Science and Mathematics Education Centre

Development, Validation and Use of an Instrument for Assessing Business Management Learning Environments in Higher Education in Australia: The Business Management Education Learning Environment Inventory (BMELEI)

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Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Signature: ………………………………………….

Date: …………………….............................

ABSTRACT

Although there are numerous instruments available for assessing classroom learning environments at the tertiary level, no instrument has been specifically designed and validated for measuring the business management education learning environment (Brennan & Ahmad, 2005). My aims were (1) to design, develop and validate an instrument, the *Business Management Education Learning Environment Inventory* (BMELEI), for assessing business management students' perceptions of the psychosocial learning environments of university seminars and tutorials and (2) to relate learning environment to attitudes towards the subject and attitudes towards the case study teaching strategy. This study is distinctive in that it involved both quantitative and qualitative methods. The BMELEI and two attitude scales were administered to 480 final-year undergraduate and postgraduate business studies students in 30 classes at both Curtin University of Technology and Edith Cowan University in Perth, Australia. The qualitative component of the study involved semi-structured interviews with 42 randomly-selected participants from the above universities. Factor analysis supported a six-factor structure (Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity) with scale alpha reliabilities ranging from 0.78 to 0.90 for the actual form and from 0.80 to 0.92 for the preferred form using the individual as unit of analysis. Students' attitudes were found to be positively associated with classroom learning environment. Also differences were found between students' perceptions of the actual and preferred classroom environment, and between male and female students' perceptions of the actual and preferred classroom environment. Findings suggested that students preferred a more positive and favourable classroom learning environment than they perceived as being actually present.

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CHAPTER 1

BACKGROUND, CONTEXT AND RATIONALE

1.1   Introduction

The main purpose of this study was to investigate students' perceptions of the learning environment of business management courses at the tertiary level in Australia. This interest was aroused in me while pursuing a program for the degree of Doctor of Philosophy in the area of learning environment research. Most of the extant research literature about the learning environment at the tertiary level reflects the perspective of the teacher, implying a teacher-centred view of the classroom environment, with little focusing on the perspective of the student. Although several instruments are available for assessing classroom learning environments at the tertiary level, no instrument has been specifically designed and validated for measuring the business management education learning environment. My aims were (1) to design, develop and validate an instrument, the *Business Management Education Learning Environment Inventory* (BMELEI), for assessing business management students' perceptions of the psychosocial learning environments of university seminars and tutorials and (2) to relate the learning environment to students' attitudes towards the subject as well as towards the case study teaching strategy. It is expected that this research project will assist business academics and administrators to facilitate and maximise the learning process of business students in business management education settings.

This chapter provides an introduction to the study to facilitate understanding of why research of this nature was carried out and its importance for business management education.

This chapter consists of the following sections:

- Section 1.2: Australian Business Management Education;
- Section 1.3: Background and Field of Learning Environment;
- Section 1.4: Specific Research Questions;
- Section 1.5: Significance of the Study;
- Section 1.6: Scope and Limitations of the Study;
- Section 1.7: Overview of the Study.

1.2   Australian Business Management Education

Over the last two decades, the number of undergraduate and postgraduate students entering higher education in Australia has increased dramatically, creating a significant change in the institutional environment (Williams, 1997). The increase has been particularly pronounced in business management education. There were 39,562 students enrolled at Curtin University of Technology in 2005. Of these, 15,188 were business students which represents approximately 38% of the total number of students (Curtin University Planning, 2005). In addition, Australian business schools are increasingly attracting international students, especially from the Asia-Pacific Rim (Tompson & Tompson, 1996).

In recent years, Australia has emerged among the top five provider of international education services, behind the US, UK, Germany and France. International education has become a key part of the Australian economy. Education services is still Australia's third largest services export after personal tourism and passenger transportation, and was the seventh largest individual export for all goods and services from 2002 to 2005 according to data released by the Australian Bureau of Statistics in the Balance of Payments figures (IDP Research, 2006). For January to December 2005, the total value of Australia's education exports reached $7.28 billion. For the year 2005, the value of education services has grown 9.8% from 2004 – an increase of $652 million (IDP Research, 2006).

There has been growing demand for management training and education in the past 20 years as business education has become an important part of the young and upcoming executive's preparation for success in business. With the increasing demand for management education increases, certain questions are being raised as to the appropriateness and relevance of this type of education for successful business executives and entrepreneurs alike. It is imperative for business educators to balance the needs of three key players, namely, the students, the corporation for which they work, and the Business schools. "Business Schools, as pivotal role-players in developing managerial competence, cannot escape their intellectual skills and community sensitive values, and may lead future transformation processes" (Bosch & Louw, 1998, p. 1).

Management educators need not only teach students how to *think* about business but also how to practically *manage* business. Therefore, an equilibrium needs to be found between traditional content knowledge (finance, strategy and human resources) and business skills (team skills, problem solving and innovative thinking) in business management.

1.2.1   Development of Australian Business Management Education

Australia has been described as a 'small in terms of population not area, rich industrial society' and also rich in natural resources. The population is comparatively small, approximately 20 million people within an area just over 7.6 million square kilometres, about the size of mainland USA excluding Alaska.

Australia's economy was originally based on primary production, particularly wool, meat, wheat and sugar and mining. Some of these industries are still the largest exporters. During the twentieth century, a manufacturing industry was developed with the help of tariff protection. Manufacturing and service industries, such as transport, finance, education and government, are the major employers (Buttery & Tamaschke, 1992).

Management education in Australia, as in most countries, has been carried out at a number of levels and in a variety of forms with a primary categorisation being between award and non-award courses. Award courses involve assessment of the performance of students by means of examinations, assignments, theses or dissertations, or a combination of these. Successful students are awarded degrees, diplomas, certificates or postgraduate degrees (either at doctoral or masters' level) while non-award courses are provided for employees of organisations as in-house training.

Australian management education prior to the 1950s was largely indigenous, although foreign models were undoubtedly drawn upon. From the 1950s onwards, it constituted an aspect of what has been called educational imperialism, with part of the management education movement emanating principally from the United States (Buttery & Tamaschke, 1992; Byrt, 1989).

The University of Melbourne's degree of Bachelor of Commerce was the first post-experience, residential course in management conducted by an Australian university established within the University's Faculty of Economics and Commerce in 1924. The primary basis of the original commerce degree was economics. The objective of the course was to provide tertiary education for the employees of large organisations in the public and private sectors. Subsequently, the study of accountancy and business law became important, and completion of the degree with appropriate subjects in those fields was one method of obtaining Associateship of the Australian Society of Accountants.

An interest in management training evolved in Australia during World War II. The Institute of Industrial Administration, later called the Australian Institute of Management, was set up. In addition to providing a forum for discussion of management problems, the institute provided short courses in various aspects of management. These were usually held outside normal working hours for the first-line of management, namely, supervisors. Middle and senior managers were considered to be too busy to attend courses or to undergo any training; they had learned to manage by managing!

Technical colleges, later to become Institutes of Technology and subsequently Colleges of Advanced Education (CAE) and colleges of Tertiary and Further Education (TAFE), provided courses in supervision. During the war, the training needed by supervisors to enable them to manage the increasing number of inexperienced employees in the growing war industries was addressed through technical college courses and government-sponsored Training within Industry (TWI) courses. There were parallel developments in Sydney and Melbourne in the 1950s that provided something more prestigious than the technical colleges programs and the evening courses of the Institute of Management and other professional bodies.

The post-war development of management education constituted part of the world-wide expansion of the influence of the United States. The United States came out of World War II with an enhanced reputation for industrial and military efficiency. This was attributed to a number of factors: the nation's stable, democratic political system; its influence; its natural resources; its size in area and population; its educational institutions; and its standard of management. With the cessation of hostilities, the United States commenced intervening in other countries to export to them food, capital, skills, equipment, ideas and ideology.

One of the American exports was the system of management, referred to colloquially as part of 'American know-how'. The first managerial exports were managers and methods of management, followed by management education.

Australians had seen and admired American management during World War II. British management was not highly regarded by Australians and the German and Japanese 'miracles' had yet to occur.

The curricula of American 'business schools', particularly Harvard, were adapted for Australian conditions and the so-called Harvard case study method was adopted as a major pedagogical technique. The degree of Master of Business Administration (MBA) developed as the archetypal postgraduate degree, with awards at a lower level – bachelor, diploma and certificate – being modelled on it (Buttery & Tamaschke, 1992; Byrt, 1989).

There have been two major landmarks in the history of Australian management education: the Cyert Inquiry of 1970, and the Ralph Inquiry of 1980–1982.

The establishment of the Australian Administrative College in 1957 and the non-award Melbourne University courses in management were followed by the 1970 Cyert Report on postgraduate management education. The rollout of university MBA programs, coupled with the advent of jet travel, then saw more international experts on management coming to Australia, and more Australian managers going overseas for training. In 1979, the Crawford Report on the performance of Australian industry underlined the need for top-quality management education, and this ultimately led to the Ralph Report being published in April 1982. John Ralph ultimately went on to be a successful Chief Executive for CRA, the mining giant, and also the president of the Business Council of Australia.

At the end of 1986, there were two 'schools of excellence' in business management (University of New South Wales and Melbourne University), and five Regional Schools (Macquarie University, Royal Melbourne Institute of Technology, University of Queensland, University of Adelaide and University of Western Australia).

Karpin (1995) followed Ralph in calling for a 'super-university business school', and that threw the cat among pigeons with vice-chancellors, who always fiercely defend their patches.

The Karpin report in Australia in 1995 detailed outcomes from a major government task force to be set up to "identify effective management practices in a range of areas, to raise awareness of the need for improved leadership and management skills and to foster enterprise commitment to management development" (Karpin, 1995, Executive Summary, p. vii). The findings included recommendations as to how the tertiary education sector could improve management education programs to meet the needs of industry better. Suggestions included an increasing emphasis on soft skills, internationalization and cross-functional integration, diversity, and links to industry, and that "if the nation is to build world class enterprises through improving the skills of its managers, then we need world

class providers of management education to achieve this goal" (Karpin, 1995, p. 300).

A recent survey by the Australian Institute of Management (AIM, 2003) followed up aspects of the Karpin report and indicated that still only about 10% of management education is in formal programs. This apparent low priority given to vocational qualifications is similar to that found in a large-scale survey of British Managers (Thomson, Mabey, & Storey, 1998). While the number of MBA and similar degrees has increased in Australia over the past five years, much of this has been due to increasing numbers of overseas students (McColl, 2003). Most Australian managers obtain their management training and education by informal means, on-the-job, or by short courses and seminars. While both the Karpin and AIM studies suggest that Australian managers could benefit from greater participation in formal management education, they do not identify why these are so little used. There could be a relationship between the number of managers who undertake formal qualifications and requirements for five to ten years of management experience prior to enrolment in several programs. One question that does not seem to have been asked is whether this could be related to what is taught and the perceived level of expertise of management educators in teaching or management (Holian, 2004).

Management education and training is an export product, which in itself says something about its current competitiveness. Most of these exports are to Asian countries that are fanatically committed to growing armies of competent executives to lead their economic miracles. It will only be a matter of time before they are self-sufficient in production within their own training and educational institutions. Australians' 'radical tolerant' or multicultural values need to be promoted to maximise this opportunity.

Australian management has made tremendous progress since that meeting in Young and Jackson's pub nearly 70 years ago resulting the formation of the Institute of Industrial Management of Australia (and later, the national Australian Institute of Management). More and more, Australians are coming to realise that we have no

choice but to be a clever country if we are to avoid being economically colonised by others (Deveson, 1997).

1.2.2 Challenges Facing Australian Business Management Education

Management education faces at least four different forces that are changing the environment within which business schools operate:

a) global, technological and market changes;

b) increased competition;

c) changing educational needs and expectations; and

d) a new higher education system introduced by the European Union government (Cecez-Kecmanovic, Juchau, Kay, & Wright, 2002; DEST, 2006).

To ensure that management education is able to deal with global, technological and market changes, it is imperative for business schools to use appropriate curricula, course materials and teaching models that are not only up-to-date but also internationally competitive. In this way, business schools need not only to keep track of areas of specialisation that are in demand, but also to be able to adapt these to the local environment without losing the global perspective.

In addition, the business education environment in Australia is seen to be highly competitive, not only by local business schools, but also in the increased competition from foreign universities, especially American universities (including Carnegie Mellon University in Adelaide, South Australia and the University of Notre Dame in Fremantle, Western Australia), operating from outside Australia or in partnership with Australian institutions. In reaction to both local and foreign competition, business schools must stay ahead of their competitors by being innovative about their product offering (Edwards, 2006).

The increasing numbers of international students in Australian universities pose challenges for lecturers and international students alike. Many lecturers, faced with

unfamiliar student characteristics and needs, are unsure how to respond, whilst at the same time meeting what they perceive to be the academic expectations of the institution for research, new program development and/or income generation. At the same time, many international students also face significant difficulties, especially being academically successful in their new learning environment. They must deal with all these things and more: they face different social and cultural mores and customs, norms and values from ones that they have known; different modes of teaching and learning; and different expectations and conventions about participation and performance (Carroll & Ryan, 2005).

The Bologna Process, whereby a significant number of European countries are working together towards greater consistency and portability across their higher education system, is likely to influence developments in higher education in many parts of the world including our region. It will have important implications for Australian higher education providers as we work to enhance our success and reputation as a provider of world-class education to both domestic and international students (Illing, 2006).

The Bologna Process involves 45 European countries undertaking a series of reforms intended to create an integrated European higher education area by 2010. Signatories to the agreement have agreed to work towards greater consistency in areas such as degree structures, credit transfers and quality assurance systems.

Australian higher education must remain abreast of these international developments in order to ensure that our institutions continue to be ranked amongst the world's best and that our graduates have the skills required to participate on the world stage (DEST, 2006; Illing, 2006).

Higher education institutions are increasingly recognising that higher education is a service industry, and are placing greater emphasis on meeting the expectations and needs of their participating customers, namely, the students. This becomes even more important in those universities where university budgets utilise a fee-paying model. The rapid expansion of universities and significant increases in university education costs, combined with demographic shifts in the population, force universities to think

differently about the role of student satisfaction for their survival (Kotler & Fox, 1995). Furthermore, intense competition in today's competitive educational market forces universities to adopt a market orientation strategy to differentiate their offerings from those of their competitors. Similarly, higher educational institutions in Australia are operating in a competitive marketplace. Thus, they need to understand their target markets (i.e. students, external stakeholders of different types), assess the target needs, and modify their offerings to meet those needs if they are to enhance customer satisfaction by delivering superior-quality services (Keegan & Davidson, 2004).

In order to ensure that the need for business education is met effectively, it is important to provide a classroom environment that is conducive to learning for business students. Also there is a need to assess the effectiveness of management and marketing courses in terms of their classroom environment. In an effort to meet this need, a classroom environment instrument was developed for assessing students' perceptions of the classroom learning environment. This was necessary as there has been no research done on business education learning environments at the tertiary level. The findings of this study could then be used to improve teaching and learning in business education. The findings could also be introduced in research and education institutions to assist them in developing future training and research in the area of classroom learning environment.

1.3 Classroom Learning Environment at the Higher Education Level

Contemporary research on school learning environments partly owes inspiration to Lewin's (1936) seminal work in non-educational settings, which recognised that both the environment and its interaction with characteristics of the individual are potent determinants of human behaviour. Since then, the notion of person-environment fit has been elucidated in education by Stern (1970), while Walberg (1981) has proposed a model of educational productivity in which the educational environment is one of the nine determinants of student outcomes. Fraser and Rentoul (1982) proposed that it is useful to distinguish classroom environment from school

environment, which involves psychosocial aspects of the climate of the whole school. School climate research owes much in theory, instrumentation and methodology to earlier work on organisation in business contexts. The widely-used university-level instrument, the *College Characteristics Index* (CCI) developed by Stern (1970), relied heavily on previous work in business organisations.

A review of the literature reveals that research specifically on classroom learning environments took off more than 30 years ago with the work of Walberg (1979) and Moos (1974) that spawned many diverse research programs around the world (Fraser, 1994, 1998a). As a result, *Learning Environments Research: An International Journal* was launched in 1998 (Fraser, 1998a). The dimensions measured by individual classroom environment instruments can be classified according to Moos' (1974) scheme for classifying human environments. Although earlier work often used questionnaires to assess learning environments, the productive combination of qualitative and quantitative methods is a hallmark in the field of learning environments today (Tobin & Fraser, 1998).

The learning environment field has developed rapidly with an array of validated instruments and research in at least 12 domains (Fraser, 1998b). Typically, empirical studies have employed these instruments or contextually-modified derivatives to assess the particular environment under investigation. However, very few studies have involved university classroom learning environments (Dhindsa & Fraser, 2004; Dorman, 1998; Fraser, Treagust, Williamson, & Tobin, 1987; Fraser & Walberg, 1991; Margianti, Aldridge, & Fraser, 2004; Martin-Dunlop & Fraser, 2005, in press). A further review of the research literature by Martin-Dunlop and Fraser (in press) revealed that relatively few studies have been conducted at the tertiary level to investigate the impact of the learning environment on student outcomes. It is generally recognised that there is lack of suitable, reliable and practical instruments for use in tertiary classrooms, particularly in business management education (Brennan & Ahmad, 2005; Gniewosz, 2000). It was my aim to develop an instrument, the *Business Management Education Learning Environment Inventory* (BMELEI), to assess business management students' perceptions of the psychosocial learning environment.

University administrators and lecturers should consider the learning environment at the tertiary level as important for many reasons, including the recruitment and retention of students (Spreda & Donnay, 2000). The *Australian* newspaper reported that the boom in overseas students studying in Australian universities appears to be at an end as global security fears and the increasing exchange rate of Australian dollars make this country less appealing internationally (Illing, 2005; Lane, 2006). The double-digit growth in international undergraduate enrolments in business, information technology and engineering are over. Students cite global security concerns and the currency exchange rate as reasons for the slowdown, but it also comes amid an increase in university fees.

The BMELEI was developed (using the methodology described in Chapter 3) in two versions (i.e. the Actual and Preferred forms). The Actual form was used to measure perceptions of the actual learning environment while the Preferred form was designed to measure perceptions of the preferred learning environment. Assessment of student perceptions of both their actual and preferred learning environments could be used to identify differences between the actual classroom learning environment and that preferred by students. Most importantly, this information could be used to formulate strategies aimed at reducing these differences.

The BMELEI consists of six scales (Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity) were adapted from the *What Is Happening In this Class?* (WIHIC) questionnaire (Fraser, Fisher, & McRobbie, 1996), with several of the items modified to suit the business management learning environment. The Investigation scale was omitted as it was not relevant to this study.

1.4   Specific Research Questions

The first research question was developed to determine whether the instrument designed for the purpose of this study and those modified for use in this study were valid and reliable at the tertiary level in Australia.

Research Question #1

Is it possible to develop a valid and reliable instrument for assessing business students' perceptions of the business management education learning environment at the tertiary level in Australia?

The second research question sought to determine whether relationships exist between business students' attitude outcomes (attitudes towards the subject and attitudes towards the case studies) and perceptions of the learning environment.

Research Question #2

Are there relationships between students' perceptions of the learning environment and students' attitudes?

To determine whether differences exist between students' perceptions of the actual and preferred learning environments in management and marketing classes at the university level in Australia, the third research question was developed:

Research Question #3

Are there differences between students' perceptions of the actual and preferred learning environment?

To determine whether differences between male and female students' perceptions of the learning environment and their attitudes towards the subjects (Management and Marketing) and their attitudes towards the case study teaching strategy, the fourth research question was developed.

Research Question #4

Are there differences between male and female students' perceptions of the learning environments and their attitudes?

1.5   Significance of the Study

This study is significant because this is the first time that any business management education learning environment research has been undertaken at the tertiary level in Australia. This research project aims to assess business management students' perceptions of the learning environment. It is envisaged that the result of the study will assist university administrators and lecturers to explore, facilitate and maximise the learning process of the students in business management education settings. Regarding the assessment of students' attitudes, the findings are likely to have practical implications for the effective use of the case study method. Lecturers using the case study method need to be aware of the students' attitudes towards this approach and consider these when designing appropriate teaching and learning strategies.

It is evident from the previous research that there is a lack of learning environment studies at the tertiary level from a psychosocial educational perspective, particularly in business management education. Hence this study, which involves assessment of business management students' perceptions of the psychosocial perspective of the classroom learning environment, is timely. The development of a new instrument also contributes to the field of learning environments.

The proposed study is relatively unusual in the field of classroom environments research because it combined qualitative and quantitative methods as recommended by Tobin and Fraser (1998).

1.6   Scope and Limitations of the Study

The sample size used in the study was limited to 480 final-year and postgraduate students from 30 classes (seminars and tutorials) in two business schools in Perth, Australia due to various difficulties encountered during data collection. The sample obtained is smaller and less representative than originally intended, thereby limiting

the generalisability of the findings. In interpreting the findings from this study, several other factors should be considered.

This study encompassed learning environments that exist in two universities with a wide spectrum of cultures. In this way, it was hoped that some inference could be drawn regarding gender relationships of several demographic characteristics.

1.7 Overview of the Thesis

The thesis is arranged in six chapters. Chapter 1 has set the stage for the rest of the thesis. Here I discussed background issues, current Australian business management education, and the research questions, significance and the scope of the study.

In Chapter 2, literature relevant to the area of learning environment, the case study teaching method and business education is reviewed. It provides a window on understanding progress in the area of learning environment research at the tertiary level.

Chapter 3 contains a description of the study's methodology, which included both quantitative and qualitative approaches. The chapter gives an account of the development of the *Business Management Education Learning Environment Inventory* (BMELEI), which was used to collect quantitative data. Following a description of the quantitative methods, the chapter concludes with a description of how qualitative data were collected through interviewing of randomly-selected students.

Chapter 4 reports the findings of statistical analyses of quantitative questionnaire data. These analyses were conducted to answer my research questions concerning the reliability and validity of learning environment and attitude scales, associations between learning environment and students' attitudes, differences between students' perceptions of actual and preferred learning environment, and gender differences in learning environment perceptions and attitudes.

Chapter 5 includes an analysis and interpretation of the qualitative data collected through interviews with a selected sample of business students. This chapter also integrates insights gained from qualitative data with the quantitative findings in Chapter 4.

Chapter 6 reports the major findings of the study by integrating the quantitative and qualitative findings. The chapter concludes with an account of the limitation of this study and recommendations for future research.

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1   Introduction

Learning environment research has undergone remarkable growth, diversification
and internationalisation over the last 40 years (Fraser, 1986, 1991, 1994, 1998a,
2002). This field of learning environments has a rich diversity of valid, economical
and widely-applicable questionnaires that have been developed and used for
assessing students' perceptions of the classroom environment (Fraser, 1998b, 2002).
Fraser, Treagust and Dennis (1986) have reported that, despite the existence of
strong tradition of classroom environment research at the primary and secondary
school levels, surprisingly little analogous work has been conducted at the tertiary
level. A further review of the research literature by Dorman (1998) revealed that
there are relatively few studies have been conducted at the university level to
investigate the impact of the learning environment on student outcomes. It is
generally recognised that there is a lack of suitable, reliable and practical instruments
for use in tertiary classrooms, particularly in management education (Brennan &
Ahmad, 2005; Fraser et al., 1986; S. L. Huang, 2006; Margianti et al., 2004).

The primary aim of the present study was to examine students' perceptions of their
learning environment, and students' attitudes towards business management studies
and towards case study teaching strategy at the tertiary level in Australia. In this
chapter, I review literature relevant to various aspects of this study, including
background to the field of learning environments (Section 2.2), the development of
learning environment instruments (Section 2.3), the development of the *What Is
Happening In this Class?* (WIHIC) questionnaire (Section 2.4), research on
perceptions of classroom learning environment (Section 2.5), student attitudes

(Section 2.6) and the study of learning environments at the tertiary level (Section 2.7).

2.2 Background to the Field of Learning Environments

Research on learning environments over the last 40 years, builds upon the earlier ideas of Lewin and Murray and others. A key contribution to the study of learning environments was the formula proposed by Kurt Lewin (1936). Lewin's study recognised that both the environment and its interaction with personal characteristics of the individual are potent determinants of human behaviour. Lewin formulated his idea in the form of the equation, $B = f(P, E)$. He expressed in the formula that human behaviour (B) is a function of the personality of the individual (P) and his or her environment (E) (Fraser, 1998a).

Murray (1938) proposed a needs-press model to describe an individual's behaviour within an environment as the result of the interaction between personal needs and his or her external environment. Personal needs are motivated by personality characteristics which represent an individual's tendency to move in the direction of certain goals, while the environmental press is a situation external to the person which either supports or frustrates the expression of internalised personal needs. Moreover, Murray introduced the term *alpha press* to refer to an external observer's perception of the environment and *beta press* to refer to the perceptions held by the members of the environment (Murray, 1938).

Stern, Stern and Bloom (1956) made a further distinction involving Murray's concept of press between each person's perception of the environment – the individual's view of the environment (*private beta press*) – and the shared view that members of a group hold about the environment (*consensual beta press*). This study utilised the consensual beta press perspective for data collected through surveys, and the private alpha press perspective for the interviews conducted with the students.

Moos (1974) developed social climate scales for use in hospital wards, juvenile and adult correctional facilities, residential care settings, therapeutic groups, sheltered workshops, work settings, families and classrooms (Moos, 1974). In designing these scales, he suggested that the characteristics of these diverse environments can be classified in terms of three dimensions (Walker & Fraser, 2005). Moos identified three psychosocial dimensions: the *Relationships Dimension,* which measures the relationship and the quality of interaction between individuals; the *Personal Development Dimension*, which measures the extent to which an individual's personal growth and self-fulfilment are met; the *System Maintenance and System Change Dimension,* which measures the extent to which the environment is orderly, clear in expectations, controlled and adaptable to change (Moos, 1974). On the other hand, Walberg (1976) focused on the notion that psychology is a science of mental life and that a key aspect of mental life is perception, Walberg proposed that participants such as students and teachers could quite successfully express their views on various aspects of their learning environments.

The pioneering work of Walberg and Moos on perceptions of classroom environment developed into a major field of research in education resulting in numerous publications in professional journals over the last four decades (Fraser, 1991, 1994, 1998a, 1998b; Fraser & Tobin, 1998; Fraser & Walberg, 1991; McRobbie & Ellett, 1997). The study of classroom environments research has developed tremendously over the last four decades and the burgeoning field of learning environments necessitated the launch of a new journal dedicated to the field – *Learning Environments Research* (Fraser, 1998a).

2.3 Development of Learning Environment Instruments

A number of reliable and economical learning environment instruments have been developed for general classroom use, across various subjects and also for specific classroom contexts since learning environment studies began in the late 1960s. A timeline of the development of key learning environment instruments is shown in Figure 2.1. It is important to examine these learning environment instruments in

order to determine their potential suitability for use in the management education learning environment. A brief account of the development and validation of each instrument (see Figure 2.1), details of its scales and items, and its previous use in learning environments research is provided in Sections 2.3.1 to 2.3.16.
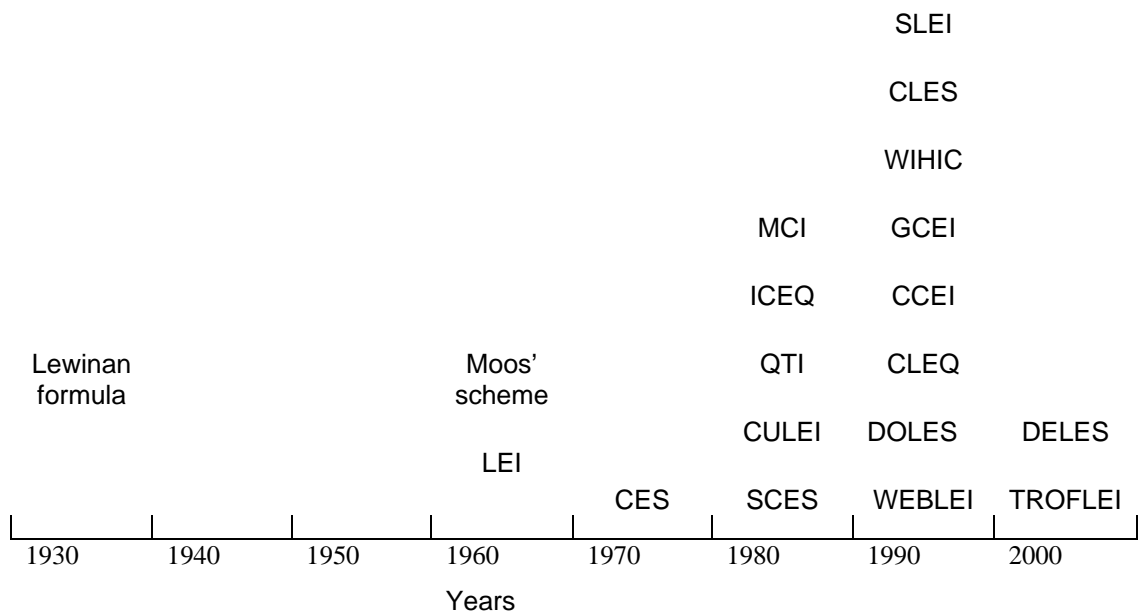
Figure 2.1   Timeline of the Development of Key Learning Environment Instruments

2.3.1   Learning Environment Inventory (LEI)

The initial development and validation of the preliminary version of the LEI began in the late 1960s in conjunction with evaluation and research related to the Harvard Project Physics (Fraser, Anderson, & Walberg, 1982; Walberg & Anderson, 1968). The final version of the LEI measures student perceptions of 15 environment dimensions or scales of secondary school classroom with seven items per scale to make a total of 105 items. The LEI employs a four-point Likert-type scale with four response alternatives, namely, Strongly Disagree, Disagree, Agree and Strongly Agree. The disadvantages of the LEI include the length of the questionnaire, complex language used in the questionnaire, lack of evidence for its factorial validity, and its focus on traditional teacher-centred classes. The LEI has been

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validated with 1,048 students by Fraser, Anderson, and Walberg (1982) who reported alpha reliabilities ranging from 0.54 to 0.85.

2.3.2 Classroom Environment Scale (CES)

The CES was developed by Rudolf Moos at Stanford University (Fisher & Fraser, 1983b; Moos, 1979; Moos & Trickett, 1987) and grew out of a comprehensive program of research involving perceptual measures of a variety of human environments including psychiatric hospitals, prisons, university residences and work milieus (Moos, 1974). The final published version contains nine scales consisting 10 items with a True–False response format. Published materials include a test manual, a questionnaire, an answer sheet and a transparent hand scoring key. The shortcomings of the CES include its focus on teacher-centred classes, lack of factorial validity, and response scales that do not provide an accurate gauge of perceptions.

2.3.3 Individualised Classroom Environment Questionnaire (ICEQ)

The ICEQ assesses those dimensions which distinguish individualised classrooms from conventional ones. The initial development of the ICEQ (Rentoul & Fraser, 1979) was guided by: the literature on individualised open and inquiry-based education; extensive interviewing of teachers and secondary school students; and reactions to draft versions sought from selected experts, teachers and junior high school students. The final published version of the ICEQ (Fraser, 1990) contains 50 items altogether, with an equal number of items belonging to each of the five scales. Each item is responded to on a five-point frequency response scale with the alternatives of Almost Never, Seldom, Sometimes, Often and Very Often. The scoring direction is reversed for many of the items. A weakness of the ICEQ is the lack of established factorial validity.

2.3.4   My Class Inventory (MCI)

The LEI has been simplified to form the MCI for use among children aged 8–12 years (Fisher & Fraser, 1981; Fraser et al., 1982; Fraser & O'Brien, 1985). Although the MCI was developed originally for use at the primary school level, it also has been found to be very useful with students in the junior high school, especially those who might experience reading difficulties with the use of other instruments. The MCI differs from the LEI in four important ways. First, in order to minimise fatigue among younger children, the MCI contains only five of the LEI's original 15 scales. Second, item wording has been simplified to enhance readability. Third, the LEI's four-point response format has been reduced to a two-point (Yes–No) response format. Fourth, students answer on the questionnaire itself instead of on a separate response sheet to avoid errors in transferring responses from one place to another. The final form of the MCI contains a total of 38 items altogether, with typical items being: 'Children are always fighting with each other' (Friction) and 'Children seem to like the class' (Satisfaction). Although the MCI traditionally has been used with a Yes–No response format, Goh, Young and Fraser (1995) have successfully used a three-point response format (Seldom, Sometimes and Most of the Time) with a modified version of the MCI which includes a Task Orientation scale. The weaknesses of the MCI including the lack factorial validity, that its Yes–No rating could suggest correct answers, and the conceptual problem of including satisfaction as a learning environment scale (when it conventionally is used as an attitudinal outcome in learning environment research).

In Brunei Darussalam, Majeed, Fraser and Aldridge (2002) used the original version of the MCI with 1,565 mathematics students in 81 classes in 15 government secondary school. When the Satisfaction scale was used as an attitudinal outcome variable, instead of as a measure of classroom environment, Majeed et al. (2002) found strong support for a three-factor structure for the MCI consisting of three of the four *a priori* scales, namely, Cohesiveness, Difficulty and Competitiveness. In an evaluation study, Mink and Fraser (2005) used MCI to measure students' perceptions of the classroom learning environment. Sink and Spencer (2005) reported a psychometric analysis of an elementary-level classroom climate survey using *My Classroom Inventory-Short Form* (MCI-SF).

2.3.5 College and University Classroom Environment Inventory (CUCEI)

Until the development of the CUCEI (Fraser et al., 1986) there was no suitable instrument for use in tertiary education settings that parallels those available for assessing classroom environment at the school level (Fraser & Walberg, 1991). The four initial criteria guiding the development of the CUCEI were economy of response time and scoring, selection of meaningful items that were relevant to, and understood by, university or college teachers and students, relevance of scales to the three general dimensions formulated by Moos (1974), and an examination of previous instruments to determine relevant scales at that time. This instrument needed to be tested at college or university levels (Fraser, Treagust et al., 1987). Fisher and Parkinson (1998) used it successfully to assess hospital-based nursing education classroom environments. The CUCEI has seven scales each with seven items scored on a four point Likert-type scale with about half of the items reversed. As with some other questionnaires, the CUCEI has been adapted to form instruments that are specific to particular studies. Fraser, Williamson and Tobin (1987) used the CUCEI to evaluate alternative high schools catering for adult students, and Logan, Crump and Rennie (2006) used a modified version of the CUCEI in two independent studies in computing classrooms in secondary schools and tertiary institutions in New Zealand. In a recent study, the CUCEI has been used in examining changes in classroom environments across the transition from secondary school to the university level (Nair & Fisher, 2001).

2.3.6 Questionnaire on Teacher Interaction (QTI)

The Questionnaire on Teacher Interaction (QTI), developed in The Netherlands by Wubbels, Creton and Hooymayers (1985), was based on a conceptual framework developed by Leary (1957) in a clinical setting. The instrument is used to look into the students' perceptions of their interpersonal relationships with their teacher in the classroom. These interpersonal behaviours are characterized as Helping/Friendly, Understanding, Dissatisfied, Admonishing, Leadership, Student Responsibility and Freedom, Uncertain, and Strict (Creton, Hermans, & Wubbels, 1990; Wubbels,

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Brekelmans, & Hooymayers, 1991; Wubbels & Levy, 1993). Each item has a five-point response scale ranging from Never to Always. Typical items are "This teacher gives us a lot of free time" (Student Responsibility and Freedom) and "This teacher gets angry unexpectedly" (Admonishing).

The QTI has been shown to be a valid and reliable instrument based on research conducted at various grade levels with 1,606 students and 66 teachers in the USA (Wubbels & Levy, 1993). The QTI was used in Australia to examine the perceptions 489 senior biology students in 28 classes (Fisher, Henderson, & Fraser, 1995), confirming its validity and reliability.

The QTI has been used in several large-scale studies in Asia. A simplified form of the QTI was used and cross-validated in Singapore with 1,512 primary mathematics students in 39 classes from 13 schools (Goh & Fraser, 1996, 1998, 2000) and with 497 gifted and non-gifted secondary school chemistry students (Quek, Wong, & Fraser, 2005).

The QTI was translated into Standard Malay and cross-validated with 3,104 primary school students in 136 classes in Brunei Darussalam (Scott & Fisher, 2004). An English version of the QTI has been cross-validated for secondary schools in Brunei Darussalam using samples of 1,188 science students (Khine & Fisher, 2002) and 644 chemistry students (Riah & Fraser, 1998). In Korea, Kim, Fisher and Fraser (2000) validated a Korean-language version of the QTI among 543 Grade 8 students in 12 schools, and Lee and Fraser (2001a) provided further crossvalidation information for the QTI using a sample of 440 Grade 10 and 11 science students. In India, Koul validated the QTI with a sample of 1,021 students in 32 science classes in seven co-educational private schools in Jammu, India (Koul & Fisher, 2005). In Indonesia, Soerjaningsih, Fraser and Aldridge (2001b) translated the QTI into the Indonesian language and cross-validated it with a sample of 422 university students in 12 research methods classes. In a more recent study, a Thai version of the QTI was used and cross-validated with 1,194 Grade 10 biology students from different areas of Thailand (Kijkosol & Fisher, 2005), further demonstrating the widespread applicability of the QTI (Fraser & Walberg, 2005).

2.3.7 Science Laboratory Environment Inventory (SLEI)

Because of the critical importance and uniqueness of laboratory settings in science education, an instrument specifically suited to assessing the environment of science laboratory classes at the senior high school or higher education levels was developed (Fraser, Giddings, & McRobbie, 1995; Fraser & McRobbie, 1995; Fraser, McRobbie, & Giddings, 1993). The SLEI has five scales (each with seven items) and the five response alternatives are Almost Never, Seldom, Sometimes, Often and Very Often. Typical items are 'I use the theory from my regular science class sessions during laboratory activities' (Integration) and 'We know the results that we are supposed to get before we commence a laboratory activity' (Open-Endedness). The Open-Endedness scale was included because of the importance of open-ended laboratory activities often claimed in the literature. The SLEI was field tested and validated simultaneously with a sample of over 5,447 students in 269 classes in six different countries (the USA, Canada, England, Israel, Australia and Nigeria), and cross-validated with 1,594 Australian students in 92 classes (Fraser & McRobbie, 1995), 489 senior high school biology students in Australia (Fisher, Henderson, & Fraser, 1997), and in Singapore with 1,592 grade 10 chemistry students (A. F. L. Wong & Fraser, 1995) and with 497 gifted and non-gifted secondary school chemistry students (Quek et al., 2005). Also, Riah and Fraser (1998) cross-validated the English version of the SLEI with 644 Grade 10 chemistry students in Brunei Darussalam. In a more recent study, the SLEI was used to evaluate the use of anthropometric activities with a sample of 761 high school biology students (Lightburn & Fraser, in press).

2.3.8 Constructivist Learning Environment Survey (CLES)

The Constructivist Learning Environment Survey (CLES) measures the extent to which a classroom environment conforms to the constructivist approach to learning. According to the constructivist view, meaningful learning is a cognitive process in which individuals make sense of the world in relation to the knowledge which they have already processed, and then negotiate the new learning. The CLES (Taylor,

Dawson, & Fraser, 1995; Taylor, Fraser, & Fisher, 1997) was developed to assist researchers and teachers to assess the degree to which a particular classroom's environment is consistent with a constructivist epistemology. The instrument has undergone several revisions and the final version consists of 30 items (Taylor et al., 1995; Taylor et al., 1997; Taylor, Fraser, & White, 1994). The instrument measures five scales, namely, Personal Relevance, Uncertainty, Critical Voice, Shared Control, and Student Negotiation and each scale has six items. The five possible responses are Almost Never, Seldom, Sometimes, Often and Almost Always. Typical items are "I help the teacher to decide what activities I do" (Shared Control) and "Other students ask me to explain my ideas" (Student Negotiation). The CLES has been validated by Taylor, Fraser, and Fisher (1997) with 1,081 students and scale alpha reliabilities ranging from 0.76 to 0.91 were achieved. The CLES was cross-validated with a pretest sample of 440 high school science students and a posttest sample of 351 science students in the United States (Dryden & Fraser, 1998). Kim, Fisher and Fraser (1999) translated the CLES into Korean language and administered it to 1,083 science students in 24 classes in 12 schools. In a more recent study, Nix, Fraser and Ledbetter (2005) validated and use of a new form of the CLES with a sample of 1,079 students in the United States.

2.3.9   Geography Classroom Environment Inventory (GCEI)

The Geography Classroom Environment Inventory (GCEI) was primarily designed to assess innovation and gender equity in computer-assisted learning environments in Singapore (Teh & Fraser, 1994, 1995a, 1995b). Although the original form of the instrument had eight scales, this was later reduced to only four scales following factor and item analysis. Each of the four scales has eight items. These items are scored on a five point Likert-type scale. In this instrument, nearly half of the items are reverse-scored. The scale of Gender Equity was new, while the rest of the scales were adapted from other already-existing instruments and modified to suit computer assisted classroom learning environments. Four main criteria guiding the development of the GCEI were: consistency with the literature on computer-assisted learning, consistency with the dimensions set out by the Moos, salience to classroom

environment researchers, teachers and students, and lastly salience to computer-education experts.

2.3.10   Computer Classroom Environment Inventory (CCEI)

The Computer Classroom Environment Inventory (CCEI) was develop to assess the perceptions of learning environments which involve both inquiry learning methods and the use of computer-assisted instruction (Maor & Fraser, 1996). The initial version of the CCEI had 40 items but was later reduced to five scales with a total of 30 items. The responses are scored on a five point Likert-type scale, and some of the items are reversed scored. The main criteria in the development of CCEI were: consistency with the dimensions set out by Moos (1974), consistency with the existing literature on inquiry learning and learning environment instruments, ease and efficiency to complete and score, and lastly salience to teachers and students in the target audience.

2.3.11   Cultural Learning Environment Questionnaire (CLEQ)

The Cultural Learning Environment Questionnaire (CLEQ) was developed by Waldrip and Fisher (1997a) to assess culturally-sensitive factors (gender equity, collaboration, deference, competition, teacher authority, modelling and congruence) of the classroom learning environment. Research on dimensions of culture (Hofstede, 1984) and Moos' dimensions served as the main guide in the development of the CLEQ. The questionnaire has eight scales with five items in each scale giving a total of 40 items. When Waldrip and Fisher (1997b) used the CLEQ with the individual student as the unit of analysis, factor analyses resulted in retaining all the 40 items in eight scales. The six main criteria followed in the development of the CLEQ were: consistency with previous learning environment research and literature, consistency with Hofstede's and Moos' dimensions, salience for teachers, and students in target audience, and economy of operational requirements. Dhindsa and Fraser (2004)

cross-validated the CLEQ with a sample of 475 teacher trainees to evaluate culturally-sensitive factors in teacher trainees' learning environments in Brunei Darussalam.

2.3.12 Distance and Open Learning Environment Survey (DOLES)

The Distance and Open Learning Environment Survey (DOLES) is a unique instrument developed by Jegede, Fraser, and Fisher (1995) to assess the growing need for research into university distance education settings particularly in science (Jegede, 1992). The initial version of the DOLES had 60 items. This was reduced in the final version to 52 items arranged into five core scales and two optional scales containing varying numbers of items. The optional scales are designed to be used for specific purposes or by students for whom these aspects are relevant. Responses are scored on a five-point Likert-type scale. The criteria used in the development of the DOLES were: consistency with existing literature on learning environments, consistency with the previously-constructed instruments for face-to-face learning environments, coverage of distance and open learning characteristics, economy in administration time and scoring responses, and finally salience to teachers and students in the target distance and open education audience.

2.3.13 Socio-Cultural Environment Scale (SCES)

The Socio-Cultural Environment Scale (SCES) was developed by Jegede and Okebukola (1988) to assess students' perceptions of the socio-cultural environment of their classrooms. This instrument has five scales with six items in each scale making a total of 30 items. Responses are scored on a three point Likert-type response scale. Experts in African studies, comprised of science educators, science teachers, sociologists and anthropologists, contributed to the development of the SCES (Jegede & Okebukola, 1992).

2.3.14 Web-Based Learning Environment Instrument (WEBLEI)

The Web-based Learning Environment Instrument (WEBLEI) was developed with four scales and was used to establish students' perceptions of web-based learning environments in tertiary settings (Chang & Fisher, 2003). The four scales of Access, Interaction, and Response was built upon the work of Tobin (1998), with the Results scale focusing on information structure and the design of online material. Statistical analyses, Cronbach alpha reliability coefficient, factor analysis and discriminant validity, indicated that the WEBLEI was a reliable and valid instrument.

2.3.15 Technology-Rich Outcomes-Focused Learning Environment Inventory (TROFLEI)

The Technology-Rich Outcomes-Focused Learning Environment Inventory (TROFLEI) is a generally-applicable instrument that was designed to assess students' perceptions of their actual and preferred classroom learning environments in technology-rich, outcomes-focused learning settings (Aldridge & Fraser, 2003; Aldridge, Fraser, Fisher, & Wood, 2002). Its use in two research applications includes 1) how the learning environment created by teachers influences students' achievement, attitudes and self-efficacy, and 2) whether an innovative new school was effective in terms of the classroom learning environments that it creates. Analysis of data from 1,035 student responses from 80 classes provided evidence for the validity and reliability of the questionnaire for use at the senior high school level across a number of different subjects. In a more recent study, Aldridge, Dorman and Fraser (2004) validated the actual and preferred forms of the TROFLEI using multitrait-multimethod modelling with a sample of 1,249 high school students in Australia.

2.3.16 Distance Education Learning Environment Survey (DELES)

The Distance Education Learning Environment Survey (DELES) has been developed by Walker (2003) with six psychosocial environment scales and one attitude scale. It is a new six-scale, 34-item Web-based learning environment instrument suitable for use in a number of asynchronous post-secondary distance education environments. The DELES assesses Instructor Support, Student Interaction and Collaboration, Personal Relevance, Authentic Learning, Active Learning, and Student Autonomy. Analysis of data from 680 subjects supported the factorial validity and internal consistency reliability. The result also indicated statistically significant associations between distance education learning environments and student enjoyment of distance education (Walker & Fraser, 2005).

2.4   What Is Happening In this Class? (WIHIC) Questionnaire

The WIHIC questionnaire brings parsimony to the field of learning environment by combining modified versions of the most salient scales from a wide range of existing questionnaires with additional scales that accommodate contemporary educational concerns (e.g., equity and constructivism) (Fraser, 1998a, 1998b, 2002). Fraser, Fisher and McRobbie (1996) developed the WIHIC, a new general-purpose classroom learning environment instrument. The original 90-item nine-scale version was refined by statistical analysis of data from 355 junior high school science students, as well as by extensive interviewing of students about their views of their classroom environments in general and about the wording and salience of individual items and their questionnaire responses (Fraser et al., 1996). Analysis of data from an Australian sample of 1,081 students in 50 classes (Aldridge & Fraser, 2000) led to a final form of the WIHIC containing the seven eight-item scales. The seven scales include Student Cohesiveness, Teacher Support, Involvement, Investigation, Task Orientation, cooperation and Equity. The WIHIC employs a five-point frequency scale with response alternatives ranging from Always Never to Very Often. Table 2.1 gives a scale description and a sample item for each scale of the WIHIC.

Table 2.1   Scale Description and Sample Item for each WIHIC Scale

Scale	Description	Example of Item
Student Cohesiveness [SC]	Extent to which students know, help and are supportive of one another.	I make friendship among students in this class.
Teacher Support [TS]	Extent to which lecturer/tutor helps, befriends, trusts, and shows interest in students.	The lecturer/tutor takes a personal interest in me.
Involvement [IV]	Extent to which students have attentive interest, participate in discussions, perform additional work and enjoy the class.	I discuss ideas in class.
Investigation [IN]	Extent to which there is emphasis on the skills and their use in problem solving investigation.	I am asked to think about the evidence for statements.
Task Orientation [TO]	Extent to which it is important to complete activities planned and to stay on the subject matter.	Getting a certain amount of work done is important.
Cooperation [CO]	Extent to which students cooperate rather than compete with another on learning tasks.	I cooperate with other students when doing assignment work.
Equity [EQ]	Extent to which the lecturer/tutor treats students equally.	The lecturer/tutor gives as much attention to my questions as to other students' questions.

Responses to the items are scored 1, 2, 3, 4 and 5 respectively.

The WIHIC can be used to measure students' perceptions from either a whole-class or a personal viewpoint. It has a separate Class form (which assesses a student's perceptions of the class as a whole) and Personal form (which assesses a student's personal perceptions of his or her role in a classroom).

The robust nature of the WIHIC questionnaire, in terms of reliability and validity, has been widely reported in studies that have used the instrument in different subject areas, at different age levels and in different countries. Moreover, the WIHIC has been used successfully in its original form or in modified forms to assess the learning environment and has been translated into several Asian languages and cross-validated:

- Two studies have used an English version of the WIHIC in Singapore. Fraser and Chionh (Fraser & Chionh, 2000) reported strong validity and reliability for both an actual and a preferred form of the WIHIC when it was administered to mathematics and geography classes involving a sample of 2,310 students in 75 senior high school classes. Khoo and Fraser (in press) used a sample of 250 adult learners to evaluate adult computer education classes taught by five separate private computer schools in Singapore.

- In Brunei Darussalam, an English version has been cross-validated with samples of 1,188 Form 5 science students (Khine & Fisher, 2001) and 644 Grade 10 students from 23 government secondary schools (Riah & Fraser, 1998) in chemistry classes.

- A Chinese version of the WIHIC has been developed for use in Taiwan and was used in a cross-national study with a sample of 1,879 junior high school students in 50 classes in Taiwan and 50 Australian classes (Aldridge & Fraser, 2000; Aldridge, Fraser, & Huang, 1999).

- In Singapore, a bilingual version of WIHIC was developed by Chua, Wong and Chen (Chua, Wong, & Chen, 2001) based on the Taiwanese version. Every item was presented in both English and Chinese. The WIHIC was cross-validated with a sample of 1,460 students in 50 classes.

- In Australia, Dorman (2001) used the WIHIC together with the Constructivist Learning Environment Survey (CLES) to form an instrument that assessed the associations between classroom psychosocial environment and academic efficacy with a sample of 1,055 mathematics students from nine Australian secondary schools. Results from the study showed that the classroom environment relates positively with academic efficacy. Moreover, the WIHIC questionnaire was validated cross-nationally using a sample of 3,980 high school students from Australia, the UK and Canada (Dorman, 2003).

- The WIHIC has been translated into the Indonesia language and used with university students in computer-related courses. The WIHIC was validated with samples of 2,498 university students in 50 computing classes (Margianti et al., 2004) and 422 students in 12 research methods classes (Soerjaningsih, Fraser, & Aldridge, 2001a, 2001b). Similarly, the WIHIC was validated with a sample of

1,188 Year 9 students from 16 urban and rural schools in Indonesia (Wahyudi & Fisher, 2006).

- The WIHIC has been translated into the Korean language and validated with a sample of 543 Grade 8 students in 12 secondary schools (Kim et al., 2000).

- The WIHIC questionnaire was drawn on especially during the development of the Technology-Rich Outcomes-focused Learning Environment Inventory (TROFLEI) (Aldridge & Fraser, 2003). The new instrument included all seven of the original WIHIC scales, namely Student Cohesiveness, Teacher Support, Involvement, Investigation, Task Orientation, Cooperation and Equity. Aldridge and Fraser (2003) reported strong evidence for the validity and reliability of the questionnaire with 1,035 student responses from 80 classes at senior high school level across a number of different subjects. Also, Dorman, Aldridge and Fraser (2006) reported the use of structural equation modelling in investigating associations between classroom environment and outcomes using TROFLEI with a sample of 2,178 high school students in Australia.

- In India, Koul used both the WIHIC and the QTI with a sample of 1,021 students in 32 science classes in seven co-educational private schools in Jammu, India (Koul & Fisher, 2006).

- In the United States, four scales from the WIHIC (Student Cohesiveness, Instructor Support, Cooperation and Investigation) were used to measure students' perceptions of the learning environment in a study conducted by Martin-Dunlop and Fraser (in press). The results of the study indicated strong evidence for the validity and reliability of the questionnaire with 525 female students from 27 classes of A Process Approach to Science course at a large urban university. In another American study by Ogbuehi and Fraser (in press), the WIHIC was used to measure students' perceptions of the learning environment with a sample of 661 student in 22 classes.

- The WIHIC questionnaire was validated in a cross-national study with samples of 1,433 high school students (Grade 8, 10, and 12) from Australia, 951 Grade 8, 10 and 12 students from Canada, and 1,596 Grade 8, 10 and 12 students from the UK (Dorman, 2003). In total, there were 82 within-school grade groups. This study used confirmatory factor analysis to support the WIHIC as a valid measure of classroom environment. The factorial invariance of model parameters across

the three countries, three grade levels and gender attests to the wide applicability of this instrument.

2.5 Review of Research on Perceptions of Classroom Learning Environment

Fraser (1998b) outlined many and varied applications and identified 12 types of research which involved classroom learning environment instruments: (1) associations between student outcomes and learning environments, (2) evaluation of educational innovations, (3) differences between students' and teachers' perceptions of the same classrooms, (4) whether students achieve better when in their preferred environments, (5) teachers' practical attempts to improve their classroom climates, (6) combining qualitative and quantitative methods, (7) school psychology, (8) links between educational environments, (9) cross-national studies, (10) transition from primary to secondary education, (11) teacher education, and (12) teacher assessment.

Fraser (1999b) noted that the strongest aspect of past learning environments research focused on the investigation of associations between students' cognitive and affective outcomes and their perceptions of their classroom environments. The learning environment was found to be consistently and strongly associated with affective and cognitive outcomes. Because one of the research questions (see research question #2 of Section 1.4) in my study involved attitude-environment associations, Section 2.5.1 is devoted to past research on relationships between student outcomes and classroom environment. Section 2.5.2 is devoted to past research on differences between the actual environment and that preferred by students or teachers as this is relevant to research question #3. Past research on gender differences in the learning environment perceptions and attitudes (relevant to research question #4) is addressed in Section 2.5.3. Section 2.5.4 is devoted to past research on the combination of quantitative and qualitative methods in studies of educational environments and finally, a separate section is devoted to cross-national educational studies in different countries, especially in Asian countries (Section 2.5.5).

2.5.1 Associations between Student Outcomes and Learning Environment

Studies that involved the investigation of associations between students' cognitive and affective learning outcomes and their perceptions of psychosocial characteristics of their classrooms have dominated past classroom environment research (Fraser, 1986, 1994, 2002). Numerous learning environment studies have indicated that students' perceptions consistently account for an appreciable amount of variance in students' learning outcomes (Aldridge & Fraser, 2003; Idris & Fraser, 1997; Lizzio, Wilson, & Simons, 2002; McRobbie & Fraser, 1993; A. F. L. Wong & Fraser, 1994). A tabulation by Fraser (1994) of 40 past studies showed that associations between outcome measures and classroom environment perceptions have been replicated for a variety of cognitive and affective outcome measures, a variety of classroom environment instruments and a variety of samples. The practical implication of this type of research is that student outcomes might be improved by creating classroom environments found empirically to be conducive to learning (Fraser, 1994).

A wide variety of valuable studies have involved associations between student outcomes and student perceptions of their classroom learning environments. These studies also cover a wide variety range of learning environment instruments, student outcomes, school subjects and grade levels, as well as many translations of instruments into various Asian languages. Studies conducted over the past 40 years have provided convincing evidence that the quality of the classroom environment in schools is a significant determinant of student learning (Fraser, 1994, 1998a). Dorman, Fisher and Waldrip (2006) reported attitude-environment associations when they used the WIHIC with a sample of 449 students in Australian secondary schools. Using both the *College Science Classroom Environment Survey* (CSCES) and TROFLEI, Kerr, Fisher, Yaxley and Fraser (2006) reported links with student attitudes for a sample of 1,084 and 816 Year 11 science classes over a five-year period. Aldridge and Fraser (2003) established links between students' attitudes and scores on TROFLEI for a sample of 1,035 students responses from 80 classes. Lizzio, Wilson and Simmons (2002) investigated relationships between students' perceptions of their academic environment, their approaches to study, and their academic outcomes at the tertiary level. Dorman, Aldridge and Fraser (2006)

reported attitude-environment associations when they used the TROFLEI with a sample of 2,178 high school students from Western Australia and Tasmania in Australia.

In Turkey, attitude-environment associations have been reported for students' attitudes towards biology using a Turkish-language version of the WIHIC with a sample of 1,983 Grade 9 and 10 biology students in 57 classes in two major Turkish cities (Telli, Cakiroglu, & den Brok, 2006).

In recent years, Asian researchers have undertaken a wide variety of valuable studies into associations between students' attitudes and their perceptions of their classroom learning environment in various countries and languages. In Singapore, relationships have been established between students' attitudes and students' classroom environment perceptions as assessed by several instruments. In one of the early learning environment studies in Singapore, Wong and Fraser (1996) established links between students' attitudes and scores on SLEI scales for a sample of 1,592 Grade 10 chemistry students in 56 classes. In another pioneering study in Singapore, Goh used both the MCI and the QTI with 1,512 primary mathematics students in 39 classes to establish associations between the classroom environment and mathematics achievement and attitudes (Goh & Fraser, 1998, 2000). Fraser and Chionh's (2000) unusually comprehensive study established associations between WIHIC scales and three student outcomes (examination results, attitudes and self-esteem) among a large sample of 2,310 mathematics and geography students in 75 classes. Using both the SLEI and QTI, Quek et al. (2005) reported links with student attitudes for a sample of 497 gifted and non-gifted secondary school chemistry students. Khoo and Fraser (in press) established links between student satisfaction and dimensions of the WIHIC for a sample of 250 adults attending 23 computing classes. Using an instrument suited for computer-assisted instruction classrooms, Teh and Fraser (1995a) found associations between classroom environment, achievement and attitudes among a sample of 671 high school geography students in 24 classes in Singapore. Finally, Waldrip and Wong (1996) reported attitude-environment associations when they used the SLEI in both Singapore and Papua New Guinea.

In India, Koul used both the WIHIC and the QTI with 1,021 students in 32 science classes in seven co-educational private schools in Jammu, India to establish associations between the classroom environments and attitudes to science classes (Koul & Fisher, 2006).

In Brunei Darussalam, outcome-environment associations have been established for: satisfaction and scales of the MCI for a sample of 1,565 Form 2 mathematics students in 81 classes (Majeed et al., 2002); for science attitudes and scales of both the WIHIC and QTI for a sample of 1,188 Form 5 students in 54 science classrooms (Khine & Fisher, 2001, 2002); achievement and attitudes and scales of the WIHIC, QTI and SLEI for a sample of 644 chemistry students in 35 classes from 23 government secondary schools (Riah & Fraser, 1998); and for enjoyment of science lessons with scales of a primary school version of the QTI that had been translated into Standard Malay and used with 3,104 students in 136 classes in 23 private schools (Scott & Fisher, 2004).

In Korea, outcome-environment associations have been reported for: students' attitudes to science using a Korean-language version of the SLEI, CLES and QTI (Lee & Fraser, 2001a, 2001b, 2002) for a sample of 440 Grade 10 and 11 science students in 13 classes; students' attitudes using Korean-language versions of the CLES for a sample of 1,083 science students in 24 classes (Kim et al., 1999) and of the QTI and WIHIC for 543 students in 12 schools (Kim et al., 2000).

In Taiwan, outcome-environment relationships have been found for student satisfaction using a Chinese-language version of scales for both the WIHIC and CLES for a sample of 1,879 science students in 50 classes (Aldridge & Fraser, 2000; Aldridge et al., 1999; Aldridge, Fraser, Taylor, & Chen, 2000).

In Indonesia, Margianti et al. (2004) reported associations between the outcomes of achievement and attitudes and students' perceptions on an Indonesian-language version of the WIHIC for a sample of 2,498 university students in 50 classes. Similarly, Soerjaningsih et al. (2001a, 2001b) used Indonesian-language versions of both the WIHIC and QTI to establish links with student outcomes (course

achievement, leisure interest in computers, and attitudes towards the internet) among 422 university students in 12 classes.

In Mauritius, attitude-environment associations have been reported for students' attitudes towards ICT using the *Computer Laboratory Environment Inventory* (CLEI) and the *Attitudes towards Computing and Computer Courses* Questionnaire (ACCC) for a sample of 108 primary school trainee teachers at the Mauritius Institute of Education (Jhurree, Bessoondyal, & Fisher, 2005).

In the United States, attitude-environment associations have been reported for: students' attitudes towards science using one scale from the Test of Science-Related Attitudes and scales from the *Science Laboratory Environment Inventory* (SLEI) and *What Is Happening In this Class?* (WIHIC) for a sample of 525 female students in 27 classes at a large urban university in Southern California (Martin-Dunlop & Fraser, in press). In a recent study of environment-outcome associations conducted with 661 middle schools students in the USA, Ogbuehi and Fraser (in press) reported associations between dimensions of the classroom environment and students attitudes to mathematics.

In addition, the existence of actual and preferred forms also facilitates person-environment fit studies of whether students achieve better in their preferred environment (Fraser, 1991). The practical implication of this research is that class achievement of certain outcomes might be enhanced by changing the actual classroom environment in ways which make it more congruent with that preferred by the class. An investigation of differences between students' and teachers' perceptions of the same actual and the preferred classroom environments using two instruments (CES and ICEQ) was reported by Fisher and Fraser (1983a). The findings revealed that students preferred a more positive classroom environment than was actually present for all five environment dimensions. Also, teachers perceived a more positive classroom environment than did their students in the same classroom on four of the dimensions. In another similar study using the CES with a large sample of 116 junior high school science classes in Tasmania, Australia, Fisher and Fraser (1983b) reported that students preferred a more positive classroom environment than the one

perceived to be actually present, but teachers tended to perceive the actual classroom environment more positively than did students in the same classrooms.

2.5.2   Differences between Perceptions of Actual and Preferred Environment

Many past studies have been undertaken into differences between students' and teachers' perceptions of their actual and preferred classroom learning environments (Fisher & Fraser, 1983a). These studies involved the use of both actual form (which measures the students' and teachers' perceptions of the actual classroom environment) and preferred form (which measures the students' and teachers' perceptions of the classroom learning environment that they would ideally like) of educational environment instruments. The actual and preferred forms can be used to investigate the differences between students and teachers in their perceptions of the same actual classroom environment and that preferred by students or teachers. The results of the studies revealed that students and the teachers are likely to prefer a more positive environment than the one actually present in the classroom (Fisher & Fraser, 1983a). These findings replicate a consistent pattern carried out in classrooms in the USA (Moos, 1979), Australia (Aldridge & Fraser, 2003; Fraser, 1982a, 1982b), Israel (Hofstein & Lazarowitz, 1986), The Netherlands (Wubbels et al., 1991), Indonesia (Margianti et al., 2004) and Singapore (Fraser & Chionh, 2000; A. F. L. Wong & Fraser, 1996).

The existence of actual and preferred forms also facilitates person-environment fit studies of whether students achieve better in their preferred environment (Fraser, 1991). The practical implication of this research is that class achievement of certain outcomes might be enhanced by changing the actual classroom environment in ways which make it more congruent with that preferred by the class (Fisher & Fraser, 1983a, 1983b).

In a recent study, Allen and Fraser (2007) reported that parents' perceptions were utilised in conjunction with students' perceptions in investigating Grade 4 and 5 classroom learning environments in Miami, Florida. The WIHIC was modified for

young students and their parents to explore the differences between students' and parents' perceptions of the actual and preferred learning environment, among a sample of 520 students from 22 classes in three schools. The findings revealed that students and parents both preferred a more positive classroom environment than the one perceived to be actually present, but effect sizes for actual-preferred differences were larger for parents than for students. Associations were found between some learning environment dimensions (especially task orientation) and student outcomes (especially attitudes).

2.5.3   Studies of Gender Differences

In the world of international educational research, the study of gender equity with specific reference to science and mathematics education is well established. Educational researchers and practitioners are continually contributing to knowledge in this area. The majority of the studies show that girls are lagging behind boys in terms of attitudes towards science and enjoyment in scientific inquiry and tend to avoid mathematical and physical sciences (Forgasz, 1998). This gender gap is likely to widen as the social scale descends (Teese, Davis, Charlton, & Polesel, 1995). The learning environment could well be a crucial factor when university lecturers consider closing this gender gap.

Studies of gender differences in student-teacher interactions using the QTI have been reported by Fisher and Rickards (1998). The results of this study showed that female students perceived greater leadership, helping, friendly and understanding behaviours in their teachers but male students perceived their teachers as being more uncertain, dissatisfied, admonishing and strict. Overall, females perceived their teachers in a more positive way than did males.

Riah and Fraser (1998) investigated the gender differences in their perceptions of the classroom learning environment using the scales of the WIHIC, QTI and SLEI with a sample of 644 chemistry students in 35 classes from 23 government secondary schools in Brunei Darussalam. The results revealed that female students perceived

the chemistry classroom learning environment more favourably than did the male students.

Majeed, Fraser and Aldridge (2002) reported a study of lower secondary mathematics classroom learning environment in Brunei Darussalam and their associations with students' satisfaction with learning mathematics, using a modified version of *My Class Inventory* (MCI) with a sample of 1,565 students from 81 classes in 15 government secondary schools. The findings revealed that male students perceived significantly more Cohesiveness and significantly less Competition than did female students. However, gender differences were negligible for the Difficulty scale. Overall, the results suggest that the mathematics classroom environment was perceived more favourably by male students than by female students.

In Singapore, a study was undertaken to evaluate adult computer education classes using the *Computer Classroom Environment Personal Form* (CCEPF) questionnaire with a sample of 250 students from five separate private computer schools (Khoo & Fraser, in press). The results revealed that male students perceived more Teacher Support as compared to female students. And also male students' perceptions of Teacher Support were independent of age, whereas older female students perceived greater Teacher Support that did younger female students.

A recent study on the science classroom learning environment using QTI, WIHIC questionnaires and two subscales of TOSRA with a sample of 1,188 students from 54 classrooms in 10 government secondary schools in Brunei Darussalam (Khine, 2002). The results showed that there were significant gender differences in six out of the eight QTI scales (Leadership, Understanding, Uncertainty, Admonishing, Helping/Friendly and Dissatisfied). Similarly, with the WIHIC, male and female secondary students perceived differences in their classroom learning environments, with female students perceiving more favourably than did the male students in the same class. Female students perceived significantly higher levels of Task Orientation, Cooperation and Equity than did male students. In terms of gender differences in enjoyment of science and attitudes towards scientific inquiry, it was

reported male and female students equally enjoyed their science lessons, but male students seemed to have a more positive attitude towards scientific inquiry.

Kim, Fisher and Fraser (2000) investigated gender differences in students' perceptions of the classroom environment using the Korean-version of the WIHIC and QTI with a sample of 543 students in 12 Korean schools. The findings revealed that male students perceived their learning environments and their teachers' interpersonal behaviour more favourably than did female students.

In Indonesia, a study was conducted to examine gender differences in classroom learning environment perceptions using Indonesian-language version of the WIHIC among a sample of 2,498 university students in 50 classes (Margianti et al., 2004). The results revealed that female students perceived significantly more Order and Organisation and Task Orientation than did male students, whereas male students perceived significantly more Equity and Cooperation than their female counterparts on the actual classroom environment. Also, female students preferred a more favourable classroom environment than did male students in terms of more Student Cohesiveness, Teacher Support, Task Orientation and Cooperation. In another study, Wahyudi and Treagust (2006) reported differences between male and female students' perceptions of the science classroom learning environment using an Indonesian-language version of the WIHIC among a sample of 1,188 students from 72 classes in 16 lower secondary schools. Female students reported more favourable perceptions than male students in terms of actual Task Orientation. Also, female students preferred a more favourable classroom environment than did male students in terms of Student Cohesiveness, Investigation Task Orientation and Cooperation.

2.5.4 Combining Quantitative and Qualitative Methods in Studies of Educational Environments

According to Fraser and Tobin (1991) and Tobin and Fraser (1998), significant progress has been made in using qualitative methods in learning environment research and in combining quantitative and qualitative methods within the same

study of classroom environments. The benefit of using multiple research methods lies in the assumptions that complementary insights can lead to the identification of new problems and possible solutions to new and persistent problems. Aldridge, Fraser and Huang (1999) combined quantitative and qualitative methods in exploring the nature of classroom environments in a cross-national study involving Taiwan and Australia. This comparative study made it possible to investigate differences in learning environments in each country. The researchers stressed that the use of multiple research methods helps them understand better the different aspects of classroom learning environments, especially the influence of social and cultural factors, and also concluded that each country has much to learn from the other with regard to the development of a learning environment that fosters better attitudes for learning.

Fraser (1999a) used the notion of 'grain size', which involves focusing on different levels of intensity or extent, while studying ten science classes taught by the same teacher. Qualitative data were gathered from a variety of sources including student diaries, interviews and videotapes of the activities. The quantitative data were obtained by administering a modified version of the CLES to three sub-groups: 1) a selection of students in classes being studied; 2) a selection of students from other teachers in the same school; and 3) a larger representative group. These data were used for making comparisons to find out the extent to which the teacher was typical of her school and the state. The overall pattern indicated differences between perceptions of students in this teacher's class and perceptions of students in the comparison groups.

In Asia, a few studies have used qualitative methods in a minor way, such as in interviews with a small group of students aimed at checking the suitability of a learning environment questionnaire and modifying it before using it in a large-scale study (Margianti et al., 2004; Soerjaningsih, Fraser, & Aldridge, 2001a, 2001b). In Singapore, Khoo and Fraser (in press) randomly selected 46 students for interviews in order to cross-check students' questionnaire responses and to obtain richer insights into students' perceptions of their classroom environments. In another study in Singapore, Wilks (2000) studied English classes at the senior high school level using interpretative and narrative methods to support the validity of a modified version of

the Constructivist Learning Environment Survey. Also these qualitative methods, in conjunction with the questionnaire survey, were used to investigate the extent to which the teaching and learning environment in English classes in consistent with critical constructivism. In Brunei Darussalam, Khine and Fisher (2001, 2002) conducted a pilot study in which students were interviewed concerning difficulties experienced in responding to classroom environment surveys.

In another study in Korea, Lee's research involved a strong quantitative component involving administration of the SLEI, CLES and QTI to 439 students in 13 classes, of which four classes were from the humanities stream, four classes were from the science-oriented stream and five classes were from the science-independent stream (Lee & Fraser, 2001a, 2001b, 2002). In a more minor qualitative component, two or three students from each class (in the humanities streams and the science-oriented stream) were selected for face-to-face interviews. All interviews were audio-taped and later transcribed in Korean and translated into English. In addition, one class from each stream was selected for observation. According to Fraser (2002), in general, the findings from interviews and observations replicated the findings from using the learning environment surveys. The information from interviews with students mainly contributed to clarifying their replies to the questionnaire, but the interviews with teachers also contributed insights by providing background information about the practical situation in classrooms and school.

In Hong Kong, qualitative methods involving open-ended questions were used to explore students' perceptions of the learning environment in Grade 9 classrooms (N. Y. Wong, 1993, 1996). This study found that many students identified the teacher as the most crucial element in a positive classroom learning environment. These teachers were found to keep order and discipline whilst creating an atmosphere that was not boring or solemn. They also interacted with students in ways that could be considered friendly and showed concern for students.

2.5.5   Cross-National Studies

According to Fraser (1997), educational research that crosses national boundaries offers much promise for generating new insights for at least two reasons. First, there usually is greater variation in variables of interest (e.g. teaching methods, student attitudes) in a sample drawn from multiple countries than from a one-country sample. Second, the taken-for-granted familiar educational practices, beliefs and attitudes in one country can be exposed, made 'strange' and questioned when research involves two countries. Researchers from Singapore and Australia have carried out a cross-national study of secondary science classes (Fisher, Goh, Wong, & Rickards, 1997). The QTI was administered to students and teachers from a sample of 20 classes from 10 schools in each of Australia and Singapore. Australian teachers were perceived as giving more responsibility and freedom to their students than was the case for the Singapore sample, whereas teachers in Singapore were perceived as being stricter than their Australian counterparts. These differences are not surprising given the different cultural backgrounds and education systems in the two countries.

Another cross-national study involved six Australian and seven Taiwanese researchers working together on a study of learning environments (Aldridge & Fraser, 2000; Aldridge et al., 1999; Aldridge et al., 2000; She & Fisher, 2000). The WIHIC and CLES were administered to 1,879 students from 50 junior high school science classes in Taiwan and 1,081 students in Australia. A Chinese version of the WIHIC and CLES were translated from the original English version for this study. Qualitative data collected from interviews with teachers and students, and classroom observations were used to complement the quantitative information and to clarify reasons for patterns and differences in the scale means in each country. Data from the questionnaires guided the collection of qualitative data. Student responses to individual items were used to form an interview schedule to clarify whether items had been interpreted consistently by students and to help to explain differences in questionnaire scale means between countries. Classrooms were selected for observations on the basis of the questionnaire data, and specific scales formed the focus for observations in these classrooms. The qualitative data provided valuable insights into the perceptions of students in each of the countries, helped to explain

some of the differences in the scale means between countries, and highlighted the need for caution when interpreting differences between the questionnaire results from two countries with cultural differences (Aldridge & Fraser, 2000; Aldridge et al., 1999).

Adolphe, Fraser and Aldridge (Adolphe, Fraser, & Aldridge, 2003) conducted a cross-national study of classroom environment and attitudes with junior secondary science students in Australia and Indonesia. The study involved a sample of 1,161 students from 36 Year 9 and 10 classes from eight private coeducational schools (four schools in each of two cities in Australia and Indonesia). Both questionnaires had to be translated into Indonesian before their administration in the Indonesian classrooms. This study reported that both the WIHIC and TOSRA were valid and reliable instruments for the assessment of students' perceptions of their psychosocial classroom learning environment and their attitudes to science in both Indonesia and Australia.

In a more recent cross-national study, the *What Is Happening In this Class?* (WIHIC) questionnaire was validated cross-nationally using a sample of 3,980 high school students from Australia, the UK and Canada (Dorman, 2003). Students from Grade 8, 10 and 12 mathematics classes participated in this study. In total, there were 82 within-school grade groups. This study reported that the WIHIC to be a valid measure of classroom environments. The factorial invariance of model parameters across the three countries, three grade levels and gender, attests to the wide applicability of this instrument.

2.6   Student Attitudes

Attitude measurement is particularly important in behavioural research (Zikmund, 1997). According to Zikmund, attitudes are enduring dispositions to respond consistently, in a given manner, to various aspects of the world, including persons, events and objects. Three components of attitudes are: the affective (emotions or feelings involved), the cognitive (awareness or knowledge), and the behavioural

(predisposition to action). Attitudes are hypothetical constructs, that is, they are variables that are not directly observable but are measured indirectly.

The assessment of students' attitudes towards their management and/or marketing classes and case study teaching strategies was regarded as important in the present study. Research literature relating to students' attitudes is briefly reviewed below in terms of definition of students' attitudes (Section 2.6.1), evaluation of students' attitudes (Section 2.6.2), students' attitudes towards their management and marketing classes (Section 2.6.3), and students' attitudes towards the case study teaching strategy (Section 2.6.4).

2.6.1   Definition of Student Attitudes

According to Peterson and Carlson (1979), the definition of the terms associated with the study of students' affective outcomes such as attitudes and interests often have been used loosely and without clarification in the past studies. Krathwohl, Bloom and Masia (1964) developed a taxonomy in which various affective behaviours were placed along a hierarchical continuum, which clarified some of the terms used to describe affective behaviours. Klopfer (1976) took this taxonomy one step forward and developed a structure for the affective domain specifically related to science education. He included four categories into his structure: events in the natural world (awareness and an emotive response to experiences that require no formal study); activities (students' participation in activities related to science, both informal and formal); science (the nature of science as a means of knowing about the world); and inquiry (scientific inquiry processes).

2.6.2   Evaluation of Student Attitudes

According to Laforgia (1988), students' attitudes towards a subject have been measured using a variety of techniques, including interviews, open-ended questions,

projective techniques, closed-item (Likert-type) questionnaires and preference ranking. A number of the instruments have been designed to elicit the attitudes of students towards science in the past (Fraser, 1978, 1981b; Mackay, 1971; Wubbels et al., 1985). Many of these instruments have been criticised on conceptual and empirical grounds (Gardner, 1975; Munby, 1980; Schibeci, 1984) and because of their inability to be used in different countries (Schibeci, 1986).

2.6.3   Students' Attitudes towards their Subject

A review of the research literature revealed numerous scales available for science related attitudes. Of particular interest to this study is the *Test of Science Related Attitudes* (TOSRA) developed by Fraser (1978) to measure students' attitudes towards their science classes. Fraser based the scales of this instrument on Klopfer's (1976) taxonomy of the affective domain related to science education. The robust nature of the TOSRA questionnaire, in terms of reliability and validity, has been widely reported in studies that have used the instrument in different subject areas, at different age levels and in Australia and several Asian countries. Various modified versions of the TOSRA have been used successfully in recent studies involving both attitudes and learning environments in Singapore (Fraser & Chionh, 2000; Goh, 1994; Goh & Fraser, 1995, 1998, 2000; Khoo & Fraser, in press; Quek et al., 2005; Teh & Fraser, 1995a; Waldrip & Wong, 1996; A. F. L. Wong & Fraser, 1996), Brunei Darussalam (Khine & Fisher, 2001, 2002; Majeed et al., 2002; Riah & Fraser, 1998; Scott & Fisher, 2004), India (Koul & Fisher, 2006), Indonesia (Margianti et al., 2004), Korea (Kim et al., 1999, 2000; Lee & Fraser, 2001a, 2001b, 2002), Mauritius (Jhurree et al., 2005), Taiwan (Aldridge & Fraser, 2000; Aldridge et al., 1999; Aldridge et al., 2000), Turkey (Telli et al., 2006), the United States (Martin-Dunlop & Fraser, in press), and Australia (Aldridge & Fraser, 2003; Dorman, Aldridge et al., 2006; Dorman, Fisher et al., 2006; Kerr et al., 2006).

For the present study, it was considered pertinent to modify and make use the Enjoyment of Science Lessons scale from the TOSRA developed by Fraser (1981b) to measure students' attitudes towards management and marketing classes. A shorter

scale that consists of eight items derived from the above questionnaire was used in this present study (see Appendix 1).

2.6.4   Students' Attitudes towards the Case Study Teaching Strategy

According to Christensen and Hansen (1987), business schools throughout the world use the case study approach in teaching business management, particularly in the strategic management and marketing fields. Almost all collegiate-level instruction in these fields makes some use of case studies (Wolfe, 1998). Alexander, O'Neill, Snyder and Townsend (1986) suggested that the case study approach is the primary mode of instruction in strategic management. The case study approach has also become a popular method in training and management development programmes within organisations (Argyris, 1980; Berger, 1983).

Much has been written about the case study method since it originated at the Harvard Business School at the beginning of the last century (Wright, 1996). However, most of this literature has focused upon the merits, benefits, criticisms and limitations of this technique from the teaching perspective, with scant attention being paid to student perceptions of this approach to learning strategic management and marketing (Brennan & Ahmad, 2005).

The rationale for using the case study method in management education is that it is the most practical way of providing students with a variety of management problems, albeit vicariously, to which to apply the knowledge and skills that they have acquired in their studies (Sawyer, Tomlinson, & Maple, 2000). It allows the selection of problems and decision scenarios, and the level of complexity, in a controlled environment and in a relatively short period of time. Mistakes made in analysis or the choice of action recommended have no repercussions for any organisation, thereby allowing students to practice analysis and decision-making without fear of failure and all that it might entail (Gurd, 2001).

On the other hand, the benefits and merits of the case study method were challenged by Weil, Oyelere, Yeoh and Firer (2001) who noted that the research literature was primarily descriptive, with no empirical evidence about its effectiveness. Krebar (2001) has argued that the purported improvements in educational outcomes were not underpinned by research. Argyris (1980) highlights a number of discrepancies between the learning theory espoused by faculty members and their actions, implying a gap between the stated value of using the case study method and its actual use. Some of the criticism appears to be contradictory, suggesting inadequate research evidence.

According to Brennan and Ahmad (2005), previous studies of the attitudes of business and management students towards different teaching and learning approaches have not produced entirely consistent results. For example, Young, Klemz and Murphy (2003) found that "empirical evidence supports that business students prefer pedagogies that are active and concrete" (p. 132), while Hunt, Eagle and Kitchen (2004) found that business students showed the greatest preference for traditional (didactic) methods, and the lowest preference for student-based methods (student presentations and group work). There is no doubt that many business and marketing educators advocate greater use of interactive, experiential learning methods (Cunningham, 1999; Daly, 2001; Schibrowsky, Peltier, & Boyt, 2002; Smith & Van Doren, 2004). Case studies occupy a potentially-valuable position in the portfolio of pedagogical methods, because the approach is familiar to business students, and yet it offers the lecturer various degrees of student involvement, from traditional teacher-centred classroom discussions to 'live cases' which involve student teams in extensive interactions inside and outside the classroom (Kennedy, Lawton, & Walker, 2001). Moreover, Brennan and Ahmad (2005) suggested that the case study method requires students to possess previously-acquired process skills at a level sufficient to make case analysis an interesting and useful learning technique. In addition, any given cohort of students using the case study method should be at, or close to, the same level. This implies a similar educational background, fairly homogenous cultural attitudes, and little variation in work experience or age.

Brennan and Ahmad (2005) recently measured students' attitudes towards the case study teaching approach with 288 final-year undergraduate students at two UK

higher learning institutions. The study was designed to uncover their views about the case study method. Student attitudes were investigated using a self-administered questionnaire which included seven questions about the respondent and 24 questions using a four-point Likert-type scale (agree strongly to disagree strongly) on attitudes to case studies. The results revealed marked differences in attitudes towards case studies between students with different entry qualifications and with different ethnic backgrounds. Older students were found to have more favourable attitudes to case studies than younger students. Based on a review of the research literature, I conclude that the research evidence base supporting the case study method is limited, and the usefulness of the case study method with an increasingly diverse student body could be problematic.

For the present study, it was considered pertinent to modify and make use of the questionnaire developed by Brennan and Ahmad (2005) to measure students' attitudes towards the case study teaching approach. A shorter scale that consists of eight items derived from the above questionnaire was used in this present study (see Appendix 1).

2.7 Recent Studies of Learning Environments at Tertiary Level

Learning environment workers have distinguished between classroom-level environments and school-level environments. At the university level, school-level research owes much in theory, instrumentation and methodology to earlier work on organization, such as the widely-used university-level instrument, the *College Characteristic Index* (Stern, 1970). In a more recent study, Dorman (1998) made an important contribution by developing the *University-Level Environment Questionnaire* (ULEQ) to assess lecturers' perceptions of the university environment and validating it with a sample of 489 academic staff from 52 departments in 28 Australian universities.

Fraser and Treagust (1986) developed and used the *College and University Classroom Environment Inventory* (CUCEI) to assess students' perception of aspects

of the learning environment. Using a sample of 127 university students, they reported that student satisfaction was greater in classes where students perceive higher levels of involvement, task orientation and innovation. The CUCEI was validated in an Australian study (Fraser et al., 1986) resulting in Cronbach alpha coefficient values ranging from 0.72 to 0.92. The instrument was also cross-validated using Australian and American student samples. The findings of the study utilising the CUCEI were replicated in other studies in the USA, Spanish universities, and also again in Australia (Fisher & Parkinson, 1998; Marcelo, 1988; Winston, Vahala, Nichols, Wintrow, & Rome, 1994; Yarrow, Millwater, & Fraser, 1997). The sensitivity, effectiveness and suitability of the CUCEI for the tertiary or higher education settings is clearly demonstrated in the above studies (Nair & Fisher, 2001). In two more recent studies, the CUCEI has been used in examining changes in classroom environment across the transition from senior secondary school to the university level (Nair & Fisher, 2001) and in practical attempts to improve nursing education learning environments (Fisher & Parkinson, 1998).

Logan, Crump and Rennie (2006) used a modified-version of the CUCEI in two independent studies in computing classrooms in secondary schools and tertiary institutions in New Zealand. The tertiary study involved a sample of 239 computing students, whereas the secondary study involved a sample of 265 secondary school students. The statistical performance of the CUCEI was not completely satisfactory in these studies, highlighting the importance of checking the psychometric properties of any instrument before using it. A number of problems (including item statements being inappropriate for computing learning environments, the length of the survey, the response format and the negatively-worded item statements) were common to these two studies.

Newby and Fisher (1997) adapted the *Science Laboratory Environment Inventory* (SLEI) to examine university students' perception of their computer laboratory classroom environments. Bain, McNaught, Mills and Lueckenhausen (1998) also described the computer-facilitated learning environment at the university level. This study was based entirely on archival material and was designed to provide the sampling plan for a second study. The original SLEI was validated simultaneously (involved two groups of students – university and high schools) with a sample of

5,447 students in 269 classes in six different countries (the USA, Canada, England, Israel, Australia and Nigeria) and cross-validated with Australian students (Fisher, Henderson et al., 1997; Fraser & McRobbie, 1995).

In a study of mathematics courses at five universities in Australia, a learning environment instrument was developed based on factors implicated in decision making about pursuing mathematics at the university level. The questionnaire was validated using a sample of 1,883 students attending university mathematic courses (Forgasz, 1998; Forgasz & Leder, 2000).

Spreda and Donnay (2000) validated a single learning environment scale, embedded in the *Strong Interest Inventory* developed for use in career counselling. The questionnaire was administered to 115 first-year students attending a Midwestern university in the USA enrolled in a career development course. The findings suggested that there were associations between the learning environment scales and students' career interests.

In Indonesia, Soeryaningsih and Fraser (2000) developed a questionnaire consisting of four scales adapted from the WIHIC combined with one scale of the CUCEI developed by Fraser, Treagust & Dennis (1986). The study revealed that the association between students' perceptions of the learning environment and their course achievement score was statistically not significant, while association with their Grade Point Average (GPA) score and their satisfaction was statistically significant.

Another study at the tertiary level was also conducted in Indonesia by Margianti (2003) and Margianti, Fraser and Aldridge (2004). This study involved the investigation of factors that could influence students' outcomes (achievement and attitudes) in private computer institutions in Indonesia, including students' perceptions of the learning environment and their mathematical ability at the secondary and tertiary levels. Students' perceptions of the classroom environment were measured using adapted and translated versions of the WIHIC Questionnaire and the sample consisted of about 2,500 students doing their Computer Science course in one of the private universities in Indonesia. In order to assess students'

affective outcomes, a scale derived from the TOSRA was adapted for use in higher education computing classes and translated into Indonesian. Students' final scores in their mathematics course were used as a measure of cognitive achievement. The results of the questionnaire provided evidence for a reliable and validated instrument that is suitable for use at the university level. Moreover, the finding provided evidence of the cross-cultural validity and reliability of the WIHIC when used in the Indonesia higher learning context.

Khine and Goh (2001) reported the pioneering effort in a study of a university learning environment in Singapore which utilized the CUCEI in an attempt to examine associations between attitudes and environment. The study supported the reliability of the instrument and reported significant attitude-environment relationship, as well as gender-related differences among tertiary education students in Singapore.

Another study shifted the focus from a tutorial classroom setting to an Internet-based environment. The study was about teacher trainees' perceptions of synchronous Internet-based learning environments (Teh, 2001; Teh & Fraser, 1999). The instrument used was the *Internet Classroom environment Inventory* (ICEI) and the sample comprised postgraduate teacher trainees doing their social studies course in the Postgraduate Diploma in Education (PGDE) program. The asynchronous Internet-based learning was in real-time mode, online and took the form of web-based conferencing and tele-computing approaches. The data yielded cross-validation support for the use of the ICEI in Singapore Internet-based learning environments (Goh, 2002).

In Australia, Lizzio, Wilson, and Simmons (2002) investigated relationships between students' perceptions of their academic environment, their approaches to study, and their academic outcomes at the university and faculty levels. A questionnaire was administered to a large, cross-disciplinary sample of undergraduate students. Data were analysed using higher-order path and regression analyses. The results of the study indicated that students' perception of the learning environment influenced both academic achievement and student satisfaction.

In Brunei Darussalam, Dhindsa and Fraser (2004) conducted a study to cross-validate the modified version of the *Cultural Learning Environment Questionnaire* (CLEQ) (Fisher & Waldrip, 1997) with 475 teacher trainees of the Universiti Brunei Darussalam to evaluate culturally-sensitive factors such as gender equity, collaboration, deference, competition, teacher authority, modelling and congruence, in teacher trainees' learning environment. Factor and reliability analyses supported the CLEQ's suitability to evaluate six of the seven culturally-sensitive factors with the exception of the teacher authority associated with the cultural learning environment of teacher trainees in Brunei.

Martin-Dunlop and Fraser (in press) evaluated the impact of an innovative science course for prospective elementary teachers on their perceptions of the learning environment and to compare these perceptions with their previous science laboratory course. The WIHIC questionnaire was used to measure students' perceptions of the learning environment in this study. The study used four scales from the WIHIC, namely, Student Cohesiveness, Instructor Support, Cooperation and Investigation. The results of the study indicated strong evidence for the validity and reliability of the questionnaire with 525 female students from 27 classes of A Process Approach to Science course at a large urban university in the United States.

In Taiwan, Huang (2006) conducted a study to validate the *College and University Environment Inventory–Students* (CUEI–S) and an initial assessment of psychosocial environments as perceived by college and university students. The questionnaire was validated using a randomly-selected sample of 5,626 juniors from 35 public colleges and universities and 9,776 juniors from 34 independent colleges and universities in Taiwan. Exploratory factor analysis resulted in retaining the seven dimensions of the CUEI–S, namely, Student Cohesiveness, Faculty-Student Relationships, Administrative Services, Language Ability, Emotional Development, Library Resources, and Student Affairs. Each scale had adequate internal consistency reliability and discriminant validity with the two groups of students. The results of application of the CUEI–S revealed that, in Taiwan, most juniors had favourable relationships with other students and with administrative staff, and perceived positively their library resources and emotional development. Student-faculty

relations, university system support to student affairs, and language learning, however, might need to be improved.

Hirata, Ishikawa and Fisher (2006) carried out three survey studies to investigate associations between students' perceptions of their classroom environments and their individual characteristics in Japanese higher education. In the first study, the CUCEI and the Nowicki-Strickland Locus of Control scale were administered to 406 college and university students in three kinds of psychology classes, namely, Educational Psychology in a teacher-training course, Mental Health in a nursing course and Environmental Psychology in a landscape gardening course. Analysis of data revealed that students' academic achievement and internal locus of control were associated with satisfaction with learning. In another study, analysis of data from 100 students (Mental Health class at a Nursing College in the Tokyo Metropolitan area) clarified the relevance between students' perceptions of actual and preferred satisfaction as well as innovation in learning. In a third study, analysis of covariance structures, using structural equation modelling with data from 568 college and university students in three of psychology classes, namely, Educational Psychology, Mental Health and Environmental Psychology as described above revealed that each preferred CUCEI scale was a causal factor of the corresponding scale on the actual form of CUCEI. It was also shown that students' preferred personalisation had a distinctive effect on all the other actual factors. These results suggested that student perceptions of their classes are clearly relevant to individual student characteristics and needs.

In Thailand, a case study of a tertiary computer classroom was conducted in the north-eastern region of Thailand. A Thai-version of the *Constructivist Learning Environment Survey* (CLES) was used with a sample of 366 students undertaking a computer course to determine its reliability for use in Thailand. Then the CLES was administered to a class of 29 students taking a computer course to find out their perceptions of their preferred learning environments in order to compare these with their perceptions of the actual situation (Wanpen & Fisher, 2006). The results of the study were used to plan improvements in learning environments through a classroom action research process involving revising lessons and instructions, and encouraging changes in students' classroom behaviours. Students' reflective journals, discussions

and small-group work were used to encourage students' expression of critical opinions, cooperation and shared control in their learning environment. After the intervention, the CLES was re-administered and the findings showed that there had indeed been an improvement.

Another important study on the implementation of constructivist learning environments was carried out in Belgium to foster the development of students' learning skills in an effective way. Petegem and Donche (2006) carried out three surveys to explore the intricate associations between learning and teaching in higher education. In the first study, the researchers explored the coherence between conceptions of learning and teaching and learning strategies using Vermunt's *Inventory of Learning Styles* (ILS) (1992) for a sample of 858 first-year Bachelor students from a Flemish institution of higher education. Students from five different disciplines were involved: Business Management (232), Communication Management (244), Office Management (47), Information Management and Systems (169) and Tourism and Recreation Management (166). This study focused on scales that measure processing strategies, regulation strategies and learning conceptions. The first study provided substantial support for the presence of learning patterns among students and student teachers. Three distinct patterns of learning could be distinguished across two contexts, namely, meaning-oriented, reproductive-undirected and flexible learning patterns. Study 2, at the institutional level, involved associations between personal and contextual variables and learning patterns among 1,340 student teachers from a Flemish institution of higher education. In Study 3, an exploratory analysis was carried using the same data from Study 2 to investigate associations between the learning patterns of student teachers and preferences for constructivist learning environments in their own teaching practice. Study 4 involved 119 teacher educators and examined associations between the conceptions of how students should learn to teach and their own teaching strategies. Results showed that individual differences in learning and teaching were present. Different learning patterns were also associated with different preferences for learning environments. The studies also indicated that personal and contextual factors like learning orientation and types of education were associated with differences in learning patterns.

Despite all of the past research examined, I have not found any specific studies of business management education learning environments from the psychosocial educational perspective. Although a number of studies have been carried out at the tertiary level to examine existing learning environment in various countries, there is no evidence that any study specifically on management education has been carried out at the tertiary level. Subsequently, the researcher has developed the *Business Management education Learning Environment Inventory* (BMELEI) to facilitate the study of the business management education learning environments (see Chapter 3 for the development of the BMELEI in more detail). It is envisaged that this instrument will assist researchers to assess students' perceptions of the psychosocial characteristics of the classroom learning environments at the tertiary level in Australia and to relate the learning environment to attitudes towards the subject and attitudes towards the case study teaching strategy.

2.8 Summary of the Chapter

The literature review in this chapter has shown that there is abundant research at the primary and secondary school levels, but that there is a need for more studies of classroom learning environments at the tertiary level, particularly in management education. The literature review covered six main areas: the historical background to the field of learning environment; numerous learning environment instruments; the *What Is Happening In this Class?* (WIHIC) questionnaire (which formed the basis for the instrument used in my study); a review of research on perceptions of classroom learning environment; student attitudes; and the study of learning environments at the tertiary level.

The first section considered literature relevant to the historical background to the field of learning environments. An overview of the key conceptual contributions to the study of learning environments made by the earlier works of Lewin (1936) Murray (Murray, 1938) and others was included.

An overview was provided of numerous learning environment instruments, including their development and validation, details of their scales and items, and their previous use in learning environments research. A timeline of the development of key learning environment instruments was provided in Figure 2.1.

The third section reviewed the development, validity and use of the *What Is Happening In this Class?* (WIHIC) questionnaire that was used as a basis for the questionnaire in my study. Several studies in which this instrument had been used to investigate students' perceptions of classroom learning environment were reviewed. These studies also indicated that aspects of classroom learning environments are associated with the student outcomes of achievement and attitudes.

The fourth section reviewed research literature pertinent to the different lines of past research that have been pursued in the field of learning environment. This section reviewed literature related to studies of associations between classroom environment and student outcomes, differences between perceptions of actual and preferred environment, studies of gender differences, combining quantitative and qualitative methods in studies of educational environments, and cross-national studies.

Literature relating to students' attitudes was briefly reviewed in terms of definition of students' attitudes, evaluation of students' attitudes, students' attitudes towards their management and marketing classes, and students' attitudes towards the case study teaching strategy.

The last section in this chapter reviewed studies of the learning environments undertaken at the tertiary level were provided. There is no evidence that any study specifically on management education has been carried out previously at the tertiary level. Much of the past research relates to science and mathematics students in primary and secondary schools. In order to achieve this, a learning environment instrument was needed for use in the present study to assess business management education learning environments at the tertiary level.

The aim of the next chapter is to describe how an instrument for assessing the business management education learning environment at the tertiary level was

developed and validated, and the approach that was taken in gathering and analysing data, in the present study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1   Introduction

In learning environment research, considerable progress has been made through realising the benefits of combining quantitative and qualitative methods (Fraser, 1998a, 2002; Fraser & Tobin, 1991). Upon completion of a quantitative study, its main findings can be contextualized with more detailed descriptions and verbal accounts from participants (Tobin & Fraser, 1998). This multi-method design serves dual purposes. Firstly, using triangulation, the findings are validated through the use of methods with differing biases to investigate the same concepts with convergent approaches. Secondly, using the differing research approaches a more complete picture of the study than that which could be obtained by using either method alone, can be obtained. With these dual purposes in mind, this research project combined quantitative and qualitative approaches in the study of business students' perceptions of classroom learning environment and students' attitudes towards the subjects and the case study teaching strategy (Brennan & Ahmad, 2005; Khoo & Fraser, in press).

This chapter outlines the overall methodological approach that was used in the study. It 1) presents a description of a four-stage approach used to develop, validate and use a new questionnaire – the *Business Management Education Learning Environment Inventory* (BMELEI) – which is a new instrument for business management education settings at tertiary level, 2) presents an overview of the BMELEI by using a concept map (see Section 3.2) that links various components together, 3) presents an overview of a four-stage, multi-step approach to developing the instrument (see Section 3.3) in which stage 1 was identification and development of salient scales

(see Section 3.4), Stage 2 was writing items (see Section 3.5), Stage 3 was pilot testing and analysis (see Section 3.6), and Stage 4 was administration of BMELEI and analysis (see Section 3.7), 4) describes the target population and how the data were collected using the BMELEI, 5) describes how qualitative data were collected through interviewing randomly-selected business studies students (see Section 3.8), and 6) describes the common statistical methods used to quantitatively analyse the data obtained from surveys conducted using the BMELEI (see Section 3.9).

3.2   Overview of the Business Management Education Learning Environment Inventory (BMELEI) and Attitude Scales

This study involved the use of both quantitative and qualitative methods. The sample for this study included 480 business students from two major universities, namely, Curtin University of Technology and Edith Cowan University in Perth, Western Australia as shown on the concept map (see Figure 3.1). These students are pursuing undergraduate and postgraduate studies. All of the respondents were currently enrolled in a module related to strategic marketing or strategic management. Case studies were used as a key component of the teaching and learning strategy. On the other hand, the qualitative component of the study involved both open questions and semi-structured interviews. Both of these qualitative methods were used with a view to enhancing and seeking explanations to patterns identified through statistical analyses of the quantitative information.

The *What Is Happening In this Class?* (WIHIC) questionnaire was drawn on especially during the development of the BMELEI (see literature review in Section 2.4). The WIHIC was originally developed by Fraser, Fisher and McRobbie (1996) and attempted to incorporate those scales that previous studies had shown to be predictors of student outcomes. The robust nature of the WIHIC questionnaire, in terms of reliability and validity, has been widely reported in studies that have used the instrument in different subject areas, at different age levels and in different countries (Aldridge & Fraser, 2000; Aldridge et al., 1999; Chionh & Fraser, 1998; Dorman, 2003; Dorman, Fisher et al., 2006; Jhurree et al., 2005; Kerr et al., 2006;

Khoo & Fraser, in press; Koul & Fisher, 2005; Margianti et al., 2004; Martin-Dunlop & Fraser, in press; Riah & Fraser, 1998; Telli et al., 2006). The robust nature of the WIHIC made it a sensible choice as a starting point for the present study. The BMELEI consists of six eight-item scales (Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity) that were adapted from the WIHIC questionnaire (Fraser et al., 1996) with several of the items being modified to suit the business management learning environment. Each scale was designed to measure one dimension of the business management education classroom learning environment (see Figure 3.2). Each item is scored on a five-point frequency scale, consisting of Almost never, Seldom, Sometimes, Often and Almost Always, indicating the degree of agreement by the respondents with each statement. Table 3.1 gives an overview of the six scales and a sample item for each scale of the BMELEI.
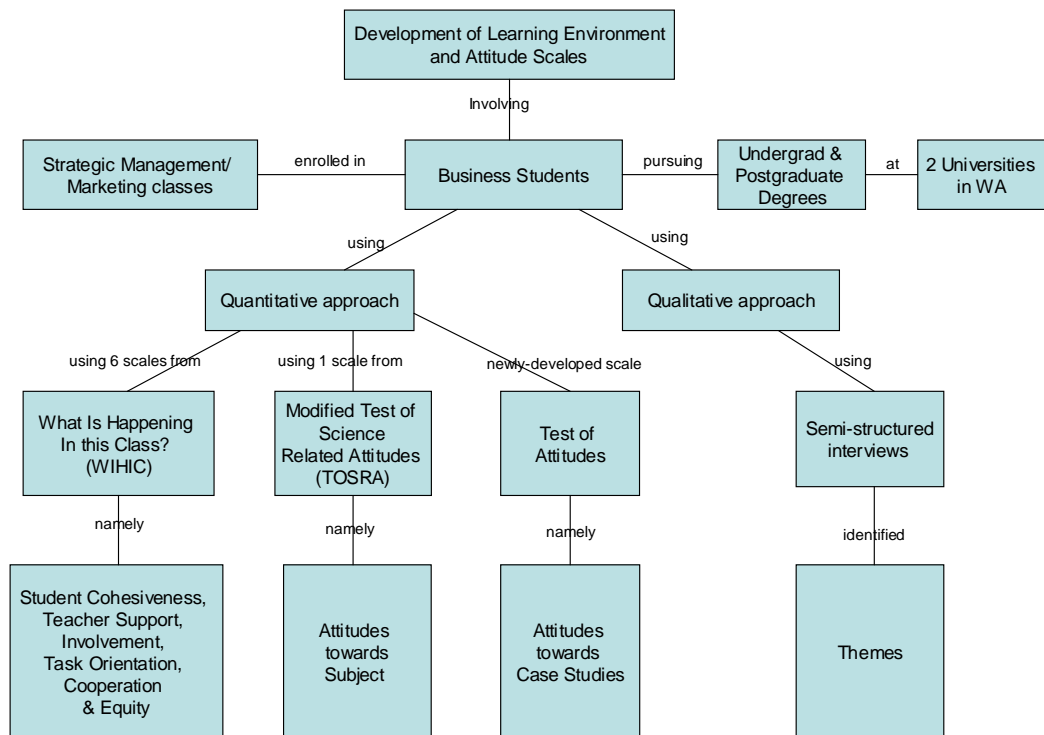
Figure 3.1   Concept Map Illustrating Overview of Study

In order to investigate students' attitudes, my study included two scales located physically at end of the six BMELEI scales for reasons of convenience. The two eight-item attitude scales are called Attitudes towards Subject and Attitudes towards Case Studies. The Attitudes towards Subject scale was based on the Enjoyment of Science Lessons scale from the *Test of Science-Related Attitudes* (TOSRA)

questionnaire which was developed by Fraser (1981a). The robust nature of the TOSRA questionnaire, in terms of the reliability and validity that have been widely reported in studies that have used the instrument in different subject areas, at different age levels, in different countries, made it a sensible choice for the present study (Aldridge & Fraser, 2003; Dorman, Fisher et al., 2006; Jhurree et al., 2005; Kerr et al., 2006; Khine, 2002; Khoo & Fraser, in press; Kim et al., 1999, 2000; Koul & Fisher, 2005; Majeed et al., 2002; Margianti et al., 2004; Martin-Dunlop & Fraser, in press; Quek et al., 2005; Telli et al., 2006). For the second scale, Attitudes towards Case Studies, I modified and made use of a questionnaire developed by Brennan and Ahmad (2005) to measure students' attitudes towards the case study teaching approach. A shorter scale consisting of eight items derived from the above questionnaire was used in this present study (see literature review in Section 2.6.4 on students' attitudes towards the case study teaching strategy).
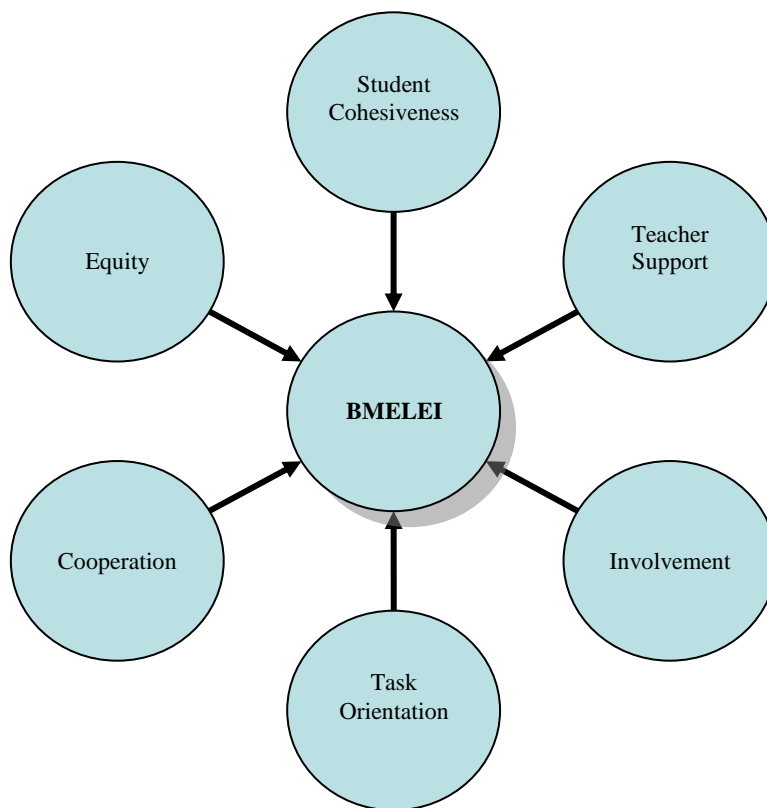
Figure 3.2   Six Scales of the BMELEI

Table 3.1   Description of the Six Scales of the BMELEI and Two Attitude Scales with a Sample Item for Each Scale

Scale	Description	Item
Student Cohesiveness [SC]	Extent to which students know, help and are supportive of one another.	I make friendship among students in this class.
Teacher Support [TS]	Extent to which lecturer/tutor helps, befriends, trusts, and shows interest in students.	The lecturer/tutor takes a personal interest in me.
Involvement [IV]	Extent to which students have attentive interest, participate in discussions, perform additional work and enjoy the class.	I discuss ideas in class.
Task Orientation [TO]	Extent to which it is important to complete activities planned and to stay on the subject matter.	Getting a certain amount of work done is important.
Cooperation [CO]	Extent to which students cooperate rather than compete with another on learning tasks.	I cooperate with other students when doing assignment work.
Equity [EQ]	Extent to which the lecturer/tutor treats students equally.	The lecturer/tutor gives as much attention to my questions as to other students' questions.
Attitudes towards Subject [AS]	Extent to which students enjoy the subject.	I like tutorials in Strategic Management/Marketing subject.
Attitudes towards Case Studies [ACS]	Extent to which the case study teaching strategy enhances students' learning process.	I usually prepare for case study discussions before tutorials.

The BMELEI was developed in two versions (i.e. the Actual and Preferred forms). The actual form was used to assess students' perceptions of the existing learning environment, whilst the preferred form was used to assess the type of learning environment that students would prefer. Assessment of student perceptions of both their actual and preferred learning environments could be used to identify differences between the actual classroom learning environment and that preferred by students. Most importantly, this information could be used to formulate strategies aimed at reducing these differences.

Historically, researchers have administered separate actual and preferred version of questionnaires. To provide a more economical format, however, the BMELEI adapted the questionnaire response format of TROFLEI (Aldridge & Fraser, 2003) that pioneered the inclusion of two adjacent response scales on the one sheet. One response scale is used to record what students perceived as actually happening in their class and the other to record what students would prefer to happen in their class. By using these two forms of the BMELEI questionnaire, the researcher was able to determine differences between students' perceptions of actual and preferred learning environments. Refer to Appendix 1 to see this side-by-side format.

3.3 Overview of the Stages in the Development of BMELEI

The development of the BMELEI used a modified version of a common three-stage approach suggested by Fraser (1986), Jegede, Fraser, and Fisher (1998), and Walker and Fraser (2005) for developing learning environments instruments. The development process for the BMELEI consisted of four stages as shown on Figure 3.3. Stage 1 included identification of salient learning environment scales to cover Moos' (1974) three social organization dimensions of Relationship, Personal Development, and System Maintenance and Change. Relationship Dimensions identify the nature and intensity of personal relationships within the environment and assess the extent to which people are involved in the environment and support and help each other. Personal Development Dimensions assess basic directions along which personal growth and self-enhancement tend to occur, and System Maintenance and System Change Dimensions involve the extent to which the environment is orderly, clear in expectations, maintains control, and is responsive to change. Stage 2 involved writing individual items within the scales. Stage 3 involved pilot-testing items followed by item analysis and validation procedures in order to improve the draft instrument to produce a final version. Stage 4 involved administration of the final version of the BMELEI to a large sample, followed by data analysis. Below are descriptions of the steps involved in each stage.
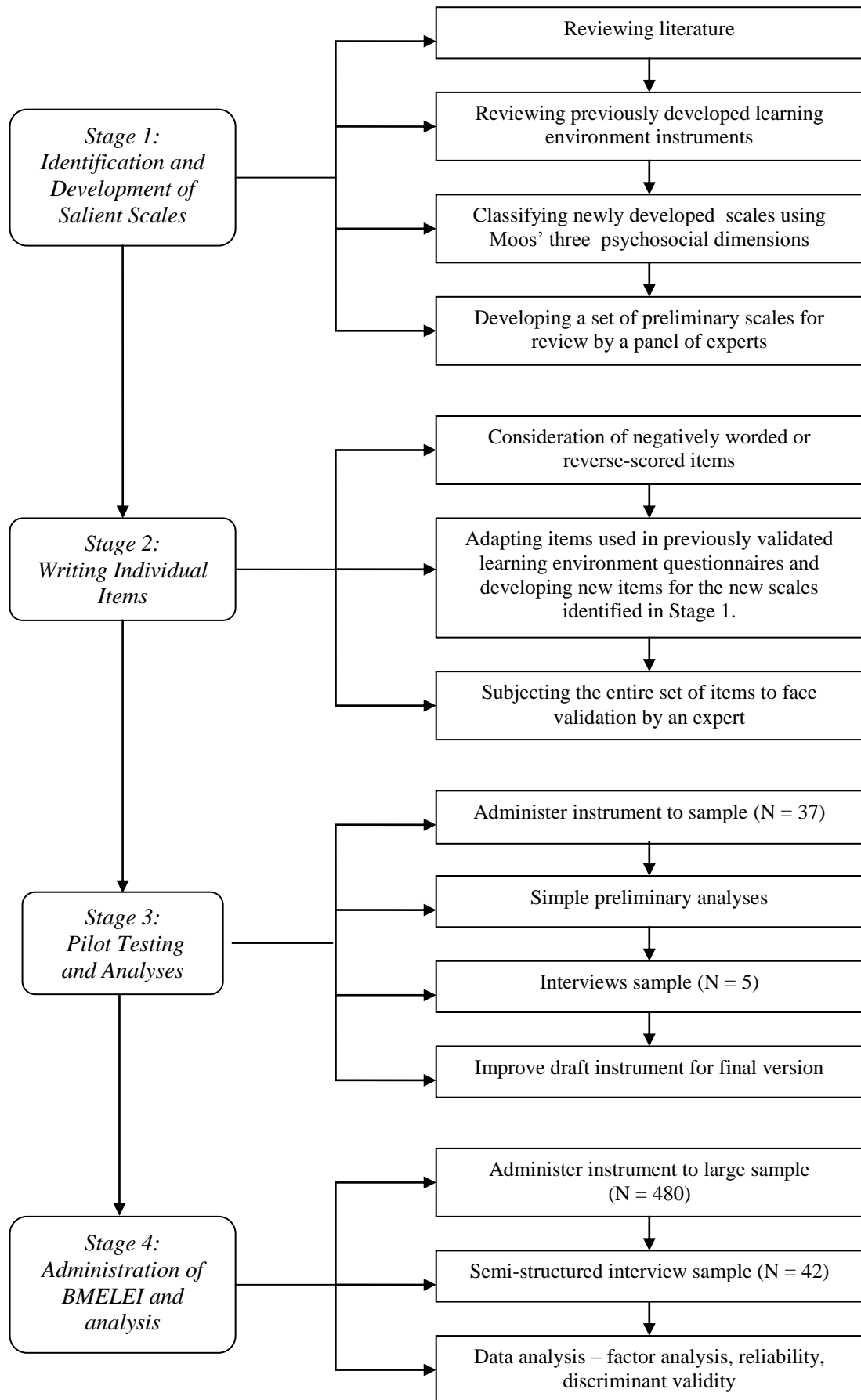
Figure 3.3   Modified Scheme of Development of the BMELEI Adapted from Fraser (1986), Jegede, Fraser, and Fisher (1998) and Walker and Fraser (2005)

3.3.1 Stage 1 - Identification and Development of Salient Scales

Stage 1 consisted of four steps that led to the identification and development of salient scales. The first step included reviewing the literature related to psychosocial learning environments in business management education. This crucial step sought to identify key components that researchers and practitioners consider important in high-quality business management education learning environments. The second step involved reviewing previously-developed learning environment instruments (Fraser, 1986, 1998a, 1998b) for scales that could be modified for the BMELEI. The third step was to classify newly developed scales using Moos' three psychosocial dimensions in order to ensure adequate coverage of these dimensions. Finally, the fourth step was to develop a set of preliminary scales for review by a panel of experts. The scales remaining after review were Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity.

3.3.2 Stage 2 - Writing Individual Items

Stage 2 involved three steps. Step 1 was a consideration of negatively-worded or reverse-scored items. Step 2 involved both adapting items used in previously validated learning environment questionnaires and developing new items for the new scales identified in Stage 1. Step 3 involved subjecting the entire set of items to face validation by my doctoral research supervisor.

3.3.3 Stage 3 – Pilot Testing and Analyses

Stage 3 required four steps. Step 1 included pilot testing the draft instrument with a small sample of 37 business management students from the target population in order to collect sufficient responses to utilize in statistical analyses. Step 2 involved checking students' understandings of individual items of the BMELEI and attitude scales as well as the amount of time required to administer the questionnaire. In

addition, simple preliminary analyses were carried out that included item analysis and internal consistency reliability analysis before the main study. Step 3 involved interviewing five students to see whether or not modifications were needed before conducting the main study. Step 4 involved the development of the final version of the BMELEI to be used in the main study.

3.3.4 Stage 4 – Administration of BMELEI and Analysis

Step 1 included field testing the draft instrument with a large sample of 480 business students, including undergraduate students and postgraduate students from two universities namely, Curtin University of Technology and Edith Cowan University in Perth, Western Australia in order to generate dependable validated data and permit detailed statistical tests. Step 2 involved interviewing 42 randomly-selected students from the target sample (a small group due to the intensive nature of the qualitative component of the research). Step 3 included factor analysis, aimed at identifying items whose removal would enhance the instrument's factor structure, and internal consistency reliability analysis based on a large sample, to determine the extent to which items within a scale measure the same construct as other items within that scale, and also involves the validity of the original structure (i.e. allocation of items to the different scales).

3.4 Stage 1 – Identification and Development of Salient Scales

3.4.1 Review of Scales from Previously-Developed Instruments and Development of New Scales

Classroom learning environment research has spanned more than three decades with significant contributions to the field of education. There have been three common approaches to studying classroom learning environment, these being systematic

observation, case studies and assessing student and teacher perceptions. Reviews of research (Fraser, 1986, 1998a; Fraser & Walberg, 1991; Haertel, Walberg, & Haertel, 1981) reported that most of the studies on classroom learning environments used perceptual measures to investigate the nature of classroom learning environments. The use of perceptual measures formed a major focus in this study.

These studies have involved developing many well-validated and robust classroom environment instruments (see Chapter 2) for use in many countries in different classroom contexts (Fraser, 2002). Fraser (1998a) identified nine important and contemporary classroom learning environment instruments which are widely used in environment studies using the perceptual measures approach: (1) *Learning Environment Inventory* (LEI) (Fraser et al., 1982), (2) *Classroom Environment Scale* (CES) (Moos & Trickett, 1987), (3) *Individualised Classroom Environment Questionnaire* (ICEQ) (Rentoul & Fraser, 1979), (4) *My Class Inventory* (MCI) (Fraser & O'Brien, 1985), (5) *College and University Classroom Environment Inventor*y (CUCEI) (Fraser et al., 1986), (6) *Questionnaire on Teacher Interaction* (QTI) (Wubbels & Levy, 1993), (7) *Science Laboratory Environment Inventory* (SLEI) (Fraser, Giddings, & McRobbie, 1993), (8) *Constructivist Learning Environment Survey* (CLES) (Taylor et al., 1997) and (9) *What Is Happening In this Class?* (WIHIC) (Fraser et al., 1996).

Among these instruments, the *Learning Environment Inventory* (LEI) (Fraser et al., 1982) and *Classroom Environment Scale* (CES) (Moos & Trickett, 1987) are the two pioneering environment instruments and their many scales have been adapted or modified for use in other instruments developed at a later date. For example, the MCI (Fraser & O'Brien, 1985) was simplified from the LEI. The CUCEI (Fraser et al., 1986) adapted items from both the LEI and CES. The *What Is Happening In this Class?* (WIHIC) questionnaire (Fraser et al., 1996) was developed using the best features of the existing instruments, adapting their salient scales and including new scales that accommodated contemporary educational concerns. The final version of the WIHIC consists of seven eight-item scales, namely, *Student Cohesiveness, Teacher Support, Involvement, Investigation, Task Orientation, Cooperation* and *Equity,* where the first six scales were adapted from the existing instruments and the *Equity* scale was introduced to address new educational concerns of gender equality.

The WIHIC questionnaire has also been translated into various languages, such as Taiwanese Chinese (I. T. C. Huang & Fraser, 1997), Korean (Kim, Fraser & Fisher, 2000), Indonesian (Margianti et al., 2004) and Singaporean Simplified Chinese (Chua, Wong, & Chen, 2000) for use in different countries. Reviews of classroom environment studies also indicated that there are associations between students' perceptions of their classroom learning environments and their cognitive and affective learning outcomes (Fraser, 1986; Haertel et al., 1981).

A limitation of these instruments is that they have not been used with business management courses. Therefore, an important aim of the present study was to adapt and validate a learning environment instrument for assessing students' perceptions and their attitudes. The robust nature of the WIHIC and TOSRA questionnaires, in terms of the reliability and validity widely reported in studies that have used the instrument in different subject areas, at different age levels, in different countries, made it a sensible choice for the present study.

3.4.2 Review of and Consistency with the Literature Related to Business Management Education Learning Environments

The BMELEI was developed following an in-depth literature review on classroom learning environments and discussion with experts in the field of business management education. The construction of the BMELEI using only scales perceived to be salient for the business management education learning environment was developed by modifying the WIHIC. The modification of this instrument was guided by the following criteria:
1. Consistency with Existing Tertiary Learning Environment Instruments
2. Coverage of Moos' General Dimensions of Human Environments.

3.4.2.1 *Consistency with Existing Tertiary Learning Environment Instruments*

A review of the literature was undertaken for the purpose of identifying scales that are considered important in a tertiary setting. At the university level, school-level

environment research owes much in theory, instrumentation and methodology to earlier work on organisations, such as the widely-used university-level instrument, the *College Characteristic Index* (Stern, 1970). Presently, there are numerous instruments available for assessing the classroom learning environments at the tertiary level (Bain et al., 1998; Forgasz & Leder, 2000; Fraser et al., 1986; Hirata et al., 2006; S. L. Huang, 2006; Khine & Goh, 2001; Lizzio et al., 2002; Newby & Fisher, 1997; Petegem & Donche, 2006; Saunders & Fisher, 2006; Spreda & Donnay, 2000; Wanpen & Fisher, 2006). However, no instrument has been specifically designed and validated for measuring the business management education learning environment. The development of the BMELEI was based on the existing scales of the WIHIC, which has been validated in past research in tertiary settings (Khoo & Fraser, in press; Margianti et al., 2004; Martin-Dunlop & Fraser, in press; Soerjaningsih et al., 2001a, 2001b). However, some modifications both in the scales and items had to be made to the new inventory to make it specific to the unique business management education learning environment.

3.4.2.2 *Coverage of Moos' Three General Categories of Dimensions*

The BMELEI provides coverage of the three general categories of dimensions identified by Moos (1974) for conceptualising all human environments. Moos' three dimensions of psychosocial environment include the Relationship Dimensions (the nature and intensity of personal relationships), Personal Growth Dimensions (personal development and self enhancement) and System Maintenance and Change Dimensions (extent to which the environment is orderly, clear in expectations, maintain control and is responsive to change). Moos stated that these dimensions, when included in an environment instrument, provide an adequate and reasonably complete picture of any environment. Therefore, the instrument for the present study was chosen to include scales in each of Moos' three general classifications.

The scales in the BMELEI covered all of Moos' dimensions as shown in Table 3.2.

Table 3.2   Classification of BMELEI Scales in Relation to Moos' Scheme

Relationship Dimension	Personal Growth Dimension	System Maintenance & Change Dimension
Student Cohesiveness	Task Orientation	Equity
Teacher support	Cooperation	
Involvement		

3.4.2.3 *Justification of the Choice of Scales Included in the Business Management Education Questionnaire*

Over the past few decades, the learning and teaching of business and management in higher education has experienced rapid growth and considerable diversification. Moreover, this trend has been a worldwide phenomenon, with the result that today there are few countries without a rich array of business and management courses and programmes at all levels of higher education which encompass a wide variety of modes of delivery. The learning experiences of contemporary business and management students are many and varied.

Effective teaching and learning impact positively on student performance, the student experience and the community into which our graduates emerge. Learning how to facilitate learning, of course, is a never-ending process that depends not simply on personal reflection, but also on engagement with others. Thus, MacFarlane and Ottewill (2001) suggested specific guidelines (based on some of the principal traditions and trends in the development of business and management education worldwide) for:

- dealing with student expectations and the motivational challenges to which they can give rise;
- managing the differences in learning styles that are likely to exist among most groups of students;

- utilising the prior experiences and concerns of learners in the design of learning activities;

- helping students to maximise the potential of their learning time;

- treating students as a resource rather than as 'empty vessels waiting to be filled'.

Houston and Bettencourt (1999) validated a single learning environment scale (Equity), using the *critical incident technique* (CIT) to identify fair and unfair instructor behaviours that are salient to students. The questionnaire was administered to 180 students attending a large, southwestern metropolitan university in the USA enrolled in a marketing course. The findings revealed implications for teachers and for future research on classroom fairness. It is well established that students' perceptions of fairness are strongly linked to desirable outcomes, including student effort and learning.

McKone (1999) adapted the Darden Course Feedback Survey for investigating university students' perception of their instructors' performance and classroom climate with a sample of 342 Master of Business Administration (MBA) students from Darden Graduate School of Business at University of Virginia in the USA. The results of the study indicated that the relationship between course value and instructor performance is a complex relationship involving course input and output factors and instructor product and process factors.

In a recent study, DeShields, Kara and Kaynak ((2005) used a modified-version of a questionnaire developed by Keaveney and Young (1997) to investigate the determinants of student satisfaction and retention in higher educational institutions by focusing on the links between teaching staff (understanding, accessible, professional, helpful and provide feedback), advising staff (accessible, reliable, responsive, helpful and understanding) and classes (real-world relevance, course scheduling and projects/cases skills) that influence students' experience with a college/university. The instrument was administered to 160 undergraduate business students at a state university in Pennsylvania. The findings indicated that students who have a positive college experience were more likely to be satisfied with the college or university than students who did not have a positive college experience.

The development of a new instrument for the present study drew heavily on the *What Is Happening In this Class?* (WIHIC) questionnaire. Past studies that have made use of the WIHIC, therefore, are of particular interest to this study. The WIHIC has been used to assess students' perceptions of the learning environment in a number of different subject areas, at a range of grade levels, and in several countries (see Section 2.4 in Chapter 2). In each case, the WIHIC has been used successfully and has been shown to be robust in terms of its reliability and validity.

In the present study, the new instrument, the *Business Management Education Learning Environment Inventory* (BMELEI), consists of six scales (Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity) with eight items per scale. These six scales in the BMELEI that are considered relevant to the philosophy of business management education have been adapted from the WIHIC questionnaire. The BMELEI assesses:

- Student Cohesiveness – the extent to which students know, help and are supportive of one another.
- Teacher Support – the extent to which lecturer/tutor helps, befriends, trusts and shows interest in students.
- Involvement – the extent to which students have attentive interest, participate in discussions, perform additional work and enjoy the class.
- Task Orientation – the extent to which it is important to complete activities planned and to stay on the subject matter.
- Cooperation – the extent to which students cooperate rather than compete with one another on learning tasks.
- Equity – the extent to which the lecturer/tutor treats students fairly and equally.

Table 3.2A provides a description of each BMELEI scale. The items in the BMELEI are listed in Appendix I.

In an attempt to justify the salience and relevance of the dimensions selected for inclusion in the BMELEI, I followed an approach used effectively in research in Texas and South Africa. Nix et al. (2005) justified choosing the Constructivist

Learning Environment Survey (CLES) scales for their study in terms of a standards document used in Texas. Similarly, Aldridge et al. (2006) justified the dimensions included when developing the Outcome-Based Learning Environment Questionnaire (OBLEQ) in terms of a Department of Education document in South Africa.

Following the lead of Nix and colleagues and Aldridge and colleagues, I drew on the work of MacFarlane and Ottewill (2001) in justifying the inclusion of each of the BMELEI's six dimensions. The last column of Table 3.2A clarifies the relevance of each BMELEI dimension to the sound business management education practices espoused by MacFarlane and Ottewill (2001).

Table 3.2A   Description and Origin of Each BMELEI Scale and Its Relevance to the Development of Business Management Education Learning Environments as Suggested by MacFarlane and Ottewill (2001)

Scale	Origin of scale	Scale Description	Relevance to Business Management Education According to Macfarlane and Ottewill (2001)
Student Cohesiveness	WIHIC	The extent to which students know, help and are supportive of one another.	Learners should be supportive and friendly towards each other.
Teacher Support	WIHIC	The extent to which lecturer/tutor helps, befriends, trusts, and shows interest in students.	Managing the differences in learning style that are likely to exist in most groups of students and utilising the prior experiences and concerns of learners in the design of learning activities. Lecturer/tutor should be helpful, caring and show interest in students as customers.
Involvement	WIHIC	The extent to which students have attentive interest, participate in discussions, perform additional work and enjoy the class.	Dealing with student expectations and the motivational challenges to which they can give rise. Learners are to be active participants in the learning process.

Task Orientation	WIHIC	The extent to which it is important to complete activities planned and to stay on the subject matter.	Managing the differences in learning style that are likely to exist in most groups of students and helping students maximise the potential of their learning time. Learners should be encouraged to improve their achievement and/or attitude outcomes.
Cooperation	WIHIC	The extent to which students cooperate rather than compete with another on learning tasks.	Learners should collaborate in learning rather than compete. They should cooperate and work together as a group or a team, especially for special projects.
Equity	WIHIC	The extent to which lecturer/tutor treats students fairly and equally.	Making students aware of the need to be fair in responding to the needs of members in all levels of an organisation, without favouring any group in particular.

3.4.3 Preliminary Scales for Review by Research Supervisor

Based on the literature previously cited, a set of six preliminary scales was created to address Moos' three psychosocial dimensions. The BMELEI consists of six scales (*Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity*) from the *What Is Happening In this Class?* (WIHIC) questionnaire (Fraser et al., 1996), with several of the items modified to suit the business management learning environment. The Investigation scale is not relevant to this study. Table 3.1 presents the six learning environment scales and two attitude scales as used in the preliminary scales for review by my doctoral research supervisor.

In order to investigate students' attitudes, my study included two additional scales that consist of eight items in each scale, namely, Attitudes towards Subject and

Attitudes towards Case Studies. The Attitudes towards Subject scale was based on a scale from the *Test of Science-Related Attitudes* (TOSRA) questionnaire which was developed by Fraser (1981a). For the second scale, Attitudes towards Case Studies, I modified and made use of the questionnaire developed by Brennan and Ahmad (2005) to measure students' attitudes towards the case study teaching approach. A shorter scale that consists of eight items derived from the above questionnaire will be used in this present study.

To provide a more economical format, however, the BMELEI adopted the inclusion of two adjacent response scales on the one sheet (one to record what students perceived as actually happening in their class and the other to record what students would prefer to happen in their class). This was similar to the *Technology-Rich Outcomes-focused Learning Environment Inventory* (TROFLEI) (Aldridge & Fraser, 2003) that pioneered the inclusion of two adjacent response scales on the one sheet.

3.5   Stage 2 – Writing and Developing Individual Items

Once salient scales had been identified, the next step in the development of this instrument was to write a set of items to measure each scale. This process involved making sure that each item was measuring only the dimension covered by its a priori assigned scale and not measuring the dimensions covered by any of the other scales in the instrument.

3.5.1   Consideration of Negatively-Worded or Reverse-Scored Items

Reviews of research (Chamberlain & Cummings, 1984; Schriesheim, Eisenbach, & Hill, 1991; Schriesheim & Hill, 1981) reported that past studies have revealed higher reliability when all items are worded positively in terms of response accuracy and consistency. Negatively-worded items, when mixed with positively-worded items, have been found using factor analyses to solicit differing response patterns (Benson,

1987; Knight, Chishoml, Mash, & Goffrey, 1988). Barnette (2000) concluded that mixing positive and negative items was not a recommended procedure.

In the case of the modified version of the WIHIC used in the present study, the WIHIC questionnaire (Fraser et al., 1996), that combined the best features of the existing instruments and adapted their salient scales, was designed to have no negatively-worded items. Aldridge and Fraser (2003) also had chosen positively-worded items only in their development of the TROFLEI in order to minimise confusion among students.

For the above reasons, I utilised only positively-word items that were modified to suit the business management education environment in the present study. In addition, in order to provide a more economical format, the BMELEI adapted the inclusion of two adjacent response scales on the one sheet (Aldridge & Fraser, 2003). One column of the response scale was used to record what students perceived as actually happening in their class and the other to record what students would prefer to happen in their class. The TROFLEI was pioneered to include two adjacent response scales on the one sheet.

3.5.2   Adapting Items from Previously-Validated Learning Environment Questionnaires and Developing New Items for the New Scales

In the case of the modified version of the WIHIC used in the present study, items within the questionnaire were examined to ensure their suitability for university-level business management classes in Australia. In some cases, individual words were changed (e.g. the word 'teacher' was replaced with the word 'lecturer/tutor').

3.5.3   Validating Items

The modified instrument consisted of 64 items that were adapted from existing instruments or were newly developed to fit within the eight scales in the first draft of the BMELEI. These items and their corresponding scale descriptions were then forwarded to Professor Fraser for his comments and inputs. Professor Fraser provided his opinions about each item's face validity, potential readability for the target population, scale allocation and freedom from various item faults and ambiguities outlined in standard educational measurement texts. The next step involved pilot testing the modified instrument.

3.6   Stage 3 – Pilot Testing and Analysis

A pilot study was undertaken with 37 students from two classes to:
- ensure that the modified instrument was applicable to the tertiary level in Australia;
- check that students' understandings of individual items were consistent with the researchers' understandings; and
- provide a guide for determining the amount of time required to administer the questionnaire.

To ensure that the instrument was applicable in the Australian context, the modified WIHIC and attitude scales were pilot tested with 37 Curtin business students. Each student was asked to complete the questionnaire. The process also involved interviews with the students as well some preliminary data analysis. In addition, the estimated time to complete a questionnaire was recorded during the pilot study. The approximate time taken to complete a questionnaire was 15 minutes.

Data collected from 37 students in two classes during the pilot study were used to perform simple preliminary analyses, such as item analysis and internal consistency reliability analysis, for the draft instrument before the main study.

The purpose of the interview process based on the questionnaire responses was to obtain first-hand feedback from four students about the readability, comprehensibility and suitability of the questionnaire. Based on the results of the interviews, fine-tuning to individual items was made. The interviews revealed that students' understandings of the items were consistent with those of the researcher. The time taken to complete a questionnaire was crucial to students as well.

After a few minor changes were made, a final version of the BMELEI and attitude scales was developed for major field testing. Table 3.3 presents the BMELEI and attitude dimensions, scale names, scale descriptions and items as used in the final field-test version.

Table 3.3   Scale Descriptions for Final Version of BMELEI and Attitude Scales after Pilot Test

Dimension	Scale	Scale Description	Items
Relationship	Student Cohesiveness	Extent to which students know, help and are supportive of one another.	1. I make friendships among students in this class. 2. I know other students in this class. 3. I am friendly to members of this class. 4. Members of the class are my friends. 5. I work well with other class members. 6. I help other class members who are having trouble with their work. 7. Students in this class like me. 8. In this class, I get help from other students.
Relationship	Teacher Support	Extent to which teacher helps, befriends, trusts, and shows interest in students.	9. The lecturer/tutor takes a personal interest in me. 10. The lecturer/tutor goes out of his/her way to help me. 11. The lecturer/tutor considers my feelings. 12. The lecturer/tutor helps me when I have trouble with the work. 13. The lecturer/tutor talks with me. 14. The lecturer/tutor is interested in my problems. 15. The lecturer/tutor moves about the class to talk with me. 16. The lecturers'/tutors' questions help me to understand.
Relationship	Involvement	Extent to which students have attentive interest, participate in discussions, perform additional work and enjoy the class.	17. I discuss ideas in class. 18. I give my opinions during class discussions. 19. The lecturer/tutor asks me questions. 20. My ideas and suggestions are used during classroom discussions. 21. I ask the lecturer/tutor questions. 22. I explain my ideas to other students. 23. Students discuss with me how to go about solving problems. 24. I am asked to explain how I solve problems.
Personal Development	Task Orientation	Extent to which it is important to complete activities planned and to stay on the subject matter.	25. Getting a certain amount of work done is important to me. 26. I do as much as I set out to do. 27. I know the goals for this class. 28. I am ready to start this class on time. 29. I know what I am trying to accomplish in this class. 30. I pay attention during this class. 31. I try to understand the work in this class. 32. I know how much work I have to do.

Personal Development	Cooperation	Extent to which students cooperate rather than compete with another on learning tasks.	33. I cooperate with other students when doing assignment work. 34. I share my books and resources with other students when doing assignments. 35. When I work in groups in this class, there is teamwork. 36. I work with other students on projects in this class. 37. I learn from other students in this class. 38. I work with other students in this class. 39. I cooperate with other students on class activities. 40. Students work with me to achieve class goals.
System Maintenance & Change	Equity	Extent to which the teacher treats students equally.	41. The lecturer/tutor gives as much attention to my questions as to other students' questions. 42. I get the same amount of help from the lecturer/tutor as do other students. 43. I have the same amount of say in this class as other students. 44. I am treated the same as other students in this class. 45. I receive the same encouragement from the lecturer/tutor as other students do. 46. I get the same opportunity to contribute to class discussions as other students. 47. My work receives as much praise as other students' work. 48. I get the same opportunity to answer questions as other students.
	Attitudes towards Subject	Extent to which students enjoy the subject.	49. I like lessons in Strategic Management/Marketing subject. 50. Strategic Management/Marketing classes are interesting. 51. Strategic Management/Marketing subject is one of my favourite subjects. 52. Lessons in Strategic Management/Marketing subject interest me. 53. I enjoy lessons in Strategic Management/Marketing subject. 54. I enjoy the activities that we do in Strategic Management/ Marketing subject. 55. These lessons make me interested in this subject. 56. We should have more lessons in this subject each week.
	Attitudes towards Case Studies	Extent to which the case study teaching strategy enhances students' learning process.	57. I usually prepare for case study discussions before seminars/tutorials. 58. I usually contribute to case study discussions in class. 59. I usually learn something new during case study discussions. 60. Analysing case studies gives me the confidence to express opinions. 61. Doing case study work has helped me to develop my presentational skills. 62. Doing case study work has helped me to develop my skills in business analysis. 63. Doing case study work has helped me to develop my skill in business report writing. 64. Doing case study work has helped me to develop my team-working skills.

Response choices are: Always Never, Seldom, Sometimes, Often and Almost Always.

3.7   Stage 4 – Administration of BMELEI and Analysis

The final stage of developing a learning environment instrument involves conducting a field test with the target population, followed by statistical analyses of the item responses in term of factor analysis, internal consistency reliability and ability to differentiate classes (Fraser, 1986; Jegede, Fraser, & Fisher, 1998; Walker & Fraser, 2005). The purposes of theses analyses are to refine the instrument and to provide evidence of the overall reliability and validity of the refined scales. This section describes the field-testing, including a description of how the field test was conducted and the sample of students who responded. This is followed by a brief description of the data analyses methods that are described more fully in Chapter 4.

3.7.1   Field Testing

The BMELEI was administered to final-year students and postgraduate students at both Curtin University of Technology and Edith Cowan University. All of the respondents were enrolled in a strategic marketing or strategic management module in which case studies were used extensively as a key component of the teaching and learning strategy. Data collection could only be carried out after the tutorial sessions. In all, 480 students in 30 classes responded.

3.7.2   Semi-Structured Interviews

Semi-structured interviews were conducted with 42 randomly-selected participants from the final-year undergraduate and postgraduate students from two business schools namely Curtin Business School and Edith Cowan Business School in Perth, Western Australia. All interviews were conducted by the researcher after the quantitative survey. With the consent of the students, the interviews were audio-taped and transcribed. Similarly, these responses were coded qualitatively with the

help of the qualitative data analysis software SPSS Text Analysis for Surveys Version 2.0. The students were assured of confidentiality and anonymity and were encouraged to talk about their experiences in classroom. Each interview took about 20 minutes. The questions explored students' feelings and perceptions about their classroom environment and were designed to address the six scales of classroom learning environments as well as the two attitude scales covered by the BMELEI.

3.7.3 Data Analysis

The BMELEI was validated using responses from the student sample described above. The data were then stored in various SPSS files before performing statistical analyses for the factorial validity, internal consistency reliability, discriminant validity, and ability to differentiate between the perceptions of students in different classrooms for BMELEI scales.

Principal component factor analysis with varimax rotation was conducted to determine the validity of the structure of the instrument for assessing students' perceptions of the classroom learning environment and to identify any items to be removed. The purpose of this factor analysis was to test whether the 48 items of the BMELEI would load on the six *a priori* scales for assessing six different dimensions of the business management education classroom learning environment. Only items with factor loading greater than 0.4 (the minimum value conventionally accepted as meaningful in factor analysis) on its own scale and less than 0.4 on all other scales were considered in deciding the factor structure of each scale of the modified instrument (Field, 2005; Stevens, 1992).

3.8   Data Collection

Collection of data for this study was not as easy a task as anticipated. The main problems faced were due to the research culture in the universities where the data

were collected. Further problems were encountered as a result of the bureaucratic requirements of the university administrations.

3.8.1 Procedures of Data Collection

The researcher administered the BMELEI to 480 students and conducted 42 semi-structured interviews personally. The data were collected in the first semester of 2006. In order to ensure a smooth data-collection process, the preparation for data collection was carried out comprehensively. This included, for example, seeking the approval from the Curtin University Human Ethics Committee, the Pro Vice-Chancellor, Academic Services of Curtin University of Technology, the heads of the five business schools in Western Australia, administrators, the respective unit controllers and lecturers for permission to collect data from students. As for Curtin University of Technology, the approval for data collection from students was given on the condition that the researcher did not deprive students of their learning time during their tutorials. I duly agreed with the suggested conditions and proposed to distribute my questionnaires to students before or after the tutorial sessions and returned the following week to collect the completed questionnaires.

During the preparation for data collection, I experienced negative responses from most of the heads of business schools in Western Australia who gave various excuses and reasons for not participating in my study, such as:

> *I am afraid class time is fully utilised and cannot be used for any purposes other than students' learning in that subject. The unit controllers will not permit this* (Curtin Business School);
> *I am the Head of the Curtin Business School of X and Y. We don't teach any business management courses or units in our School;*
> *I generally leave my unit leaders to decide whether they have time to spare from class time and wish to support your research. I can, however, recommend you to them* (NATO - No Action Talk Only) - Curtin Business School; and

In the very least, you will require the School of Business Research Committee to ratify your research instrument and covering letter. Further to this, it is possible that your research will also require the University Ethics approval. This is what we call an Expedited Review Process that is administered at the College level. However, this is subject to ratification at university level and may be a lengthy process due to the timing of relevant committee meetings. (Response from one of the new universities in Western Australia).

Worst of all, an academic staff member of one of the best business schools in Western Australia told me bluntly that the Postgraduate School of Management would not allow 'outsiders' to conduct any form of data collection from their students during their information evening.

The experiences that I have described above tend to reflect a negative attitude of university staff who should vigorously encourage and promote research in various fields. This negative attitude was also reflected in a recent report by the University's Planning Unit (2006). Some of the comments included:

- Lack of support network for research
- Flawed funding model driven by teaching – not recognising research
- Need for proper research infrastructure
- Lack of technical support – becoming worse with time
- Insufficient post doctoral fellowships – flow through not helped by employment structure (many people just taken on as casuals)
- Shift in the expectations of research at Curtin (moved goal posts from industry to ARC)
- Lack of sabbatical leave arrangements – vital to keep enthusiasm
- Very high teaching load that restricts time for research
- Limited funding to attend research conferences (particularly in the Humanities).

Finally, based on the above unexpected, unfriendly, demotivating encounters and experiences, I had decided to collect most of my data from the School of Marketing at Curtin Business School and also from the School of Management at Edith Cowan

University because these two business schools were very encouraging about promoting research in the field of business education. My initial plan was to collect data from all five universities in Perth, Western Australia. However, I managed to convince only two universities to participate in my study despite this being the first study in Australian business education learning environment. Moreover, the results of the study would be made available to university administrators and lecturers to guide improvements in the teaching and learning process in business management education.

During data collection, the response rate from students who participated in my survey was very disappointing and demotivating. I managed to collect only 9 out of 200 questionnaires distributed to the classes after one week. Due to the poor response from students, I decided to change my data-collecting strategy by contacting all my associates including my colleagues and friends working at the other universities in Perth to seek their permission and assistance in collecting data from their classes. My colleagues and friends were very encouraging and agreed to allow me to collect data from their students only after their tutorial sessions. This was possible because their classes often finished a little before the allotted time and it took only 15 minutes of students' time to complete the questionnaire. As a result, only those students who did not proceed to another lecture or tutorial, were able to participate in this study. One of the important features of the BMELEI questionnaire was that it was designed in such a way that the language used was simple, precise and clear. And most importantly, it took just about 15 minutes to complete. During data collection, I explained the purpose and the methods of the study using the prepared verbatim instructions. At the end of the survey, I performed a manual check of all the completed questionnaires for any missing entries.

A limitation of this study is that the sample size used in the study was limited to 480 final-year and postgraduate students from 30 classes in two business schools in Perth, Australia due to the difficulties encountered during the data collection. The sample obtained is smaller and less representative (because only two universities participated in this study) than originally intended, thereby limiting the generalisability of the findings.

3.8.2   Quantitative Methods

The BMELEI questionnaire was developed to gather valid quantitative data in order to assess business management students' perceptions of the psychosocial learning environments as well as students' attitudes towards the subject and towards the case study teaching strategy. The BMELEI questionnaire was administered to final-year students, as well as to postgraduate students, at both Curtin University of Technology and Edith Cowan University. All of the respondents were enrolled in a strategic marketing or strategic management module in which case studies were used extensively as a key component of the teaching and learning strategy. In all, 480 students in 30 classes responded. Tables 3.4 to 3.7 show some of the characteristics of the sample. The mean age of the respondents was 22.75 years and male students (48.8%) and female students (51.2%) were more or less equally represented. Table 3.4 shows the gender distribution of the respondents.

Table 3.5 shows that 54.8% of respondents were enrolled in strategic management subject whereas 45.2% of respondents were enrolled in strategic marketing subject. These two subjects were quite equally represented.

Table 3.4   Distribution of Respondents by Gender

| Gender | Number of Respondents | | | |
	Curtin University of Technology	Edith Cowan University	Total	Percentage
Male Students	164	70	234	48.8
Female Students	192	54	246	51.2

Table 3.5   Distribution of Respondents by Course Subject

| Subject | Number of Respondents | | | |
	Curtin University of Technology	Edith Cowan University	Total	Percentage
Strategic Management	175	88	263	54.8
Strategic Marketing	181	36	217	45.2

Table 3.6   Distribution of Respondents by Course Level

Course	Number of Respondents		Total	Percentage
	Curtin University of Technology	Edith Cowan University		
Undergraduate	343	65	408	85.0
Postgraduate	13	59	72	15.0

Table 3.7   Age Distribution of Respondents

Age Group	Number of Respondents		Total	Percentage
	Curtin University of Technology	Edith Cowan University		
19-20	87	14	101	21.0
21-22	164	28	192	40.0
23-24	56	21	77	16.0
25-26	25	12	37	7.7
27-29	8	10	18	3.8
30-35	8	23	31	6.5
36-40	3	9	12	2.5
41-50	5	5	10	2.1
51-60	0	2	2	0.4

As for the types of courses, 85% of the respondents were undergraduate students and 15% of the respondents were postgraduate students. Table 3.6 shows the respondents' choices of courses at the two universities. The postgraduate students were included in this study in order to increase the sample size of respondents. Moreover, the inclusion of the postgraduate students who were much older than the undergraduates enabled me to explore the relationship between the learning environment, attitudes and the age of students.

While the mean age of the respondents was 22.75 years (standard deviation 1.75), age ranged was from 19 to 60 years. Table 3.7 shows the distribution of respondents by age category. What might be regarded as an unusually wide age range for an undergraduate course can be explained by the success of Curtin University of Technology in pursuing its strategic aim of attracting a diverse student body. The majority of the respondents were in the conventional age range for undergraduate students, namely, their early 20s. However, the inclusion of students aged 25 years or

older enabled me to explore the relationship between the learning environment, attitudes and the age of students.

Students' responses to both the actual and preferred forms of the BMELEI were coded with periodic checks for errors, entered student-by-student into a computer file in Microsoft Excel format, and analysed with the use of *Statistical Package for the Social Sciences* (SPSS) Version 14. The database was set up in the following manner: respondents were recorded in rows and the individual scale items were arranged in columns. This arrangement allowed ease of data entry and analysis because each row represented all of the responses of an individual student.

3.8.3 Qualitative Methods

Qualitative data were collected by means of semi-structured interviews with randomly-selected participants from the final-year undergraduate and postgraduate students at two Universities in Perth. A total of 42 students participated in the interviews. Consent was obtained from these students involved prior to their interviews. All the 42 students were voluntary and were aware that they could withdraw their consent at any time. Participants were informed that any evaluation report and subsequent publication would respect their confidentiality and anonymity. All interviews were conducted by the researcher after the quantitative survey. With the consent of the students, the interviews were audio-taped and transcribed. Similarly, these responses were coded qualitatively with the help of the qualitative data analysis software, SPSS Text Analysis for Surveys Version 2.0 (Text analysis software that can be used for the extraction of useful information from text such as open-ended responses, so that the key ideas contained within this text can be grouped into an appropriate number of categories). The students were assured of confidentiality and anonymity and were encouraged to tell of their experiences in classroom. Each interview took about 20 minutes. The questions asked explored students' feelings and perceptions about their classroom environment and were designed to address the six scales of classroom learning environment covered by the

BMELEI as well as the two attitude scales (Chan, 1999; Koul & Fisher, 2006; Rickards, 1998). Questions for the semi-structured interviews included:

Questions on Student Cohesiveness:

Are you able to work well with your classmates?

What sort of help have you got from your classmates?

Questions on Teacher Support:

What type of help/support have you got from your tutor/lecturer?

How do you perceive your relationship with your tutor/lecturer?

Questions on Involvement:

What opportunities did you have to be involved in learning experiences?

Questions on Task Orientation:

Do you believe the tutorial activities in which you were involved were well structured and of benefit to you?

What do you like most about this tutorial?

If you could change the classroom environment, what would you prefer the classroom environment to be in order to maximise your learning?

Questions on Cooperation:

In what ways have you cooperated with your classmates? For instances, how were you able to learn from your classmate?

Questions on Equity:

In what ways do you feel that you are treated equally during tutorials/lectures?

Questions on Attitudes towards Subject:

What are the interesting features about the subject?

Questions on Attitudes towards Case Studies:

What are the interesting features about the case studies?

The above questions generated relevant qualitative data in assessing the students' perceptions of the classroom learning environments and students' attitudes towards the subjects and the case studies.

3.9   Data Analysis

After the completed questionnaires were collected, they were coded, entered into a computer file in Microsoft Excel format, and analysed with the use of the *Statistical Package for the Social Sciences* (SPSS) Version 14. The database was set up in the following manner: respondents were recorded in rows and the individual scale items were arranged in columns. This arrangement allowed for ease of data entry and analysis because each row represented all the responses of an individual.

Following the entry of all the collected data, I performed a manual check of all records entered for any missing entries to ensure the accuracy of data entry. This was followed by the following analyses.

- Validation of the Learning Environment Instrument (Section 3.9.1)
  - Factor Analysis
  - Cronbach Alpha Reliability
  - Ability to Differentiate between Classes

- Associations between Learning Environment and Students' Attitude Outcomes (Section 3.9.2)
  - Simple Correlation
  - Multiple Regression Analysis

- Differences between Students' Perceptions of the Actual and Preferred Learning Environments (Section 3.9.3)
  - One-way MANOVA for Repeated Measures

- Gender Differences in the Learning Environment Perceptions and Attitudes (Section 3.9.4)
  - One-way MANOVA

The following is a discussion of the usage of each of these statistical tests in determining the results.

3.9.1 Validation of the BMELEI

In the validation of the learning environment instrument, principal components factor analysis with varimax rotation was chosen to check the structure of the instrument for assessing students' perceptions of the classroom learning environment and to identify appropriate items to be removed. Only items with factor loading greater than 0.4 (the minimum value conventionally accepted as meaningful in factor analysis) on its own scale and less than 0.4 on each of the other scales were retained in the modified instrument (Field, 2006; Stevens, 1992).

Once the final set of items had been selected for retention in the instrument, the Cronbach alpha reliability coefficient was computed for each scale of the BMELEI as a measure of the internal consistency reliability for each scale, using two units of analysis (the individual and the class mean). In addition, the discriminant validity of each scale was also determined by calculating the mean correlation of each scale with the other five scales of the BMELEI instrument using the individual students as the unit of analysis.

An ANOVA (with class membership as the independent variable) was used to determine the ability of each BMELEI scale to differentiate between the perceptions of students in different classes. The eta^2 statistic (the ratio of 'between' to 'total' sums of squares) was used to describe the proportion of variance in each BMELEI scale scores accounted for by class membership.

The validity and reliability of the BMELEI were sought to help answer research question #1:

Is it possible to develop a valid and reliable instrument for assessing business students' perceptions of the business management education learning environment at higher education in Australia?

In addition, the factor structure, internal consistency reliability and discriminant validity of each of the two attitude scales were checked in the present study.

3.9.2 Associations between Learning Environment and Students' Attitudes

Research Question #2

Are there relationships between students' perceptions of the learning environment and students' attitudes?

In investigating the associations between learning environment scales and the two student attitude scales, the statistical tests used were simple correlation and multiple regression analyses. Simple correlation was chosen to analyse the bivariate relationship between each attitude scale and each classroom environment scale. Multiple regression analysis was used to provide a parsimonious index of the relationship existing between the set of correlated environment scales and attitudinal outcomes. To interpret which individual learning environment scales make the largest contribution to explaining variance in student attitudes, the regression weights (β) were examined to ascertain which ones were significantly greater than zero ($p<0.05$). The regression weight describes the influence of a particular environment variable on an outcome when all other environment variables in the regression analysis are mutually controlled.

3.9.3 Differences between Students' Perceptions of Actual and Preferred Learning Environments

Research Question #3

Are there differences between students' perceptions of the actual and preferred learning environment?

The existence of separate actual and preferred learning environment instruments has permitted the investigation of differences between students in their perceptions of the same actual classroom environment and of differences between the actual environment and that preferred by students. Past research into differences between forms has revealed that, generally, students prefer a more positive classroom environment than is actually present (Fisher & Fraser, 1983a). In the past, person-environment fit studies (Fraser & Fisher, 1983b, 1983c) have revealed that, if the discrepancy between students actual and preferred learning environments are reduced, then student outcomes are likely to improve.

The present study examined student perceptions of the actual and preferred learning environments in their university-level business courses. To investigate differences between students' perceptions of the actual and preferred learning environment (Research Question #3), students' responses to the two different forms of the BMELEI were matched. These two sets of responses were then used in performing a multivariate analysis of variance (MANOVA) for repeated measures. The set of dependent variables consisted of the six BMELEI scales and the form of the questionnaire (actual or preferred) was the independent variable. The analysis was conducted separately for the individual student and the class mean as the unit of analysis. Because the multivariate test produced statistically significant results using Wilks' lambda criterion, the results of the univariate ANOVA for repeated measures for each individual scale was interpreted to investigate whether students had different perceptions of their actual and preferred classroom learning environments (see Chapter 4).

3.9.4 Gender Differences in the Learning Environment Perceptions and Attitudes

Research Question #4

Are there differences between male and female students' perceptions of the learning environment and their attitudes?

Over the past two decades, numerous researchers have studied the topic of gender differences in education (Parker, Rennie, & Fraser, 1996). To examine gender differences in classroom environment perceptions in the present study (Research Question 4), data were analysed with a one-way MANOVA and using the student as the unit of analysis. Gender was the independent variable, and the BMELEI scales and the attitude scales formed the set of dependent variables. Because the multivariate test produced statistically significant results using the Wilks' lambda criterion, the results of the ANOVA for each individual scale and attitude scale was interpreted (see chapter 4).

3.10 Summary of the Chapter

The purpose of this chapter was to describe the research methodology used in the present study. The sample consisted of 480 business students from 30 classes in two major universities in Perth, Western Australia.

For the purposes of this study, it was necessary to assess students' perceptions of the classroom learning environment and their attitudes towards the subjects and the case study teaching strategy. The BMELEI was developed in two versions (i.e. actual and preferred). The BMELEI can be used to identify differences between the actual classroom learning environment and that preferred by students. The BMELEI consists of six scales (Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity) that were adapted from the *What Is Happening In this Class?* (WIHIC) questionnaire (Fraser et al., 1996), with several of the items

being modified to suit the business management learning environment. In order to investigate students' attitudes, my study included two scales that consist of eight items in each scale, namely, Attitudes towards Subject and Attitudes towards Case Studies. The Attitudes towards Subject scale was based on a scale from the *Test of Science-Related Attitudes* (TOSRA) questionnaire which was developed by Fraser (1981a). For the second scale, Attitudes towards Case Studies, was based on the questionnaire developed by Brennan and Ahmad (2005) to measure students' attitudes towards the case study teaching approach.

A selection of statistical methods was chosen for analysing the data from this study. In order to validate the BMELEI for use with the Australian sample, a series of item and factor analyses were chosen. Alpha reliability and mean correlation statistics were generated for the sample in the present study as indices of scale reliability and discriminant validity respectively. These analyses also enabled the identification of possible 'faulty' items which could be omitted to further analysis. An ANOVA (with class membership as the independent variable) was used to determine the ability of each BMELEI scale to differentiate between the perceptions of students in different classes.

To investigate the associations between the two student attitude outcomes and the six classroom environment scales, simple correlation and multiple regression analyses were conducted.

To investigate the difference between students' perceptions of the actual and preferred learning environment, students' responses to the two different forms were matched. These two sets of responses were then used to perform a multivariate analysis of variance (MANOVA) with repeated measures, to determine whether differences were statistically significant between actual and preferred forms for each BMELEI scale. Because the multivariate test produced statistically significant results using Wilks' lambda criterion, the results of the univariate ANOVA for repeated measures for each individual scale was interpreted to investigate whether students had different perceptions of their actual and preferred classroom learning environments.

To examine gender differences in classroom environment perceptions in the present study, data were analysed with a one-way MANOVA and using the student as the unit of analysis. Gender was the independent variable, and the BMELEI scales and the attitude scales formed the set of dependent variables. Because the multivariate test produced statistically significant results using the Wilks' lambda criterion, the results of the ANOVA for each individual scale and attitude scale were interpreted.

Qualitative data were collected through interviewing 42 randomly-selected final-year undergraduate and postgraduate students at two Universities in Perth. These qualitative data were obtained in an effort to further validate the findings from the quantitative data that are reported in Chapter 4 (triangulation of qualitative data and the quantitative findings in Chapter 4).

The next chapter reports the validation of the BMELEI and the quantitative data analysis. This is followed by an analysis and interpretation of the qualitative data collected through semi-structured interviews in Chapter 5.

CHAPTER 4

QUANTITATIVE DATA ANALYSIS AND RESULTS

4.1 Introduction

This chapter is devoted to describing the results of the quantitative analysis that was used to confirm the reliability and validity of the *Business Management Education Learning Environment Inventory*, BMELEI. As described in Chapter 3, the BMELEI was developed in two versions (i.e. Actual and Preferred) to enable identification of differences between the actual classroom learning environment and that preferred by students. The BMELEI consists of eight scales of which six scales (Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity) were adapted from the *What Is Happening In this Class?* (WIHIC) questionnaire (Fraser et al., 1996), with several of the items modified to suit the business management learning environment. The Investigation scale is not relevant to this study.

In order to investigate students' attitudes, I used two additional eight-item scales called Attitudes towards Subject and Attitudes towards Case Studies. The Attitudes towards Subject scale was based on a scale from the *Test of Science-Related Attitudes* (TOSRA) questionnaire which was developed by Fraser (1981a). For the second scale, Attitudes towards Case Studies, I modified and made use of the questionnaire developed by Brennan and Ahmad (2005) to measure students' attitudes towards the case study teaching approach.

The analyses of the quantitative data that were gathered using the methodology discussed in Chapter 3 are examined in detail in this chapter. The data used for the analysis were those collected from the sample of final-year and postgraduate business students of two universities' business schools in Perth, Western Australia,

namely, Curtin University of Technology and Edith Cowan University. The following is an outline for reporting the data analysis in this chapter in response to the research questions as stated in Chapter 1:

- Validation of the Learning Environment Instrument (Section 4.2)
- Associations between Learning Environment and Students' Attitudes (Section 4.3)
- Differences between Students' Perceptions of the Actual and Preferred Learning Environment (Section 4.4)
- Gender Differences in the Learning Environment Perceptions and Attitudes (Section 4.5).

4.2   Validation of the Classroom Learning Environment Instrument

Reliability and validity are two crucial aspects in the critical appraisal of a measurement instrument. Reliability of a research instrument is the extent to which it yields the same results on repeated measures. A reliable instrument is one that can produce similar results if the behaviour is measured again by the same scale. Reliability, therefore, refers to the proportion of consistency to inconsistency in measurement. That is to say, if one uses the same or a comparable instrument on more than one occasion to measure a set of behaviours that ordinarily remain relatively constant, one would expect similar results, if the tools are reliable. Validity refers to whether a measuring instrument accurately measures what it is supposed to measure. When an instrument is valid, it truly reflects the concept that it is supposed to measure.

Data collected from the 480 students from 30 classes for both the actual and preferred versions of the BMELEI were analysed to determine the following characteristics of the learning environment scales: factor structure (Section 4.2.1); internal consistency reliability (Section 4.2.2); discriminant validity (mean correlation of a scale with other scales) (Section 4.2.3); and ability to differentiate between classrooms (Section 4.2.4). Validation of the student attitude scales involved

reporting factor structure (Section 4.2.5.) and reliability and discriminant validity (Section 4.2.6.).

4.2.1 Factor Structure of BMELEI

As a first step, factor analysis was conducted to determine the factor structure of the BMELEI and to identify those items whose removal would improve the internal consistency reliability and factorial validity. A separate factor analysis was conducted for the 480 students' responses to the 48 items of the actual form and the preferred form of the BMELEI.

Principal components factor analysis followed by varimax rotation confirmed a refined structure of the actual and preferred forms of the instrument comprising 39 items in six scales. All these 39 items have a loading of at least 0.40 on their *a priori* scale and no other scale (see Table 4.1) for both the actual and preferred versions. Stevens (1992) and Field (2006) recommended interpreting only factor loadings with an absolute value of greater than 0.40. Table 4.1 shows the factor loadings, percentage of variance and eigenvalue for each scale of both the actual and preferred versions. With the exception of Items SC6 and SC8 from the Student Cohesiveness scale, Items TS1, TS2 and TS8 from the Teacher Support scale, Items IN7 and IN8 from the Involvement scale, Item TO5 from the Task Orientation scale and Item CO1 from the Cooperation scale, all other items loaded 0.40 or above on its own and less than 0.40 on any other scale for either the actual or preferred versions.

The percentage of the total variance extracted with each factor is also recorded in Table 4.1. For the actual version, the percentage of the variance ranged from 5.92% to 11.59% for different scales, with the total variance accounted for being 47.84%. For the preferred version, the percentage of the variance ranged from 6.72% to 12.30% for different scales, with the total variance accounted for being 53.41%. For the actual version, eigenvalues varied from 2.31 to 4.52 for different scales. For the preferred version, eigenvalues varied from 2.62 to 4.80 for different scales. Based on the factor and items analyses, Items SC6, SC8, TS1, TS2, TS8, IN7, IN8, TO5 and

CO1 were removed in subsequent analysis, leaving a total of 39 of the 48 items in the original list.

Table 4.1   Factor Analysis Results for the Actual and Preferred Forms of the BMELEI

| Item | Factor Loading | | | | | | | | | | | |
| | Student Cohesiveness | | Teacher Support | | Involvement | | Task Orientation | | Cooperation | | Equity | |
	Act	Pref	Act	Pref	Act	Pref	Act	Pref	Act	Pref	Act	Pref
SC1	0.63	0.61										
SC2	0.59	0.63										
SC3	0.46	0.45										
SC4	0.59	0.61										
SC5	0.49	0.45										
SC7	0.55	0.55										
TS3			0.59	0.61								
TS4			0.53	0.49								
TS5			0.58	0.65								
TS6			0.77	0.74								
TS7			0.62	0.61								
IN1					0.79	0.58						
IN2					0.83	0.62						
IN3					0.57	0.57						
IN4					0.73	0.67						
IN5					0.59	0.67						
IN6					0.47	0.51						
TO1							0.58	0.58				
TO2							0.52	0.57				
TO3							0.55	0.55				
TO4							0.44	0.62				
TO6							0.59	0.68				
TO7							0.62	0.74				
TO8							0.56	0.72				
CO2									0.43	0.43		
CO3									0.56	0.50		
CO4									0.70	0.72		
CO5									0.70	0.66		
CO6									0.75	0.76		
CO7									0.69	0.70		
CO8									0.68	0.66		
EQ1											0.68	0.59
EQ2											0.64	0.65
EQ3											0.57	0.71
EQ4											0.75	0.73
EQ5											0.74	0.72
EQ6											0.76	0.70
EQ7											0.67	0.67
EQ8											0.73	0.69
Eigenvalue	2.31	2.72	2.48	2.62	3.36	3.02	2.58	3.98	3.41	3.69	4.52	4.80
% Variance	5.92	6.98	6.35	6.72	8.62	7.75	6.61	10.21	8.75	9.45	11.59	12.30

Loading smaller than 0.40 omitted.
$N = 480$ students in 30 classes.
Items SC6, SC8, TS1, TS2, TS8, IN7, IN8, TO5 and CO1 were omitted.

For the revised 39-item version of the BMELEI, three further indices of scale reliability and validity were generated separately for the actual and preferred versions. The Cronbach alpha reliability coefficient was used as an index of scale internal consistency. Analysis of variance (ANOVA) results were used as evidence of the ability of each scale in the actual form to differentiate between the perceptions

of students in different classrooms. A convenient discriminant validity index (namely, the mean correlation of a scale with other scales) was used as evidence that each BMELEI scale measures a separate dimension that is distinct from the other scales in this questionnaire. There were five classes had relatively small numbers of students. When an ANOVA was performed after removing the 5 classes with 'small' numbers of students, the difference between the actual and preferred means of each of the scales was still statistically significant.

4.2.2   Internal Consistency Reliability of BMELEI

The internal consistency reliability was determined for two units of analysis. Table 4.2 reports the Cronbach alpha reliability coefficient for the actual and preferred versions for each of the six BMELEI scales for two units of analysis (individual and class mean). Using the individual as unit of analysis, scale reliability estimates for different scales ranged from 0.78 to 0.90 for the actual form and from 0.80 to 0.92 for the preferred form. Generally reliability figures were even higher with the class as the unit of analysis (from 0.80 to 0.94 for the actual form and from 0.84 to 0.95 for the preferred form). These internal consistency indices are comparable to those in past studies that used the WIHIC (Aldridge & Fraser, 2000, 2003; Fraser & Chionh, 2000; Margianti et al., 2004).

4.2.3   Discriminant Validity of BMELEI

The discriminant validity of an instrument can be assessed by calculating the mean correlation with the other scales (see Table 4.2). A low mean correlation implies that each scale is measuring a distinct aspect of the learning environment. Using the individual as the unit of analysis, the discriminant validity results (mean correlation of a scale with other scales) for the six scales of the BMELEI ranged from 0.28 to 0.36 for the actual form and between 0.46 to 0.49 for the preferred form (see Table 4.2). With the class mean as the unit of analysis, the discriminant validity results for the six scales of the BMELEI ranged from 0.29 to 0.55 for the actual form and

between 0.36 to 0.51 for the preferred form. The data suggest that the raw scores on the BMELEI assess distinct but somewhat overlapping aspects of learning environment. However, the factor analysis supports the independence of factor scores on the six scales. The results from the students replicate findings from past studies that employed the WIHIC (Aldridge & Fraser, 2003; Margianti et al., 2004; Martin-Dunlop & Fraser, in press).

Table 4.2   Internal Consistency Reliability (Cronbach Alpha Coefficient), and Discriminant Validity (Mean Correlation with Other Scales) for Two Units of Analysis and Ability to Differentiate Between Classrooms (ANOVA Results) for the BMELEI

Scale	No of Items	Unit of Analysis	Alpha Reliability		Mean Correlation with Other Scales		ANOVA Eta^2
			Actual	Preferred	Actual	Preferred	
Classroom Environment:							
Student Cohesiveness	6	Individual	0.78	0.80	0.33	0.47	0.18**
		Class Mean	0.92	0.87	0.52	0.44	
Teacher Support	5	Individual	0.83	0.84	0.34	0.47	0.15**
		Class Mean	0.89	0.84	0.51	0.47	
Involvement	6	Individual	0.86	0.85	0.34	0.49	0.08
		Class Mean	0.87	0.88	0.50	0.41	
Task Orientation	7	Individual	0.78	0.88	0.28	0.46	0.10*
		Class Mean	0.80	0.90	0.29	0.36	
Cooperation	7	Individual	0.85	0.88	0.29	0.48	0.14**
		Class Mean	0.89	0.90	0.43	0.38	
Equity	8	Individual	0.90	0.92	0.36	0.49	0.15**
		Class Mean	0.94	0.95	0.55	0.51	
Attitudes to Business Education							
Attitudes towards Subject	7	Individual	0.93		0.52		
		Class Mean	0.93		0.50		
Attitudes towards Case Studies	6	Individual	0.85		0.52		
		Class Mean	0.82		0.50		

*p<0.05   **p<0.01
The sample consisted of 480 students in 30 classes.
The eta^2 statistic (which is the ratio of 'between' to 'total' sums of squares) represents the proportion of variance explained by class membership.

4.2.4   Ability of BMELEI to Differentiate Between Classrooms

Finally, an analysis of variance (ANOVA) was used to determine the ability of the actual version of each BMELEI scale to differentiate between the perceptions of

students in different classes. A one-way ANOVA was performed for each scale with class membership as the independent variable and the individual student as the unit of analysis. Table 4.2 reports the ANOVA results showing that five BMELEI scales differentiated significantly between classes, with the exception being the Involvement scale. Thus, students within the same class tend to perceive the environment in a similar manner, while the within-class mean perceptions of the students vary between classes. The eta^2 statistic (an estimate of the strength of association between class membership and the dependent variable) ranged from 0.08 to 0.18 for the different BMELEI scales. The results are comparable to other studies that have utilised WIHIC (Aldridge & Fraser, 2003; Margianti et al., 2004; Martin-Dunlop & Fraser, in press).

In conclusion, the statistics obtained for the internal consistency (alpha reliability) and the ability of each scale to differentiate between the perceptions of the students in different classrooms (eta^2 statistic from ANOVA) can be considered acceptable. The data presented in Table 4.2, in conjunction with the factor analysis results in Table 4.1, support the contention that the BMELEI is a valid and reliable classroom environment instrument for the assessment of students' perceptions of their psychosocial environments at the tertiary level.

4.2.5   Factor Structure of Student Attitude Scales

To measure students' attitudes, the present study adapted selected scales from two instruments: Attitudes towards Subject and Attitudes towards Case Studies. The original instrument consisted of 16 items, with 8 eight items in each of the two scales.

The data collected from 480 student responses in 30 classes were used to perform a principal component factor analysis followed by varimax rotation. This resulted in the acceptance of a revised version of the instrument with the same two *a priori* factors, but with three items omitted, namely, Item AS8 from the Attitudes towards Subject scale, and Item ACS1 and ACS2 from the Attitudes towards Case Studies

scale. For the final version, all 13 items loaded more than 0.40 on their own scale and no other scale (see factor loadings reported in Table 4.3). The percentage of variance for the two scales was 23.69 and 34.45, with the total variance accounted for being 58.14%.

Table 4.3   Factor Analysis Results for the Attitude Scales

| Item | Factor Loading | |
	Attitudes towards Subject	Attitudes towards Case Studies
AS1	0.70	
AS2	0.73	
AS3	0.73	
AS4	0.83	
AS5	0.87	
AS6	0.77	
AS7	0.78	
ACS3		0.52
ACS4		0.59
ACS5		0.76
ACS6		0.74
ACS7		0.68
ACS8		0.65
Eigenvalue	4.48	3.08
% Variance	34.45	23.69

Loadings smaller than 0.40 omitted.
$N = 480$ students in 30 classes.
Items AS8, ACS1 and ACS2 were omitted.

4.2.6   Reliability and Discriminant Validity of Student Attitude Scales

The internal consistency reliability (Cronbach alpha coefficient) of each of the two student attitude scales for two units of analysis (individual and class mean) is reported in Table 4.2. The scale reliability estimates for the two scales are 0.85 and 0.93 using the individual as the unit of analysis, and 0.82 and 0.93 using the class mean as the unit of analysis. As a convenient index of the discriminant validity of the attitude questionnaire, use was made of the correlation between the two scales. The correlation between scales is 0.50 using individual as the unit of analysis and 0.52

using the class mean as the unit of analysis (see Table 4.2). These values indicate that there is considerable overlap between raw scores on the two attitude scales (although the factor analysis results attest to the independence of factor scores). The results in Table 4.2 and Table 4.3 support the factorial validity, internal consistency reliability and discriminant validity for the two student attitude scales.

4.3 Associations between Learning Environment and Students' Attitudes

As indicated in Chapter 3, the students' attitudes towards the subject and the case studies were used as student outcome measures. Use of this dimension as a dependent variable provided some useful information about what other aspects of the business management education learning environment tended to be linked with students' attitudes. Associations between the attitude outcome measure and the other six modified WIHIC scales measured by the BMELEI were investigated.

To investigate associations between two student attitude outcomes and the six classroom environment scales, simple correlation and multiple regression analyses were conducted. The two student outcomes were student attitudes towards the subjects and student attitudes towards the case studies. A simple correlation analysis of relationships between each outcome and each of the six learning environment scales was performed to provide information about the bivariate association between each learning environment scale and each student outcome. The correlation coefficient (r) has a possible range of values from -1 to +1, the value indicating the strength of the relationship, while the sign (+ or -) indicating the direction. A multiple correlation analysis of relationships between each attitude scale and the set of six learning environment scales was conducted to provide a more complete picture of the joint influence of the correlated environment dimensions on outcomes and to reduce the Type I error rate associated with the simple correlation analysis. The multiple correlation coefficient (R) is based on inter-correlations between variables, so that the highest possible relationship, as in the case of r, is 1.00 (Popham & Sirotnik, 1973). To interpret which individual learning environment scales make the largest contribution to explaining variance in student attitudes, the regression weights

(β) were examined to ascertain which ones were significantly greater than zero ($p<0.05$). The regression weight describes the influence of a particular environment variable on an outcome when all other environment variables in the regression analysis are mutually controlled. Table 4.4 shows the association between each of the student outcomes and each BMELEI scale using both the individual and the class mean as the units of analysis.

Table 4.4 Simple Correlation and Multiple Regressions Analyses for Associations Between Two Student Outcomes (Attitudes towards Subject and Attitudes towards Case Studies) and Classroom Environment Scales for Two Units of Analysis

| Environment Scale | Unit of Analysis | Outcome-Environment Association | | | |
| | | Attitudes towards Subject | | Attitudes towards Case Studies | |
		r	β	r	β
Student Cohesiveness	Individual	0.19**	0.03	0.24**	0.00
	Class Mean	0.31	0.25	0.47**	0.38
Teacher Support	Individual	0.35**	0.19**	0.32**	0.13**
	Class Mean	0.39*	0.02	0.27	-0.05
Involvement	Individual	0.24**	0.03	0.32**	0.13**
	Class Mean	0.24	0.07	0.35	-0.01
Task Orientation	Individual	0.34**	0.21**	0.37**	0.21**
	Class Mean	0.28	0.12	0.22	0.15
Cooperation	Individual	0.14**	-0.04	0.34**	0.19**
	Class Mean	-0.03	-0.48	0.42*	0.21
Equity	Individual	0.39**	0.21**	0.32**	0.08
	Class Mean	0.42*	0.44	0.34	-0.03
Multiple Correlation, R	Individual		0.47**		0.50**
	Class Mean		0.58		0.52

*$p<0.05$ **$p<0.01$
$N = 480$ students in 30 classes

4.3.1 Student Attitudes towards their Subject

The results of simple correlation analysis (Table 4.4) indicate that all of the six BMELEI scales are statistically significantly and positively associated with student attitudes towards their class ($p<0.0l$) at the individual level of analysis. Two of the six learning environment scales (Teacher Support and Equity) are statistically significantly ($p<0.05$) and positively related to the Attitudes to Subject scale at the class mean level of analysis. The results of the simple correlation analysis suggest that improved student attitudes towards a subject are associated with greater emphasis on these scales.

The multiple correlation (R) between students' perceptions of the set of six BMELEI scales and the Attitudes towards Subject scale (reported in Table 4.4) is 0.47 at the student level of analysis and 0.58 at the class mean level of analysis, and is statistically significant ($p<0.01$) for student level. Standardised regression weights (β) were inspected to provide information about the unique contribution of each learning environment scale to the Attitudes towards Subject scale when the other five scales are mutually controlled. Table 4.4 indicates that three of the six BMELEI scales uniquely account for a significant ($p<0.0l$) amount of variance in student attitudes towards their subject (Teacher Support, Task Orientation and Equity) at the student level of analysis. However, none of BMELEI scales is a significant independent predictor of Attitudes to Subject at the class level of analysis.

4.3.2 Student Attitudes towards Case Studies

With the individual as unit of analysis, the results of the simple correlation analysis (reported in Table 4.4) indicate that all of the six BMELEI scales are positively and statistically significantly ($p<0.01$) related to the Attitudes towards Case Studies. At the class mean level of analysis, two of the six BMELEI scales (namely, Student Cohesiveness and Cooperation) are positively and statistically significantly ($p<0.05$) related to Attitudes towards Case Studies.

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For the Attitudes towards Case Studies scale, the multiple correlation is 0.50 and 0.52, respectively, for the individual and class mean levels of analysis, and is statistically significant ($p<0.0l$) for individual level. The standardised regression weights (β) reported in Table 4.4 indicate that four of the six BMELEI scales (Teacher Support, Involvement, Task Orientation and Cooperation) are statistically significantly ($p<0.0l$) and independently related to the Attitudes towards Case Studies scale at the student level of analysis, whereas there is no statistically significantly relationship to the Attitudes towards Case Studies scale at the class mean level. All relationships are positive, thus replicating the finding from considerable past research (Aldridge & Fraser, 2003; Fraser, 1998a, 1998b, 2002; Margianti et al., 2004; McRobbie & Fraser, 1993) that a positive classroom environment is linked to positive student outcomes, including attitudes. Aldridge and Fraser (2003) established links between students' attitudes and scores on TROFLEI for a sample of 1,035 students responses from 80 classes. Also, Margianti, Fraser and Aldridge (2004) reported associations between the outcomes of achievement and attitudes and students' perceptions on an Indonesian-language version of the WIHIC for a sample of 2,498 university students in 50 classes in Indonesia.

4.4 Differences between Students' Perceptions of Actual and Preferred Learning Environment

The actual form was used to assess students' perceptions of the existing learning environment, whilst the preferred form was used to assess the type of learning environment that students would prefer. Historically, researchers have administered separate actual and preferred version of questionnaires. To provide a more economical format, however, the format of the BMELEI followed the questionnaire design of *Technology-Rich Outcomes-Focuses Learning Environment Inventory*, TROFLEI (Aldridge & Fraser, 2003) that pioneered the inclusion of two adjacent response scales on the one sheet (one to record what students perceived as actually happening in their class and the other to record what students would prefer to happen in their class). By using these two forms of the BMELEI questionnaire, the

researcher was able to determine economically whether any differences between students' perceptions of actual and preferred learning environments.

To examine differences between students' perceptions of the actual and preferred classroom environments, data were analysed with a one-way MANOVA for repeated measures. The set of dependent variables consisted of the six BMELEI scales and the form of the questionnaire (actual or preferred) was the independent variable. The analysis was conducted separately for the individual student and the class mean as the unit of analysis. Because the multivariate test produced statistically significant results using Wilks' lambda criterion, the results of the univariate ANOVA for repeated measures for each individual BMELEI scale was interpreted to investigate whether students had different perceptions of their actual and preferred classroom learning environments (see Table 4.5). All analyses were performed twice, once at the student level of analysis and again with the class mean as the unit of analysis. Students' responses to the actual and preferred forms were also used to generate graphical profiles of students' perceptions of their actual and preferred learning environments (Figure 4.1).

The results reported in Table 4.5 indicate a significant difference ($p<0.01$) between the actual and preferred mean scores for all six learning environment scales for both units of analysis.

Table 4.5   Average Item Mean, Average Item Standard Deviation, and Differences between Actual and Preferred Perceptions (Effect Size and MANOVA Results) for BMELEI for Two Units of Analysis

Scale	Unit of Analysis	Average Item Mean		Average Item Standard Deviation		Difference Between Actual and Preferred	
		Actual	Preferred	Actual	Preferred	Effect Size	*F*
Classroom Environment							
Student Cohesiveness	Individual	3.50	4.15	0.63	0.57	1.08	4.99**
	Class Mean	3.53	4.16	0.29	0.20	2.53	3.61**
Teacher Support	Individual	3.21	3.93	0.76	0.71	0.98	4.75**
	Class Mean	3.22	3.94	0.31	0.21	2.72	3.91**
Involvement	Individual	3.12	3.71	0.72	0.67	0.85	4.38**
	Class Mean	3.16	3.73	0.23	0.20	2.64	3.65**

Task Orientation	Individual	3.93	4.48	0.55	0.54	1.01	4.98**
	Class Mean	3.91	4.46	0.18	0.16	3.23	4.25**
Cooperation	Individual	3.84	4.26	0.69	0.66	0.62	4.22**
	Class Mean	3.86	4.29	0.23	0.19	2.04	4.21**
Equity	Individual	3.84	4.30	0.71	0.61	0.69	4.23**
	Class Mean	3.82	4.29	0.27	0.21	1.94	3.94**

**$**p<0.01$*
N =480 students in 30 classes
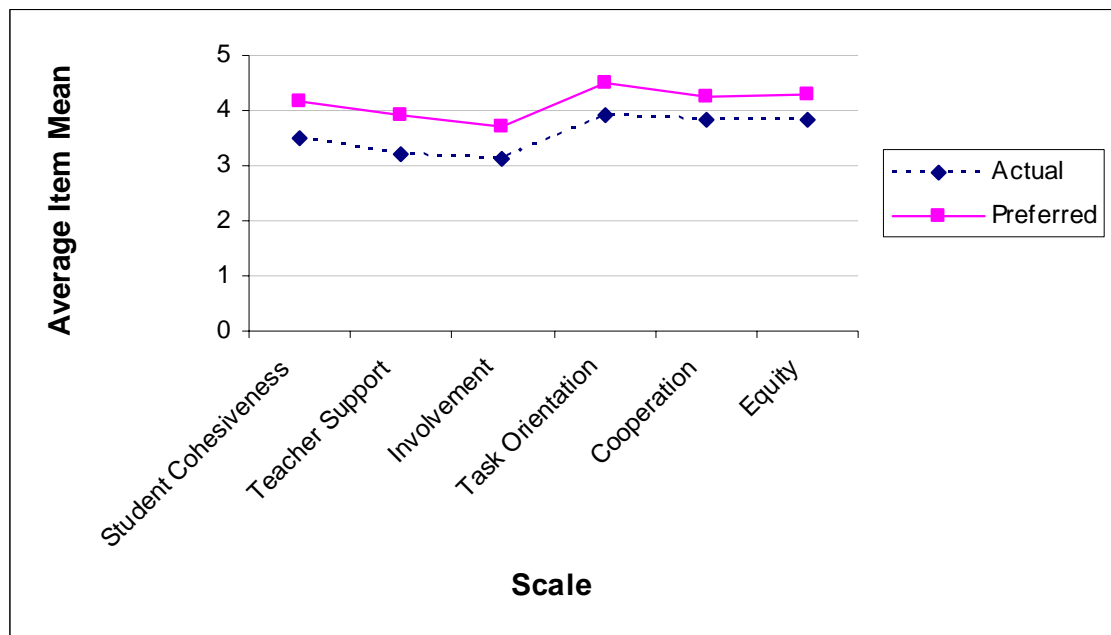
Figure 4.1   Differences in Students' Perceptions of Actual and Preferred Learning Environments for the BMELEI

To estimate the magnitude of the differences between students' scores on the actual and preferred forms of the BMELEI as distinct from their statistical significance, effect sizes were calculated as recommended by Thompson (1998a, 1998b). Effect size is defined as the strength of the relationship between the independent variable and the dependent variable, and/or the magnitude of the difference in the dependent variable between levels of the independent variable. There are a number of different effect size statistics, the most common of which are Cohen's *d* and *eta²*. For the present study, I used the difference between means expressed in standard deviation units (Cohen's *d*) rather than *eta²* as a number of criticisms have been levelled at *eta²* (Tabachnick & Fidell, 1996, p. 53). The effect size for actual-preferred differences

for each of the BMELEI scales, reported in Table 4.5, ranged between 0.62 and 1.08 standard deviations for the individual as the unit of analysis and between 1.94 and 3.23 standard deviations with the class mean as the unit of analysis. These results suggest that there are large differences between students' perceptions of the actual and preferred environment.

The average item mean (or the scale mean divided by the number of items in that scale) for students' scores on the actual and preferred forms that are summarised in Table 4.5 are graphed in Figure 4.1. The reason for using the average item mean is to provide meaningful comparisons between the means of scales containing differing numbers of item. Figure 4.1 shows that students would prefer a much more positive learning environment than the one they experienced on all BMELEI dimensions. This finding has important practical implications for university teachers and administrators in Australia.

Figure 4.1 also shows that the average item mean of each BMELEI dimension perceived to be actually present is lower than the preferred average item mean for every scale. The two lowest average item means in Figure 4.1 occur for Teacher Support and Involvement, for which the classroom practices referred to in the items are perceived to occur approximately 'sometimes'. Students would prefer activities associated with the BMELEI items to occur 'often' (average item mean of 4 in Figure 4.1) for the Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity scales, and to occur approximately 'often' for the Involvement scale.

The improvement of Teacher Support and Involvement appears to be a high priority in these students' opinions. These results for Australian university students (with students preferring a more positive classroom environment than the one perceived to be actually present) replicate past research at the tertiary and secondary-school levels in several countries (Fraser & Fisher, 1983a; Fraser & McRobbie, 1995; Hofstein & Lazarowitz, 1986; Margianti et al., 2004).

4.5   Gender Differences in Learning Environment Perceptions and Attitudes

This section reports the findings for differences and similarities between male and female students' perceptions of the learning environment and their attitudes towards the subjects (Management and Marketing) and their attitudes towards the case studies teaching strategy. The analyses involved a total of 480 students, of whom 234 (48.8%) were males and 246 (51.2%) were females. Males and females were more or less equally represented.

To examine gender differences in classroom environment perceptions in the present study, data were analysed with a one-way MANOVA and using the student as the unit of analysis. Gender was the independent variable, and the BMELEI scales (actual and preferred forms) and the attitude scales formed the set of dependent variables. Because the multivariate test produced statistically significant results using the Wilks' lambda criterion, the results of the ANOVA for each individual scale and attitude scale were interpreted.

Table 4.6   Average Item Mean, Average Item Standard Deviation, and Differences between Male and Female Scores (Effect Size and MANOVA Results) for BMELEI Actual, BMELEI Preferred and Attitude Scales

Scale	Form of Questionnaire	Average Item Mean		Average Item Standard Deviation		Difference Between Male and Female	
		Male	Female	Male	Female	Effect Size	F
Classroom Environment							
Student Cohesiveness	Actual	3.55	3.45	0.61	0.64	0.16	1.33
	Preferred	4.14	4.16	0.56	0.58	0.04	0.61
Teacher Support	Actual	3.30	3.11	0.78	0.74	0.25	1.65**
	Preferred	3.96	3.90	0.69	0.72	0.09	0.98
Involvement	Actual	3.24	3.01	0.69	0.73	0.32	1.91**
	Preferred	3.71	3.71	0.67	0.67	0.00	0.36
Task Orientation	Actual	3.84	4.01	0.53	0.56	0.31	1.86**
	Preferred	4.39	4.57	0.55	0.51	0.34	1.95**
Cooperation	Actual	3.78	3.90	0.68	0.69	0.18	1.39
	Preferred	4.19	4.32	0.65	0.67	0.20	1.45*
Equity	Actual	3.79	3.90	0.71	0.70	0.16	1.32
	Preferred	4.23	4.38	0.64	0.58	0.25	1.63**

Attitudes to Business Education

Attitudes towards Subject	3.53	3.37	0.77	0.85	0.20	1.49*
Attitudes towards Case Study	3.68	3.66	0.64	0.72	0.03	0.57

*p < 0.05 **p<0.01
N =480 students in 30 classes. Male=234 and Female=246

Table 4.6 reports the average item mean and average item standard deviation for male and female students for each actual BMELEI scale and each preferred BMELEI scale. Also, the results for the ANOVAs and effect sizes based on Cohen's *d* are reported in Table 4.6. A statistically significant outcome does not give information about the strength or size of the outcome. Therefore, it is important to know, in addition to information on statistical significance, the size of an effect. The means generated using the scores of males and females on each actual BMELEI scale and the attitude scale were used to draw the graphical profile provided in Figure 4.2, whereas Figure 4.3 shows the differences between male and female students' scores on the preferred form of the BMELEI scales.

As show in the Table 4.6, out of six scales in the actual form of the BMELEI, scores on three scales were found to be significantly different (*p*<0.01) for male and female students. These scales are Teacher Support, Involvement and Task Orientation. The ANOVA results in Table 4.6 indicate that female students perceived significantly (*p*<0.01) more actual Task orientation than male students (see Figure 4.2). On the other hand, male students perceived Teacher Support and Involvement more positively (see Figure 4.2). As for the Involvement scale, male students perceived that more involvement existed among the students in the learning environment.
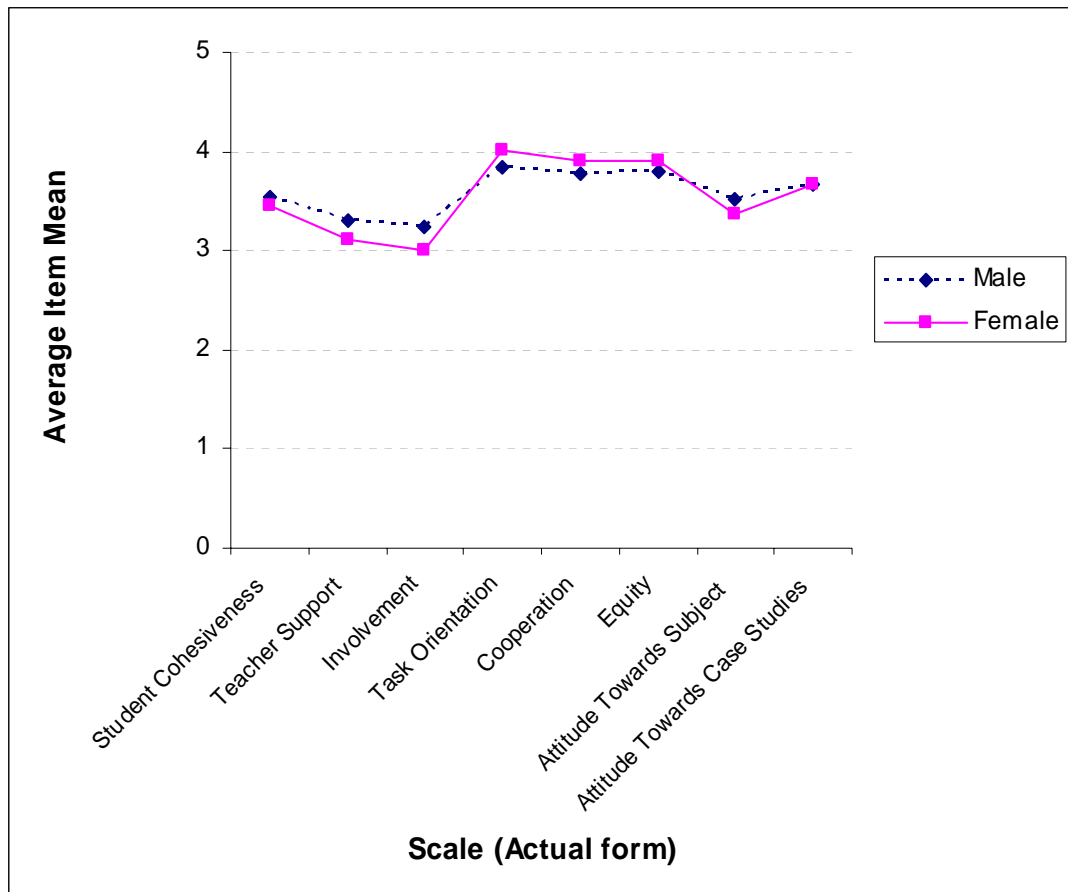
Figure 4.2   Differences between Male and Female Students' Scores on the Actual Form
              of the BMELEI and the Attitude Scales

The effect sizes for gender differences for each actual and preferred scale of the BMELEI (calculated by using Cohen's *d* to provide an approximation of the magnitude of the differences), reported in Table 4.6, ranged between 0.25 and 0.32 for the actual form and between 0.20 and 0.34 for the preferred form. These results suggest that there are medium differences between students' perceptions of actual and preferred environments.

The average item mean (or the scale mean divided by the number of items in that scale) for students' scores on the actual form that are summarised in Table 4.6 are graphed in Figure 4.2. This figure shows that male students preferred a more favourable classroom environment than female students in terms of more Teacher Support and Involvement, whereas female students perceived more positive learning environment than male students in Task Orientation scale. This finding has important practical implications for university teachers and administrators in Australia.

For the preferred form of the six BMELEI scales, scores on three scales were found to be significantly different ($p<0.05$) for male and female students. These scales are Equity, Cooperation and Task Orientation. Again, for female students, it was found that Task Orientation was more important for them. As for the Cooperation scale, female students perceived that more cooperation existed among the students in their learning environment. In terms of the teacher treating the male and female students equally, again female students perceived that their teachers gave as much attention to both genders. The effect size (Cohen's *d*) for gender differences on the preferred form of the BMELEI scales ranged from one fifth of a standard deviation (0.20) to approximately one third of a standard deviation (0.34). Overall, the finding that female university students generally perceived and preferred a more favourable classroom environment replicates past research in Western primary and secondary schools (Fisher & Rickards, 1998) and Indonesian universities (Margianti et al., 2004).
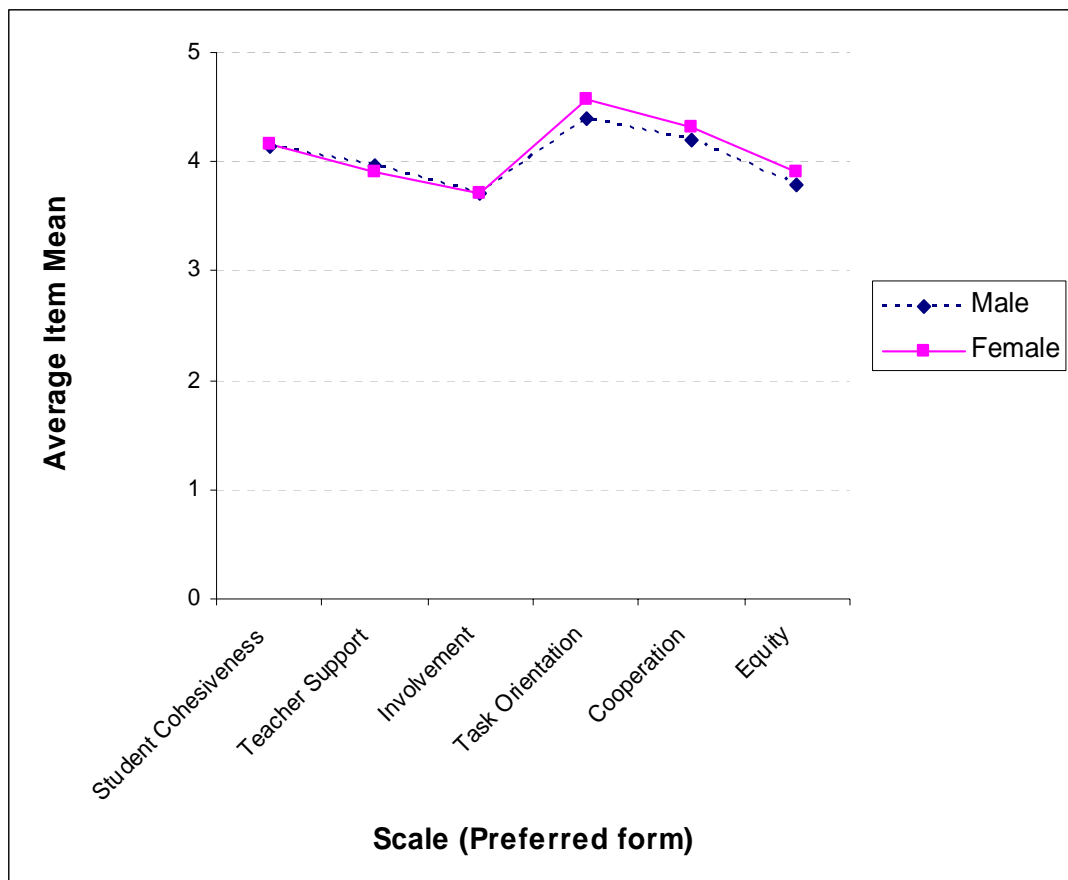
Figure 4.3   Differences between Male and Female Students' Scores on the Preferred Form of the BMELEI Scales

Gender differences in student attitudes were also explored. The results reported in Tabled 4.6 indicate that scores on the Attitudes towards Subject scale was found to be significantly different ($p<0.05$) for male and female students. The effect size for gender differences in Attitudes towards Subject is 0.20. Male students reported a more positive attitude towards the management and marketing subjects than did female students. In general this study replicated past research (Aldridge & Fraser, 2003; Margianti et al., 2004) in that more favourable attitudes were displayed by male students towards the business education subjects.

4.6   Summary

This chapter reported findings from analyses of the quantitative data collected from 480 business studies students from two universities in Perth, Australia. There were four main areas of findings that this chapter covered: (a) validation of the learning environment instrument (BMELEI) and attitude scales; (b) associations between learning environment and students' attitudes; (c) differences between students' perceptions of actual and preferred learning environment; and (d) gender differences in the learning environment perceptions and attitudes.

Validation of the BMELEI and two attitude scales involved factor analysis, item-scale correlations, Cronbach alpha reliability, and a test of the ability to differentiate between classes for learning environment scales. The process of validation resulted in the removal of several items from the actual and preferred scales of the BMELEI, as well as from the attitude scales. The various data analyses supported the learning environment instrument's factorial validity, alpha reliability and ability to differentiate between classes. Also, the results supported the factorial validity, internal consistency reliability and discriminant validity of the two student attitude scales.

Associations between learning environment and students' attitudes were analysed using simple correlations and multiple regression analysis. Sizable and statistically

significant associations were established between students' attitudes and students' perceptions of their classroom learning environment. These associations found between students' attitudes and classroom learning environment are consistent with past learning environment research (Aldridge & Fraser, 2003; Fraser, 1998a, 1998b, 2002; Jhurree et al., 2005; Margianti et al., 2004; McRobbie & Fraser, 1993).

The differences between students' perceptions of the actual and preferred learning environment were analysed using MANOVA for repeated measures and effect sizes (Cohen's *d*). There was a statistically significant and large difference between actual and preferred scores for all six learning environment scales for two units of analysis (individual and class mean). These findings for Australian university students (with students preferring a more positive classroom learning environment than the one perceived to be actually present) replicate previous research at the tertiary (Margianti et al., 2004; Wanpen & Fisher, 2006) and secondary-school levels (Aldridge & Fraser, 2003; Fraser & McRobbie, 1995; Hofstein & Lazarowitz, 1986; Wahyudi & Treagust, 2006) in several countries.

MANOVA and effect sizes (Cohen's *d*) using the student as the unit of analysis were used to investigate differences between male and female students in attitudes and perceptions of their classroom learning environments. It was found that female students perceived significantly more actual Task Orientation than did male students, whereas male students perceived more Teacher Support and Involvement than did female students. For the Involvement scale, male students had more positive perceptions than female students. As for the preferred form of BMELEI, the results again indicated that female students perceived significantly more preferred Task Orientation than male students. For the Cooperation scale, female students perceived that more cooperation existed among the students in their learning environment. The effect size using Cohen's *d* suggests that there were moderate differences between male and female students in their perceptions of actual and preferred environments. Overall, the finding that female university students generally perceived and preferred a more favourable classroom learning environment than did males replicates previous research in primary and secondary schools (Fisher & Rickards, 1998; Kim et al., 2000; Majeed et al., 2002; Riah & Fraser, 1998) and at the tertiary level (Khoo & Fraser, in press; Margianti et al., 2004).

Furthermore, the results of the Attitudes towards Subject scale reflect that male students showed a more positive attitude towards management and marketing subjects than female students. This is consistent with past research on attitudes (Aldridge & Fraser, 2003; Margianti et al., 2004).

The next chapter reports results based on qualitative data collected through interviews of randomly-selected students from the same cohort. The results of the analysis of these qualitative data were used to enhance the quantitative findings.

CHAPTER 5

QUALITATIVE DATA ANALYSIS AND INTERPRETATION

5.1   Introduction

This chapter reports analyses and interpretations of the qualitative data collected through interviewing 42 randomly-selected final-year undergraduate and postgraduate business studies students who responded to six questions about the BMELEI, together with two additional questions about attitudes. These qualitative data were obtained in an effort to validate the findings from the quantitative data that are reported in Chapter 4. Details on the collection of the qualitative data are provided in Section 3.8.3 of Chapter 3 in this thesis.

The analysis and interpretation of the qualitative data are a synthesis of the students' perceptions of the classroom learning environment. Students were asked a series of questions relating to their classroom learning environment that were categorised according to the six scales of the BMELEI (i.e. Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity) and two attitude scales (i.e. Attitudes towards Subject and Attitudes towards Case Studies). Details of the semi-structured interview questions are provided in Chapter 3.

5.2   Analysis of the Interview Data

Qualitative interviews are more like conversations than interrogations. They can be structured with a list of set questions to be asked, or they can be relatively unstructured with little more than an invitation being issued by the researcher for the participant to talk about an area of interest. In between these extremes is the semi-

structured interview, which is a conversation in which the researcher invites the participant to talk, encouraging a free flow of words and ideas, while at the same time keeping the person relatively on track in the conversation (Cohen, Manion, & Morrison, 2000; Veal, 2006).

Interviewing for research purposes must follow a plan related to the objectives that one wants to achieve in the data collection. It is not merely to meet with people and conduct an informal chat. One should plan the interview in great detail and write down the questions in a modified questionnaire form by means of an interview protocol or schedule (Anderson, 1998). Kvale (1996) sets out seven stages of a high-quality interview investigation that were used to plan for this study: (1) *thematising* – formulate the purpose of an investigation and describe the concept of the topic to be investigated before the interviews start; (2) *designing* – plan the design of the study by taking into consideration of all seven stages of the investigation before the interviewing starts; (3) *interviewing* – conduct the interviews based on an interview guide and with a reflective approach to the knowledge sought and the interpersonal relation of the interview situation; (4) *transcribing* – prepare the interview material for analysis, which includes a transcription from oral speech to written text; (5) *analysing* – decide on the basis of the purpose and topic of the investigation and on the nature of the interview material which methods of analysis are appropriate for the interviews; (6) *verifying* – ascertain the generalisability, reliability and validity of the interview findings; and (7) *reporting* – communicate the findings of the study and the methods applied in a form that lives up to scientific criteria, takes the ethical aspects of the investigation into consideration, and results in a readable product. By following the above steps of developing an interview protocol, I was able to develop an effective interview protocol.

In order to compare and contrast the findings from the qualitative analysis, specific questions were designed as a guide to address each learning environment scale of the BMELEI and each attitude scale. Moreover, the interviews were conducted informally and participants were encouraged to air their general concerns regarding their classroom learning experience. Hence, the semi-structured interview was chosen as the ideal technique in this instance.

Of the 42 randomly-selected final-year undergraduate and postgraduate business studies students who were requested to be involved in interviews, all agreed to participate in the interviews and were aware that they could withdraw their consent at anytime. Participants were informed that any evaluation report and subsequent publication would respect their confidentiality and anonymity.

The interview data reported in this chapter have been grouped by each scale of the BMELEI, as the primary data-gathering instrument, followed by the two attitude variables. The construct validity of the BMELEI scales is presented more clearly if the data are grouped in this way. Construct validity is "the degree to which a test measures an intended hypothetical construct" (Gay, 1992, p. 157). Pallant (2001) proposed that the construct validity can be explored by investigating its relationship with other constructs, both *related* (convergent validity) and *unrelated* (discriminant validity).

In order to facilitate the ease of triangulation of qualitative data with quantitative data obtained through the BMELEI, information gathered from the transcripts of the interviews was categorised and presented according to the six scales of the BMELEI (i.e. Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation and Equity) (Veal, 2006).

A description of each BMELEI scale and sample items was provided in Table 3.1, while the BMELEI scale means and standard deviations were summarised in Table 4.5. The construct validity of the instrument is discussed in the following subsections.

5.3   Triangulation of Qualitative and Quantitative Data

The use of different research approaches, methods and techniques in the same study to validate research findings is known as *triangulation* and can overcome the potential bias, limitations and sterility of a single-method approach (Anderson, 1998; Hussey & Hussey, 1997). One way of validating interview measures is to compare

the interview measure with a quantitative measure that has already been shown to be valid in Chapter 4. If the two measures agree, it can be assumed that the validity of the interview is comparable with the proven validity of the quantitative measure (Cohen et al., 2000).

An average item mean for a BMELEI scale of 2, 3 or 4, respectively, can be interpreted in terms of the practices described in the items occurring Seldom, Sometimes, often.

I have used a system of codes for the 42 interviewed students. For example, the code SM1C04M represents male student number 4 in the Strategic Management class number 1 from Curtin University; the code SMKT2E10F represents female student number 10 in the Strategic Marketing class number 2 from Edith Cowan University.

5.3.1   Student Cohesiveness Scale

Student Cohesiveness in the BMELEI assesses students' perceptions of the extent to which students know, help and are supportive of one another. Interview results supported the average item mean score of 3.50 (suggesting that practices occurred with a frequency between Sometimes and Often) for the Student Cohesiveness scale as reported previously in Table 4.5 of Chapter 4. Students displayed positive perceptions of their classroom environment. When asked the questions "Are you able to work well with your classmates? What sort of help have you got from your classmates?", students generally responded that they were able to work well with their classmates:

> *Yes, we are all friends and I know most of the students in this class. We have been in this uni together for more than two years.*
> *- SM1C04M*
> *Part of the workload is quite hard for one person to do. We distribute the work among group members; we work like a team.*
> *- SM3C08F*
> *I think so far it has been ok, but most of the students here generally want to get good grades…So we are working towards a common goal…We want to*

produce a good project, assignments and a good case study presentation. So most of the time, with common goals, it is easier to work with my classmates.
- SM4C05M

Most of the time, we help each other out with assignments, tutorials, and by just asking others if we don't understand something; especially if the tutor doesn't have enough time to explain everything that you are not sure of.
- SMKT12C18M

Yes, I like to work in groups. I learn a lot of stuff that I don't know or that I don't understand; I can discuss with them.
- SM26C10M

These comments reflect the feelings of the students who perceived high levels of Student Cohesiveness in the classroom. However, a few students made the following comments:

Yes, I work well with my classmates. However, I find that I'm a person that does the majority of the work. I'm an older student. So my priorities are different to them, and I find that I don't get a lot out of group work. I find that irritating, generally.
- SM30C22F

Yes, I do work well with my group-mates. But there are some people in our groups that are not committed to work. They just want to take it easy through the three hours thinking that the others in the group will do the work.
- SM5C11M

There is no evidence of any students' comment about low levels of Student Cohesiveness, which is consistent with the results from the quantitative BMELEI data. Students' interviews confirmed that the average item mean score of 3.50 for this scale were consistent with their comments (see Table 4.5 of Chapter 4). The interview comments therefore supported the construct validity for the scale of Student Cohesiveness of the BMELEI.

5.3.2   Teacher Support Scale

This scale is intended to measure the extent to which the lecturer/tutor helps, befriends, trusts, and shows interest in students. Students were asked the questions "What type of help/support have you got from your tutor/lecturer?" and "How do you perceive your relationship with your tutor/lecturer?" In general, most of the

students were positive about the level of support that they were receiving from their tutors/lecturers. Some students' perceptions of their positive teacher support are reflected in the following comments:

> *The tutor is very supportive in the classroom. He knows our problems and goes all out to solve them.*
> - SM40C05M
>
> *He goes really beyond just the theory bits and into real life examples, and his own experiences, and the current happenings in the world...It's better with real life examples from the tutor.*
> - SM23C07M
>
> *Yeah, she is very good at going through problems during the tutorials. She tries to solve our problems. And even with the major assignment, she gets us to do research every week and goes through it with us, so that we know if we are going in the right direction or not.*
> - SM19C09M
>
> *He is willing to give consultation time, so for example if we have finished our assignment before the due date, we can see him and check with him. .*
> - SM27E12F
>
> *I actually found him quite good. He does clarify topics, and he will give good examples, which is helpful.*
> - SM29C14M
>
> *… She's available by email and if we have any questions, you can always go to her office and look for help. She's very helpful.*
> - SM14C20M
>
> *He is easy to communicate with, but the back up support is just not as good as it should be.*
> - SMKT11C23F
>
> *The overall classroom environment is good. However, sometimes the tutor talked too much on issues irrelevant to the subject. I prefer the tutor discuss more details and gives recent examples relevant to the business world.*
> - SM15C11M

The above two comments were reflecting the feeling of the students who perceived their tutor/lecturer to be less supportive than what they would ideally like him/her to be. A few students who rated this scale lower than the average mean commented:

> *Tutors can be a bit intimidating… Certain tutors express favouritism.*
> - SM20C19F
>
> *It's very intimidating being in this class – strict/intimidating tutor. I feel like I can't speak up. Sometimes the tutor is vague and doesn't explain things clearly.*
> - SM38C07M
>
> *In terms of help and support, it depends a lot on whether the tutors are full-timers here or not. For those full-timers, they are available in the sense that*

they are more helpful. However, tutors from outside who are part-timers, ….
We can only get to ask them through other means of communication, which
is harder...

- SM6C03F

Questions discussed in tutorials are often too 'by the book'. Tutors often
don't have enough practical experience to bring to class and enhance
discussions.

- SM9C26M

These comments confirm that students were looking for more teacher support in terms of getting close emotional security and acceptance from the teacher. Although their teacher was helping them with most of the work-related problems, the students would like it to be enhanced further.

The interview comments of students pertaining to the scale of Teacher Support were consistent with the average item mean score of 3.21 (suggesting that practices occurred with a frequency between Sometimes and Often) for Teacher Support scale as reported previously in Table 4.5. This supports the construct validity of the Teacher Support scale of the BMELEI.

5.3.3   Involvement Scale

Involvement in the BMELEI assesses students' perceptions of the extent to which students have attentive interest, participate in discussions, perform additional work and enjoy the class. Students' perceptions of their teachers' involvement in the class was well understood. Students were asked the question "What opportunities did you have to be involved in learning experiences?" Generally, students interviewed agreed that they were given ample opportunity to get involved in classroom activities, while some did differ in their views from their peers. Students were generally satisfied with their involvement in their classroom learning experiences. Some typical comments from students with high scale mean scores were:

He encourages our active involvement in the class. He respects our views and
we work out problems together.

- SM21C15F

…. sometimes the lecturers stop in between their lectures and ask us questions. And this gives me the opportunity to be involved, like give my opinions, and what I think when I'm wrong, so he can correct me. This way he involves all of us.

<div align="right">- SM13C28M</div>

…. every week a group presents a case study during the tutorial session and the rest of the class have to submit a one-page case analysis during the presentation. This arrangement is good because it involves the rest of the class who would otherwise merely listen to the presentation. It is very helpful.

<div align="right">- SM33C16M</div>

It's an interactive tutorial. I like the tutorial activities and assignments. And that's what makes the learning experience interesting. Sometimes we are asked to explain how we solved a problem. All students get a chance to express their point of view.

<div align="right">- SM22C03F</div>

We have to submit a group assignment that involves a strategic audit for a company at the end of the semester. We have to do some field studies and group discussions. It is very hands-on and useful for our future careers.

<div align="right">- SM16C14M</div>

It is very good to learn other skills such as communication, time management and building networks when you solve the case study as a team.

<div align="right">- SM7C23M</div>

Every class session, we are asked for feedback, or asked questions if we are not doing presentations. … The tutor will ask us individually as well, to try and get us involved and get some discussions going.

<div align="right">- SM35C16M</div>

Although most of the students interviewed perceived positive involvement in the class, there were a few students who perceived that there was room for improvement in regards to their involvement in the class concerned. A few students made the following significant comments:

They should involve the international students as much as the local students, even those who do not speak English as well.

<div align="right">- SM18C13M</div>

She does ask questions during the class session. She prefers to direct questions to the front benchers so that she can get correct answers.

<div align="right">- SM2C02F</div>

We are international students with poor command of English. We will be made fun of, if we make a mistake during a presentation to the class.

<div align="right">- SM8C10F</div>

With regards to the Involvement scale, some students felt that they were left behind and only a few students were involved in class activities such as discussions. In general, interview comments for this scale suggested that the BMELEI well reflected

<div align="center">129</div>

the perceptions of students in that students' average item mean score of 3.12 (suggesting that practices occurred with a frequency between Sometimes and Often) for the Involvement scale (positive perceptions of the learning environment) as reported previously in Table 4.5, were consistent with their comments. A student's average item mean of 3.12 score generally resulted in a positive comment regarding their perceptions of their involvement in the class.

5.3.4   Task Orientation Scale

Task Orientation in the BMELEI assesses students' perceptions of the extent to which it is important to complete activities planned and to stay on the subject matter. A variety of questions was asked of students. In reply to the questions "Who do you consider were the most influential participant(s) in the classroom environment that facilitated your learning? Why?", some students' perceptions of task-orientation in their classes were reflected in the following comments:

> *I believe it is up to us to make the effort to achieve our objectives…others can only assist me, ……*
>
> *- SM3C08F*
>
> *Everyone…tutors and classmates have facilitated my learning… The most influential has to be Steve (tutor) because he knows that we are here to learn and he is prepared to provide us with learning opportunities as well as guidance…*
>
> *- SM24C03M*
>
> *I think the most influential participants are the people with industrial experience, the mature age students who are actually working and doing their undergraduate studies at the same time.*
>
> *- SM21C15F*
>
> *I think I really like her way of teaching…because she has a sense of humour. All the time, she's giving out theory and the things you need to learn. I find that she's funny and friendly, so I think it is important as well.*
>
> *- SM30C22F*
>
> *I am satisfied with my tutor… He gives a lot of ideas of what's going on out there… He provides practical examples that we easily understand and relate to the theory.*
>
> *- SM39C09M*

To the question "What do you like most about this tutorial?", students gave responses such as the following:

> *The best thing about this tutorial is that I have the opportunity to practice the skills that I've learned in this course plus learning some new skills that I've never been taught in Uni...*
>
> - SM38C07M
>
> *I've enjoyed practising the soft skills we learnt in Uni. My communication, interpersonal and analytical skills were put to the test and I believed I have passed with flying colours. It is a very enjoyable experience in life.*
>
> - SM41E02F
>
> *I love the 'discussion-based' tutorials. I learn more from other students.*
>
> - SM25C06F
>
> *It feels good to be able to apply what we've learnt in this course to the real world. We have to submit a strategic audit project that requires all the skills we learned in this course.*
>
> - SM34E04M
>
> *I like the way she actually shows a lot of interest in our learning experience and uses real world examples in all tutorial exercises...*
>
> - SM33C16M

When asked "If you could change the classroom environment, what would you prefer the classroom environment to be in order to maximise your learning?", students made comments such as following:

> *I want to have more activities during tutorials...maybe we can make use of video to understand more about real cases.*
>
> - SM15C11M
>
> *I think in order to maximise my learning, we should have a longer tutorial session or have a seminar. In this way, we will learn more practical skills as compared to attending lectures.*
>
> - SM10C15F
>
> *Small classes are good; allows for more discussion and interaction, and also helps to develop friendships with other students.*
>
> - SM7C23M
>
> *Should be given the opportunity to work with everyone in class rather than sticking to original groups; gives opportunity to understand more opinions, ideas, etc.*
>
> - SM14C20M
>
> *Improve tutors' teaching skills. It is important for tutors to reflect ~~to~~ the extent to which and manner in which they might serve as professional role models for students.*
>
> - SM37C17F
>
> *Need more high technology to support our class environment like computer simulation games, LCD projector, etc.*
>
> - SM29C14M

Environment, room and facilities are poor. Improve the facilities…providing U-shape seating order would help improving students' participation and interaction during the tutorial sessions…and comfortable rooms with ergonomically designed furniture as well… need more relaxed environment…
                                                                                        - SM38C07M

Again, there is no evidence of any students' comment about low levels of Task Orientation, which is consistent with the results from the quantitative BMELEI data. Students' interviews confirmed that the average item mean score of 3.93 (corresponds to the Often response) for this scale were consistent with their comments. The students perceived that the opportunities for them to be directly involved in hands-on tutorial activities are often controlled by the tutor/lecturer. It is apparent that the students have enjoyed putting the skills that they have learned into practice during tutorial sessions. Students' comments are in agreement with the high average item mean of about 4 for the Task Orientation scale in Table 4.5, indicating strongly positive perceptions of the learning environment. The interview comments therefore supported the construct validity for the scale of Task Orientation of the BMELEI.

5.3.5   Cooperation Scale

Cooperation in the BMELEI assesses students' perceptions of the extent to which students cooperate rather than compete with one another on learning tasks. Generally, there was a high level of cooperation with an average item mean of 3.84 (frequency close to Often) for Cooperation scale of the BMELEI in the class (see Table 4.5). Students displayed strongly positive perceptions of their classroom environment. Students linked cooperation with good interpersonal skills and achieving the set goals. When asked "In what ways have you cooperated with your classmates? For instances in which you were able to learn from your classmates", students made comments such as the following:

We do work together in group meetings and discussions, and get to learn from each other.
                                                                                        - SMKT36C20M

We have to work in groups whenever a group assignment is given. All group members share some responsibility and that way it becomes easy.
- SM20C19F

Some of the best assignments I've done in groups have been with international students because you get such a different background, ideas and cultures...They bring something completely new to it. With mature students, they have more experience. So in that way, I think international cooperation and cooperation among people, different genders and different age groups, all help in learning from the class time.
- SM2C02F

……, in the tutorial and the group assignments...we have a common goal to achieve something that is to make a good presentation. Therefore, we have to work with each other…... team work, yes.
- SM23C07M

Working cooperatively is the best thing I like in this class. All the students believe in cooperation and sharing.
- SM38C07M

I dislike group work as I am the one that does the majority of the work to ensure the task gets done. When you are out in the workforce you are not assessed on your team performance like you are at university.
- SM32C22F

The above comments reflected the feelings of the student who perceived poor levels of cooperation among group members in the class.

There is no evidence of any students' comment about low levels of Cooperation, which is consistent with the results from the quantitative BMELEI data. Students' interviews confirmed that the average item mean score of 3.84 for this scale were consistent with their comments. The interview comments therefore supported the construct validity for the scale of Cooperation of the BMELEI.

5.3.6   Equity Scale

Equity in the BMELEI assesses students' perceptions of the extent to which the lecturer/tutor treats students equally. The quantitative data indicated students perceived that their tutor/lecturer generally treated them equally. Students interviewed were able to relate to this scale as they understood quite well the description of the scale. When students were asked "In what ways do you feel that you are treated equally during tutorials/lectures?", they were supportive of the terms

used in this scale. The following comments exemplify those students who had scored high means on this scale:

> *Whenever we have a class discussion, all of us are encouraged to participate equally.*
>
> <div align="right">- SM42C19F</div>
>
> *I have the same amount of say as do other students in the class. We are students in the same class.*
>
> <div align="right">- SM31C06M</div>
>
> *Well, the tutor is very fair. He will attend to all of us equally. Like when I ask him a question he gives me equal attention as he would do with other students.*
>
> <div align="right">- SM17C25F</div>
>
> *In this tutorial, there's no such a thing as somebody from Asia, be it international or domestic students. All are treated equally. Sometimes she can make a joke about somebody and does not bother about where he is from……; there's no unequal treatment, so that's very good.*
>
> <div align="right">- SM21C15F</div>
>
> *Basically, I feel treated equally. Before I came here (Australia), there was a lot of speculation that Asians were not treated equally, especially Muslims ….; but I don't find any racial problems. Probably because I'm a Muslim, I don't feel that I'm not treated unequally, in performance or participation. If she asks me a question or asks the class questions, I'm the one who wants to answer and she would let me answer. There's no unequal treatment.*
>
> <div align="right">- SMKT36C20M</div>
>
> *Well, more than equally actually. I tend to say a lot more than anyone else. But I'm the eldest person here... So I get to express my opinion and get feedback from them. In that way, I get to ask the questions I want to ask, and see what responses I get. And I not only get responses form the tutor, but also from the classmates. So yea, I got more than my fare share of chance.*
>
> <div align="right">- SM3C08M</div>

The above comments were given by most of the students and generally reflect the relatively high level of equity in the class. But there were a few students who commented negatively when they were asked if they considered their classroom environment to be offering equal opportunities to all members of the class:

> *The tutor doesn't like overseas students. She always talks to the local students...*
>
> <div align="right">- SM37C17F</div>
>
> *I know this guy and his group, which has two girls, who are international students from Singapore and Malaysia, where English is their second language. Apparently, the tutor has actually marked them down because their English wasn't their first language. It is the first time I've actually heard*

about anything like that in Curtin. I really think that this is ~~really~~ wrong because they are able to communicate .....

<div align="right">- SM28C26M</div>

We have a lot of students that are from non-English speaking backgrounds, who don't feel comfortable speaking in front of a lot of people. And that's terribly difficult for them. So I think, from my perspective, I don't have a problem with it. But I think sometimes there needs to be ~~a~~ better understanding of students with English as a second language, because it is difficult for them to speak in front of 20 people. Maybe, some group work task, where they can just speak among 3-4 people will help them to feel comfortable, and help them to develop their English skills.

<div align="right">- SM8C10F</div>

Asian students generally are quieter than any other students. It should be good if lecturers/tutors can keep encouraging the students by directing questions to the less participating students.

<div align="right">- SM41C02F</div>

The comments from students generally support the responses that they had given on the questionnaire. The three negative comments of Section 5.3.3 address both the Equity and Involvement scales in this study. Therefore, the scale does appear to be assessing the level of equity in the class.

The above comments cover fairly broad areas which have already been addressed earlier. Generally students preferred a more positive and favourable classroom learning environment than they perceived as being actually present. The construct validity for this scale is generally supported by students' comments.

5.3.7   Attitudes towards Subject Scale

The Attitudes towards Subject scale assesses students' attitudes to the extent to which students enjoy the subject. Interview results supported the average item mean of 3.45 (representing a response between Sometimes and Often) for the Attitudes towards Subject scale as reported previously in Table 4.5. Students displayed positive attitudes towards their business management lessons. They made comments about their interest and the fun experienced during the tutorial sessions. Students were asked "What are the interesting features about the subject?" Comments such as the following support the quantitative data findings:

The use of tutorial activity makes the unit more practical and enjoyable because it requires students to apply theories to solve the problems. I want to have more tutorial activities each week. I learn a lot of stuff that I don't know...

- SM23C07M

I learned a lot from my tutor such as the analysis of the environment and the actual market in WA. It was interesting and I gained knowledge and personal experience from the tutor.

- SM27C12F

I really enjoy the activities that we do in strategic management subject...it's interesting and helps me to understand concepts and their relevance to real-life.

- SM15C11M

Strategic Management is interesting when the lecturer is enthusiastic about the unit... an excellent way to learn and apply skills to real-life situations.

- SMKT12C18M

Strategic Management is a great subject, probably the most up-to-date course offered by the Uni. It helps me in understanding the real business world out there.

- SM29C14M

I am satisfied with the interactive sessions because I am able to understand much better using this process. Case studies make the subject more interesting. I like the case study... It helps me to apply the theory into real life situations.

- SM30C22F

It's normally boring and unenjoyable. However, Prof. X is the best class I've been to, due to his extensive knowledge and humour and not reading just from the text.

- SM18C13M

However, not all the students' responses were positive as indicated in the following comments:

The book for strategic marketing is too old, too difficult to understand.

- SM42C19F

It's not too easy a subject to understand because there is no correct answer.

- SM37C17F

I find it harder, not as exciting as it is not relevant to my major – advertising and marketing.

- SM41C02F

I really don't like strategic management, but strategic marketing is really good.

- SMKT36C20M

It's very dry and boring... make it more fun and interesting.

- SM34E04M

Management units are not interesting. Marketing is interesting when the lecturer is enthusiastic about the subject.
- SM10C05F

The interview results revealed that most of the students who like management lessons were generally higher achievers in their studies. Students' comments were consistent with the quantitative data for students' attitudes scale scores and hence support the construct validity of the Attitudes towards Subject scale.

5.3.8   Attitudes towards Case Studies Scale

The Attitudes towards Case Studies scale assesses students' attitudes concerning the extent to which the case study teaching strategy enhances students' learning process. Students were asked "What are the interesting features about the case studies?" They generally responded that they were satisfied and enjoyed the use of case studies as a learning tool in their management lessons:

Case studies are an excellent way of putting theories into real life situations. It is an effective way of learning, especially when they are used in the exam and in tests throughout the semester.
- SM40C05M

An excellent way to learn and apply skills to real-life situations... real world cases bridge the gap between theory and the business world.
- SM27E12F

Its effectiveness depends on the lecturer's ability to skilfully draw out the answers from students through guided questions. Case studies help me to look beyond the surface meanings of the report and unmask the hidden motives, and techniques, that drive strategy.
- SM17C25F

The answers to case studies are not very clear and when you're not used to thinking strategically you end up not actually realising what you're doing. To be handing in coursework not actually sure of what you did is a bit scary, especially in your final year. But I'm not against case studies at all! The use of case study makes the unit more practical and enjoyable because it requires students to apply theories to solve the problems.
- SM18C13M

Need wider range of case studies i.e. present and historical cases...have more up-to-date case studies.
- SM9C26M

Evidently, students were satisfied with the case studies in the class. However, a few students who rated this scale lower than the average mean commented:

> *Some of the case studies are too hard to analyse...it's boring...*
> - SM22C03F
>
> *I have never found case studies any use in learning things. As far as I am concerned it's just a convenient teaching method, even though it's no use in teaching a subject to a student.*
> - SMKT11C23F
>
> *Don't use too many! (cases). Can get boring. Try and get interesting real-life studies.*
> - SM1C04M
>
> *Don't feel case studies are a good way to examine students, as there is never a clear right or wrong answer. Perhaps, the tutor could give more explanation of the case studies, like what is the purpose, and how does it related to marketing or business.*
> - SM4C05M

The above comments suggest that students' level of satisfaction regarding their learning experience using case studies in the tutorial sessions were high when they perceived themselves as actively involved in the tutorial activities. Alternatively, students' levels of satisfaction were low when they perceived themselves as passively involved or excluded from the tutorial activities. Students' interviews confirmed that the average item mean score of 3.67 (suggesting that practices occurred with a frequency between Sometimes and Often) for this scale were consistent with their comments. The interview comments therefore supported the construct validity for the attitude scale of Attitudes towards case Studies.

A notable point was that student interviews were generally reflective of the descriptions of students' perceptions as provided by the two attitude scales. This suggested that the attitude data provide a basis for measuring students' attitudes towards business management subject and case study teaching strategy. Overall, the interview data were consistent with students' attitude scales scores. This suggests that the attitude scales have an ability to measure students' attitudes and thus support the construct validity of the attitude scales.

5.5 Summary of Qualitative Data Analysis

Semi-structured interviews were conducted with 42 randomly-selected final-year business students and postgraduates from two business schools in Perth, Australia. These qualitative data were obtained in an effort to further validate the findings from the quantitative data that are reported in Chapter 4, as a means of triangulation of qualitative data and the quantitative findings, and to provide explanations for the results based on quantitative methods.

Students' levels of satisfaction regarding their learning experience using case studies in the tutorial sessions were high when they perceived themselves as actively involved in the tutorial activities. The provision of learning opportunities was more important than formal teaching like lectures. Echoing the quantitative data, findings from students interviewed confirmed that students perceived that the opportunities for them to be directly involved in hands-on tutorial activities are often controlled by the tutor/lecturer. It is apparent that the students enjoyed putting the skills that they learned into practice during tutorial sessions. Students' comments are in agreement with the high average item mean of about 4 (corresponding to the questionnaire item response of Often) for the Task Orientation scale indicating strongly positive perceptions of the learning environment.

In general, most of the students were positive about the level of support that they were receiving from their tutors/lecturers. However, male students generally perceived their tutors/lecturers to be less supportive than what they would ideally like them to be. Generally, students interviewed agreed that they were given ample opportunity to get involved in classroom activities. Male students made comments that they were generally more satisfied with their involvement in their classroom learning experiences than female students. Consistent with the quantitative analysis of the BMELEI data, there was no evidence in any of the students' comment about low levels of Task Orientation. However, the interview results reflect that female students showed more positive perceptions of task-orientation in their classes than male students. It is apparent that the students had enjoyed putting the skills that they had learned into practice during tutorial sessions.

The interview results also support the gender differences found in student attitudes towards the subject (management and marketing). The results reflect that male students showed a more positive attitude towards management and marketing subjects than female students. Male students made comments about their interest and the fun experienced during the tutorial sessions. This is consistent with past research on attitudes.

The findings from the students' interviews also reinforced the notion that the BMELEI scales are reliable and valid (based on relatively high levels of triangulation of quantitative means and qualitative interviews). Tutors/lecturers who wish to reflect on their teacher-student interactions and business management classroom learning environments can also readily use these instruments.

The next chapter provides a discussion of the findings, the significance and limitations of the study, and suggestions for future research.

CHAPTER 6

DISCUSSION AND CONCLUSIONS

6.1   Introduction

The study of the classroom learning environment in business management is a relatively new area of research in Australia that is rapidly gaining importance. The present study involved the investigation of factors that could influence students' attitude outcomes in Australian business schools. This exploratory study involved 480 Australian business studies students from two major universities in Western Australia in 2006. Data collected from the 480 students in 30 classes were analysed to determine students' perceptions of the psychosocial learning environment of university seminars and tutorials at the tertiary level. Although there are numerous instruments available for assessing classroom learning environments at the tertiary level, no instrument has been specifically designed and validated for measuring the business management education learning environment (Brennan & Ahmad, 2005; Hirata et al., 2006; S. L. Huang, 2006; Margianti et al., 2004). This is the first time that any business management education learning environment research has been undertaken at the tertiary level in Australia.

My aims were (1) to design, develop and validate an instrument, the *Business Management Education Learning Environment Inventory* (BMELEI), for assessing business management students' perceptions of the psychosocial learning environments of university seminars and tutorials and (2) to relate students' perceptions of the learning environment to their attitudes towards the subject and towards the case study teaching strategy. This study had four objectives:

1) To develop and validate an instrument for assessing:
   a) the business management education learning environment in higher education in Australia;
   b) students' attitudes towards the subject and towards the case study teaching strategy.

2) To investigate associations between students' perceptions of the learning environment and students' attitudes.

3) To investigate whether differences exist between students' perceptions of the actual and preferred learning environment in business management classes at higher education in Australia.

4) To investigate whether or not the students' gender influences their:
   a) perceptions of the classroom learning environment;
   b) attitudes towards the subject and towards the case study teaching strategy.

A summary of the findings which emerged and a discussion of the limitations of the study, implications and directions for future research are given in the following sections of this chapter:

- Overview of the study (section 6.2),
- Major findings of the study (section 6.3)
- Limitations of the study (section 6.4),
- Implications for improving business management education in Australia (section 6.5),
- Recommendations for future research (section 6.6),
- Final remarks (section 6.7).

6.2 Overview of the Study

This thesis was organized in six parts. Chapter 1 contained an introduction to the study, Chapter 2 reviewed the related literature and Chapter 3 outlined the

methodology that was used for the research. In order to measure students' perceptions of the learning environment, the BMELEI was developed for this study. The details of the instrument used in this study were described in Chapter 3. The results and findings were described in Chapter 4 and Chapter 5, and the conclusion and discussion can be found in this chapter.

In Chapter 1, the background, context and significance of the study were described. This included an introduction to the field of learning environments and the development of Australian business management education. This chapter also focused on the challenges facing Australian business management education. As the background to the study, some of the research literature related to learning environment research was reviewed. The significance of the study, research questions, and limitations of the study were also presented in this chapter.

Chapter 2 contained a review of the wide-ranging research literature related to various aspects of this study. This included background to the field of learning environments, the development of learning environment instruments, the study of perceptions of classroom learning environments, studies of associations between learning environments and attitudes, and the study of learning environments at the tertiary level. Overall, it provided a window on understanding progress in the area of learning environment at the tertiary level. This chapter also reviewed literature related to students' attitudes in terms of definitions of students' attitudes, evaluation of students' attitudes, students' attitudes towards their management and marketing classes, and students' attitudes towards the case study teaching strategy (see Section 2.6).

Chapter 3 outlined the overall methodology that was used in the study and consisted of 1) a description of a four-stage approach used to develop, validate and use a new questionnaire (the *Business Management Education Learning Environment Inventory*, BMELEI) for business management education settings at the tertiary level, 2) an overview of the BMELEI by using a concept map (see Section 3.2) that links various components together, 3) an overview of a four-stage, multi-step approach to develop the instrument (see Section 3.3) where stage 1 involved the identification and development of salient scales (see Section 3.4), Stage 2 writing of

items (see Section 3.5), Stage 3 pilot testing and analysis (see Section 3.6), and Stage 4 administration of the BMELEI and analysis (see Section 3.7), 4) a description of the target population and how the data were collected using the BMELEI, 5) a description of how qualitative data were collected through interviewing randomly-selected business studies students (see Section 3.8), and 6) a description of the statistical methods used to quantitatively analyse the data obtained from surveys conducted using the BMELEI (see Section 3.9).

Chapter 4 provided details of the findings from analyses of the data collected from 480 business studies students randomly-selected from 30 classes were undertaken to provide information to support the reliability and validity of the questionnaire. Reliability and validity analyses were conducted by means of factor analysis, to support the factorial validity of the BMELEI, and item analysis, to check the reliability of the BMELEI. Further analysis was undertaken to explore associations between the learning environment and students' attitudes (Section 4.3), differences between students' perceptions of the actual and preferred learning environments (Section 4.4), and gender differences in the learning environment perceptions and attitudes (Section 4.5).

Chapter 5 included an analysis and interpretation of the qualitative data collected through interviews with a randomly-selected sample of business studies students. This chapter also contains a triangulation of qualitative data and the quantitative findings in Chapter 4.

6.3   Major Findings of the Study

A major contribution of the present study was the development and validation of a widely-applicable and distinctive questionnaire for assessing students' perceptions of their actual and preferred classroom learning environments in business management learning settings. This research, by examining the learning environments in two major business schools at the tertiary level in Western Australia and its impact on student attitudes towards learning and teaching, has the potential to provide

information to university administrators and lecturers to explore, facilitate and maximise the learning process for the students in business management education.

The new questionnaire measures six dimensions of the actual and preferred classroom learning environments at the tertiary level, namely, Student Cohesiveness, Teacher Support, Involvement, Task Orientation, Cooperation, and Equity. In order to investigate students' attitudes, my study included two additional eight-item scales, namely, Attitudes towards Subject and Attitudes towards Case Studies.

The questionnaire has 48 classroom learning environment items and includes a novel structure that incorporates the actual and preferred responses on the same form, thus providing an economical side-by-side format that reduces the amount of administration time (Aldridge & Fraser, 2003).

The major findings of the present study are discussed under the following headings:

- validation of the classroom learning environment instrument and the attitude scales (section 6.3.1)
- associations between the classroom learning environment and students' attitudes (section 6.3.2)
- differences between students' perceptions of actual and preferred classroom learning environment (section 6.3.3)
- gender differences in classroom learning environment perceptions and attitudes (section 6.3.4).

6.3.1 Validation of the Classroom Learning Environment Instrument and the Attitude Scales

This section summarises the validation of the classroom learning environment instrument involved in this study, namely, the BMELEI, as stated in the first research question:

Is it possible to develop a valid and reliable instrument for assessing business students' perceptions of the business management education learning environment at the tertiary level in Australia?

The final-version of the BMELEI together with two attitude scales was administered to a sample of 480 business studies students in 30 classes. The data were analysed to determine the validity and reliability of the instrument in terms of factor structure and internal consistency reliability.

The six-scale *a priori* structure of the BMELEI was supported through principal components factor analysis followed by varimax rotation that confirmed a refined structure of the actual and preferred forms of the instrument comprising 39 items in the original six scales. All these 39 items have a loading of at least 0.40 on their *a priori* scale and no other scale (see Table 4.1) for both the actual and preferred versions. The 39 items in six scales accounted for a cumulative amount of variance of 47.84% for the actual version with a cumulative amount of variance of 53.41% for the preferred version.

Internal consistency reliability (Cronbach alpha coefficient), used to identify the extent to which items within each scale measure the same construct as other items within their scale, ranged from 0.78 to 0.90 for the actual form and from 0.80 to 0.92 for the preferred form when the individual was used as the unit of analysis. When the class mean was used as the unit of analysis, the values ranged from 0.80 to 0.94 for the actual form and from 0.84 to 0.95 for the preferred form. The highest alpha reliability values of 0.90 and 0.94 were obtained for the Equity scale when, respectively, the individual and the class mean were used as the unit of analysis. Using the individual as the unit of analysis, the discriminant validity results (mean correlation of a scale with other scales) for the six scales of the BMELEI ranged from 0.28 to 0.36 for the actual form and from 0.46 to 0.49 for the preferred form (see Table 4.2). With the class mean as the unit of analysis, the discriminant validity for the six scales of the BMELEI ranged from 0.29 to 0.55 for the actual form and between 0.36 to 0.51 for the preferred form. These results suggest that the raw scores on the BMELEI assess distinct but somewhat overlapping aspects of the learning

environment. However, the factor analysis supported the independence of factor scores on the six scales.

The use of ANOVA showed that five BMELEI scales differentiated significantly between classes, with the exception being the Involvement scale. Thus, students within the same class tend to perceive the environment in a similar manner, while the within-class mean perceptions of the students vary between classes. The eta^2 values (an estimate of the strength of association between class membership and the dependent variable) ranged from 0.08 to 0.18 for the different BMELEI scales. Overall results for the reliability, discriminant validity and ability to differentiate between classrooms, in conjunction with the factor structure, confirm that the BMELEI can be used with confidence in Australian business schools at the tertiary level.

The two-scale *a priori* structure of the student attitude scales was supported through principal components factor analysis followed by varimax rotation that confirmed a refined structure for the instrument comprising 13 items in the two scales. All 13 items loaded more than 0.40 on their own scale and no other scale (see factor loadings reported in Table 4.3). The percentage of variance for the two scales was 23.69 and 34.45, respectively, with the total variance accounted for being 58.14%. The internal consistency reliability (alpha coefficient) for the two student attitude scales was 0.85 and 0.93 using the individual mean as the unit of analysis, and 0.82 and 0.93 using the class mean as the unit of analysis. As a convenient index of the discriminant validity of the attitude questionnaire, the correlation between the two scales was determined. The correlation between scales was 0.50 using the individual mean as the unit of analysis and 0.52 using the class mean as the unit of analysis. These values indicate that there is some overlap between raw scores on the two attitude scales, although the factor analysis supported the independence of factor scores. These results suggest strong factorial validity, internal consistency reliability and discriminant validity for the two student attitude scales.

The construct validity for the BMELEI and the two attitude scales was supported by consistency between the qualitative and the quantitative data. The high mean scores for the BMELEI and the attitude scales convey a positive picture of the classroom

learning environment in the business schools involved and this was further validated by students' comments during the interviews. Generally, most of the students perceived their classroom aspects positively. Students' comments were consistent with mean scores on the BMELEI and the attitude scales, and thus support the construct validity of the instrument and attitude scales.

6.3.2   Associations between Classroom Environment and Students' Attitudes

The second research question was:

> *Are there relationships between students' perceptions of the learning environment and students' attitudes?*

Simple correlation and multiple regression analyses were conducted using the six BMELEI and two attitude scales to investigate relationships between students' perceptions of the learning environment and students' attitudes. The results of this study demonstrated that attitudes of students towards their subject as being statistically significantly and positively associated with student attitudes towards their class ($p<0.0l$) at the individual level of analysis. Two of the six learning environment scales (Teacher Support and Equity) were statistically significantly ($p<0.05$) and positively related to the Attitudes to Subject scale at the class mean level of analysis. These results suggest that improved student attitudes towards a subject are associated with greater emphasis on these scales. The multiple correlation (R) was 0.47 at the student level of analysis and 0.58 at the class mean level of analysis, and was statistically significant ($p<0.01$) for the individual as the unit of analysis. Standardised regression weights (β) indicate that three of the six BMELEI scales uniquely accounted for a significant ($p<0.0l$) amount of variance in student attitudes towards their subject (Teacher Support, Task Orientation and Equity) at the student level of analysis. However, none of BMELEI scales was a significant independent predictor of Attitudes to Subject at the class level of analysis.

For the Attitudes towards Case Studies scale, the simple correlation analysis indicated that all of the six modified scales were positively and statistically significantly ($p<0.01$) related to the Attitudes towards Case Studies at the individual level of analysis. At the class mean level of analysis, two of the six modified scales (namely, Student Cohesiveness and Cooperation) were positively and statistically significantly ($p<0.05$) related to Attitudes towards Case Studies. The multiple correlation was 0.50 and 0.52, respectively, for the individual and class mean levels of analysis, and was statistically significant ($p<0.0l$) for the individual level. The standardised regression weights (β) for four of the six modified scales (Teacher Support, Involvement, Task Orientation and Cooperation) were statistically significant ($p<0.0l$) and independently related to the Attitudes towards Case Studies scale at the student level of analysis. However, there was no statistically significant relationship to the Attitudes towards Case Studies scale at the class mean level. All relationships were positive, thus replicating the finding from past research (Aldridge & Fraser, 2003; Fraser, 1998a; Margianti et al., 2004) that a positive classroom learning environment is linked to positive student outcomes, including attitudes.

6.3.3 Differences between Students' Perceptions of Actual and Preferred Classroom Environment

The third research question that was proposed for this study was:

Are there differences between students' perceptions of the actual and preferred learning environment?

MANOVA for repeated measures, effect sizes (Cohen's *d*) and *F* ratios were used to investigate any differences in scale scores of students' perceptions of the actual and the preferred classroom learning environments. The results indicated that there was a significant difference ($p<0.01$) between actual and preferred scores for all six learning environment scales for two units of analysis (individual and class mean).

The effect size for actual-preferred differences for different BMELEI scales ranged between 0.62 and 1.08 standard deviations for the individual as the unit of analysis and between 1.94 and 3.23 standard deviations with the class mean as the unit of analysis. These results suggest that there were large differences between students' perceptions of the actual and preferred learning environments. These results for Australian university students (with students preferring a more positive classroom learning environment than the one perceived to be actually present) replicate previous research at the tertiary and secondary-school levels in several countries (Fraser & Fisher, 1983a; Fraser & McRobbie, 1995; Hofstein & Lazarowitz, 1986; Margianti et al., 2004).

6.3.4 Gender Differences in Classroom Environment Perceptions and Attitudes

The final research question proposed in this thesis was:

Are there differences between male and female students' perceptions of the learning environments and their attitudes?

MANOVA, effect sizes (Cohen's *d*) and *F* ratios using the student as the unit of analysis were used to investigate any differences between male and female students in attitudes and perceptions of their classroom learning environments. The results indicated that female students perceived significantly ($p<0.01$) more actual Task Orientation than male students, whereas male students perceived Teacher Support and Involvement more positively. For the Involvement scale, male students perceived that more involvement existed among the students in the learning environment. As for the preferred form of BMELEI, the results again indicated that female students perceived significantly ($p<0.01$) more preferred Task Orientation than male students. For the Cooperation scale, female students perceived that more cooperation existed among the students in their learning environment. The effect size using Cohen's *d* for gender differences for actual and preferred scales of the BMELEI ranged between 0.25 and 0.32 standard deviations for the actual form and

between 0.20 and 0.34 standard deviations for the preferred form. These results suggest that there are moderate differences between students' perceptions of the actual and preferred environments. Overall, the finding that female university students generally perceived and preferred a more favourable classroom learning environment replicates previous research in Western primary and secondary schools (Fraser, 1998a) and Indonesian universities (Margianti et al., 2004).

Gender differences in student attitudes were also explored and the results indicated that only the Attitudes towards Subject scale was found to be significantly different ($p<0.05$) for male and female students. The effect size for differences in Attitudes towards Subject was 0.20. Male students showed a more positive attitude towards management and marketing subjects than female students. In general, this study replicated previous research in that male and female students perceived favourable attitudes towards their business education subjects (Khine, 2002; Kim et al., 2000; Margianti et al., 2004; Riah & Fraser, 1998).

As a result of the lecturer/tutor creating a classroom environment that encouraged discussion, students enjoyed doing the management and marketing subjects. The students perceived that the opportunities for them to be directly involved in hands-on tutorial activities are often controlled by the tutor/lecturer. It is apparent that the students had enjoyed putting into practice the skills that they had learned during tutorial sessions.

Information on students' perceptions of the classroom learning environment can provide a valuable source of feedback about the teaching performance of tutors and lecturers. Therefore, it is recommended that tutors be more sensitive to the learning needs of students so that they become more effective in delivering business studies courses through changing the classroom learning environment.

An investigation of gender differences in student attitudes revealed that male students had more positive attitudes towards the management and marketing subjects than did female students. Tutors should therefore be more sensitive to the learning needs of female students and create a learning environment that helps to inculcate a more positive attitude towards the subjects.

6.4   Limitations of the Study

The sample size used in the study was limited to 480 final-year and postgraduate students from 30 classes in two business schools in Perth, Australia due to the difficulties encountered during the preparation of data collection. The sample obtained is smaller and less representative (because only two universities participated in this study) than originally intended, thereby limiting the generalisability of the findings. To enlarge the survey population and to involve nation-wide coverage will no doubt require greater cooperation from the business schools, adequate resources and financial support.

The findings of this study are limited to the perspectives of students only. Inclusion of the perceptions of lecturers and tutors is likely to provide a more comprehensive picture of the teaching and learning environment.

Finally, the achievement outcomes of students could not be accessed due to the bureaucratic requirements of the university administrations. It would be desirable for future studies to relate students' perceptions of the learning environment to their achievement outcomes.

6.5   Implications for Improving Business Education in Australia

Based on the findings of this study, the following implications for improving the learning environment of business management education in Australia emerged:

a) As the BMELEI was found to be a reliable and valid instrument for assessing the business management education learning environment at the tertiary level, tutors and administrators can now use it with confidence to monitor their classroom learning environments and to take appropriate measures to improve classroom instruction.

b) The study provides important practical information that can be used by tutors and administrators in Australia. The finding of large discrepancies between the actual classroom environment and that preferred by students suggests the need to change classroom environments in order to improve the actual-preferred match and, subsequently, students' attitudes. Tutors should therefore be more sensitive to the learning needs of students, creating a learning environment that encourages students' participation and interaction so that they have opportunities to be more involved during instruction.

c) As a result of the lecturer/tutor creating a classroom environment that encouraged discussion, students enjoyed doing the management and marketing subjects. The students perceived that the opportunities for them to be directly involved in hands-on tutorial activities are often controlled by the tutor/lecturer. It is apparent that the students had enjoyed putting into practice the skills that they had learned during tutorial sessions.

d) The results of this study revealed that male students perceived more Involvement and Teacher Support as compared with female students. On the other hand, female students perceived Task Orientation more positively. Tutors should therefore be more sensitive to the learning needs of female students, creating a learning environment where students have opportunities to be more involved in the learning process.

e) An investigation of gender differences in student attitudes revealed that male students had more positive attitudes towards the management and marketing subjects than did female students. Tutors should therefore be more sensitive to the learning needs of female students and create a learning environment that helps to inculcate a more positive attitude towards the subject.

f) Sizable and statistically significant associations were established between students' attitudes and students' perceptions of their classroom learning environment. The study provides some practical and useful information to tentatively guide improvements in student achievement and attitudes through changing the classroom learning environment.

g) The present study contributed further by synthesising the use of quantitative and qualitative data (Tobin & Fraser, 1998), thus providing deeper understandings of students' perceptions and attitudes. Findings from the qualitative data collected through interviewing randomly-selected students supported and provided explanations for the quantitative results. Tutors and administrators might choose to use discussions with students as an important and convenient tool for reflection on their teaching.

h) While students are expected to play an active part during their tutorials, it is important for tutors to reflect on the extent and manner to which they might serve as professional role models for students. Particular attention needs to be given to their technical competence with respect to not only subject specialisation, but also pedagogical acumen and course management skills, standards, the exercise of autonomy, and reflective practice (Ottewill, 2001).

i) Questions pertaining to evaluation of students' perceptions of business studies classroom learning environments should be part of the regular business studies course in order to provide tutors with continuing feedback.

6.6   Recommendations for Future Research

Classroom learning environment research for tertiary business studies classes in Australia is still in its infancy at present. This study was distinctive because the BMELEI was validated for use at the tertiary level. Despite this significant contribution to the field of learning environments, further crossvalidation would be desirable. A larger and more diverse sample would provide further evidence to support the reliability and validity of the BMELEI.

The present study was restricted to investigating students' perceptions of the learning environments and their attitudes. It would be more desirable for future research to

include the perceptions of tutors, lecturers and administrators across a variety of universities.

The results of the present study indicate that positive associations exist between students' perceptions of the learning environment and their attitudes. An achievement measure could not be accessed due to the bureaucratic requirements of the university administrations. Extension of this study to include a broader range of cognitive and affective outcome measures would be desirable.

The qualitative methods employed complemented and substantiated findings of the quantitative methods in the present study of business studies classroom learning environments and should therefore continue to be included in similar future studies (Koul & Fisher, 2006; Tobin & Fraser, 1998).

Information on students' perceptions of the classroom learning environment can provide a valuable source of feedback about the teaching performance of tutors and lecturers. Therefore, it is recommended that tutors be more sensitive to the learning needs of students so that they become more effective in delivering business studies courses through changing the classroom learning environment.

As limited research has been conducted in business management learning environment, this study has the potential to provide the impetus for further research in this field. The above suggestions for further studies are aimed at extending the scope of research on classroom learning environment, particularly in the area of business management education. It is hoped that this study will stimulate more interest in this area and that its research findings will provide a catalyst in the search for excellence in higher education in Australia.

6.7   Final Remarks

The present study marks the beginning of business management classroom learning environment research in Australia. The findings of this study, which focused on the unique learning environment of the business management class, are likely to prove

useful to Australian business studies tutors and lecturers. It serves to inform tutors and lecturers about how their students currently perceive their classes and what they prefer them to be like. With this knowledge, tutors and lecturers are likely to be in a better position to make the improvements in their business studies classrooms necessary to help their students to attain more positive attitudes towards the subject and case studies, and in turn to help to create a more supportive environment for teaching and learning. Finally, this study is significant as it provides greater understanding of the business studies learning environment, which has not been extensively reported in the research literature.

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APPENDIX 1

BUSINESS MANAGEMENT EDUCATION LEARNING ENVIRONMENT INVENTORY (BMELEI)[1]

[1] The BMELEI in this appendix is based on the *What Is Happening In this Class?* questionnaire developed by Fraser, Fisher and McRobbie (1996) and described in detailed in Sections 2.4 and 3.3 of this thesis. The Attitudes to Subject scale in this appendix is based on the Enjoyment of Science Lessons scale from the *Test of Science Related Attitudes* (Fraser, 1981a) described in Section 2.6.3. The Attitudes to Case-Studies scale in this appendix is based on the *Attitudes towards Case Study* questionnaire developed by Brannan and Ahmad (2005) described in Section 2.6.4 of this thesis. All scales were used in my study with the permission of their authors.

BUSINESS MANAGEMENT EDUCATION LEARNING ENVIRONMENT INVENTORY (BMELEI)

SECTION B

This section contains statements about practices that could take place in this class at universities or colleges (sometimes referred to as seminars or tutorials). You will be asked how often each practice takes place.

There are no 'right' or 'wrong' answers. Your opinion is what is wanted. Your responses will be confidential.

The '*Actual*' column is to be used to describe how often each practice actually takes place in your class. The '*Preferred*' column is to be used to describe how often you would like each practice to take place (a wish list).

Indicate your opinion about each questionnaire statement by **crossing** the appropriate number in both '**Actual**' and '**Preferred**' columns.

Example	ACTUAL					PREFERRED				
1. I am friendly to members of this class.	1	2	3	4	5	1	2	3	4	5
2. Members of the class are my friends.	1	2	3	4	5	1	2	3	4	5

		ACTUAL					PREFERRED			
STUDENT COHESIVENESS (SC)	Almost Never	Seldom	Sometimes	Often	Almost Always	Almost Never	Seldom	Sometimes	Often	Almost Always
1. I make friendships among students in this class.	1	2	3	4	5	1	2	3	4	5
2. I know other students in this class.	1	2	3	4	5	1	2	3	4	5
3. I am friendly to members of this class.	1	2	3	4	5	1	2	3	4	5
4. Members of the class are my friends.	1	2	3	4	5	1	2	3	4	5
5. I work well with other class members.	1	2	3	4	5	1	2	3	4	5
6. I help other class members who are having trouble with their work.	1	2	3	4	5	1	2	3	4	5
7. Students in this class like me.	1	2	3	4	5	1	2	3	4	5
8. In this class, I get help from other students.	1	2	3	4	5	1	2	3	4	5

		ACTUAL					PREFERRED			
TEACHER SUPPORT (TS)	Almost Never	Seldom	Sometimes	Often	Almost Always	Almost Never	Seldom	Sometimes	Often	Almost Always
9. The lecturer/tutor takes a personal interest in me.	1	2	3	4	5	1	2	3	4	5
10 The lecturer/tutor goes out of his/her way to help me.	1	2	3	4	5	1	2	3	4	5
11 The lecturer/tutor considers my feelings.	1	2	3	4	5	1	2	3	4	5
12 The lecturer/tutor helps me when I have trouble with the work	1	2	3	4	5	1	2	3	4	5
13 The lecturer/tutor talks with me.	1	2	3	4	5	1	2	3	4	5
14 The lecturer/tutor is interested in my problems.	1	2	3	4	5	1	2	3	4	5
15 The lecturer/tutor moves about the class to talk with me.	1	2	3	4	5	1	2	3	4	5
16 The lecturers'/tutors' questions help me to understand.	1	2	3	4	5	1	2	3	4	5

		ACTUAL					PREFERRED			
INVOLVEMENT (IN)	Almost Never	Seldom	Sometimes	Often	Almost Always	Almost Never	Seldom	Sometimes	Often	Almost Always
17 I discuss ideas in class.	1	2	3	4	5	1	2	3	4	5
18 I give my opinions during class discussions.	1	2	3	4	5	1	2	3	4	5
19 The lecturer/tutor asks me questions.	1	2	3	4	5	1	2	3	4	5
20 My ideas and suggestions are used during classroom discussions.	1	2	3	4	5	1	2	3	4	5
21 I ask the lecturer/tutor questions.	1	2	3	4	5	1	2	3	4	5
22 I explain my ideas to other students.	1	2	3	4	5	1	2	3	4	5
23 Students discuss with me how to go about solving problems.	1	2	3	4	5	1	2	3	4	5
24 I am asked to explain how I solve problems.	1	2	3	4	5	1	2	3	4	5

	ACTUAL					PREFERRED				
TASK ORIENTATION (TO)	Almost Never	Seldom	Sometimes	Often	Almost Always	Almost Never	Seldom	Sometimes	Often	Almost Always
25. Getting a certain amount of work done is important to me.	1	2	3	4	5	1	2	3	4	5
26. I do as much as I set out to do.	1	2	3	4	5	1	2	3	4	5
27. I know the goals for this class.	1	2	3	4	5	1	2	3	4	5
28. I am ready to start this class on time.	1	2	3	4	5	1	2	3	4	5
29. I know what I am trying to accomplish in this class.	1	2	3	4	5	1	2	3	4	5
30. I pay attention during this class.	1	2	3	4	5	1	2	3	4	5
31. I try to understand the work in this class.	1	2	3	4	5	1	2	3	4	5
32. I know how much work I have to do.	1	2	3	4	5	1	2	3	4	5

	ACTUAL					PREFERRED				
COOPERATION (CO)	Almost Never	Seldom	Sometimes	Often	Almost Always	Almost Never	Seldom	Sometimes	Often	Almost Always
33. I cooperate with other students when doing assignment work.	1	2	3	4	5	1	2	3	4	5
34. I share my books and resources with other students when doing assignments.	1	2	3	4	5	1	2	3	4	5
35. When I work in groups in this class, there is teamwork.	1	2	3	4	5	1	2	3	4	5
36. I work with other students on projects in this class.	1	2	3	4	5	1	2	3	4	5
37. I learn from other students in this class.	1	2	3	4	5	1	2	3	4	5
38. I work with other students in this class.	1	2	3	4	5	1	2	3	4	5
39. I cooperate with other students on class activities.	1	2	3	4	5	1	2	3	4	5
40. Students work with me to achieve class goals.	1	2	3	4	5	1	2	3	4	5

	ACTUAL					PREFERRED				
EQUITY (EQ)	Almost Never	Seldom	Sometimes	Often	Almost Always	Almost Never	Seldom	Sometimes	Often	Almost Always
41. The lecturer/tutor gives as much attention to my questions as to other students' questions.	1	2	3	4	5	1	2	3	4	5
42. I get the same amount of help from the lecturer/tutor as do other students.	1	2	3	4	5	1	2	3	4	5
43. I have the same amount of say in this class as other students.	1	2	3	4	5	1	2	3	4	5
44. I am treated the same as other students in this class.	1	2	3	4	5	1	2	3	4	5
45. I receive the same encouragement from the lecturer/tutor as other students do.	1	2	3	4	5	1	2	3	4	5
46. I get the same opportunity to contribute to class discussions as other students.	1	2	3	4	5	1	2	3	4	5
47. My work receives as much praise as other students' work.	1	2	3	4	5	1	2	3	4	5
48. I get the same opportunity to answer questions as other students.	1	2	3	4	5	1	2	3	4	5

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	ACTUAL					PREFERRED				
ATTITUDES TOWARDS SUBJECT (AS)	Almost Never	Seldom	Sometimes	Often	Almost Always	Almost Never	Seldom	Sometimes	Often	Almost Always
1. I like tutorials in Strategic Management/Marketing subject.	1	2	3	4	5	1	2	3	4	5
2. Strategic Management/Marketing classes are interesting.	1	2	3	4	5	1	2	3	4	5
3. Strategic Management/Marketing subject is one of my favourite subjects.	1	2	3	4	5	1	2	3	4	5
4. Tutorials in Strategic Management/Marketing subject interest me.	1	2	3	4	5	1	2	3	4	5
5. I enjoy tutorials in Strategic Management/Marketing subject.	1	2	3	4	5	1	2	3	4	5
6. I enjoy the activities that we do in Strategic Management/ Marketing subject.	1	2	3	4	5	1	2	3	4	5
7. These tutorials make me interested in this subject.	1	2	3	4	5	1	2	3	4	5
8. We should have more tutorials in this subject each week.	1	2	3	4	5	1	2	3	4	5

	ACTUAL					PREFERRED				
ATTITUDES TOWARDS CASE STUDIES (ACS)	Almost Never	Seldom	Sometimes	Often	Almost Always	Almost Never	Seldom	Sometimes	Often	Almost Always
9. I usually prepare for case study discussions before seminars/tutorials.	1	2	3	4	5	1	2	3	4	5
10. I usually contribute to case study discussions in class.	1	2	3	4	5	1	2	3	4	5
11. I usually learn something new during case study discussions.	1	2	3	4	5	1	2	3	4	5
12. Analysing case studies gives me the confidence to express opinions.	1	2	3	4	5	1	2	3	4	5
13. Doing case study work has helped me to develop my presentational skills.	1	2	3	4	5	1	2	3	4	5
14. Doing case study work has helped me to develop my skills in business analysis.	1	2	3	4	5	1	2	3	4	5
15. Doing case study work has helped me to develop my skill in business report writing.	1	2	3	4	5	1	2	3	4	5
16. Doing case study work has helped me to develop my team-working skills.	1	2	3	4	5	1	2	3	4	5

Suggestions/Recommendations

1. Is there anything else that you would like to say about the classroom learning environment in Management or Marketing Education?

2. Is there anything else that you would like to say about the use of case studies in Management or Marketing Education?

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