the BID tasks. These comments might fall under the category of knowledge attainment. They also said that they were able to acquire the necessary skills to carry out the BID

tasks. These comments might be categorised as skills acquisition. Furthermore, they stated that they felt happy and enjoyed doing the BID tasks as they were very much interested in BID. These comments reflected students' affective reactions and so the category might be named after it. Students even evaluated their work and said that they were satisfied with their work besides being grateful to their teachers for the guidance provided. These comments reflected students' cognitive engagement; one of the elements of self-regulation which was to evaluate their cognition when accomplishing tasks (Pintrich & De Groot, 1990; Zimmerman, 1990). The category for those comments might be the task evaluation. Moreover, students wrote about how they were motivated to improve their performance in the future and these comments might be categorised as future prospect. As would be usual in a categorisation schedule (Spencer et al., 2009; Attride-Stirling, 2001), a miscellaneous category to trap the few outliers would be useful.

In addition to students' comments of their performance, students' work schedules, tools/materials checklist and cost estimation for each module were also looked into and these might be put under the category of work planning. Students' planning of work before starting to work on the BID tasks might indicate that students had to some extent applied the first process of self-regulation. Based on the review, the researcher developed the above mentioned categories which might be helpful in recording students' comments and analysing the data. Thus, the researcher would like to propose a Portfolio Review Form as shown in Table 9.2 to be developed for future use.

Table 9.2: Proposed Portfolio Review Form

No	School Code	Student ID	(1) Work Planning	(2) Knowledge Attainment	(3) Skills Acquisition	(4) Student Engagement	(5) Task Evaluation	(6) Future Prospects	(7) Other Remarks

9.8.2 Refined Behaviour Observation Form

The Behaviour Observation Form utilised in the study was found to be adequate and thus could be retained with some modifications done to the layout. Table 9.3 shows the proposed layout of the Refined Observation Form.

Table 9.3: Refined Behaviour Observation Form

Behavioural Engagement	Students' Names	Students' Behaviour	Phase 1/Phase2/Phase3												
			(Beginning of lesson/Middle of lesson/End of lesson)												
Involvement in learning	1	Ask teacher questions about the task.													
	2	Discuss the task with teacher.													
	3	Discuss the task with classmates.													
Positive conduct	4	Prepare required materials and equipment for the task.													
	5	Handle equipment and machinery competently.													
	6	Carry out task neatly to maintain cleanliness and safety.													
	7	Clean (wash/scrub/polish) all used equipment.													
	8	Return all used equipment to its proper place.													
	9	Clean up the workplace after working.													

9.8.3 Refined Research Model

Based on the analyses conducted in the study, the researcher proposed a refined research model as shown in Figure 9.8. This will be a parsimonious model of the employability of BID students in Malaysia which includes Affective Reactions as one of the employability dimensions. The employability dimension ‘Affective Reactions’ was found in the study to be more relevant in Malaysian context and thus replacing the initial dimension of employability ‘Balance’.

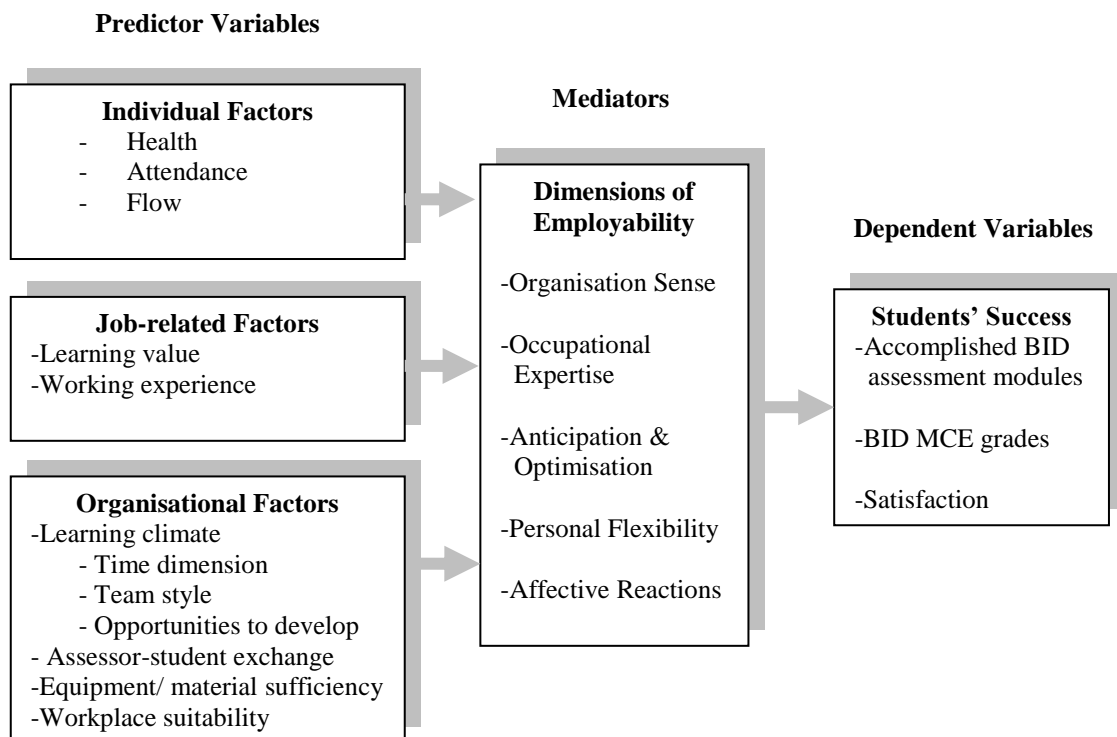


Figure 9.8: Refined Research Model for BID Students in Malaysia

9.9 Proposed Predictive Employability Profile (PEP)

The proposed Predictive Employability Profile (PEP) has emerged from the results and findings of this study. The following sections will try to describe the conceptual design of the development of the proposed PEP and the considerably detailed design of the proposed PEP. The four phases proposed in PEP include surveys using the questionnaires as the main instruments, interviews, portfolio reviews and observation.

9.9.1 The Conceptual Design of the Proposed PEP

The development of the conceptual design of PEP was based on the concept of competence as perceived by the participants in the study. Employability was perceived as predominantly represented by competence that integrated the constructive interactions between knowledge and skills which subsequently constituted the operational engagement. The suggested conceptual design for the development of the proposed PEP is as shown in Figure 9.9.

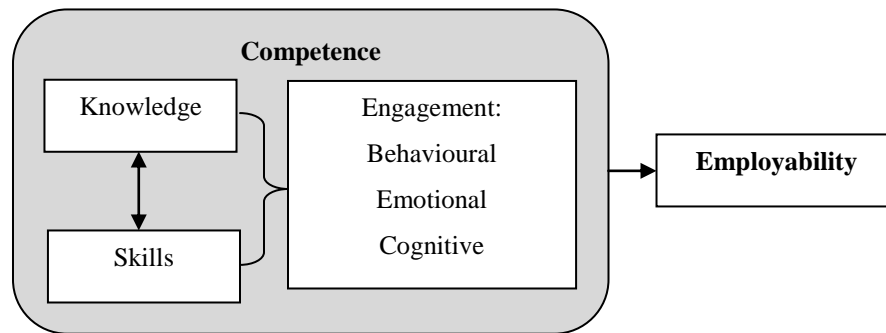


Figure 9.9: The Conceptual Design for the Development of the Proposed PEP

9.9.2 Possible Detailed Design of the Proposed PEP

Based on the development of the refined instruments and forms in the study, the design of PEP is then tailored to the phases of the proposed PEP which are the surveys, interviews, portfolio reviews and observation as shown in Figure 9.10. These phases are suggested to be conducted depending on the aspects of employability that might be determined and the levels of significance that might be considered with phase one recommended as the most important. Each of the following phases might then be conducted on their own as supplementary phases. These phases might complement the findings in phase one in various dimensions.

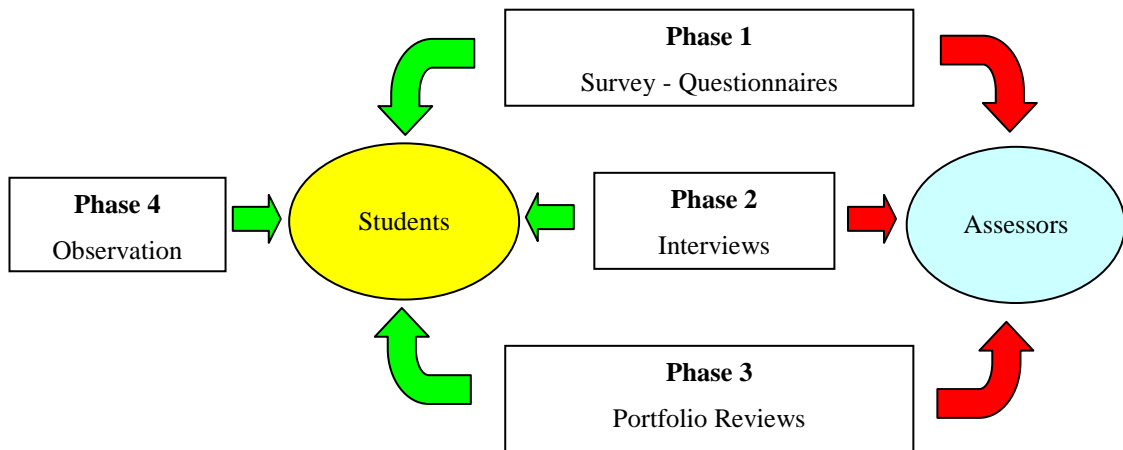


Figure 9.10: Proposed Phases within Predictive Employability Profile (PEP)

9.9.2.1 Phase One: Surveys

Phase one which might be considered the most critical phase involves surveys with the students and the assessors where both the refined questionnaires from the study might be used. The Refined Student Questionnaire (RSQ) might be able to gather students' demographic information and the predictors to students' employability which might be analysed quantitatively using SPSS. Furthermore, the RSQ might gather some insights on the practical work, the effectiveness and relevance of CAMC to students through its open-ended question. These data might then be analysed qualitatively either manually or computer software such as NVivo. The Refined Assessor Questionnaire (RAQ) might be able to gather data of students' employability based on the assessors' perceptions. The possible contents of the questionnaires that might be considered are as shown in Table: 9.4.

Table 9.4: Possible Contents of Refined Student Questionnaire and Refined Assessor Questionnaire

Variables	Refined Student Questionnaire	Refined Assessor Questionnaire
Demography	- Student's Demographic Information	- Assessor's Demographic Information
Predictors	- Individual (Health, school attendance, flow) - Job-related (Learning value, training) - Organisational (Learning climate, assessor-student exchange, equipment/material sufficiency, workplace suitability)	- Organisational (assessor-student exchange, equipment/material sufficiency, workplace suitability)
Dimensions of Employability	- Organisation sense (participation in activities – behavioural engagement) - Personal flexibility (non-technical skills – adaptive and adaptable) - Affective reactions (emotional engagement) - Anticipation & optimisation (investment in learning - cognitive engagement) - Occupational expertise (technical skills – specialist skills)	- Organisation sense (participation in activities – behavioural engagement) - Personal flexibility (non-technical skills – adaptive and adaptable) - Affective reactions (emotional engagement) - Anticipation & optimisation (investment in learning - cognitive engagement) - Occupational expertise (technical skills – specialist skills)
Dependant Variables	- Objective Success - Subjective Success	- Objective Success - Subjective Success
Open-ended Question	- BID practical work (affective reactions, positive attitudes & values, evaluation) - Effectiveness of CBA of BID (Knowledge attainment, skills acquisition, motivation) - BID relevance (equip for future prospects)	-

9.9.2.2 Phase Two: Interviews

Based on the results of the interviews conducted in the study, it is recommended that the interviews be the subsequent phase of the proposed PEP. The next phase that might be taken into account is the interview with the students and the assessors. The interview with the students might present students' point of view of their involvement in BID-related activities and the benefits of such activities. The assessors' perceptions of similar issues might be elicited from the assessor's

interviews. The possible contents of the interviews that might be considered when conducting interviews are as shown in Table 9.5.

Table 9.5: Possible Contents of the Interviews

Questions	Refined Student Interview Protocol	Refined Assessor Interview Protocol
Demography	- Student's Demographic Information	- Assessor's Demographic Information
Activities involved	- Participation in BID-related activities (behavioural engagement)	- Participation in BID-related activities (behavioural engagement)
Benefits of experience from the activities	- Knowledge attainment - Skills acquisition - Identification with school (emotional engagement)	- Knowledge attainment - Skills acquisition - Identification with school (emotional engagement)
Benefits of CBA of BID for future undertakings	- Developed self-discipline and good attitudes - Further education and training - Get a job - Venture into small business	- Developed self-discipline and good attitudes - Further education and training - Get a job - Venture into small business
Suggestions for Improvements	- Students' initiatives School management	

9.9.3 Phase Three: Portfolio Reviews

In the study, the researcher only looked into students' comments written in their portfolios and proposed a review form as in Table 9.2. The researcher would like to propose the review of the assessors' comments in the students' portfolio as well. The review of the assessors' comments might enrich the findings in relation to the assessors' perceptions of the students' work and accomplishments. These perceptions might also provide the assessors' affirmative or otherwise remarks of the students' potentials. Thus, the review of the assessors' comments might further enhance the predicting value of the research apart from the student self-rating of their ability in the questionnaire, the claims of their involvements in activities in the interview and their comments in the portfolio. Figure 9.11 shows the possible substances of the comments that might be focused on in the portfolio reviews.

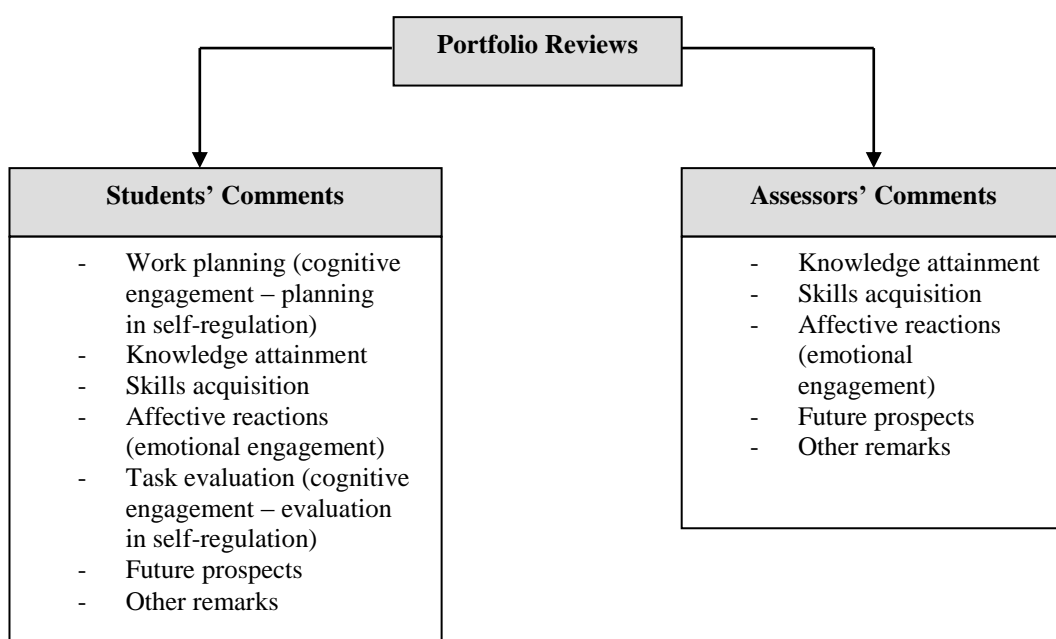


Figure 9.11: Possible Substances of the Comments in the Portfolio Reviews

9.9.4 Phase Four: Student Behaviour Observation

It was recommended that students' names be written instead of using numbers to represent them for easy identification in relating the observation to other relevant findings in the study. Thus, columns for the names might be provided in the Refined Behaviour Observation Form which is shown in Table 9.3.

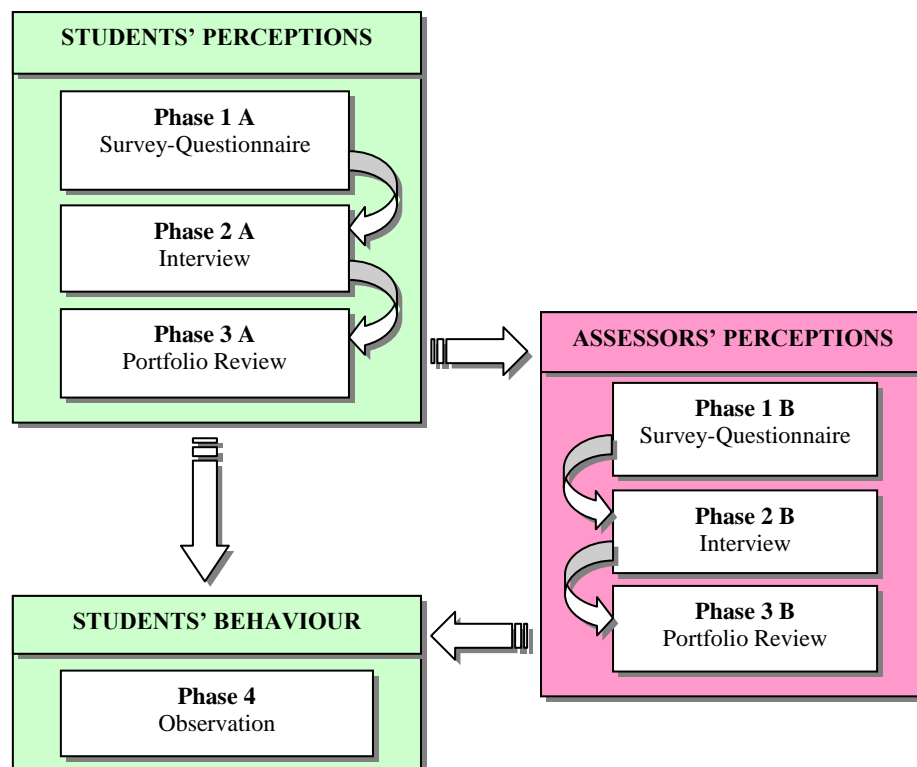
The Refined Behaviour Observation Form (RBOF) might be retained and observation is proposed to be Phase Four in the proposed PEP. This final phase might only be necessary if it is crucial to determine students' behaviour while working on the tasks and whenever there is sufficient time to conduct the observation. As such this phase might be the least important within the proposed PEP but might be useful to some extent in ascertaining students' ability and behaviour. Table 9.6 shows the possible content of the observation that might be considered.

Table 9.6: Proposed Content of Observation

	Content
Observed Behaviour	<ul style="list-style-type: none"> - Involvement in learning (behaviour engagement – participation in class discussion) - Positive conduct (behaviour engagement – follow rules and regulations) -

9.9.5 Possible Procedures for the Proposed PEP

Based on the findings of the study and in order to substantially elicit its potential, the researcher put forward the procedures shown in Figure 9.12 for the proposed PEP and the possible complete measures of the proposed PEP are shown in Figure 9.13. The phases in the proposed PEP might be divided into three sections; students' perceptions, students' behaviour and assessors' perceptions.

**Figure 9.12: Possible Procedures for the Proposed PEP**

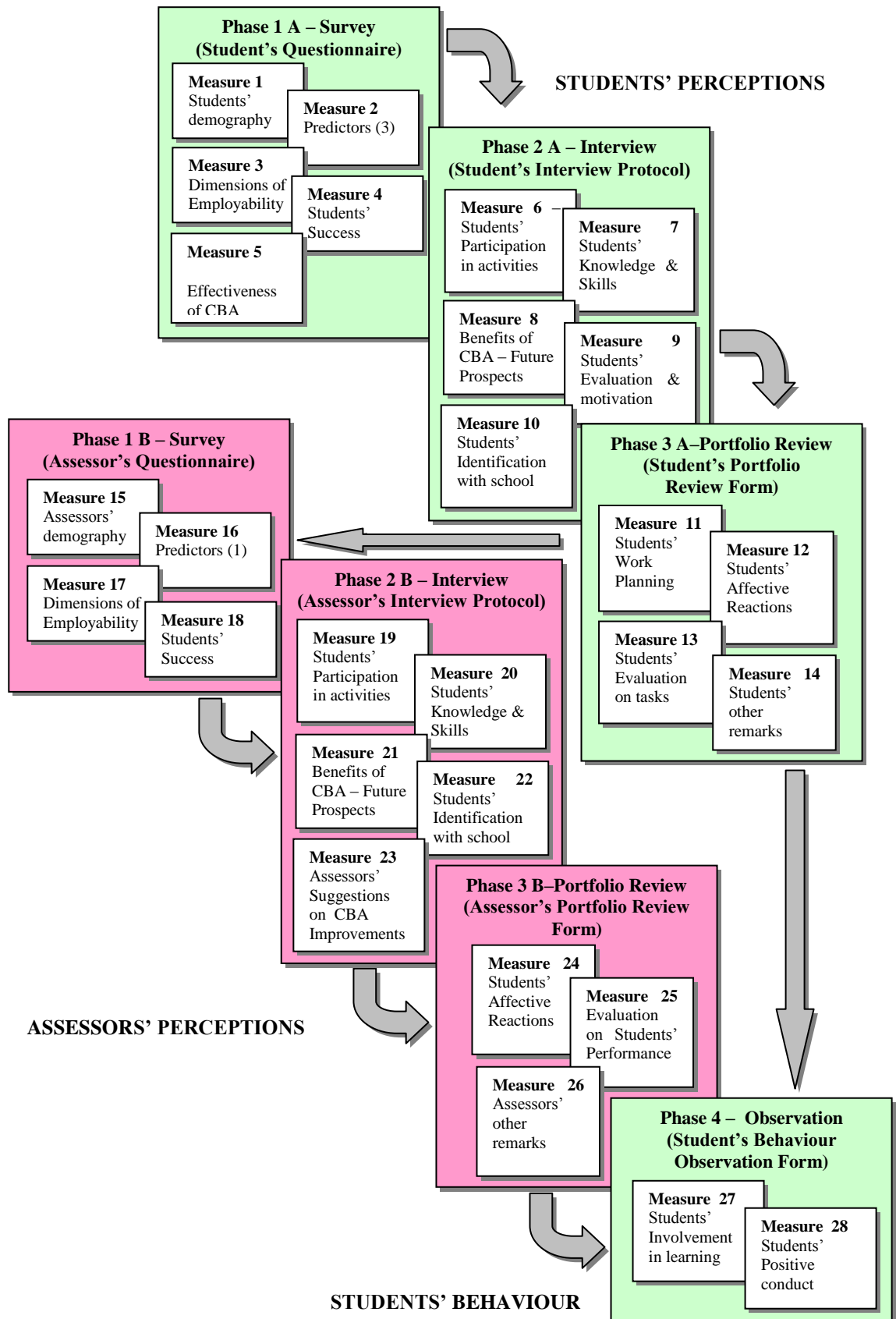


Figure 9.13: Possible Complete Measures and Phases of the Proposed PEP

The development of the PEP has somehow emerged from a mixed methods approach of the study. The supposedly straightforward nature of the design of the proposed PEP might be easy to implement as the steps to a certain extent fall into clear and separate stages. The proposed design might allow for considerably easy description and reporting. The proposed design might be able to better explain and interpret relationships. As such it might provide evidence of possible answers to **RQ8**.

RQ8: In a proposed procedure, what measures are to be considered to determine students' employability effectively?

As it is still at the proposal stage and was based on one particular study, further refinements and improvements to increase the validity and reliability, and the potential predictive measures of the proposed PEP are recommended.

9.10 Conclusions

In conclusion, this chapter has tried to answer most of the research questions. One of the main findings is that both students and assessors perceived CAMC of BID positively. They believed that CAMC of BID had to some extent contributed to the development of some necessary dimensions of employability among BID students which could be beneficial for students' future undertakings including employment and further trainings. This may indicate that CAMC of BID had to some extent been effective in its implementation in Malaysia as it was perceived to have served the purpose it was designed for. Findings of this small scale research might have made modest but considerably unique and substantive contributions to knowledge as it had attempted to refine the concept of competence in the context of CAMC of BID by adapting a scale to measure it and later basing on participants' perceived competence. The perceived competence could still be described in terms of the constructive interactions between knowledge and skills which constituted student engagement (as proposed in the study) with slight disparity in student engagement where the emphasis was on cognitive and emotional engagement rather than behavioural engagement. The mixed methods approach utilised in the study included

multiple sources in the measurement of variables which subsequently provided data that might have enhanced the findings of this study. Finally, a proposed measure of predicting employability which still needs further development emerged from the study. The next chapter is the conclusions of this research.

Chapter 10

Discussions and Conclusions

10.1 Introduction

A number of issues will be addressed in this final chapter of the thesis: a summary of the findings, an evaluation of the quality of the research and a discussion of the contribution of the study. Recommendations for future research on employability predictions will be made. The structure of this chapter is as shown in Figure 10.1.

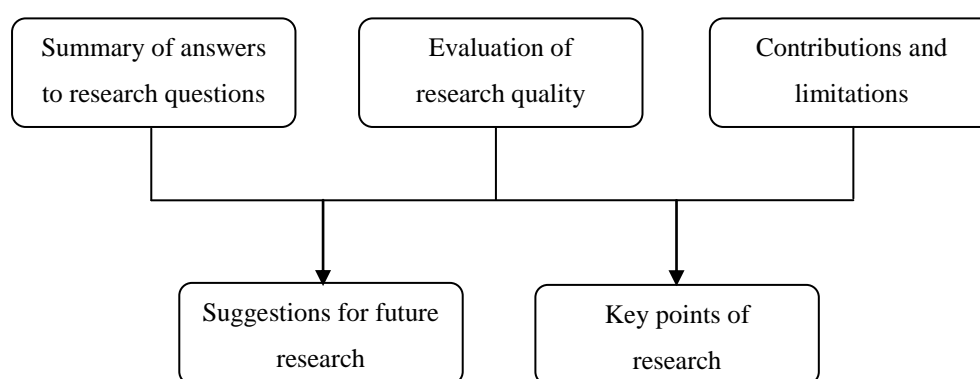


Figure 10.1: The Structure of Chapter 10

10.2 Summary of Answers to Research Questions

This study set out to investigate the employability of students undertaking CAMC and gradually focused on the development of suitable instruments and procedures to predict students' employability. In this investigation, the aim was to uncover whether or not CAMC has managed to prepare and equip students with relevant employability effectively and efficiently. The research started with one big question – **'how can we predict the employability of students undertaking CAMC?'** This question corresponded to the awareness of various bodies, agencies and practitioners

that employability is essential in human capital in current and future labour market for a developing country to prosper. The literature overview identified research needs as the following:

- The current research on employability is not well related to students at schools as most are concerned about employability of college or university graduates and employees in the industries.
- Employability is becoming an essential ‘resource’ in surviving the challenging and competitive labour market in the 21st century.
- The investigation of predicting employability might be one of the approaches towards assessing the effectiveness of CAMC in meeting its designed purposes.
- Understanding of how to define and describe employability in the context of CAMC is lacking
- Investigation into how CAMC might have an impact on students’ employability is lacking.
- The attention paid to developing instruments that could be used to measure employability among secondary school students is limited.

RQ1: How can we define and describe employability in the context of CAMC?

One of the more significant findings to emerge from this study is a framework of an operational description of employability in the context of CAMC. In reviewing the literature, the basis of employability was found to be the lifelong learning processes of acquisition, application and adaptability of competence (Harvey & Green, 1994).

Therefore in the initial stage, employability in the context of CAMC was conceptually described as competence. As mentioned in Chapter 3, competence is characterised in terms of the constructive interactions between knowledge and skills which subsequently constitute student engagement. The extent to which *how* knowledge and skills are used will influence the competence that can be evidenced. This knowledge-in-use to achieve competence can be thought of as engagement which entails the intensity and quality of the students' involvement in initiating and carrying out learning activities (Wellborn, cited in Hijzen et al, 2007). This study has found that generally, participants' perceived competence seems to correspond to this description of competence but with some disparity in the emphasis of the components of engagement. Cognitive engagement and emotional engagement were perceived to be slightly more important than behavioural engagement in CAMC of BID. Nevertheless, it was only students' Organisation Sense or their participation in school related activities that was perceived as not too important. The other two components of behavioural engagement, positive conduct and involvement in learning, were perceived to be important. Students demonstrated capability in accomplishing BID tasks, achieving pass grades in MCE exam and feeling satisfied, all of which were a set of achievements in a BID-related job. The evidence thus suggests that students had exhibited employability in respect of BID tasks as proposed by Yorke (2006). Figure 10.2 illustrates the framework of an operational description of employability in the form of competence as emerged from the study.

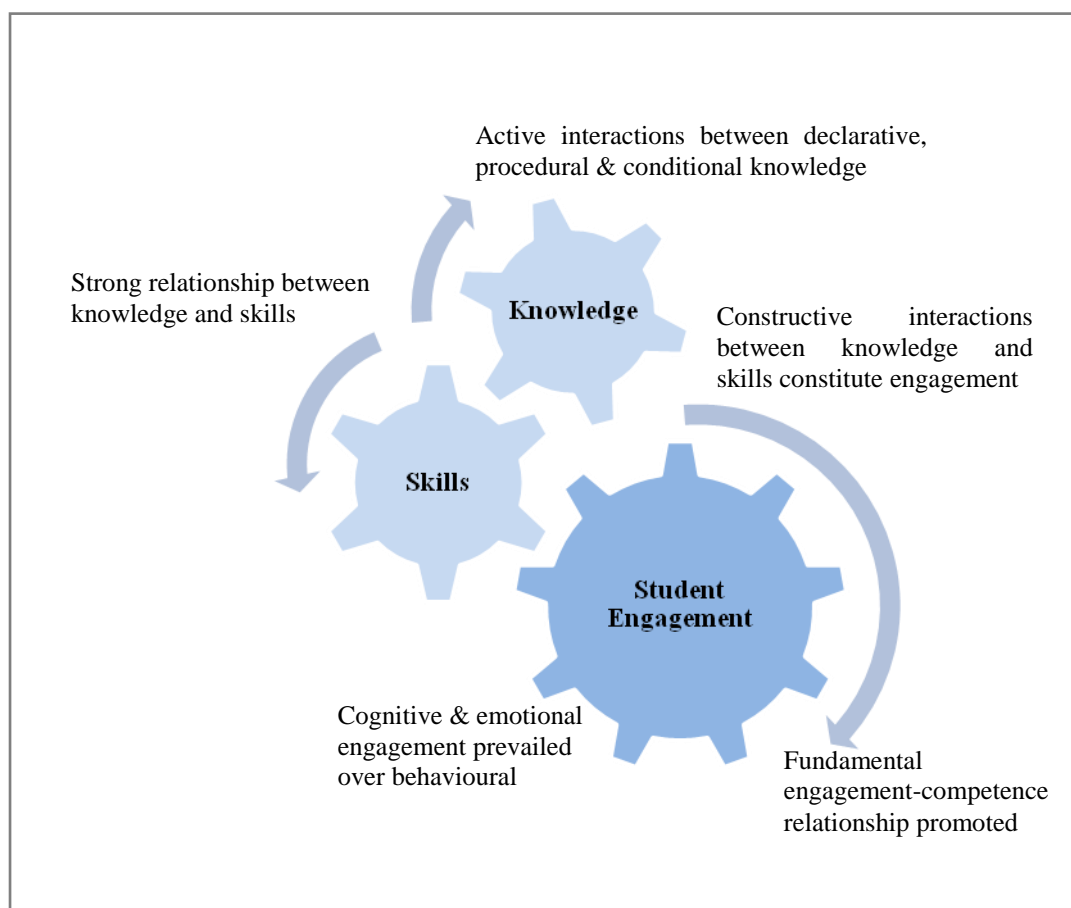


Figure 10.2: A Framework of Operational Description of Employability in the Form of Competence in the Context of CAMC of BID

RQ2: How can we measure the employability of BID students and what are the psychometric qualities (reliability and validity) of the measure developed for this study?

This study has shown that possible measures of employability include students' knowledge, skills and engagement in accomplishing BID tasks. These measures of employability were thoroughly considered based on the concept of competence as described in Chapter 3. Figure 10.3 shows the possible measures of employability.

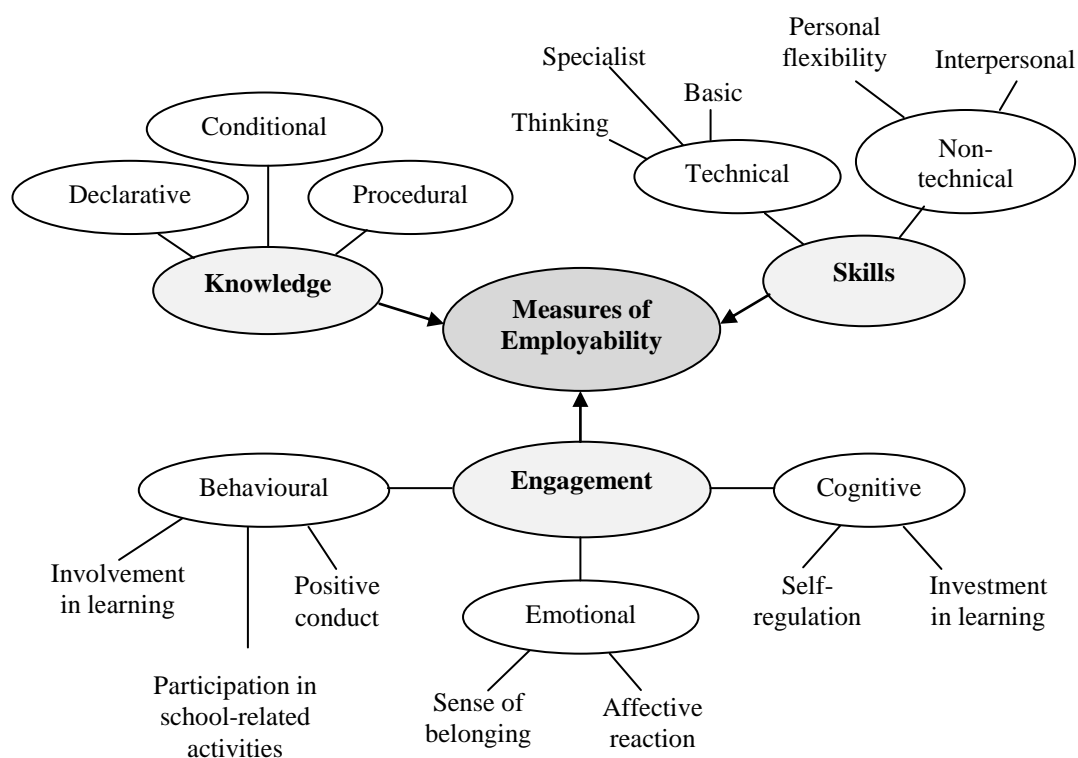


Figure 10.3: Possible Measures of Employability Considered

Instruments that were considered suitable to measure students' employability were adapted and developed. Chapter 5 has described the development of the instruments in detail while Chapter 6 has described the refined instruments that were used for analysis and has addressed some of the psychometric qualities of the instruments. A summary of the instruments utilised in the study is shown in Table 10.1.

Table 10.1: Summary of the Instruments Utilised in the Study

Instruments	Purposes	Details Examined
Surveys		
Refined Student Questionnaire	<ul style="list-style-type: none"> - Student self-ratings of their employability - Students' perceptions of the effectiveness of CBA of BID 	<ul style="list-style-type: none"> - Students' demographic characteristics - Individual, job-related and organisational factors - Dimensions of employability; organisation sense, occupational expertise, anticipation & optimisation, personal flexibility, affective reaction - Open-ended question
Refined Assessor Questionnaire	<ul style="list-style-type: none"> - Assessor ratings of students' employability 	<ul style="list-style-type: none"> - Assessors' demographic characteristics - 3 organisational factors - Dimensions of employability; organisation sense, occupational expertise, anticipation & optimisation, personal flexibility, affective reaction
Interviews		
Refined Student Interview Protocol	<ul style="list-style-type: none"> - Students' views on the benefits of BID related activities in school, 	<ul style="list-style-type: none"> - Behavioural engagement – students' participation in school activities
Refined Assessor Interview Protocol	<ul style="list-style-type: none"> - Assessors' point of views on the benefits of BID-related activities in school 	<ul style="list-style-type: none"> - Behavioural engagement – students' participation in school activities
Others		
Behaviour Observation Form	<ul style="list-style-type: none"> - Students' behaviour when working on BID tasks 	<ul style="list-style-type: none"> - Behavioural engagement – positive conduct and involvement in teaching and learning
Portfolio Review	<ul style="list-style-type: none"> - Students' evaluation of their performance 	<ul style="list-style-type: none"> - Cognitive engagement planning, monitoring and evaluation

RQ3: What are the dimensions of employability incorporated in CAMC of BID?

Multiple regression analyses revealed that all five dimensions of employability (Organisation Sense, Occupational Expertise, Anticipation & Optimisation, Personal Flexibility and Affective Reactions) as displayed in Chapter 8 and discussed in

Chapter 9, were incorporated in CAMC of BID but with small variation in their contributions to students' objective success (BID MCE grades and accomplished BID assessment modules) and students' subjective success (satisfaction). The relationship between the employability dimensions and their contributions to students' success is shown in Figure 10.4.

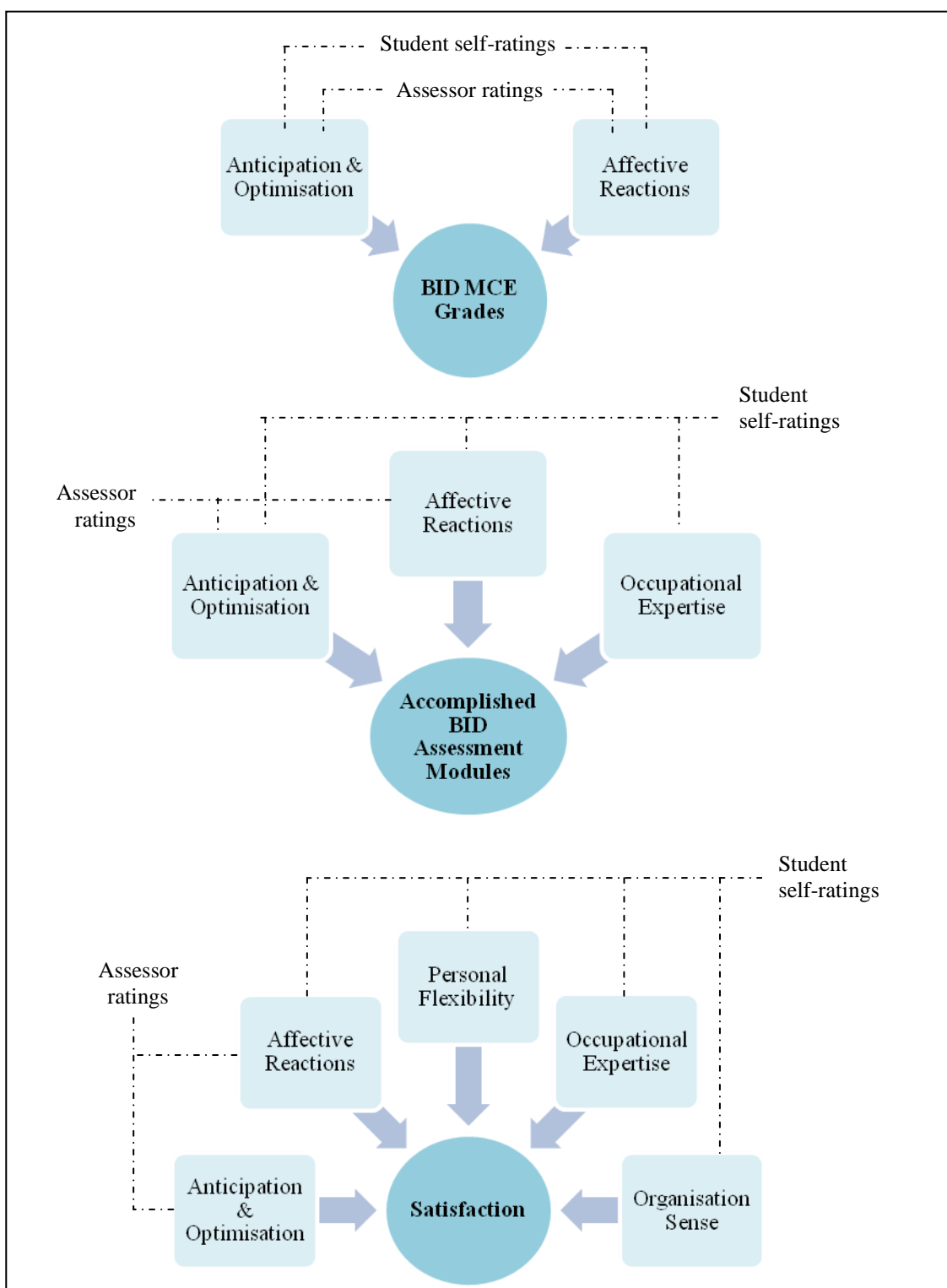


Figure 10.4: Employability Dimensions that Contributed to Students' Success

RQ4: What are the factors that influence students' employability and are there any differences in the strength and pattern of the relations between these factors and the employability of students of different gender and race?

Another major finding of the study is that among all of the factors examined, Job-related factors had the most impact on students' employability followed by Organisational and Individual factors. An implication of this is that students needed external factors such as school interventions in creating conducive learning environment for them to acquire relevant employability skills in comparison to factors related to them. This however, does not deny the influence of Individual factors on students' employability. The factors that had contributed to the five dimensions of employability and total employability are shown in Figure 10.5.

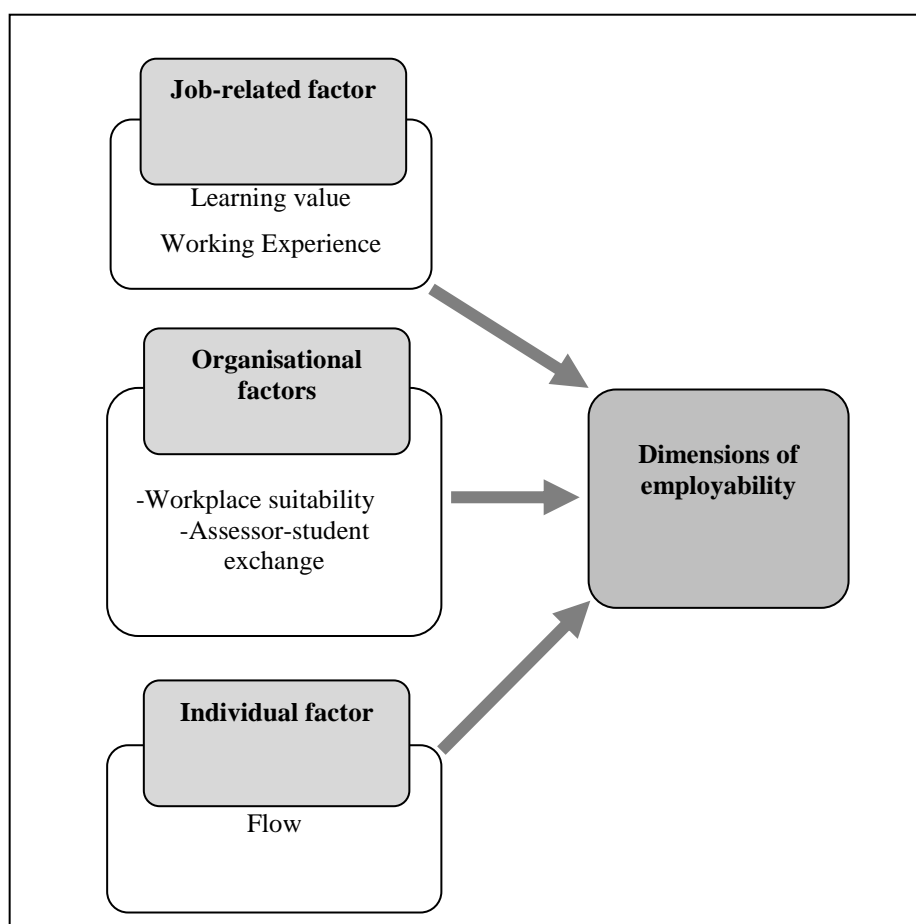


Figure 10.5: Factors that Contributed to Students' Employability

An interesting finding to emerge from this study is that the differentiating power in employability between male and female students was statistically insignificant. Gender was found in the study as not affecting students' ability to accomplish BID tasks successfully and it is likely therefore, that gender did not affect students' employability. It seems possible that this finding might unravel the misconceptions many had about the different abilities between male and female students in vocational programmes (Sadker & Sadker, 1985, Francis, 2000; Stromquist, 2007), particularly in accomplishing BID tasks. This finding therefore, may be a satisfactory and unique outcome of this study.

Generally, there was statistically significant difference in all dimensions of employability except for Occupational Expertise for the four groups of ethnicity: Malay, Chinese, Indian and Others. The results support the perceptions that many had about different work ethic among the groups (Hirschman, 1986; Abdullah and Pedersen, 2003; Omar, 2005; Guinee, 2005). The only dimension of employability that was not affected by ethnicity was Occupational Expertise, possibly because students had been able to acquire relevant and sufficient knowledge and skills to do BID tasks regardless of their ethnicity-related experience.

There was a small difference between the Malay and the 'Others' students in developing Organisation Sense, possibly because of the influence of close-knit social upbringing and background within their own groups (Marger, 2008; Peoples & Bailey, 2006). Another small difference was apparent in Anticipation & Optimisation between the Chinese, Malay and 'Others' students. This may be due to the students from these three groups having different levels of motivation and interest (Hirschman, 1986; Abdullah and Pedersen, 2003; Omar, 2005; Guinee, 2005) in BID which inevitably had influenced the effort put into the success of BID tasks. Students' Personal Flexibility differed moderately among all four ethnic groups. In other words, they perceived differences in their ability to be adaptive and adaptability, possibly because of concern about being accepted by classmates (Hirschman, 1986; Hefner, 2001). The impact of ethnicity on all five dimensions of employability is shown in Figure 10.6.

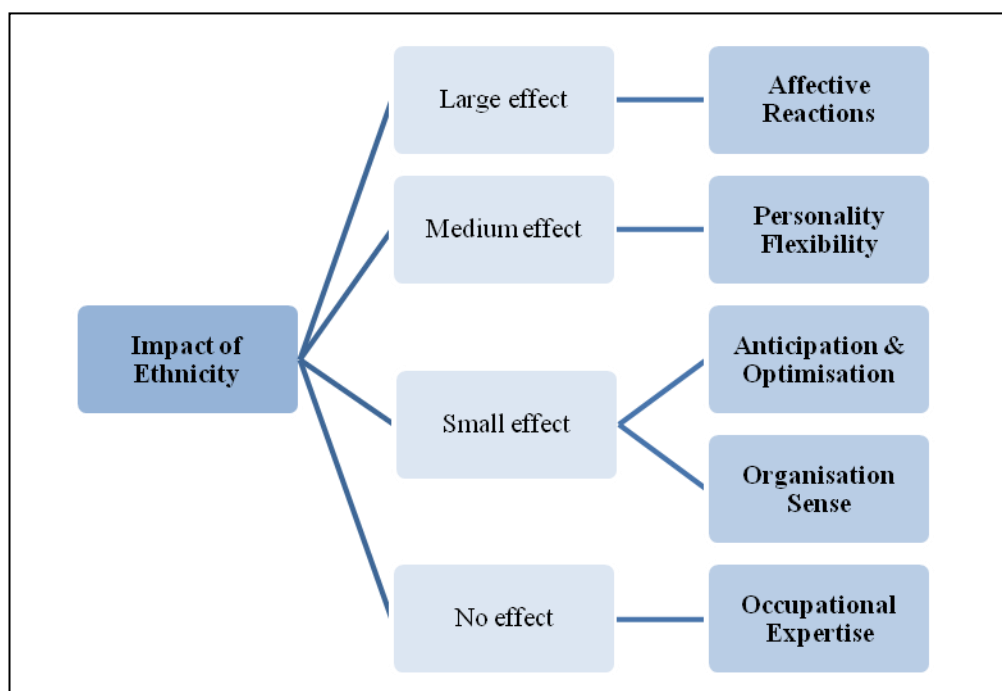


Figure 10.6: The Impact of Ethnicity on Dimensions of Employability

RQ5: Are there any differences in perceptions of BID students' employability between the assessors and the BID students?

This research question investigated whether students and assessors perceived students' employability differently. The study has found that both the assessors and students had positive perceptions of students' employability. They had similar perceptions of students' Anticipation & Optimisation, Occupational Expertise and Personal Flexibility and acknowledged students' motivation and investment in increasing learning, showing that students had the ability to acquire relevant knowledge and skills, including interpersonal skills such as communication and team-work. However, students perceived the development of Organisation Sense more positively than the assessors. On the other hand, assessors perceived students' Affective Reactions more positively than the students. It seems possible that the assessors might have realised students' ability to be comfortable and unperturbed based on students' observed and demonstrated behaviours.

RQ6: How do the interviews with assessors and BID students help explain any further contributions CAMC had on students' employability?

The sixth research question looked into the role played by qualitative data obtained from the interviews with the students and the assessors. The study showed that the responses provided in the interviews exemplified what students and assessors had meant in the survey, in the observations and in the portfolios. The interview situation afforded the opportunity for participants to speak freely and fully, thereby yielding further rich information about components of student engagement such as participation in school activities, not otherwise obtainable. The role of the interviews was therefore significant.

RQ7: To what extent and in what ways do observations of BID students at work and reviews of their portfolios serve to contribute to a more comprehensive and nuanced understanding of the predicting relationship between students' success and students' employability?

Data obtained from observations provided first-hand information on student behaviour engagement; positive conduct and involvement in the lessons. Data obtained from the portfolio reviews provided information on student cognitive engagement especially the planning, monitoring and evaluation which the other instruments used in this study could not elicit. These observations and portfolio reviews enhanced the understanding of employability and its relationship to students' success.

RQ8: In a proposed procedure, what measures are to be considered thoroughly to determine students' employability effectively?

This question posed one of the main purposes of this research: to develop suitable instruments and procedures that might predict students' employability. One of the important outcomes from this study is the proposed Predictive Employability Profile

(PEP). The development of PEP was based on an emerging framework of operational competence, measures of employability identified and the refinement of instruments in the study. Chapter 9 has described the development of the proposed PEP in detail. Four phases of the proposed PEP include the surveys, interviews, portfolio reviews and observation. Although phase one, the surveys, was suggested to be conducted first, other phases may precede phase one, depending on the aspects of employability that might be determined in any research study. Each of the other phases acts as contributory phase. Thus, both quantitative and qualitative data may be collected and analysed in this proposed PEP. However, to increase its value in predicting employability, it is essential for the PEP to be further refined.

Table 10.2 shows the matching of the constructs in instruments used in the study to provide evidence to possible answers to all of the research questions.

Table 10.2: Matching Constructs in Instruments with Research Questions

	Refined Student Questionnaire	Refined Assessor Questionnaire	Refined Student Interview Protocol	Refined Assessor Interview Protocol	Behaviour Observation Form	Portfolio Review
RQ1	Dimensions of Employability Open-ended Question	Dimensions of Employability	Questions 1a, 1c, 2 & 3	Questions 1a, 1c, 2	Involvement in learning Positive conduct	Categories 1, 2, 3, 4, 5,6 & 7
RQ2	Dimensions of Employability	Dimensions of Employability	Questions 1a, 1c, 2 & 3	Questions 1a, 1c & 2	Involvement in learning Positive conduct	Categories 1, 2, 3, 4, 5
RQ3	Dimensions of Employability Open-ended Question	Dimensions of Employability	Questions 1a, 1c, 2 & 3	Questions 1a, 1c, 2	Involvement in learning Positive conduct	Categories 1, 2, 3, 4, 5
RQ4	Demography Individual Predictors Job-related Predictors Organisational Predictors Dimensions of Employability Open-ended Question	Organisational Predictors Dimensions of Employability	Questions 1a, 1b & 1c	Questions 1a, 1b & 1c	Involvement in learning Positive conduct	Categories 5 & 7
RQ5	Dimensions of Employability Open-ended Question	Dimensions of Employability	Questions 1a, 1c, 2 & 3	Questions 1a, 1c & 2	Involvement in learning Positive conduct	Categories 1, 2, 3, 4, 5
RQ6	Dimensions of Employability	Dimensions of Employability	Questions 1a, 1b, 1c, 2 & 3	Questions 1a, 1b, 1c, & 2		
RQ7	Dimensions of Employability Objective success Subjective success	Dimensions of Employability Objective success Subjective success			Involvement in learning Positive conduct	Categories 1, 2, 3, 4, 5,6 & 7
RQ8	Dimensions of Employability	Dimensions of Employability	Questions 1a, 1c, 2 & 3	Questions 1a, 1c & 2	Involvement in learning Positive conduct	Categories 1, 2, 3, 4, 5,6 & 7

10.3 Attributes of the Research

The criteria for research quality were discussed in the Research Quality Framework in Figure 5.2 (Chapter 5). The following sections discuss this study's quality under the headings of theoretical issues, methodological issues, interpretive rigour and research contributions (Furlong & Oancea, 2005).

10.3.1 Theoretical Issues

The theoretical robustness of any research depends on the adequacy of its conceptual underpinnings. The literature within which this study is situated demarcated two main concepts: educational assessment (Chapter 2) and competence/competence-based assessment (Chapter 3); arguing that educational assessment and competence-based assessment have undergone very fundamental changes historically. This examination of the literature provided the basis for understanding some of the mechanisms of employability; thereby allowing us to see what was and was not known about employability. Thereafter, the study has gone some way to enhancing understanding of the concept of employability in the context of CAMC of BID. While employability appears to have wide and fairly flexible meaning in lay-terms, the focus in this study has been students' competence in doing BID tasks. The study sought to specify employability in terms of competence (which includes vocational and 'soft' skills) which can be evidenced and extended. CAMC of BID was deemed appropriate for the participants who were generally secondary school students, and criterion-referenced assessment underpinned the development of suitable instruments. It is therefore suggested that this research was developed on sound theoretical grounds and offers further conceptual clarity of what it means to be competent. Clearly the theoretical adequacy of any study is open to extensions and modifications and this qualification holds for this particular study also but given that competence-based assessment has until so very recently been understood as atomistic behavioural manifestations authenticated by observation only, the study has

evidenced a robust challenge and one which is in keeping with current appreciations of the complexities of edumetrically sound assessment.

10.3.2 Methodological Issues

The methodological robustness of a study is fundamentally influenced by the adequacy of the design (Teddlie & Tashakkori, 2009) which, in turn, rests on the key notion of validity. However, validity is not some 'truth' that can be understood outwith context and culture as the research needs to be defensible to the communities (both research and practice) for whom it is produced. This, of course, is not the same as claiming that all research is of equivalent standard. But the stakeholders' interest(s) mean(s) that the study's validity will have subjective and objective components. In this instance there were a number of stakeholders: the Malaysian policy makers who commissioned the study; the potential employers whose businesses might hire the apprentices; the teachers and students who want the findings to be of use to them; the researcher who seeks to build a research career; and the University overseeing the research that needs to ensure the study's academic credibility. As a pre-requisite, all necessary ethical principles and legal regulations to conduct research in Scotland and Malaysia were observed. The ethical approval to proceed with the research privileged matters such as respect for participants, the privacy and rights of participants, informed consent and maintaining confidentiality both in the design and implementation of the study.

A concurrent mixed methods design was adopted because it allowed a practical question to be addressed and the perspectives of teachers and students to be examined in a single study, thereby allowing schools and policy makers to get some sense of what would be useful in local situations. Multiple sources of evidence - questionnaires, interviews, direct observation and portfolio reviews (all of which were trialled and honed) - were used to collect data from Form Five BID students and their assessors in 19 secondary schools in Malaysia. The approach provided qualitative and quantitative data which together allowed the researcher to compare

results. While the two sources did not validate each other with any precision, they reinforced each other allowing the conclusion that greater insight into competence and competence-based assessment had been achieved. The combination of qualitative and quantitative instrumentation allowed the dynamic exploration of the constructs in recognition of the fact that the boundaries, elements and constituent relationships of competence-based assessment are not yet fully understood (Newby, 2010). The claim for the study being a concurrent one is derived from the following conditions having been met: the quantitative and qualitative data were collected separately but at approximately the same point in time, the results from each type of analysis were consolidated after *both* sets of data had been collected and analysed separately, the inferences made from the separate quantitative and qualitative data and findings were integrated into a meta-inference (Onwuegbuzie & Johnson, 2006). Purists might argue that because the study derived qualitative data after the collection of quantitative data, the study might be better characterised as of sequential rather than concurrent design. However, since the collection of qualitative data did not arise from the *analyses* of the quantitative data, a concurrent design is the more accurate descriptor (Collins, Onwuegbuzie, & Jiao, 2006). The difficulty in combining the quantitative and qualitative dimensions in mixed methods designs gives rise to the issue of integration (Bryman, 2007; Creswell, Shope, Plano Clark, & Greene, 2006; Yin, 2006). In this instance integration was pursued to ensure instrument fidelity (Collins, Onwuegbuzie, & Sutton, 2006) through assessing the appropriateness and/or utility of existing instruments; developing a more refined instrument and assessing the operation of the instrument through participants' responses. In other words from different approaches to get at the same phenomenon, convergence and/or corroboration were sought. Insofar as the adequacy of the observations and interviews have been explored, descriptive and inferential statistical analyses explain within and between variation, and optimal uses of the instruments have been evaluated, it is reasonable to claim trustworthiness of the research conducted; though further development of the PEP is called for.

10.3.3 Quality of Research Interpretations

The quality of research interpretations essentially depends on the credibility of the inferences drawn from the obtained results. Such quality can be characterised as interpretive rigour (Teddlie & Tashakkori, 2003; 2009) or inferential consistency (Dellinger & Leech, 2005). The credibility of the inferences would require the findings to be plausible given the extant literature(s) on the topic (in other words, do the findings make sense given prior understandings, previous research and theoretical considerations?) and to articulate with the study's methodology (in other words, the results should neither be over or under interpreted). Because the validity in each of qualitative and quantitative research has an accepted and (particularly in the case of quantitative research) well documented nomenclature and paradigm-specific set of terms, Onwuegbuzie & Johnson (2006) recommend the term, *legitimation* be used instead of 'validity'; arguing that it better captures the inferencing needed to combine the quantitative and qualitative components of the study. A number of points can be made about the credibility of the inferences in this study.

Combining the results of a large quantitative sample with those of a small qualitative sample does not automatically allow one to claim legitimate findings, as potential generalisation to the underlying population from which the larger sample was selected, on the basis of the qualitative results, may be flawed. However, in this study the smaller qualitative sample was a sub-set of the larger sample and the larger sample was, give or take a few survey absentees, the total population. The extent to which the sample in this study represents the larger population with whom it is intended to use the PEP, however, is yet to be confirmed. Nevertheless, insofar as the 'qualitative' participants were the same as the 'quantitative' ones, the generalizability of the findings seems safe, at least for the time being.

Related to the issues of sampling, is the concern that the researcher neither imposes his/her professional analyses on the participants' views nor uncritically privileges their views at the expense of systematic and rigorous exploration of the data. It will

be important for the development of the PEP that such studies explicitly incorporate strategies for member checking/participant review such that the relationship between the data and the conclusions are agreed both by study participants and by disinterested (but trained/knowledgeable) others. The legitimisation of mixed-methods research requires balancing the interpretations of both researcher and participant.

The very strength of mixed-methods design is that it allows the combination of qualitative and quantitative methods. There nevertheless remains the matter of whether the weaknesses of one can be compensated for by the strengths of the other. Minimising any overall weakness is then, clearly, an aim. In this study the combination of quantitative analyses (ANOVA, t-tests and hierarchical multiple regression) with qualitative analysis - principally thematic analysis as recommended by Spencer et al. (2009), Lincoln & Guba (1985) and Attride-Stirling (2001) - has observed a fairly well established approach to mixed methods research (Teddlie & Tashakkori, 2009); thereby authenticating the claim for quality inferences having been made. This does not deny that further scrutiny of both qualitative and quantitative data are merited in future studies when the issues of quantification and the generalisation from limited sampling might usefully be revisited.

A final point to be made about the credibility of the inferences is the extent to which the stakeholders in the project value both the qualitative and quantitative dimensions. In quantitative research the project is centralised in the researcher's decision making with the findings being presented and 'given'. To some extent the researcher in this study started with this perspective, giving priority to the quantitative dimension and believing the qualitative dimension to be no more than a supplement. However, during the course of the project the researcher has learned, through the wealth of nuanced meaning gleaned from the qualitative dimension, that 'top-down' approaches may be limiting, if not misleading since the benefits of this research project will actually be distributed amongst teachers and students, policy-makers and vocational employers. Because the research in this project was the first step in answering the important question of how to predict employability within a particular population of

persons, and in providing some workable ideas as to how to prepare such a population to be employable, the extensions to this study will require the increased participation of the various stakeholders at different times. Tasks such as clarifying why outcomes did or did not occur, enhancing findings that are/were practically and statistically significant, seeking further complementarity between the findings from one method and the results of the other, illuminating 'dry' results through 'real-life' exemplification are just a few triggered by the findings surfaced in this project; thereby giving credibility to, or 'legitimising', important consequential validity considerations.

10.3.4 Quality of Research Contributions

The quality of research contributions could be looked at as the theoretical and practical contributions that are of value for people and capacity building (Furlong & Oancea, 2005). The theoretical contributions of the research could be seen from the link of the research to existing theory and novelty (Teddlie & Tashakkori, 2009). The practical contributions on the other hand, could be evaluated from the usefulness, functionality of the output of the research in serving the purposes (Miles & Huberman, 1994; Furlong & Oancea, 2005; Teddlie & Tashakkori, 2009).

10.3.4.1 Contributions to Theory

The easiest way of understanding the contribution of this study towards theory is by asking the question *'what have we discovered after carrying out this research compared to what we knew before?'*

The findings from this study make several contributions to the current literature:

1. The empirical findings in this study add substantially to our understanding of a relevant concept of employability in the context of

CBA and CAMC of BID in particular which is competence and its elements and components i.e. knowledge, skills, student engagement and demonstrating the competence-engagement relationship (**RQ1**). The present study provides evidence with respect to competence and its detailed dimensions of employability (Organisation Sense, Occupational Expertise, Anticipation & Optimisation, Personal Flexibility and Affective Reactions) in CAMC of BID (**RQ3**). The concept of employability that has been identified therefore assists in our understanding of the role of CAMC of BID in fulfilling the purpose it was designed for in preparing students with relevant and sufficient employability.

The current findings add to a growing body of literature on student engagement, particularly in the context of CAMC of BID. An interesting finding of the study is that CAMC of BID had developed student engagement which might have enhanced students' employability. Students were found to be happy to do BID tasks and they felt belonged to the class. They seemed to become more strategic in planning, monitoring and evaluating their performance in BID apart from having acquired good attitudes and behaviour by doing BID tasks. These elements of student engagement (emotional, cognitive and behavioural) had been perceived to have an affirmative effect on students' ability to develop employability, thereby achieving high levels of personal well-being and qualities desired by employers.

2. The adapted instruments and procedures used to assess students' employability in this study may serve as a base for instruments applied in future studies involving secondary school students undertaking other CAMC subjects. This is essential as the previously established instruments and procedures to predict students' employability were basically for college graduates or employees at work (**RQ2**).

3. The present study confirms previous findings on the influence of ethnicity on students' employability and contributes additional evidence that suggests gender-related bias to be irrelevant and insignificant in CAMC of BID. The study further confirms that individual, job-related and organisational factors have different impact on students' employability at different level of significance (**RQ4**).
4. Whilst this study did not confirm the extent of students' success in the future, it did partially substantiate the positive impact the dimensions of employability utilised in the study had on students' success at present and that there was no difference in perceptions of three out of five dimensions of employability between students and assessors (**RQ5**). Both students and assessors generally had positive perceptions of students' employability. They had similar perceptions of students' Anticipation & Optimisation, Occupational Expertise and Personal Flexibility while slight difference in perceptions of students' Organisation Sense and Affective Reactions.
5. Taken together, these findings underline the importance of the role of the qualitative data gathered from the interviews, observation and portfolio reviews. It can therefore be assumed that the qualitative data had significantly contributed to a comprehensive understanding of the findings of this study (**RQ6** and **RQ7**).
6. The study proposes the development of the Predictive Employability Profile (PEP) which might have fulfilled some of the necessary requirements and can be further developed to increase its potential in predicting employability before actually using it in practice (**RQ8**). The proposed PEP, is a key outcome of this study and its potential to be a prototype to predict employability among students in secondary schools can be further enhanced through further studies.

10.3.4.2 Contributions to Practice

The contribution to practice of this research is based on the researcher's experience in conducting the research, the input and feedback received from the participants, and the discussions had at conferences with other researchers who specialised in areas such as educational assessment, vocational education and training, and research methodologies. The present study makes several contributions:

1. The present study adds to the evidence for valid and practical instruments that might be developed to predict employability among students in secondary schools. Such instrumentation might assist principals and teachers in schools to assess the effectiveness of CAMC of any vocational subjects in preparing students with relevant employability skills.
2. The findings of the study will enhance students' awareness and understanding of how they could benefit from their experience in undertaking CAMC of BID. Students will become more informed about prospects in BID-related industries and how they could seize these opportunities based on their experience in doing BID tasks.
3. The current findings add to the assessors' understanding of the importance of their role in relation to developing students' competence in accomplishing BID tasks. Assessors will have to become more aware of how a good assessor-student relationship, proper guidance and encouragement could help promote students' employability.
4. The findings of the present study will enable the participant schools to understand their role in providing satisfactory facilities and services such as suitable workplace, healthy assessor-student exchange and sufficient equipment-material that are vital in ascertaining students' employability.

5. The present study provides additional evidence with respect to relevant illustrations of CAMC of BID which might be used to inform guiding principles at the Malaysia Examinations Syndicate (MES) and policy at the highest ministerial level. Consequently, the study has provided some valuable guidance to increase investment in human capital with regards to employability.

In summary, each of the discussions show that the study has contributed to theory and practice as outlined earlier: students' undertaking CAMC of BID have acquired relevant employability; making them attractive to employers and well prepared to develop their own skill set.

10.4 Limitations of the Research

This research was conducted for a PhD programme which took about three years to complete. The current study has only investigated the employability of Form Five students undertaking CAMC of BID in Malaysian secondary schools. The main participants were the Form Five students who were in their final year of compulsory education and their assessors. The current investigation was limited by time constraints, prohibiting the researcher from the opportunity to do a longitudinal study on the predictive assessment of students' employability when they left school. Thus, the prediction of employability could only be based on the time when students were still in school and the predictive value could not be further confirmed.

An issue that was not able to be taken into consideration in this study was the process of member checks. Although this process of member checks is perceived to be one of the methods to increase the validity of qualitative interpretations (Cutcliffe & McKenna, 2002) even when some may argue about it (Sandelowski, 2002), it was not possible for the researcher to carry it out as she had limited time and was only able to see the participants once during data collection in Malaysia.

Another important issue to note is that the current study has only examined students' employability based on students' and assessors' perceptions. Therefore, the findings of this study reflected only on how students and assessors perceived students' performance in CAMC of BID in relation to their future employability. Other desirable perceptions may be of the internal and external moderators. Furthermore, this study did not set out to generalise findings across the full range of vocational subjects. The extent to which the findings in relation to BID can be generalised has still to be examined.

10.5 Suggestions for Future Research and Recommendations

This research has thrown up some questions in need of possible investigation. The researcher, based on this study and through her experience, has identified several areas for future research to be undertaken in the following areas:

- A number of possible future studies using the proposed PEP are needed to determine higher validity and reliability of the constructs in the instruments. This current research was applied in 19 secondary schools in Malaysia offering BID subject. Further investigations involving more schools offering other vocational subjects using the proposed PEP might be beneficial as comparisons, further developments and improvements. A follow up large scale study with the trainees at training colleges or employees in the industries might be able to further verify the effectiveness of the further developed proposed PEP. It is only after thorough development and improvements that the proposed PEP is possible to be adopted for actual use in predicting employability.
- It would be useful to assess the effects of CAMC on the employability of students after they have completed their compulsory education. A follow up study tracking down the student participants in this study after leaving school

and looking at what they are doing in the future might be beneficial to confirm the predictive value of this study.

- It would be enriching to compare experiences and perceptions of other teachers or individuals involved in CAMC regarding students' employability. A further investigation on students' employability including the perceptions of the internal and external moderators of CAMC of BID might be worthwhile as it might further enhance the findings of this study.
- Future research should concentrate on the investigation of the impact of culture on employability in the context of CAMC of any other vocational subjects while considering the sensitivity of the matter in Malaysia. The results from such research might enable this study to be included in the comparative analysis.

In addition to the suggestions for future research, the researcher has also outlined a number of general recommendations:

- This study has found that healthy assessor-student exchange had contributed quite remarkably to students' employability and success in relation to CAMC of BID. This finding of this study has a number of important implications for future practice especially in teacher training programmes (in-service and pre-service trainings). Teachers should be trained in educational assessment and in how to assess students' performance reliably. Emphasis on teachers' roles as educators, facilitators and assessors should be given so that they would be able to help students learn in a conducive learning environment. It is therefore recommended that proper and sufficient assessor training is continuously provided to teachers in order to increase the credibility of the assessment and the reliability of the judgments made by assessors.

- The information from the study can be used to develop interventions aimed at improving vocational qualifications. A continuation of CAMC of BID or other existing vocational subjects is recommended to be offered as an elective subject to Form Six students for Sijil Tinggi Pelajaran or Higher School Certificate (HSC), for a vocational qualification - similar to A-levels vocational qualifications. The introduction of this qualification will enable a full utilization of the facilities and resources available in schools. Moreover, it may provide further training for students to increase knowledge and skills, and subsequently obtain higher level of vocational qualifications locally without having to move to other cities. This inevitably will benefit the nation as a more skilled workforce is developed.
- Another important practical implication is that all of the relevant ministries running CBA in respective ways and standards should join forces to develop common competence standards that could be applied at different levels in various sectors or organisations. These standards could be used in schools, training colleges or even the industries and should be recognised by all the involved ministries in order to enhance students' mobility in training and development of workforce as well as for employment.
- There is, therefore, a definite need for a national credits and qualifications framework to be created and made public for more structured and organised implementation of CBA. Malaysia could learn from and adapt examples of frameworks developed for Scotland, England, Ireland and South Africa to suit the Malaysian context. Such a framework provides guidance and motivation for lifelong learning where people could advance and progress academically or professionally at any point in their lives.

In conclusion, each of the activities in this study has produced some key outcomes which attempted to address how we can predict the employability of students undertaking CAMC? Figure 10.7 shows the summary of this research. Some of the

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Students' Perceptions of the Impact of Competency Based Assessment on Their Employability

Student's Consent to Participate in Research

1. The research team is inviting you to participate in a research project to survey, interview and observe students to find out what they have acquired when completing tasks in the assessment modules of the subject Basic Interior Decorations (BID).
2. This study is funded by the Ministry of Education, Malaysia and sponsored by the University of Strathclyde, Glasgow, Scotland. The findings will be of benefit to the students and will provide the Ministry of Education, with pointers to improve the assessment procedures and the quality of every student's learning and assessment.
3. Your participation in this study is entirely voluntary. You can withdraw from the study at any time without giving a reason. The information you provide will be held confidentially, and only the research team will have the access to it. The information will be retained for up to ten years when it will be destroyed. Your name is only recorded for statistical analysis purposes and will not be identified on any publication.
4. If you have any further questions about the survey, the interview and observation which will be recorded, or about taking part in this study, you may contact any member of the research team.
5. Signing your name at the bottom means that you agree to participate in this study.

Your cooperation is greatly appreciated. Thank you.

Student's Signature:

Date:

Student's Name :

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Persepsi Pelajar Terhadap Impak Pentaksiran Kompetensi Ke Atas Kebolehpasaran (*Employability*) Pelajar

Pengesahan Penglibatan Pelajar Dalam Kajian

1. Pengkaji menjemput anda untuk mengambil bahagian dalam kajian yang dijalankan dalam bentuk soal selidik, temuduga dan pemerhatian. Kajian ini bertujuan menyelidiki tentang apa yang pelajar telah kuasai setelah melaksanakan tugas dalam modul pentaksiran Hiasan Dalaman Asas (HDA).
2. Kajian ini dibiayai oleh Kementerian Pelajaran Malaysia dan ditaja oleh University of Strathclyde, Glasgow, Scotland. Dapatan kajian adalah bermanfaat bagi pelajar dan dapat memberi maklumat kepada Kementerian Pelajaran Malaysia tentang bagaimana prosedur pentaksiran dan pembelajaran pelajar dapat dipertingkatkan.
3. Penglibatan anda dalam kajian ini adalah secara sukarela. Anda boleh menarik diri tanpa memberi sebarang alasan pada bila-bila masa sahaja. Maklumat yang anda berikan adalah sulit dan hanya boleh diakses oleh pengkaji yang terlibat sahaja. Maklumat akan disimpan sehingga sepuluh tahun dan akan dimusnahkan selepas itu. Nama anda hanya direkod untuk tujuan analisis statistik sahaja dan tidak akan dimaklumkan dalam apa jua bentuk penerbitan.
4. Jika anda ada sebarang pertanyaan berkaitan soal selidik, temuduga dan pemerhatian yang akan dirakam, atau tentang penglibatan anda dalam kajian ini, bolehlah menghubungi mana-mana pengkaji seperti nama di atas.
5. Apabila anda menandatangani nama anda di bawah, ianya bermakna anda bersetuju untuk mengambil bahagian dalam kajian ini.

Kerjasama anda amatlah dihargai dan ribuan terima kasih diucapkan..

Tandatangan pelajar:

Tarikh:

Nama pelajar:



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**Teachers' Perceptions of the Impact of
Competency Based Assessment on Learners' Employability**

Teacher's Consent to Participate in Research

1. The research team is inviting you to participate in a research project to survey and interview teachers who are also the assessors of competency based assessment to find out what their perceptions of their students who have completed the tasks in the assessment modules of the subject Basic Interior Decorations (BID) are in relation to their employability.
2. This study is funded by the Ministry of Education, Malaysia and sponsored by the University of Strathclyde, Glasgow, Scotland. The findings will be of benefit to the students and will provide the Ministry of Education, with pointers to improve the assessment procedures and the quality of every student's learning and assessment.
3. Your participation in this study is entirely voluntary. You can withdraw from the study at any time without giving a reason. The information you provide will be held confidentially, and only the research team will have the access to it. The information will be retained for up to ten years when it will be destroyed. Your name is only recorded for statistical analysis purposes and will not be identified on any publication.
4. If you have any further questions about the survey, the interview that will be recorded or about taking part in this study, you may contact any member of the research team.
5. Signing your name at the bottom means that you agree to participate in this study.

Your cooperation is greatly appreciated. Thank you.

Participant's Signature: Date:

Participant's Name :

School Code

Appendix B (1)

Index Number

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Student's name:

A SURVEY ON
STUDENTS' PERCEPTIONS OF THE IMPACT OF COMPETENCY-
BASED ASSESSMENT ON THEIR EMPLOYABILITY

STUDENT QUESTIONNAIRE

(JULY 2008)



This is a survey to find out more about the assessment of the subject, Basic Interior Decorations (BID) which you are currently undertaking. It is part of my research and your responses will not be disclosed to your teacher or anyone else.

CONTACT PERSONS:

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STUDENT QUESTIONNAIRE

Instruction: *Remember that there are no right or wrong answers. Just be sincere and answer what is true to you.*

Section A

1. Location of school: Rural/Urban*
2. Gender: Male/Female*
(* Circle your answers)
3. Race: Malay/Chinese/Indian/Others*

Section B: Individual Predictors

*Read each sentence and indicate how much you agree or disagree by putting a tick (✓) in the box that best describes you or how you feel about the assessment of the subject, Basic Interior Decorations (BID). Remember to mark **one** box for each sentence.*

	Item	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
<i>I</i>	<i>Health Predictor</i>					
4	In general, I am healthy.					
5	I exercise to stay healthy.					
6	I have not been absent from school due to illness for the past year.					
<i>II</i>	<i>Flow</i>					
	<i>Happiness</i>					
7	I enjoy doing BID tasks.					
8	I feel cheerful when I am doing BID tasks.					
	<i>Absorption</i>					
9	When doing BID tasks, I tend to forget everything else around me.					
10	I get carried away by BID tasks.					
	<i>Intrinsic Motivation</i>					
11	I get the motivation to do BID tasks because of the good prospect the subject offers.					
12	I do BID tasks because I want to, not because I have to.					
13	I do BID tasks without asking what the results will be.					
Section C: Job-related Predictors						
<i>I</i>	<i>Student's working experience</i>					
14	How often do you work after school in areas related to BID in a week?	Days: 0 1 2 3 4 5 6 7				
15	How often have you been going for further training after school in areas related to BID in the past year?	Frequency: 0 1-3 4-6 7-9 >10				
<i>II</i>	<i>Learning value</i>					
16	Doing the tasks related to BID helps me learn more.					
17	Doing the tasks related to BID further develops my talents.					
18	I can completely utilise my capabilities when doing BID tasks.					

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Section D: Organisational Predictors						
<i>I</i>	<i>Learning Climate</i>					
	<i>Time Dimension</i>					
19	I do not have enough time to learn new BID tasks before I have to do them.					
20	There is no time to get all the information I need in order to do my BID tasks well.					
21	I have no time to do my BID tasks properly.					
	<i>Team style</i>					
22	My friends are willing to share information relevant to the BID tasks.					
23	If I have a question about BID tasks, my classmates will help answer it.					
24	There is no one willing to help if I get stuck with my BID tasks.					
	<i>Opportunities to develop</i>					
25	I have the chance to do other BID tasks besides the required ones.					
26	I have the chance to develop my strengths by doing BID tasks.					
27	I can apply what I have learned in BID tasks in other situations.					
<i>II</i>	<i>Assessor-student exchange</i>					
28	My assessor/teacher recognises my potential in BID.					
29	My assessor/teacher understands my problems and needs in BID.					
30	My assessor/teacher would help me solve problems in BID.					
31	My assessor/teacher is satisfied with what I do in BID tasks.					
32	My relationship with my assessor/teacher is close (can communicate effectively).					
<i>III</i>	<i>Sufficient Facilities</i>					
33	I am satisfied with the amount of equipment provided for my BID tasks.					
34	I am satisfied with the condition of the equipment in the workplace.					
35	My assessor/teacher provides enough materials for me to do my BID tasks.					
36	The materials provided for BID tasks are in good condition.					
37	The workplace is suitable for me to do my BID tasks.					
38	I am satisfied with the condition of my workplace.					
39	The water supply in the workplace is satisfactory.					
40	I am happy with the location of the workplace.					
41	There is no problem with the power supply in the workplace.					

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Section E: Mediators: dimensions of employability						
<i>I</i>	<i>Balance</i>					
42	I feel stressed when doing my BID tasks.					
43	My doing of BID tasks does not interfere with the rest of my life.					
44	After doing my BID tasks I am generally able to relax.					
<i>II</i>	<i>Occupational expertise</i>					
45	I have performed my BID tasks with only few mistakes.					
46	I feel confident to provide information on the BID tasks that I have done.					
47	I am able to help my classmates understand how to do the BID tasks better.					
48	I have carried out my BID tasks independently.					
49	I am confident of my ability to do BID tasks.					
50	I have acquired the required skills to complete BID tasks.					
<i>III</i>	<i>Anticipation and optimisation</i>					
51	I spend some of my free time improving my skills in BID.					
52	I take the initiative to learn how to overcome my weaknesses.					
53	I am eager to apply the knowledge and skills that I have learned and acquired in BID class.					
54	I am focused on continuously developing myself.					
<i>IV</i>	<i>Personal Flexibility</i>					
55	I can easily adapt to changes in my BID workplace (eg: new storage, extended/renovated workplace, new equipment).					
56	I adapt easily to developments within my BID workplace.					
57	I can cope with changes in my BID class.					
58	I feel comfortable doing my BID tasks in the presence of my classmates.					
<i>V</i>	<i>Corporate/Organisation Sense</i>					
59	I am involved in achieving the mission of my BID class.					
60	I do that extra bit for my BID class apart from my direct responsibilities.					
61	In my BID class, I take the initiative to share responsibilities with my classmates.					
62	I share my experience and knowledge with others from outside my class.					

Kod Sekolah

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Appendix B (2)

Nombor Indeks

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Nama Pelajar:

KAJIAN TENTANG
PERSEPSI PELAJAR TERHADAP IMPAK
PENTAKSIRAN KOMPETENSI KE ATAS KEBOLEHPASARAN
(EMPLOYABILITY) PELAJAR

SOAL SELIDIK PELAJAR

(JULAI 2008)



Soal selidik ini merupakan satu kajian tentang diri anda dan pentaksiran mata pelajaran Hiasan Dalaman Asas (HDA) yang anda sedang ikuti. Ianya sebahagian daripada kajian saya dan respons anda tidak akan didedahkan pada guru atau sesiapa pun kecuali pengkaji yang terlibat sahaja.

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SOAL SELIDIK PELAJAR

Arahan: Tiada jawapan salah atau pun betul. Berikan jawapan anda secara jujur dan benar.

Bahagian A

1. Lokasi sekolah: Luar bandar/Pinggir bandar/Bandar*
2. Jantina: Lelaki/Perempuan*
(* Bulatkan jawapan anda)
3. Bangsa: Melayu/Cina/India/Lain-lain*

Bahagian B

Baca dan tanda (✓) dalam ruang yang disediakan bagi menunjukkan sejauh mana anda setuju atau tidak dengan setiap pernyataan tentang anda dan pentaksiran kompetensi Hiasan Dalaman Asas (HDA). Hanya satu ruang sahaja yang perlu tanda bagi setiap pernyataan.

Item	Sangat tidak setuju	Tidak setuju	Tidak pasti	Setuju	Sangat setuju
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					

		Sangat tidak setuju	Tidak setuju	Tidak pasti	Setuju	Sangat setuju
24	Saya berpeluang memperkembangkan kekuatan diri dengan melakukan tugas HDA.					
25	Saya boleh menggunakan apa yang dipelajari daripada tugas HDA pada situasi lain.					
26	Guru saya mengenal pasti potensi saya dalam HDA.					
27	Guru saya memahami masalah dan keperluan saya dalam HDA.					
28	Guru saya akan membantu menyelesaikan masalah dalam tugas HDA.					
29	Guru saya berpuashati dengan apa yang saya lakukan dalam tugas HDA.					
30	Hubungan saya dengan guru adalah rapat (boleh berkomunikasi dengan berkesan).					
31	Saya berpuashati dengan jumlah peralatan yang dibekalkan untuk tugas HDA.					
32	Saya berpuashati dengan keadaan peralatan di bengkel HDA.					
33	Guru saya menyediakan bahan yang mencukupi untuk melakukan tugas HDA.					
34	Bahan yang disediakan untuk tugas HDA adalah dalam keadaan baik.					
35	Bengkel HDA adalah sesuai untuk saya melakukan tugas HDA.					
36	Saya berpuashati dengan keadaan bengkel HDA.					
37	Bekalan air di bengkel HDA adalah memuaskan.					
38	Saya berpuashati dengan lokasi bengkel HDA.					
39	Tiada masalah dengan bekalan elektrik di bengkel HDA.					
40	Saya merasa tekanan (stres) apabila melakukan tugas HDA.					
41	Penglibatan saya dalam tugas HDA tidak mengganggu kehidupan saya yang lain.					
42	Saya pada amnya relaks setelah selesai melakukan tugas HDA.					
43	Saya telah melakukan tugas HDA dengan hanya beberapa kesilapan sahaja.					
44	Saya yakin untuk memberi maklumat berkaitan tugas HDA yang telah dilakukan.					
45	Saya berupaya membantu rakan sekelas memahami cara untuk melakukan tugas HDA dengan lebih baik.					
46	Saya telah melakukan tugas HDA dengan sendiri.					
47	Saya yakin dengan keupayaan saya melakukan tugas HDA.					
48	Saya telah memperolehi kemahiran yang diperlukan untuk menyiapkan tugas HDA.					
49	Saya memperuntukkan sebahagian daripada masa lapang saya bagi mempertingkatkan kemahiran dalam bidang HDA.					
50	Saya mengambil inisiatif untuk belajar memperbaiki kelemahan saya.					
51	Saya bersedia untuk menggunakan pengetahuan dan kemahiran yang telah diperolehi daripada kelas HDA.					

		Sangat tidak setuju	Tidak setuju	Tidak pasti	Setuju	Sangat setuju
52	Saya fokus terhadap perkembangan diri saya secara berterusan.					
53	Saya mudah menerima perubahan di bengkel HDA (stor & peralatan baru, pengubahsuaian bengkel).					
54	Saya mudah menerima perkembangan yang berlaku dalam bengkel HDA.					
55	Saya berupaya menyesuaikan diri dengan perubahan yang berlaku dalam kelas HDA.					
56	Saya terlibat dengan pencapaian misi kelas HDA.					
57	Saya merasa selesa melakukan tugas HDA dengan kehadiran rakan sekelas.					
58	Saya melakukan lebih daripada yang dipertanggungjawabkan kepada saya dalam kelas HDA.					
59	Saya mengambil inisiatif untuk berkongsi tanggungjawab dengan rakan sekelas saya di kelas HDA.					
60	Saya berkongsi pengalaman dan pengetahuan dengan orang selain rakan sekelas HDA.					
61	Saya merasa terasing dalam kelas HDA.					
62	Saya mudah berkawan.					
63	Saya merasai diri saya diterima dalam kelas HDA.					
64	Saya merasa janggal dan terasing di kelas HDA.					
65	Rakan sekelas seolah-oleh suka pada saya.					
66	Saya merasa keseorangan di kelas HDA.					
67	Saya berada dalam kelas yang menawarkan peluang untuk belajar kemahiran baru.					
68	Saya berada dalam situasi di mana saya dapat melakukan tugas yang benar-benar saya sukai.					
69	Saya dihormati oleh rakan-rakan saya.					

Bahagian C

Baca soalan di bawah dan bulatkan jawapan anda.

70. Berapakah bilangan modul pentaksiran HDA yang telah anda cuba lakukan dalam masa setahun yang lepas?

Modul Pentaksiran: 1 2 3 4 5 6 7 8 9 10 11 12 13

71. Berapakah bilangan modul pentaksiran HDA yang telah anda kompeten dalam masa setahun yang lepas?

Modul Pentaksiran: 1 2 3 4 5 6 7 8 9 10 11 12 13

Appendix C (1)

**A SURVEY ON
TEACHERS' PERCEPTIONS OF THE IMPACT OF COMPETENCY-
BASED ASSESSMENT ON LEARNERS' EMPLOYABILITY**

(ASSESSOR QUESTIONNAIRE)

JULY 2008

*This is a survey to find out more about you, your students and the assessment of the subject
Basic Interior Decorations (BID). There are no right or wrong answers.
Your answers will be kept anonymous and only known to the research team.*

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ASSESSOR QUESTIONNAIRE

Section A

Select **twelve** students who have accomplished the number of assessment modules within these categories: **1-4**, **5-9**, and **10- 13**. Write their names in the provided columns. Read each statement and indicate how much it describes your students by writing (1) Strongly Disagree, (2) Disagree, (3) Undecided, (4) Agree, or (5) Strongly Agree.

No	Item	Students' Names											
		1 – 4 modules				5 – 9 modules				10 – 13 modules			
1	This student feels stressed when doing his/her BID tasks.												
2	This student's doing of BID tasks does not interfere with the rest of his/her life.												
3	After doing his/her BID tasks, this student is generally able to relax.												
4	This student has performed his/her tasks with only a few mistakes.												
5	This student feels confident to provide information on the BID tasks that he/she has done.												
6	This student is able to help his/her classmates understand how to do BID tasks better.												
7	This student has carried out his/her BID tasks independently.												
8	This student is confident of his/her ability to do BID tasks.												
9	This student has acquired the required skills to complete BID tasks.												
10	This student spends some of his/her time improving the skills in BID.												
11	This student takes the initiative to learn how to overcome his/her weaknesses.												

12	This student is eager to apply the knowledge and skills that he/she has learned and acquired in BID class.													
13	This student is focused on continuously developing him/herself.													
14	This student can easily adapt to changes in the BID workplace (eg; new storage, extended/renovated workplace, new equipment).													
15	This student adapts easily to developments within the BID workplace.													
16	This student can cope with changes in the BID class.													
17	This student is involved in achieving the mission of the BID class.													
18	This student feels comfortable doing BID tasks in the presence of his/her classmates.													
19	This student does that extra bit for the BID class apart from his/her direct responsibilities.													
20	In the BID class, this student takes the initiative to share responsibilities with his/her classmates.													
21	This student shares his/her experience and knowledge with others from outside the BID class.													
22	This student feels like an outsider (or left out of things) in the BID class.													
23	This student makes friends easily.													
24	This student feels like he/she belongs to the BID class.													
25	This student feels awkward and out of place in the BID class.													
26	This student's classmates seem to like him/her.													
27	The student feels lonely in the BID class.													
28	This student is in a class that offers him/her the chance to learn new skills.													
29	This student is in a position to do mostly work that he/she really likes.													
30	This student is respected by his/her friends.													

Section B

Based on the documented evidence, fill in the correct number of assessment modules obtained by each student.

31	This student has attempted to do assessment modules in the past year.													
32	This student has demonstrated competence in assessment modules in the past year.													

Section C

Read each statement below and indicate how much you agree or disagree by putting a tick (✓) in the box that best describes you, your students or the assessment of the subject, Basic Interior Decorations (BID). Remember to tick **one** box for each statement.

No	Item	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
33	I am satisfied with what my students do in the BID tasks.					
34	I understand my students' problems and needs in BID.					
35	I recognise my students' potential in BID.					
36	I would help my students solve problems in BID.					
37	My relationship with my students is close (can communicate effectively).					
38	I provide satisfactory amount of equipment for my students' BID tasks.					
39	I am satisfied with the condition of the equipment in the workplace.					
40	I provide sufficient materials for my students to do the BID tasks.					
41	The materials provided are in good condition.					
42	The workplace is suitable for my students to do their BID tasks.					
43	There is no problem with the power supply in the workplace.					
44	The water supply in the workplace is satisfactory.					
45	I am happy with the location of the workplace.					
46	I am satisfied with the condition of the workplace.					

Section D

47. School Code:
48. Location of school: Rural/Urban*
49. Gender: Male/Female*
50. Race: Malay/Chinese/Indian/Others*
51. Highest Education Qualification: Diploma/Degree/Master (* Circle your answers)
52. Major in First Degree:
53. Teaching experience (in years):

Your time and cooperation is greatly appreciated. Thank you.

Appendix C (2)

**KAJIAN TENTANG
PERSEPSI GURU TERHADAP IMPAK PENTAKSIRAN KOMPETENSI
KE ATAS KEBOLEHPASARAN (*EMPLOYABILITY*) PELAJAR**

(SOAL SELIDIK PENTAKSIR)

JULAI 2008

Soal Selidik ini merupakan satu kajian tentang diri anda, pelajar dan pentaksiran mata pelajaran Hiasan Dalaman Asas (HDA). Tiada jawapan salah atau pun betul. Segala respons dalam soal selidik ini adalah sulit dan hanya diketahui oleh pengkaji yang terlibat sahaja.

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SOAL SELIDIK PENTAKSIR

Bahagian A

Pilih **dua belas** orang pelajar yang telah melengkapkan bilangan modul pentaksiran dalam kategori berikut: **1-4**, **5-9**, dan **10-13**. Tulis nama pelajar dalam lajur yang disediakan. Baca dan tulis (1) Sangat tidak setuju, (2) Tidak setuju, (3) Tidak pasti, (4) Setuju, atau (5) Sangat setuju.

No	Item	Nama Pelajar											
		1 – 4 modul				5 – 9 modul				10 – 13 modul			
1	Pelajar ini merasa stres apabila melakukan tugas HDA.												
2	Penglibatan pelajar dalam tugas HDA tidak mengganggu kehidupannya yang lain.												
3	Pelajar ini pada amnya relaks setelah selesai melakukan tugas HDA.												
4	Pelajar ini telah melakukan tugas HDA dengan hanya beberapa kesilapan sahaja.												
5	Pelajar ini yakin untuk memberi maklumat berkaitan tugas HDA yang telah dilakukan.												
6	Pelajar ini berupaya membantu rakan sekelas memahami cara untuk melakukan tugas HDA dengan lebih baik.												
7	Pelajar ini telah melakukan tugas HDA dengan sendiri.												
8	Pelajar ini yakin dengan keupayaannya melakukan tugas HDA.												
9	Pelajar ini telah memperolehi kemahiran yang diperlukan untuk menyiapkan tugas HDA.												
10	Pelajar ini memperuntukkan sebahagian daripada masa lapangnya mempertingkatkan kemahiran dalam bidang HDA.												
11	Pelajar ini mengambil inisiatif untuk belajar memperbaiki kelemahannya.												

12	Pelajar ini bersedia untuk mengaplikasi pengetahuan dan kemahiran yang telah diperolehi daripada kelas HDA.																		
13	Pelajar ini fokus terhadap perkembangan dirinya secara berterusan.																		
14	Pelajar ini mudah mengadaptasi perubahan di bengkel HDA (stor & peralatan baru, pengubahsuaian bengkel).																		
15	Pelajar ini mudah mengadaptasi perkembangan yang berlaku dalam bengkel HDA.																		
16	Pelajar ini berupaya menyesuaikan diri dengan perubahan yang berlaku dalam kelas HDA.																		
17	Pelajar ini terlibat dengan pencapaian misi kelas HDA.																		
18	Pelajar ini merasa selesa melakukan tugas HDA dengan kehadiran rakan sekelasnya.																		
19	Pelajar ini melakukan lebih daripada yang dipertanggungjawabkan kepadanya dalam kelas HDA.																		
20	Pelajar ini mengambil inisiatif untuk berkongsi tanggungjawab dengan rakan sekelasnya di kelas HDA.																		
21	Pelajar ini berkongsi pengalaman dan pengetahuan dengan orang selain rakan sekelas HDA.																		
22	Pelajar ini merasa terasing dalam kelas HDA.																		
23	Pelajar ini mudah berkawan.																		
24	Pelajar ini merasai dirinya diterima dalam kelas HDA.																		
25	Pelajar ini merasa janggal dan terasing di kelas HDA.																		
26	Rakan sekelas seolah-olah suka pada pelajar ini.																		
27	Pelajar ini merasa keseorangan di kelas HDA.																		
28	Pelajar ini berada dalam kelas yang menawarkannya peluang untuk belajar kemahiran baru.																		
29	Pelajar ini berada dalam situasi di mana beliau dapat melakukan tugas yang benar-benar disukainya.																		
30	Pelajar ini dihormati oleh rakan-rakannya.																		

Bahagian B

Berdasarkan dokumen sedia ada, tulis bilangan modul pentaksiran yang diperolehi oleh setiap pelajar yang dinamakan di atas.

31	Pelajar ini telah cuba melakukan modul pentaksiran dalam masa setahun yang lepas.																		
32	Pelajar ini telah kompeten dalam modul pentaksiran dalam masa setahun yang lepas.																		

Appendix D (1)

Learners Enrolled for Competence-Based Assessment Interview Basic Interior Decorations

Date:
Name:
School:

Time:
Gender: Male/Female

STUDENT INTERVIEW PROTOCOL

My name is Rahimah Adam. I am working on a PhD research at the University of Strathclyde, Glasgow on the impact of competence-based assessment on learners' employability. The study will involve nineteen secondary schools in Malaysia which offer the subject of Basic Interior Decorations (BID). I am here to ask you a few questions about the subject that you have been learning. Do you have any questions at this point?

Thank you for your willingness to participate in this research project. Before we begin the interview, I would like to reassure you that this interview will be confidential and the tape and the transcripts available only to the research group. Do you mind if I record the interview? If there is anything you don't want me to record, just let me know and I will turn off the recorder. The interview will take about 10 minutes.

Excerpt of this interview may be made part of my final research report, but under no circumstances will your name or identifying characteristics be included in this report.

Is it all right for me to turn on the recorder now?

1. You have been doing BID tasks in school for almost two years now.
 - a. Apart from the BID tasks what other relevant activities have you taken part in?
 - b. Did any parties from outside of the school such as the industry or training colleges take part in these activities? If yes, name the parties.
 - c. How do you think these experiences have helped you gain knowledge and skills in BID?
2. Now, tell me five specific assessment modules that you think you have acquired the most knowledge and skills in BID.
 - a. For each of the assessment module, how do you think it will help you in their future work?
3. Now, tell me any assessment modules that you think contribute the least in preparing you for future work in BID and why do you think so?
4. What are your suggestions to improve your knowledge and skills in BID?

Appendix D (2)

Pelajar mendaftar untuk Temuduga Pentaksiran Kompetensi Hiasan Dalaman Asas

Tarikh:
Nama:
Sekolah:

Masa:
Jantina: Lelaki/Perempuan

PROTOKOL TEMUDUGA PELAJAR

Saya, Rahimah Adam merupakan pelajar ijazah kedoktoran di University of Strathclyde, Glasgow dan kajian saya berkaitan impak pentaksiran kompetensi ke atas kebolehpasaran (*employability*) pelajar. Kajian ini akan melibatkan sembilan belas sekolah yang menawarkan mata pelajaran Hiasan Dalaman Asas (HDA) di seluruh Malaysia. Saya di sini ingin bertanya beberapa soalan tentang pentaksiran mata pelajaran tersebut. Adakah anda mempunyai sebarang soalan pada ketika ini?

Terima kasih kerana sudi mengambil bahagian dalam kajian ini. Sebelum kita mulakan temuduga ini, saya ingin maklumkan bahawa temuduga ini adalah sulit dan rakaman serta transkripsi hanya diketahui oleh pengkaji yang terlibat sahaja. Adakah anda memberi kebenaran untuk saya merakamkan perbualan kita? Sekiranya terdapat apa-apa yang anda tidak mahu saya rakamkan, sila maklumkan pada saya dan saya akan padam alat perakam suara. Temuduga ini akan mengambil masa selama sepuluh minit sahaja.

Catatan daripada temuduga ini akan digunakan dalam laporan akhir kajian saya tapi nama atau sebarang identiti yang merujuk kepada anda tidak akan dinyatakan dalam laporan tersebut.

Boleh saya pasang alat perakam suara sekarang?

1. Anda telah melakukan tugas HDA di sekolah selama hampir dua tahun sekarang ini.
 - a. Selain daripada tugas HDA tersebut, apakah aktiviti lain yang anda pernah mengambil bahagian?

- b. Adakah terdapat badan-badan tertentu dari luar sekolah seperti kolej latihan atau industri yang mengambil bahagian dalam aktiviti tersebut? Jika ya, boleh namakan badan-badan tersebut?

 - c. Bagaimana pengalaman anda dalam aktiviti tersebut dapat membantu anda menimba pengetahuan dan kemahiran dalam bidang HDA?
-
2. Sekarang, boleh beritahu saya lima modul pentaksiran yang anda rasa anda telah menguasai paling banyak pengetahuan dan kemahiran dalam HDA.
 - i
 - ii
 - iii
 - iv
 - v
 - a. Bagi setiap modul pentaksiran tersebut, bagaimanakah ianya dapat membantu anda dalam kerjaya pada masa depan?

- i
- ii
- iii
- iv
- v

3. Sekarang, beritahu saya mana-mana modul pentaksiran yang anda rasakan paling kurang menyumbang kepada menyediakan anda untuk kerjaya berkaitan HDA pada masa depan dan mengapa anda fikir begitu?

4. Apakah cadangan anda untuk mempertingkatkan pengetahuan dan kemahiran dalam HDA?

Appendix E (1)
Teacher-Assessor of Competence-Based Assessment Interview
Basic Interior Decorations

Date:

Time:

Name:

Gender: Male/Female

School:

ASSESSOR INTERVIEW PROTOCOL

My name is Rahimah Adam. I am working on a PhD research at the University of Strathclyde, Glasgow on the impact of competence-based assessment on learners' employability. The study involves nineteen secondary schools in Malaysia which offer the subject of Basic Interior Decorations (BID). I would like to ask you a few questions about the subject that you have been teaching. Do you have any questions at this point?

Thank you for your willingness to participate in this research project. Before we begin the interview, I would like to reassure you that this interview will be confidential and the tape and the transcripts available only to the research group. Do you mind if I record the interview? If there is anything you don't want me to record, just let me know and I will turn off the recorder. The interview will take about 15 minutes.

Excerpt of this interview may be made part of my final research report, but under no circumstances will your name or identifying characteristics be included in this report.

Is it all right for me to turn on the recorder now?

1. You have been teaching and assessing BID for some time now.
 - a. Apart from the BID modules, what other activities have you carried out that will enhance learners' knowledge and skills in BID?
 - b. Did any parties from outside of the school such as the industry or training colleges take part in these activities? If yes, name the parties.
 - c. How do you think these experiences have contributed to learner's learning?
2. Now, tell me five specific assessment modules that you think learners have acquired the most knowledge and skills in BID.
 - a. For each of the assessment module, how do you think it helps learners in their future work?
3. Now, tell me any assessment modules that you think contribute the least in preparing learners for future work in BID and why do you think so?
4. What other modules do you think should be assessed and give reasons to your answers.
5. Could you tell me what additional forms of assessment you think could help learners equip themselves with required employability skills?

Appendix E (2)

Temuduga Guru Pentaksir Pentaksiran Kompetensi Hiasan Dalaman Asas

Tarikh:
Nama:
Sekolah:

Masa:
Jantina: Lelaki/Perempuan

PROTOKOL TEMUDUGA PENTAKSIR

Saya, Rahimah Adam merupakan pelajar ijazah kedoktoran di University of Strathclyde, Glasgow dan kajian saya berkaitan impak pentaksiran kompetensi ke atas kebolehpasaran (*employability*) pelajar. Kajian ini akan melibatkan sembilan belas sekolah yang menawarkan mata pelajaran Hiasan Dalaman Asas (HDA) di seluruh Malaysia. Saya di sini ingin bertanya beberapa soalan tentang pentaksiran mata pelajaran yang anda telah laksanakan. Adakah anda mempunyai sebarang soalan pada ketika ini?

Terima kasih kerana sudi mengambil bahagian dalam kajian ini. Sebelum kita mulakan temuduga ini, saya ingin maklumkan bahawa temuduga ini adalah sulit dan rakaman serta transkripsi hanya diketahui oleh pengkaji yang terlibat sahaja. Adakah anda memberi kebenaran untuk saya merakamkan perbualan kita? Sekiranya terdapat apa-apa yang anda tidak mahu saya rakamkan, sila maklumkan pada saya dan saya akan tutup alat perakam suara. Temuduga ini akan mengambil masa selama sepuluh minit sahaja.

Catatan daripada temuduga ini akan digunakan dalam laporan akhir kajian saya tapi nama atau sebarang identiti yang merujuk kepada anda tidak akan dinyatakan dalam laporan tersebut.

Boleh saya pasang alat perakam suara sekarang?

1. Anda telah mengajar dan mentaksir tugas HDA di sekolah selama beberapa tahun sekarang ini.
 - a. Selain daripada tugas HDA tersebut, apakah aktiviti lain yang anda pernah jalankan untuk mempertingkatkan pengetahuan dan kemahiran pelajar dalam bidang HDA?

b. Adakah terdapat badan-badan tertentu dari luar sekolah seperti kolej latihan atau industri yang mengambil bahagian dalam aktiviti tersebut? Jika ya, boleh namakan badan-badan tersebut?

c. Pada pendapat anda, bagaimanakah pengalaman dalam aktiviti tersebut dapat membantu pembelajaran pelajar dalam bidang HDA?

2. Sekarang, boleh beritahu saya lima modul pentaksiran yang anda rasa pelajar telah menguasai paling banyak pengetahuan dan kemahiran dalam HDA.

i

ii

iii

iv

v

a. Bagi setiap modul pentaksiran tersebut, bagaimanakah ianya dapat membantu pelajar dalam kerjaya pada masa depan?

i

ii

iii

iv

v

Appendix F

**BEHAVIOUR OBSERVATION FORM
BASIC INTERIOR DECORATIONS**

Name of School		Date	
Class Attendance		Start Time	
Module		End Time	

Engagement		Students' Behaviour	Phase 1 (Beginning of lesson)											
			i	ii	iii	iv	v	vi	vii	viii	ix	x		
Behavioural	1	Ask teacher questions about the task.*												
	2	Discuss the task with teacher.*												
	3	Discuss the task with classmates.*												
	4	Prepare required materials and equipment for the task.												
	5	Handle equipment and machinery competently.												
	6	Carry out task neatly to maintain cleanliness and safety.												
	7	Clean (wash/scrub/polish) all used equipment.												
	8	Return all used equipment to its proper place.												
	9	Clean up the workplace after working.												

* Record number of occurrence

A rating scale is used to record each student's behaviour at an interval of 60 seconds:

1 = not at all/very little **2** = some/moderate **3** = a great deal

All health, safety and environment rules and regulations are as indicated in the learning modules.

Engagement		Students' Behaviour	Phase 2 (Middle of lesson)										
			i	ii	iii	iv	v	vi	vii	viii	ix	x	
Behavioural	1	Ask teacher questions about the task.*											
	2	Discuss the task with teacher.*											
	3	Discuss the task with classmates.*											
	4	Prepare required materials and equipment for the task.											
	5	Handle equipment and machinery competently.											
	6	Carry out task neatly to maintain cleanliness and safety.											
	7	Clean (wash/scrub/polish) all used equipment.											
	8	Return all used equipment to its proper place.											
	9	Clean up the workplace after working.											

Engagement		Students' Behaviour	Phase 3 (Ending of lesson)										
			i	ii	iii	iv	v	vi	vii	viii	ix	x	
Behavioural	1	Ask teacher questions about the task.*											
	2	Discuss the task with teacher.*											
	3	Discuss the task with classmates.*											
	4	Prepare required materials and equipment for the task.											
	5	Handle equipment and machinery competently.											
	6	Carry out task neatly to maintain cleanliness and safety.											
	7	Clean (wash/scrub/polish) all used equipment.											
	8	Return all used equipment to its proper place.											
	9	Clean up the workplace after working.											

Appendix G: Data Collection Schedule

Date	School	Before BID Lesson		During BID Lesson			After BID Lesson			
14/07/08 Monday	E	Briefing and getting the assessors' consent	Assessor's Survey	Assessor's Interview	Briefing and getting the students' consent	Observation (Installation of rolled carpet)	Student's Interview	-	Debriefing	Portfolio review
15/07/08 Tuesday	L		Assessor's Survey	Portfolio review		Student's Survey	Student's Interview	-		Assessor's Interview
16/07/08	K		Assessor's Survey	Portfolio review		Observation (Installation of wall lights)	Student's Interview	Student's Survey		Assessor's Interview
17/07/08	H		Assessor's Survey	Assessor's Interview		Student's Survey	Observation (Presentation of business proposal)	Student's Interview		Portfolio review
18/07/08	D		Assessor's Survey	Assessor's Interview		Student's Survey	Student's Interview	-		Portfolio review
21/07/08	I		Assessor's Survey	Portfolio review		Student's Survey	Student's Interview	-		Assessor's Interview
22/07/08	J		Assessor's Survey	Assessor's Interview		Observation (Installation of window and door accessories)	Student's Interview	Student's Survey		Portfolio review

Date	School	Before BID Lesson		During BID Lesson			After BID Lesson			
23/07/08	G	Briefing and getting the assessors' consent	Assessor's Survey	Assessor's Interview	Briefing and getting the students' consent	Observation (Installation of window and door accessories)	Student's Interview	Student's Survey	Debriefing	Portfolio review
30/07/08	C		Assessor's Survey	Assessor's Interview		Student's Survey	Observation (Construction of wooden framework for drywall)	Student's Interview		Portfolio review
31/07/08	A		Assessor's Survey	Assessor's Interview		Observation (Wall painting)	Student's Interview	Student's Survey		Portfolio review
01/08/08	B		Assessor's Survey	Assessor's Interview		Observation (Installation of wall panel)	Student's Interview	Student's Survey		Portfolio review
03/08/08	M		Assessor's Survey	Portfolio review		Student's Survey	Student's Interview	-		Assessor's Interview
04/08/08	O		Assessor's Survey	Assessor's Interview		Student's Survey	Student's Interview	-		Portfolio review
05/08/08	N		Assessor's Survey	Assessor's Interview		Student's Survey	Student's Interview	-		Portfolio review

Date	School	Before BID Lesson		During BID Lesson				After BID Lesson		
08/08/08	F	Briefing and getting the assessors' consent	Assessor's Survey	Assessor's Interview	Briefing and getting the students' consent	Observation (Installation of gypsum board ceiling)	Student's Interview	-	Debriefing	Portfolio review Student's Survey (conducted by the assessor at another convenient time)
12/08/08	R		Assessor's Survey	Assessor's Interview		Student's Survey	Observation (Flower arrangements)	Student's Interview		Portfolio review
13/08/08	Q		Assessor's Survey	Assessor's Interview		Student's Survey	Student's Interview	-		Portfolio review
14/08/08	S		Assessor's Survey	Assessor's Interview		Student's Survey	Student's Interview	-		Portfolio review
15/08/08	P		Assessor's Survey	Assessor's Interview		Student's Survey	Student's Interview	-		Portfolio review

Appendix H

List of Academic Contributions on the Research

- Adam, R (2008). *The essence of employability in competence-based assessment*. Paper presented at The Annual Moving Forward Postgraduate Conference 2008 from 11-12 June 2008 at the University of Aberdeen, Scotland.
- Adam, R (2009). *Predicting employability: A proposed procedure for students undertaking competence-based assessment in Malaysian secondary schools*. A poster presented at the University of Strathclyde Research Day 2009 and Scottish Educational Research Association Conference 2009.
- Adam, R. (2009). *What is competence in competence-based assessment? An Evaluation by the secondary school students in Malaysia*. Paper presented at Journal of Vocational Education and Training (JVET) 8th International Conference from 3 – 7 July 2009 in Oxford, England.
- Adam, R. (2009). *Student engagement and the impact on employability: A creative contribution of competence-based assessment in Malaysian secondary schools*. Paper presented at The 35th International Association for Educational Assessment (IAEA) Annual Conference from 13 – 18 September 2009 in Brisbane, Australia.
- Adam, R. (2010). *The essence of employability in competence-based assessment*. In Morgan, H. M., Cernic, J. L. and Milligan, L. (Eds.) *Perspectives on power: An inter-disciplinary approach* (pp. 267-287). Newcastle upon Tyne: Cambridge Scholars Publishing.