Social-Psychological Factors and Tertiary Learning Environments: Student Perspectives, Measures, and Influences

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ABSTRACT

Although studies on learning environments, or classroom climate, have flourished in the past decade, little is known about how student perceptions of the learning environment are associated with student psychosocial beliefs and outcomes at the tertiary level. The purpose of this doctoral project was to explore student conceptions of tertiary learning environments, and whether student assessments of their learning environments were associated with their self-expectations, motivational beliefs, as well as achievement. In Study One, 24 interviews were conducted with university students to explore their conceptions of typical, ideal, and dreaded learning environments. Results revealed various behaviours and qualities, exhibited by both teachers and students. In Study Two, a new learning environment questionnaire was developed, using the themes found in Study One to guide the instrumentation. The questionnaire was administered to 711 undergraduate students. Finally, using another sample of 751 undergraduate students, Study Three confirmed the structure of the newly developed questionnaire from Study Two, and investigated the relations between students' psychosocial beliefs and outcomes. Consequently, this doctoral project confirmed the structure of a new 10-factor learning environment questionnaire which was then used for subsequent analyses. This thesis concludes by arguing that it has contributed to understanding ways in which tertiary students' views of their environments may relate to their beliefs as learners situated within these environments, and how these beliefs about self-expectations and motivation can explain some variance in their achievement.

DEDICATION

Dad, I made it!

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CHAPTER ONE

HUMBLE BEGINNINGS: INTRODUCTION

This doctoral project was driven by personal as well as research interests in the area of tertiary learning environments (also known as class climate). On a personal level, as a first-generation university student, the connections between believing in success and achieving it were clear and pivotal to me. Also, the connections between a supportive university environment, teaching staff, and students have all been central to my personal and academic development in previous years. Therefore, it was unsurprising to read the work of fellow researchers who concluded that students who "feel good" and "think more positively" about themselves and their learning tend to achieve substantially better than their counterparts who do not (Bonne, 2016; Marsh & O'Mara, 2008). However, on a research level, it was interesting to find that studies such as the ones above were mainly conducted at the pre-tertiary level of education (i.e., primary or secondary).

Hence, the research journey that accompanied this doctoral project began in 2010, when my Honours project (Alansari, 2011) revealed statistically significant differences in the way 342 undergraduate students and their 18 tutors viewed their mathematics learning environments. These findings motivated me to further investigate the extent to which differences in reported climate perceptions would result in different achievement outcomes for these students. Indeed, my masters project (Alansari, 2012) revealed statistically significant differences between the reported climate perceptions of 651 undergraduate students and their 35 mathematics tutors, with cluster analyses revealing that students who were "dissatisfied" with the class climate achieved the least in the above sample (Cohen's d = .40).

However, by the end of my masters project, a number of limitations had emerged, such as the lack of a qualitative follow-up study to explore student voice in tertiary learning environments, the relevance of the quantitative data collection instrument used in both studies (Alansari, 2011, 2012), and questions such as “What counts as an important aspect of tertiary learning environments?” and “Who decides on the features and aspects of these tertiary learning environments?” These discussion points formed the basis of my thinking for the current doctoral research, and provided a new set of challenges that were undertaken in this thesis: examining student voice, views, and outcomes from a social-psychological perspective.

As this thesis will discuss, a plethora of research in the past 30 years has shown that the classroom climate, typically measured by self-report quantitative measures, is a strong predictor of student cognitive and affective outcomes at all educational levels (e.g., attitudinal and achievement outcomes; Babad, 2009; Fraser, 1986, 2002; Raviv, Raviv & Reised, 1990). Further, students’ perceptions of the learning environment and teacher effectiveness have been shown to be significantly related to their educational outcomes, as well as the quality of education received and perceived by them (Coffey & Gibbs, 2001; Lizzio, Wilson, & Simons, 2002; Marsh, 1982, 2007). However, these studies have mostly been conducted at pre-tertiary levels, with few studies carried out on tertiary learning environments. Moreover, these studies often rely on expert judges or “outstanding” teachers when determining the classroom aspects to be investigated as part of their climate (e.g., Hativa, Barak, & Simhi, 2001; Hardesty & Bearden, 2004; Keeley, Smith, & Buskist, 2006). In other studies where student perspectives were considered, they were only used as reliability checks to confirm the researchers’ intuitive understanding of the classroom climate, as opposed to tools for exploring the dimensions of that climate (e.g., Taylod & Maor, 2000; Yin & Lu, 2014).

Moreover, the development of the area has been linear, as judged by the studies that investigated the relations between the class climate and a single outcome measure such as achievement or a specific belief (e.g., Hattie, 2009; Owens & Barnes, 1982; Pascarella, Walberg, Junker, & Haertel, 1981; Zedan, 2010). It is for these reasons, along with my personal experiences, that I decided to investigate tertiary learning environments using student voice and views as central to investigating how such environments can be conceptualised, how they might be measured, and how they might be associated with a range of psychosocial variables such as self-expectations, motivational beliefs, and achievement.

Chapter Two explores the current literature on the psychosocial aspects of the classroom environment and how the latter are associated with educational outcomes, including achievement at all levels of education. It must be noted that, historically, pathways in classroom climate research have been unusual. Classroom climate was heavily studied from the 1970s until the late 1980s (e.g., Moos & Brownstein, 1977; Moos & Insel, 1974; Moos & Trickett, 1987), after which classroom climate studies were infrequent until the late 1990s when they gained popularity again. What has also shifted in the literature is the move away from defining the term *climate* in the 1980s towards understanding the linear influence of class climate on educational outcomes such as achievement (e.g., Cornelius-White, 2007; Hattie, 2009). As a result, to capture this shift, the range of studies included in the literature review focus on studies published in the last 30 years (1990–2017), although some older studies are included (e.g., Anderson & Walberg, 1968; Moos & Insel, 1974; Fraser, 1986) to make reference to the seminal work in the area and to show how it was built upon. A number of search engines and databases, such as Google Scholar, PsychINFO, ERIC, and ProQuest, were used for the literature review, enabling the search to be refined with respect to specific keywords (e.g., climate, self-beliefs, tertiary, university, and outcomes) as well as the period

of publishing. Chapter Two concludes with the main research questions that are addressed in the three studies underpinning this research, which comprise Chapters Three, Four and Five.

Chapter Three discusses the first study, which uses semi-structured interviews to explore student conceptions of tertiary learning environments, or class climate. Using a thematic analysis technique, student conceptions of ideal, typical, and dreaded learning environments were explored. This was followed by a quantified taxonomy of student climate perceptions which were categorised with respect to type (qualities or behaviours), focus (teacher or student), and influence (positive or negative). The results of the first study guided the development and validation of a new learning environment questionnaire that was discussed in the subsequent chapter.

Chapter Four presents the second study, which used the findings of Study One to create and validate a quantitative survey instrument designed to measure student assessments of tertiary learning environments. In particular, this study employed a cross-sectional design to test the psychometric properties of the newly developed 90-item questionnaire on a sample of 711 undergraduate students from six faculties. As will be presented in Chapter Four, an exploratory factor analysis supported a 14-factor solution with 67 items, demonstrating acceptable levels of reliability. The large number of factors arising from the data draws attention to the multifaceted nature of tertiary learning environments, as viewed by students.

Following on from the second study, Chapter Five presents the third study, which validated the survey instrument developed in Study Two and then used this instrument to examine student perceptions of class climate in relation to student self-expectations, motivational beliefs, and self-reported achievement. Study Three also employed a cross-sectional design to validate the 14-factor questionnaire developed in Study Two, using another sample of 751 undergraduate students from six faculties. As will be presented in Chapter Five, confirmatory factor analyses supported a 10-factor solution demonstrating best

data-to-theory fit, which was then used for subsequent analyses. Lastly, a structural equation model was used to investigate the relations between student climate perceptions, self-expectations, motivational beliefs, and achievement.

The final chapter, Chapter Six, discusses the findings from all three studies and examines why and how this doctoral research provides significant contributions and insights into the social psychology of the tertiary classroom. A revisit of the three studies is presented in that chapter, followed by a general discussion of the findings, the contributions made to the classroom climate research area, implications for future research and theorisation, and the strengths and limitations of this thesis.

CHAPTER TWO

IN SEARCH OF THEORETICAL HEROES: LITERATURE REVIEW

The current chapter seeks to rationalise the aims and research questions underpinning this doctoral project, by making reference to the existing and seminal body of literature, and discussing the theoretical and empirical frameworks that were used in this project. In doing so, this thesis can then be contextualised as part of the existing research area, as well as create links between what has been done in the past, and what is being done in the current project. In particular, this doctoral project explores a number of research areas in educational and social psychology that have not been explored within the tertiary context in previous studies. The researcher wanted to examine the pattern of a number of naturally occurring psychosocial latent constructs within the tertiary learning environment which may relate to student achievement. Therefore, the following literature review will examine the current theoretical and empirical research on the learning environment, student self-expectation beliefs, and student achievement goal orientation.

The Learning Environment

In order to establish the importance of studying the classroom climate at the tertiary level, a discussion of research that was conducted at the pre-tertiary level will be presented first along with evidence showing that tertiary and qualitative class climate studies are infrequent. An introduction to the field of class climate research in general is important because most of the studies, including the main theoretical framework, that were conducted in this area have been carried out at the pre-tertiary level. The section of the review related to qualitative studies in the field will provide an overview of how the classroom climate area developed, and will present a critique of the commonly used qualitative methods employed in examining the class climate at the pre-tertiary level. Also, it must be noted that, since the

focus of this review is on tertiary class climate studies, a detailed discussion of these studies will be explored separately in a later section.

Following the discussion of pre-tertiary and qualitative studies, the review will then provide a critique of the available tertiary class climate instruments used to measure the climate. Moos' theoretical framework of the class climate, which is the theory that underpins the current doctoral thesis, will be introduced, followed by a range of available self-report questionnaires to measure the tertiary climate. Throughout that section, it will be shown that the existing instruments either took no account of student perspectives during their instrumentation phases, or treated those perspectives as secondary to the process (e.g., as a cross-checking exercise or a follow-up reliability test). This is an important perspective because students' understandings of what constitutes a positive class climate at the tertiary level may not necessarily be reflected in the instruments developed by researchers. The instruments may be based on theoretical constructs rather than taking account of student voice.

The final, and major part of this chapter will then focus on studies that have explored tertiary learning environments, and the empirical evidence that supports the argument for investigating student psychosocial beliefs and outcomes. To do so, the argument that tertiary class climate studies are infrequent will be re-visited and further discussed, followed by a discussion on the associations between tertiary climate views and student educational outcomes. The final part of this review will explore literature in fields that may be associated with student perspectives of the class climate. For example, the studies of class climate at the pre-tertiary level suggest that self-expectations and motivational beliefs may be related to student perceptions of the class climate (e.g., McMahon, Wernsman & Rose, 2009; Suarez-Alvarez, Fernandez-Alonso, & Muniz, 2014). In presenting these studies, it will be shown that studies that have investigated relations between various psychosocial variables alongside

achievement are infrequent at the pre-tertiary level. The chapter will then present studies that have explored relations between student views of their learning environments, self-expectation beliefs, and achievement goals in particular. It will become evident that there are few such studies.

Setting the Scene and Establishing Relevance

How students feel about and view their learning environments, and how these feelings and views of the overall classroom climate are reflected in their outcomes have been the focus of many researchers and educators in the field (e.g., Fraser, 2012; Goh & Khine, 2002; Haertel, Walberg, & Haertel, 1981; Zaragoza & Fraser, 2017). Research into the social psychology of the classroom has shown that the 'climate' is a powerful construct in predicting social and academic outcomes for students (Babad, 2009; Cohn & Fraser, 2016; Fraser, 1986, 2002; Raviv, Raviv & Reised, 1990). The terms 'classroom climate', 'classroom environment', 'classroom atmosphere', and 'learning environment' are interchangeably used in the literature to describe the global summary of classroom life as it is experienced by its students and teachers (Babad, 2009) – "an overall assessment of the psychological, social, emotional, and organisational/managerial state of the classroom" (p. 54). In this thesis, the terms 'learning environment' or 'classroom climate' will mainly be used.

Research at the pre-tertiary level on learning environments is promising yet heavily based on descriptive studies (e.g., aimed at describing new or contemporary learning environments, Doppelt, 2006; James, 2006) or exploratory studies carried out at the pre-tertiary level (e.g., aimed at exploring relations or psychometric properties of new or re-examined instruments, Allen & Fraser, 2007; Telli, den Brok, & Cakiroglu, 2007). In such studies where positive perceptions of the learning environment have been reported, higher levels of student involvement (Sidelinger & Booth-Butterfield, 2010), school belongingness

and attachment (Wei & Chen, 2009), emotional competence (Jennings & Greenberg, 2009), and academic self-efficacy (McMahon, Wernsman & Rose, 2009) have also been reported. Consistently, in pre-tertiary studies where positive perceptions of the learning environment have been reported, significantly greater levels of academic performance have also been reported (Cornelius-White, 2007; Wentzel, 1997, 1998; Margianti, Fraser, & Aldridge, 2001; Fraser, 1989). On the contrary, in studies at the pre-tertiary level where negative perceptions of the learning environment have been reported, higher levels of aggression (Fraser, 1989; Zedan, 2010), competiveness (Owens & Barnes, 1982), student dropout rates (Darkenwald & Gavin, 1987), and lower levels of continued willingness to learn science (Pascarella, Walberg, Junker & Haertel, 1981) have been reported. Therefore, given the important links established above, it is somewhat unsurprising that several researchers have investigated ways in which the climate can be conceptualised and measured alongside other constructs of interest. The following section will address the theoretical framework underpinning classroom climate research, followed by a subsequent section that deals with ways to measure that climate.

Four Decades of Classroom Climate Research

Understanding the various situational and learning factors that contribute to the formation of the classroom climate can be traced back to the 1960s–1970s where the seminal work of Moos and colleagues helped with establishing the conceptual understanding of the social and learning climate (Anderson & Walberg, 1968; Moos & Brownstein, 1977, Moos & Insel, 1974; Walberg, 1968). The study of the social climate was initially introduced in the literature as part of a larger body of work that aimed at understanding characteristics of the utopian, or ideal, environments for human growth and productivity (Moos, 1974, 1976; Moos & Insel, 1974). In their book on utopian environments, Moos and Brownstein (1977) detailed their extensive qualitative investigation of various environments such as hospital wards,

military bases, schools, and families. Indeed, Moos and Brownstein's (1977) investigation attempted to describe the dynamic and unpredictable nature of the above environments in a way that dealt with "the twin problems of inherent environmental limitations and of human needs for stimulation and change, which preclude the development of a static social system" (p. 44). Although the methodological aspects of Moos and Brownstein's (1977) investigation were not clearly presented in their book, it was stated that a series of interviews, observations, and ethnographic studies were conducted in the various environments listed above as part of building a conceptual framework for understanding human environments introduced by the authors.

The sociological framework introduced by Moos and Brownstein (1977) for understanding human environments consisted of five main dimensions to investigate when deciding on the nature of these environments: (a) the ecological dimensions, which encompassed the geographical and meteorological characteristics of the environment that shaped how humans behaved and interacted with each other; (b) the human aggregate, which encompassed the characteristics of individuals or communities that inhibited those environments (e.g., age, or ability level); (c) the organisational structure, which encompassed the size of the environment as well as the levels of managerial layers involved; (d) the behaviour settings, which encompassed human interaction and socialisation; and (e) the social climate, which encompassed the unique profiles, or "personalities" of these environments. The last dimension, social climate (discussed in greater detail later), was monumental to the emergence of the classroom climate as a unique construct in educational settings.

> Social environments can be portrayed with a great deal of accuracy and detail … Some people feel a strong need to control others; similarly, some social environments are extremely rigid, autocratic, and controlling. Order, clarity, and structure are

> important to many people. Correspondingly, many social environments strongly emphasize order, clarity, and organization. (Moos & Brownstein, p. 49, 1977)

Around the same time Anderson and Walberg (1968) were developing their own conceptual framework for understanding human environments and productivity, but from a psychological perspective, focusing on individual and school factors that were associated with better educational and academic outcomes (Fraser, Walberg, Welch, & Hattie, 1987; Walberg, 1984; Wang, Haertel, & Walberg, 1993). For example, Fraser et al. (1987) discussed the psychological factors (e.g., student motivation, academic self-concept, and attitude towards school), and outcomes (e.g., achievement) associated with greater levels of educational productivity (e.g., skill development and career options). In their summary of meta-analyses relating to student achievement and productivity, Fraser et al. (1987) also showed that student psychological factors, including the ones mentioned above, were significantly correlated with achievement (average r = .44, a moderate relation) based on 484 international studies that tested 896 relations. Whereas the study focused on psychological factors, Fraser et al. (1987) also discussed the importance of classroom interactions and socialisation that influenced the extent to which students developed positive or negative beliefs about their own learning and performance, that may have explained their findings (see also Church, Elliot, & Gable, 2001; MacAulay, 1990).

A similar pattern was also evident in James, Gent, Hater, and Coray's (1979) work. They investigated the psychological climate of a work space, based on self-report perceptions of 331 employees, and found that workers' perceptions of their own influence and contributions to the environment were significantly related to their job satisfaction and in-work interactions with peers and employers. The same pattern of explaining the influence of cognitive factors using social interaction (Fraser, et al., 1987; James et al., 1979) was found

in another longitudinal study aimed at tracking secondary students one year following graduation (Sewell & Hauser, 1980). The authors of that study (Sewell & Hauser, 1980) argued that the influence of student psychological factors such as perceived ability, intelligence, academic interest, and aspirations on student achievement was 'socialised' among students before that influence became salient. That is, students were argued to have formed their own individual beliefs about intelligence and perceived ability as a product of interacting with peers and the teacher, and understanding how others performed and learnt, relative to how they did. Examining the ways in which the studies above explained their findings suggested that the influence of both social and psychological factors on the learning environment seemed intuitive and, at times, concurrent. This was in spite of the earlier studies focusing on either the social (Anderson, 1970; Moos & Moos, 1978) or psychological (James, Hater, Gent, & Bruni, 1978; Gergen, 1973) climates of the classroom.

As a result, and despite the summary of meta-analyses reported by Fraser et al. (1987) being based on correlational studies only (i.e., it is not possible to conclude causation from such findings), the direction and size of the relations found between cognitive factors and outcomes influenced other researchers in the field to consider psychological *as well as* social aspects of the classroom (e.g., other types of student perceptions, self-beliefs and attitudes) that may be related to the educational outcomes of students (e.g., Alt, 2015; Babad, 2009; Bi, 2015; Capara, Vecchione, & Alessandri, 2011; Fraser, 1998; Haertel, Walberg, & Haertel, 1981; Hattie, 2009). In doing so, the learning environments research area evolved over time by focusing on the psychosocial factors that possibly explained how these environments were conceptualised and measured in relation to student outcomes (Fraser & Walberg, 1981). Such studies will be discussed in later sections of this review.

However, the learning environments research area flourished due largely to the important and seminal work of Fraser (1982, 1986, 1998, 2002, 2012) in aligning Moos'

(1974, 1976) research on social climates with Walberg's (1980, 1984, see also Walberg and Anderson, 1968) research on the psychology of educational productivity. Fraser's work, therefore, shaped the current literature's conceptualisation of the classroom climate as a social-psychological construct (Babad, 2009). The next set of paragraphs will specifically focus on *how* Fraser contributed to the learning environments research area, as opposed to *what* he found in the studies he conducted, keeping in mind that there will be a subsequent section that will cover what his class climate studies showed. Because of the ubiquitous and important nature of Fraser's work, his findings and their contribution to the literature are presented in several sections below. Fraser's leadership and oversight of the learning environments research area also contributed to its development. This will be discussed next.

Fraser and classroom climate research. Throughout the past 35 years, Fraser has published numerous literature reviews (e.g., Fraser 1986, 2002, 2012; Fraser & Walberg, 1991) on the history, importance, and influence of the classroom climate on students' academic trajectory at all education levels. His establishment of the first *Learning Environments Research* peer-reviewed journal in 1998 marked yet another significant contribution to the research field, by creating the intellectual space for scholars to share their findings and ideas that have moved the area forward. When it comes to tertiary learning environments in particular, Fraser's work has also being published in peer-reviewed academic journals where the typical focus had not been on the social-psychological aspects of the classroom such as *Science and Technological Education* (Kim, Fisher, & Fraser, 1999), *Higher Education* (Fraser & Treagust, 1986), *Evaluation and Research in Education* (Kim, Fisher, & Fraser, 2000), *Teaching and Teacher Education* (Fraser, Williamson, & Tobin, 1987), and *Curriculum Studies* (Fraser, 1989). What this achievement signifies is the wider range of audience that Fraser helped to reach, by communicating the relevance and importance of classroom climate beyond the community of social psychology researchers.

This was especially since these studies provided evidence that student perceptions of the class climate may serve as moderate predictors of student achievement. To illustrate, one study by Fraser and Fisher (1982) demonstrated that student perceptions of the class climate were a significant predictor of the achievement of 1,083 secondary school students, with standardised beta coefficients ranging from .30 to .56 (see also Fraser & Fisher, 1983).

Lastly, Fraser also contributed to the development of a wide range of accessible tools for assessing learning environments that will be discussed later, such as the Learning Environment Inventory (Fraser, 1982), the College and University Classroom Environment Inventory (Treagust & Fraser, 1986), and the Science Laboratory Environment Inventory (Fraser, McRobbie, & Giddings, 1993). This was a response to the earlier review by Fraser (1989) and Walberg (1968) who argued at the time for the need for more objective measures that would enable capturing an overall view of classroom group processes and interaction across educational levels and subjects. In fact, Fraser also played a vital role in validating some of the translated versions of these class climate questionnaires in order for them to be accessed internationally, following the interest expressed from other researchers in the field to explore the class climate phenomenon in foreign contexts (Fraser & Walberg, 2005). Some of the languages into which the questionnaires were translated include Chinese (Aldridge & Fraser, 2000), Indonesian (Fraser, Aldridge, & Soerjaningsih, 2010), Arabic (MacLeod & Fraser, 2010), and Korean (Kim, Fisher, & Fraser, 2000) which reflect the wide recognition of the importance of Fraser's work. Notably, the increasing number of class climate questionnaires translated into Asian languages may explain the influx of studies investigating learning environments in the Asian region (e.g., Khine & Fisher, 2003; Koul & Fisher, 2005; Khine & Fisher, 2001; Yang, Huang, & Aldridge, 2002).

The section above has provided an introduction to the classroom climate research area. It has described the early contributions of researchers such as Moos (1976) and

Anderson and Walberg (1968) towards understanding the social and psychological climates of classrooms. Further, a discussion has been presented on Fraser's (2012) efforts in advocating for the class climate research as a construct worthy of investigation alongside student educational outcomes. These efforts included the establishment of the first Learning Environment Research journal, developing various data collection instruments to be used on various learning environments, and dissemination of class climate research in avenues where such a topic had not been typically published. Next, a discussion on the main and widely used theoretical framework referred to in class climate research will be introduced – Moos' tri-dimensional theory of the class climate (Anderson & Walberg, 1968; Moos, 1974, 1976; Moos & Brownstein, 1977), followed by a discussion on measuring the climate via self-report questionnaires.

Moos' Tri-Dimensional Model of the Classroom Climate

As indicated earlier, based on studying a wide range of people situated within various environments, Moos introduced a tri-dimensional model of 'social climate' which was referred to as the 'classroom climate' when investigating classrooms from a social-psychological perspective (Fraser, 1986). This model posits that the classroom climate may be manifested as a unique profile that can be understood and studied using three dimensions: (1) *The relationships dimension*; (2) *The personal growth dimension*; and (3) *The system maintenance dimension*. The definitions of these dimensions, along with sample factors that belong to each of the dimensions (see Table 2.1), have been largely adapted in this thesis from those presented by Babad (2009, see also Fraser, 2002) and are discussed next.

Table 2.1

Sample Factors (with definitions) of Moos' Dimensions of the Classroom Climate

Dimension	Factor	Definition
Relationships	Class Cohesion	The overall sense of unity and cohesion of the classroom
	Affiliation	The extent to which students feel emotionally connected to each other in the classroom
	Friction	Students' assessment of the atmosphere of tension in the classroom
Personal Growth	Autonomy	The extent to which students feel independent and 'free' in the classroom
	Competitiveness	The extent to which the classroom is designed to be competitive and to encourage academic competition
	Task Orientation	The extent to which classroom tasks are performed with minimal intrusion and the teacher spends less time in non-academic tasks
System Maintenance	Teacher Control	The extent to which the teacher is successful in controlling the classroom effectively
	Clarity of Instruction	The extent to which rules in the classroom are clear
	Innovation	The extent to which the teacher plans new, unusual class activities, teaching techniques, and assignments

As part of Moos' theory, *the relationships dimension* focuses on the interpersonal relationships that take place in the classroom and how these are experienced by students and teachers. Examples of factors that belong to this dimension are Cohesiveness, Affiliation, and Friction (see Table 2.1). This dimension is concerned with how student-student and student-teacher relationships are viewed, fostered, and are supportive of student outcomes. Further, Babad (2009) argued that this dimension could be further divided into aspects that focussed on three main aspects of the classroom: the experience of the individual; the

interpersonal relations among students and teachers; and those focusing on relevant teacher behaviour that could result from the earlier two aspects under this dimension.

The personal growth dimension focuses on students as individual learners situated within a classroom community, and how students' lived experiences within those classroom communities support their academic development and learning trajectory. Examples of factors that belong to this dimension are Autonomy, Competitiveness, and Task Orientation (see Table 2.1). According to Goh and Tobin (1998), students who judge their in-class experiences positively are more likely to make reliable and positive judgments about a number of psychosocial variables including beliefs about their learning progress. This is further supported by a number of studies that have shown that students' personal growth within the learning environment is vital to their perceptions of peer and teacher support (Waldrip, Fisher, & Dorman, 2009), as well as to performance in that class (Dart, Burnett, Boulton-Lewis, Campbell, Smith & McCrindle, 1999; Wang & Lindvall, 1984). In other words, this dimension assesses the climate factors that are associated with the classroom teaching and learning practices that influence the learning gains for students (i.e., growth needs).

Lastly, *the system maintenance dimension* focuses on the managerial role of the teacher, and how the classroom management practices are conducive to, as opposed to restrictive of, student learning needs and outcomes. Examples of these factors are Teacher Control, Innovation, and Clarity (see Table 2.1). The value of classroom management and how it contributes to an overall climate of effective teaching and learning practices, is well established in the literature (Schunk, 2012), with an increasing pressure placed on teachers to become effective classroom managers as well as leaders, educators, and role models (Malmberg & Hagger, 2009; Babad, 2009). Therefore, factors in this dimension focus on the

extent to which teachers are able to manage their classrooms, and how that role facilitates an overall supportive learning environment.

Measuring the Class Climate Using Qualitative Methods

One of the shifts in the literature on learning environments that needs to be captured at an early stage of this literature review is the move away from capturing *what* the climate represents (Fraser, 1989), to how it is measured and related to other variables (Fisher & Khine, 2006; Goh & Khine, 2002). Whereas qualitative research methods (e.g., interviews and classroom observations, also described as alpha press methods; see Dorman, 2002) provided rich data and insights into classroom life through the direct lenses of researchers, investigating the classroom climate has mostly been done using quantitative methods in previous research (Babad, 2009; Haertel, Walberg, & Haertel, 1981). To date, the number of available qualitative studies in the field of the classroom climate is minimal when compared with the large number of quantitative studies (Afari, Aldridge, Fraser, & Khine, 2012; Fisher & Khine, 2006; Goh & Khine, 2002; Fraser, 1989). The move away from employing qualitative research methods was an interesting shift to observe, given the earlier work of Moos and Brownstein (1977) who introduced and investigated the social climate using qualitative techniques only. One exception in the field includes a qualitative study conducted by Margianti, Fraser, and Aldridge (2001). In their study, Margianti et al. (2001) ran small-group interviews and focus groups, serving as cognitive labs, with university mathematics students in Indonesia in order to examine the suitability and relevance of the class climate instrument they adapted before using it with a larger sample of students. In doing so, Margianti et al. (2001) were able to revise and explore the factor structure of the translated version of the class climate questionnaire they used in their study (i.e., the What Is Happening In This Class questionnaire, WIHIC; Aldridge & Fraser, 2000), and reveal

statistically significant relations between student climate perceptions and achievement in mathematics.

Another example of a class climate qualitative study was when Khoo and Fraser (1998) conducted student interviews to cross-check the findings derived from questionnaire responses prior to confirming the factor structure of the WIHIC questionnaire. Student interviews and qualitative comments enabled Khoo and Fraser (1998) to evaluate adult computer courses in Singapore and examine the reliability of the WIHIC questionnaire (originally developed for use with secondary school settings) when used in post-tertiary settings. In other words, qualitative research methods have been mainly used as reliability checks, as opposed to the main tools, for capturing how learning environments are viewed or experienced. This is the case, in spite of qualitative studies potentially revealing substantial insights into why students perceive their environments the way they do (Clarke, 1995). As a result, although qualitative methods were used in a limited number of studies in the past (Fraser, 2002), researchers have mostly utilised quantitative measures to capture participants' self-reported perceptions of the classroom climate, through a variety of psychosocial factors initially introduced by Moos (1976, see also Moos & Insel, 1974). These factors were then further examined alongside a range of outcome measures such as achievement (Walberg, Singh & Rasher, 1977) and satisfaction (Fraser, Pearse, & Azmi, 1982). In both pre-tertiary studies mentioned above, statistically significant relations were found between climate perceptions and student outcomes (see also Fraser, 1986). Consequently, Dorman (2002) argued that the majority of the current classroom climate research had been established using beta press methods of inquiry, whereby researching the overall psychosocial state of the classroom relied on the subjective views that students and teachers reported.

It may be that the definition of the classroom climate introduced by Babad (2009) and adapted by other colleagues implied, or even dictated, that quantitative measures were needed

in order to understand the *overall* state and shape of the classroom, and to establish patterns that could be generalised. This was also evident in the rationale for developing one of the earliest self-report questionnaires, the Learning Environment Inventory (Fraser, Anderson, & Walberg, 1982), whereby the authors argued the need for objective tools that would enable understanding overall classroom properties and patterns that could be measured and systematically studied against a range of other desirable outcomes (e.g., achievement). Nonetheless, the lack of qualitative studies in the class climate field, and the extent to which substantial insights can be established from the findings of such studies, is addressed via the mixed-method design employed in the current doctoral research.

Measuring the Class Climate Using Quantitative Methods

In line with the popular use of self-report data in class climate research (Cavanagh & Romanoski, 2006), a wide range of robust quantitative data collection instruments have been developed and validated in the literature to measure the classroom climate from the perspective of students and/or teachers (Nair & Fisher, 2001; Raviv, Raviv, & Reised, 1990). Some of the commonly used instruments include the Learning Environment Inventory (LEI; Walberg, Singh & Rasher, 1977), the Classroom Environment Scale (CES; Moos & Trickett, 1987), the Science Laboratory Environment Inventory (SLEI; Fraser & McRobbie, 1995), the My Class Inventory (MCI; Fisher & Fraser, 1981; Fraser, 1982), the Constructivist Learning Environment Survey (CLES; Taylor, Fraser & Fisher, 1997), the Questionnaire of Teacher Interactions (QTI; Coll, Taylor, & Fisher, 2002), and the What Is Happening In This Class questionnaire (WIHIC; Aldridge & Fraser, 2000). These instruments have been argued to be foundational to how the classroom climate is now studied in relation to student educational outcomes (Fraser, 1998, 2012). For example, Fraser (2012) included a review of these instruments and showed that there are now multiple versions of the above instruments to measure the class climate from the perspective of students or teachers, as well as to measure

the preferred versus actual or individual versus collective views of learning environments. Many of these instruments such as the QTI, MCI, CLES, and WIHIC have also been translated into different languages such as Arabic, Indonesian, Korean, Spanish, and Malay (Allen, 2003; Fernandez-Pascual, Ferrer-Cascales, Reig-Ferrer, Albaladejo-Blazuez, & Walker, 2015; Lee & Fraser, 2002; MacLeod & Fraser, 2010; Riah & Fraser, 1998; Soerjaningsih, Fraser & Aldridge, 2001).

However, it must be noted that the instruments listed above were initially developed for use with school-aged students, with researchers arguing for the use of some of these instruments across educational levels. For example, the QTI was originally developed for measuring secondary school environments, but is commonly used at the tertiary level as well (Coll, Taylor, & Fisher, 2002; Fraser, Aldridge, & Soerjaningsih, 2010). Another example is the different versions of the My Class Inventory (MCI; Fraser, 1982) that are suitable for measuring both primary as well as middle school environments (Sink & Spencer, 2005). Lastly, other studies have decided to combine climate factors from various scales and create questionnaires to use with tertiary and secondary school students such as the Student Interests and Motivation in Science Questionnaire (SIMSQ; Hassan, 2008) as well as the WIHIC (Afari et al., 2012). Therefore, one outstanding challenge in the literature surrounds the suitability, transferability, as well as relevance, of class climate instruments across the schooling as well as tertiary years of education.

Self-report questionnaires for measuring tertiary climate views. Despite the trends reported above, there have been a number of self-report questionnaires developed to specifically measure views of the tertiary learning environment in particular. These include questionnaires that are designed to measure specific kinds of tertiary environments such as the Constructivist On-Line Learning Environment Survey (COLLES; Taylor & Maor, 2000), the University Mathematics Classroom Environment Questionnaire (UMCEQ; Yin & Lu,

2014), and the Distance Education Learning Environments Survey (DELES; Walker & Fraser, 2005), or ones that measure specialist environments such as the Science Laboratory Environment Inventory (SLEI; Fraser & McRobbie, 1995). Other tools that measure face-to-face or traditional tertiary learning environments include the College and University Classroom Environment Inventory (CUCEI; Nair & Fisher, 2001), the Course Experience Questionnaire (CEQ; Lizzio, Wilson, & Simons, 2002), and the Student Evaluation of Student Quality (SEEQ; Coffey & Gibbs, 2001; Marsh, 1982). These tertiary learning environment questionnaires have been developed and used in a number of previous studies, and will be described in greater detail next. However, first, it must be noted that SEEQ was not initially developed to measure student views of the learning environment. Instead, it was developed as a tool for determining the quality of the tertiary education experience received and perceived by students. Because some of the SEEQ factors, which will also be detailed next, are similar to the ones included in other learning environment questionnaires (e.g., CEQ), including the SEEQ instrument as part of the review was vital to arguing for the potential connection between the quality of students' educational experience at the tertiary level and their views of their tertiary learning environments.

The Science Laboratory Environment Inventory (SLEI). Table 2.2 that follows this section describes some of the questionnaires that are commonly used at the tertiary level, the salient dimensions measured in each of those questionnaires, as well as the sources used for identifying these dimensions when the questionnaires were initially developed. Despite the SLEI being a context-specific instrument, designed to measure the climate of science laboratories in particular, the initial work involved with developing the SLEI was extensive (Fraser, Giddings, & McRobbie, 1992; Fraser & McRobbie, 1995). This is evident in the range of sources used for identifying salient dimensions to be measured in this instrument that includes an extensive review of the literature and existing subscales from other

questionnaires, as well as ensuring that the questionnaire measures were consistent with ones previously established and in line with Moos' dimensions of the class climate. The SLEI measures perceptions of science laboratory climates through five factors (student cohesiveness, open-endedness, integration, rule clarity, and material environment). The validation study of the SLEI involved a total of 5,447 students who were part of a cross-national sample of secondary school and university students involved in the field testing phase prior to conducting exploratory factor analyses to validate the factor structure (Fraser & McRobbie, 1995). The results from factor analyses suggested a 7-factor solution, with 5 items per factor, demonstrating acceptable levels of internal consistency ($\alpha > .70$ for all factors).

The same study (Fraser & McRobbie, 1995) also introduced a range of versions of the SLEI such as the actual versus preferred science laboratory climate, and personal versus class forms of that questionnaire (see also Fraser, Giddings, & McRobbie, 1995) which paved the way for other researchers in the field to investigate various types of climate perceptions in subsequent studies (e.g., Nair & Fisher, 2001; Raviv et al., 2010; Tsai, 1999). For example, whereas as example of an item on the SLEI's class form would be "Students are able to depend on each other for help during laboratory classes", an example of an item on the SLEI's personal form would be "I am able to depend on other students during laboratory classes". As a result, having different versions of the SLEI had enabled analysing climate views at the student and class level (Fraser, 1998). Moreover, the SLEI was shown to be a reliable and valid instrument using confirmatory factor analysis techniques in later studies (Ozkan, Cakiroglu, & Tekkaya, 2008), revealing strong reliability and validity indicators when examined across six countries (the USA, Australia, Canada, England, Israel, and Nigeria), using a sample of 1,720 students in 71 university laboratory environments (Fraser, Giddings, & McRobbie, 1992).

However, even though the SLEI's salient dimensions have been validated with a sample of secondary school and tertiary teachers, a student versus instructor version of the questionnaire was not initially developed to capture how the climate views of students and teachers may be similar or different. This is because earlier studies argued that students and teachers tended to report similar perceptions of the preferred, rather than the actual, classroom climate (Raviv et al., 1990), and a potential mismatch in climate perceptions have been argued in previous studies to be related to significantly lower levels of satisfaction and achievement (Alansari, 2011, 2012; Aldridge & Rowley, 1998; Fraser, 2002; Yarrow & Millwater, 1995). Finally, although the instrument development procedures included a validation process with students and teachers, it was discussed by Fraser and McRobbie (1995) how items were written or re-written first based on the researchers' understanding of the literature prior to including teachers or students in the process of verifying the relevance or suitability of these items. In other words, it can be argued that the development process primarily focused on the expertise of researchers and practitioners in the area when it came to identifying questionnaire salient dimensions, whereas student role was confirmatory to the process. What is more, it remains unclear in the literature whether the initial writing of items was based on reviewing the literature on secondary classroom climates, tertiary ones, or both. This is important to consider when developing future instruments in order to examine the similarities or differences in the climate factors investigated within and across educational levels.

The College and University Classroom Environment (CUCEI). The CUCEI has been described by Fraser (1998) as a historically important and contemporary tool, as it was the first widely used questionnaire to investigate tertiary learning environments (e.g., Coll, Taylor, & Fisher, 2002; Crump & Rennie, 2004; Gifford, 1998; Joiner, Malone, & Haimes, 2002; Li, 2014). The CUCEI measures tertiary climate views through seven factors

(personalisation, innovation, student cohesiveness, task orientation, individualisation, cooperation, and equity). In addition, Fraser (1998, 2012) also argued that the development of this tool influenced other researchers to develop other instruments to capture the multifaceted nature of tertiary environment such as the Constructivist On-Line Learning Environment Survey (COLLES; Taylor & Maor, 2000) and University Mathematics Classroom Environment Questionnaire (UMCEQ; Yin & Lu, 2014). The development of CUCEI also influenced researchers to develop other instruments that measured specific aspects of learning such as the Metacognitive Orientation Learning Environment Scale—Science (MOLES—S; Thomas, 2003), and the Student Personal Perception of Classroom Climate (SPPCC; Rowe, Kim, Baker, Kamphaus, & Horne, 2010). Both MOLES—S (for secondary students) and SPPCC (for primary students) are used at the pre-tertiary level of education.

Similar to the initial development procedures involved with creating and validating the SLEI, the authors of the CUCEI (Fraser, Treagust, & Dennis, 1986; Nair & Fisher, 2001) have also used a range of sources for identifying questionnaire salient dimensions such as including a literature review, researcher observations of secondary and tertiary classroom practices, interviews with secondary school teachers, as well as ensuring that the dimensions were in line with Moos' dimensions. Actual versus preferred class climate versions of the CUCEI have also been validated using exploratory factor analysis techniques for use with tertiary and upper secondary school environments ($\alpha > .70$ for both samples, Nair & Fisher, 2001; Gifford, 1998), using a sample of 504 Canadian and Australian tertiary and secondary school students. Despite the factor structure being explored in earlier studies (Fraser, Treagust, & Dennis, 1986), the psychometric properties of the instrument had been re-examined because the CUCEI was modified by replacing the factors measuring student perceptions of involvement and satisfaction with cooperation and equity (Nair & Fisher,

1999, 2001). Modifying the questionnaire factors, as discussed by Nair and Fisher (2001), was to allow investigating factors that were shown to be related to tertiary student interactions in subsequent studies following the initial development of the CUCEI (Fraser, Treagust, & Dennis, 1986). For example, whereas Ferguson and Fraser (1996) showed that student perceptions of equity were related to student gender in science classes, others have argued that the opportunities for students to cooperate on class activities are likely to vary as they transition to higher levels of education (Midgley, Eccles, & Feldlaufer, 1991). Therefore, the modified version contains a total of 49 items, corresponding to 7 factors in total and it demonstrated acceptable levels of reliability as indicated earlier (see Table 2.2 for a list of the factors).

Further, Li (2014) conducted a large study involving 4,617 undergraduate students in China aimed at validating the CUCEI in the context of Chinese learning environments. In that study, Li (2014) conducted exploratory and confirmatory factor analyses to establish the fit of the data collected from Chinese students on the hypothesised model introduced by Fisher et al. (1986). Unlike the 7-factor solution of the CUCEI introduced and consequently investigated by Nair and Fisher (2001), the EFA results from Li's (2014) study revealed an 8-factor solution, using eigenvalues over 1.0 as criteria for determining the number of factors to be extracted. Although this may indicate potential cultural variance of the measurement model (i.e., the factor structure may differ with respect to the cultural context in which students are situated within), once items with factor loadings below the absolute value of .40 were dropped, and the EFA was re-run, a 7-factor solution was then retained. Therefore, after deleting six items, Li (2014) demonstrated that the CUCEI had robust validity and reliability. This raises an important point regarding the applicability of the CUCEI in foreign tertiary learning environments (Maherzi, 2011; Ghaith, 2003) and the need to conduct a range

of statistical analyses to ensure the fit between the theory and data prior to making conclusions about what the data represents.

Similar to Li (2014), Alansari (2011) used the CUCEI to investigate the perceptions of 342 undergraduate students of their mathematics learning environments in New Zealand, but his study revealed that not all factors demonstrated acceptable levels of reliability ($\alpha < .60$ for innovation, student cohesiveness, and individualisation) when the factor structure was assumed to be similar to that confirmed by previous studies (e.g., Nair & Fisher, 1999, 2000). However, an earlier study conducted in New Zealand with 239 tertiary students revealed similar findings to those which Alansari (2011) had reported regarding the low levels of reliability of the CUCEI factor structure (Logan, Crump, & Rennie, 2006). Logan et al.'s (2006) exploratory factor analyses revealed that items from four different factors (personalisation, student cohesiveness, cooperation, and equity) loaded onto one component, with multiple substantial cross-loadings (above .30), and one factor (task orientation) not loading as a unique component. As a result, the Logan and colleagues concluded that the CUCEI "did not prove to be as reliable and valid as it had been expected from previous reports" (p. 78), and put forward a number of recommendations when using an unfamiliar instrument such as checking the appropriateness, length, and suitability of the instrument for the learning environment being evaluated (Logan et al., 2006).

Moreover, it is worth noting that Logan et al. (2006) assessed the perceptions of computer learning environments, whereas Alansari's (2011) assessed those of mathematics learning environments. Therefore, the lower levels of reliability concluded from both studies may have been due to the nature of the learning environments investigated and the subject being taught in those environments. For example, Chauvin and Bowdish (1998) have argued that the CUCEI is only appropriate for use in small learning environments such as seminars and tutorials. Chauvin and Bowdish's (1998) argument was supported by Yin and Lu (2014)

who provided a critique of the CUCEI and suggested that the instrument measured student perceptions of "abstracted albeit real" (p. 656) factors that may not be relevant to all tertiary environments. For example, investigating the extent to which students in a mathematics class choose the activities they want to work on during class (i.e., individualisation) may not be relevant to investigate in large mathematics classes that utilise a traditional lecturing style with minimal student input as in Alansari's (2011) study. Therefore, caution is needed when using the CUCEI to investigate specific characteristics of learning environments, and a better understanding of how the data fits the hypothesised factor structure of the CUCEI (e.g., via undertaking confirmatory factor analysis techniques; see Li, 2014) is suggested prior to making conclusions on the nature of the investigated tertiary environments.

Again, similar to the SLEI procedures, qualitative comments and student input were only considered to support or cross-check the quantitative measures written by the researchers when developing the CUCEI (Treagust & Fraser, 1986). The development procedures of both the SLEI and CUCEI could imply that student views or perspectives on what constitutes the climate may not represent an accurate point of reference or starting point for researchers when developing measures. Rather, student voice was included after the development of the questionnaire. If this underlying assumption is carried forward in the literature, then questionnaire development procedures will continue, in future studies, to heavily depend on how researchers conceptualise the classroom climate, and what aspects they believe that the climate consists of. One way of challenging this assumption is to have student input drive the initial development and identification of salient dimensions, followed by a process of cross-checking, as well as examining salience with the existing literature and theoretical framework underpinning the classroom climate literature. Doing so would enable future research to examine the similarities or differences in climate instruments when researchers, teachers, and students take turns in identifying dimensions and lead the

instrumentation process. However, no studies could be located in the literature that aimed to develop and validate classroom climate instruments using different stakeholders (i.e., students, teachers, and researchers) as starting points of reference to the instrumentation process, and to examine the features of the different versions of the resulting questionnaires.

Not only did Yin and Lu (2014) introduce and validate a new questionnaire to investigate Chinese students' perceptions of their mathematics learning environments (the University Mathematics Classroom Environment Questionnaire, UMCEQ; discussed in later sections), they also provided a critique of the existing instruments (e.g., CUCEI) designed to measure learning environments. That is, the introduction of the UMCEQ was a response to the critique they offered which suggested that there was a shortage of instruments for assessing tertiary class climates; that further work needed to be done to validate the measurement models introduced in previous studies using confirmatory factor analysis techniques and not just exploratory techniques; that many of the existing class climate instruments measured factors that were abstract, vague, or not specific enough to provide implications as to how that environment could be improved; and, lastly, that little work had been done in the past to develop instruments that were uniquely relevant to the Chinese context. An example of the last argument was Li's (2014) study, in which the CUCEI was adapted for use with Chinese students and teachers, following the examination of its factor structure and whether the measurement model that was originally validated using a sample of Canadian and Australian students would fit the data collected from Chinese students and teachers. As mentioned above, Li did not find acceptable fit to the data.

Despite the CUCEI demonstrating acceptable levels of reliability and robust validity when used in various cultural contexts (Fraser, 2012; Li, 2014), what is being alluded to from reviewing the studies above is the loss of opportunity to reveal or explore other climate factors that may be unique to certain contexts (e.g., different cultures, universities, or

disciplines). That is, by adapting instruments that were driven by researchers' intuitive understanding of the classroom climate area or ones that were developed in other contexts, researchers may restrict themselves from exploring possible new climate factors and continue to re-invent the wheel by measuring a similar range of factors irrespective of the instrument they choose to use. Further, because of the limited number of qualitative studies that investigate tertiary class climates, there is a lack of reliance on qualitative studies to explore student conceptions of various learning environments (Babad, 2009; Fraser, 1998), and, hence, it becomes difficult to understand the ways in which climate factors may differ by culture or discipline. This is possibly another reason why Yin and Lu (2014) have argued for the need to develop a context- and content-specific questionnaire that is unique to mathematics environments, with its psychometric properties being explored and validated using a sample of Chinese students, prior to utilising it for investigating the climate of such environments. This new instrument is the University Mathematics Classroom Environment Questionnaire (UMCEQ; Yin & Lu, 2014) described next.

The University Mathematics Classroom Environment Questionnaire. The UMCEQ measures perceptions of tertiary mathematics learning environments through eight factors (support, satisfaction, difficulty, cooperation, competition, innovation, autonomy, and discipline). Exploratory and confirmatory factors analyses (EFA and CFA), using two samples of 1,476 and 1,024 tertiary students in China, were conducted to establish the psychometric properties of that instrument by examining its reliability, discriminant validity, and construct validity indicators. Results of the CFA showed that an 8-factor structure with 48 items had good data fit, with moderate to high factor loadings, acceptable levels of reliability ($\alpha > .70$ for all factors), and inter-factor mean correlations using Pearson's *r* correlation (0.10–0.69) indicating the overlap between factors was reasonable. Therefore, the model with eight distinct factors could be retained (see Table 2.2 for a list of all factors).

The initial development procedures for the UMCEQ were also included in Yin and Lu's (2014) study. They explained that the above procedures were guided by three criteria that included ensuring that the factors developed were consistent with those in existing classroom environment questionnaires, in line with Moos' categories, and were relevant to tertiary mathematics learning environments. Similar to the procedures included in the development of CUCEI and SLEI, the authors decided on the original content of 107 items before consulting two expert researchers in the areas of higher education and classroom climate on these items. Once the two processes above were completed, students were then invited to comment on the readability and ease of understanding of the developed set of items. In other words, despite new instruments emerging over time to measure how tertiary climates are viewed by students, they still depend on the expert opinions of researchers or teachers but not necessarily students. Moreover, even in studies where student input has been included to guide the instrumentation process, student views have often been treated as secondary data or a reliability check as opposed to being an integral part of the instrumentation process (Fraser & McRobbie, 1995; Fraser, Treagust, & Dennis, 1986; Yin & Lu, 2014).

The Constructivist On-Line Learning Environment Survey (COLLES), and the Distance Education Learning Environments Survey (DELES). To start with, both the COLLES and DELES (Taylor & Maor, 2000; Walker & Fraser, 2005) have been validated in the literature to specifically measure views and beliefs of students regarding virtual learning environments (i.e., conducted online), but they are relatively new measures when compared to the other tools that will be discussed in this section. The COLLES contains six factors (professional relevance, reflective thinking, interactivity, cognitive demand, affective support, and interpretation of meaning), whereas the DELES contains six (instructor support, student interaction, personal relevance, authentic learning, active learning, and student

autonomy). The instrumentation procedures for both tools involved conducting a literature review on practices and beliefs that may enhance the online experience of students (Walker & Fraser, 2005), as well as aligning the questionnaire factors with existing theory (e.g., Moos' dimensions of class climate). In other words, the procedures involved with developing both tools were mostly researcher-driven, as indicated by the lack of student or teacher data involved in the process of validating the factors measured. Fraser and McRobbie (1995) have argued that, in doing so, the tools may be compromising the reliability of the data collected if the factors measured turn out to be irrelevant or inaccurate representations of the online learning environments in question. Therefore, it would be interesting to re-examine the factor structure of the aforementioned tools using student and teacher input regarding the online environment aspects that could be investigated.

General remarks. So far, the previous sections have discussed some of the common questionnaires that have been used to investigate the climate of various learning environments. What distinguishes the next two questionnaires that will be discussed (the Classroom Experience Questionnaire and Student Evaluation of Educational Quality survey) in the next section is that they did not emerge out of the classroom climate literature. Also, both instruments were not developed in line with Moos' dimensions of the class climate. Rather, the two instruments emerged out of an extensive review on higher education, reports on effective pedagogy, course evaluations, performance indicators, and evaluations of 'good' or 'quality' teaching as reported by teachers (Byrne & Flood, 2003; Coffey & Gibbs, 2001; Keeley et al., 2006; Marsh, 1982; Yin & Wang, 2014, 2015; Yin, Wang, & Han, 2016). However, over time, the two instruments have become increasingly used in classroom climate research as predictors of educational outcomes such as achievement and skill development (Lizzio et al., 2002), or alongside other psychosocial variables that have provided additional

insights into classroom life such as approaches to learning (Trigwell & Prosser, 1991) and student perceptions of learning value and peer interaction (Gibbs & Coffey, 2004).

Further, some of the factors measured by CEQ and SEEQ such as group interactions, communicating goals or expectations, and rapport are argued in this thesis to be socially derived and psychologically internalised. That is, these factors involve a process of socialisation that could influence how students think about themselves as learners, as well as think about the class as a learning environment that may support or hinder their opportunities to learn (Marsh, 2007; Marsh & Roche, 1997; Ramsden, 1991b). As a result, it is not surprising to find either instrument included in the literature on the social-psychological aspects of the classroom, despite some of the factors measured by these questionnaires (e.g., appropriate workload and generic skills) not being typically investigated within the social-psychological framework that underpins the class climate research. The CEQ will be discussed next, followed by the SEEQ.

The Course Experience Questionnaire (CEQ). The rationale for developing the CEQ was similar to that of the UMCEQ in the sense that both instruments were created in response to the shortage of tools that enable practitioners and policy makers to make improvements to the overall experience of students in tertiary settings. Despite the CEQ demonstrating acceptable levels of reliability and robust validity when it was first developed (Ramsden, 1991a; Elphinstone, 1990), some criticism had been documented in the literature against using student ratings or evaluations of their tertiary environments, such as the ones captured by CEQ, as a reliable source of information to guide improvements to tertiary practice (e.g., Emery, Kramer, & Tian, 2003; Smith, 1988; Sproule, 2000). However, the work of Marsh (1987, 2007) and colleagues over the past 40 years (Feldman, 1978; Roe & Macdonald, 1983; Spooren & Brockx, 2013) has shown a need to consider the relevance and reliability of students' ratings and perspectives as indicators of the overall learning

environment. In addition, following an extensive review on the literature around students' evaluations of university teaching, Marsh (2007) concluded that student ratings, perceptions, or perspectives of tertiary practices were reliable and valid in relation to a variety of classroom outcomes such as achievement. Marsh's (2007) findings above were indicated as part of his review of 41 tertiary studies where moderate mean correlations were found for the statistically significant relations between students' achievement and student evaluations of course structure, clarity of instructions, group interactions, and teacher-student relationships. No additional information by Marsh (2007) was provided regarding the specific studies involved such as the sample size, design, or demographics of the participants.

However, the findings by Marsh (2007) have encouraged other authors in the field to validate and use the CEQ when investigating tertiary learning environments (e.g., Yin & Wang, 2014, 2015; Yin, Wang, & Han, 2016), given the important findings which have connected student views with the range of psychosocial variables stated above as well as achievement. The CEQ (or CEQ36) had gone through a number of iterations in previous years, with the final version being comprised of 36 items measuring six factors (good teaching, clear goals and standards, appropriate assessment, appropriate workload, independence, and generic skills). The original version (CEQ30) was comprised of 30 items measuring five factors (Ramsden, 1991a), with 'generic skills' being added into the questionnaire in later iterations once a 6-factor solution had been shown to demonstrate acceptable levels of reliability and robust validity. The inclusion of a new factor was due to the increasing pressure on tertiary education providers to measure the extent to which students were acquiring the transferable skills needed when joining the workforce (Lizzio et al., 2002; Wilson et al., 1997).

Wilson et al. (1997) reported on the results of validating the CEQ36, using exploratory followed by confirmatory factor analysis techniques among three large samples

of 1,362; 2,130 and 4,415 tertiary students from various Australian universities, and 14 faculties. There was an equal split of gender in all three samples. As a result, two versions of the CEQ were validated: A long form consisting of 36 items (CEQ36), and a short form consisting of 23 items (CEQ23). When examined, both forms demonstrated acceptable levels of goodness-of-fit indicators following the confirmatory factor analysis carried out in Wilson et al.'s (1997) study. However, the authors did not rule out the possibility of using the original version 30 items (CEQ30) measuring five factors (i.e., without the factor 'generic skills'). However, the CEQ30 was found to be problematic when previously used with a sample of British students (Richardson, 1994) but a relatively smaller sample of social science students was recruited in that study (*n* = 95 students), there was missing data and the sample consisted of three times as many female students as male ones (66 female students versus 23 male students). In that study, the exploratory factor analysis carried out by Richardson (1994) suggested a single factor solution only, as judged by the scree plot generated and the single eigenvalue greater than 1.0. This was despite the internal consistencies for the five-factor model meeting the acceptable threshold of .70 and above. Therefore, it may be that the poor reliability indicators of the CEQ30 reported by Richardson (1994) were related to the small sample size investigated in that study, and that a larger diverse sample of students may have been needed to either confirm or dismiss the possibility of a reliable 5-factor, 30-item, version of the CEQ.

Regardless of whether the CEQ contains five or six factors, the procedures involved related to identifying salient factors to be measured in that instrument mainly consisted of reviewing the literature on learning environment factors that were either popular or attracting the attention of researchers, as well as reviewing previous instruments and the factors that had previously been identified as crucial to student learning (Ramsden, 1991a; Lizzio et al., 2002; Wilson, Lizzio, & Ramsden, 1997). This was particularly evident when the sixth

factor, general skills, was added to the CEQ and there was no mention or consideration of student perspectives when investigating the importance or relevance of that factor to students' course experience. In other words, a similar pattern among all the tertiary climate questionnaires reviewed so far (COLLES, DELES, SLEI, CUCEI, and UMCEQ, and CEQ) is evident, whereby student perspectives have been either neglected or not considered important to the instrument development procedures (i.e., only used as a cross checking method as opposed to a dimension identification tool). As indicated earlier in this review, it is argued in this thesis that student voice is important to consider given the importance of aligning students' perceptions of their preferred with actual learning environments as a step towards improving the outcomes of those environments (Alansari, 2012; Gifford, 1998; Raviv et al., 1990; Yarrow & Millwater, 1995).

The Student Evaluation of Education Quality survey (SEEQ). Whereas other instruments such as the CUCEI, SLEI and UMCEQ had been developed to capture overall views of the classroom climate, SEEQ was developed to capture overall views of the quality of experience that students have been exposed to at the tertiary level, which encompasses a wider range of factors beyond the classroom or institutional climate (Coffey & Gibbs, 2001; Marsh, 1982). For example, the instrument measures student evaluations of the assessment and examination processes, which include procedural course aspects that may not take place in the classroom. Further, the SEEQ was initially developed by Marsh (1982) in response to the discouraging views at the time on the use of student evaluations of teaching as accurate estimators and predictors of student learning needs and outcomes. Interestingly, this was a similar rationale to that for introducing the CEQ (Ramsden (1991a, see also Wilson et al., 1997), with more recent publications indicating that the value and reliability of students' evaluations of teaching and learning practices are still being questioned in the literature (Grammatikopoulos, Linardakis, Gregoriadis, & Oikonomidis, 2015; Marsh, 2007). This

suggests that further research is needed to establish stronger evidence for the reliability, utility, and influence of students' views on classroom outcomes, which is what this thesis attempts to do.

SEEQ measures indicators of "effective teaching" (Marsh & Roche, 1993) through nine factors (learning, instructor enthusiasm, organisation, group interaction, rapport, breadth of coverage, examination, assignments, and workload/difficulty, see Table 2.2 later) and has demonstrated high levels of reliability in previous studies ($\alpha > .88$, Coffey & Gibbs, 2001). In their meta-analysis of 193 correlational studies conducted at the tertiary level, Wright and Jenkins-Guarnieri (2012) showed that the size of the bivariate relations between SEEQ factors and achievement ranged from small to medium. Again, despite such results being concluded from correlational analyses, and hence causation cannot be inferred, they still signify the importance of student views of teaching-learning processes and practices, and the potential links between those and student achievement.

Interestingly, the SEEQ measures a range of in-class processes that other class climate instruments also measure albeit labelled differently. For example, the factor "group interaction" is measured in CUCEI by a combination of "student cohesiveness" and "cooperation"; "organisation or clarity" is measured in SLEI by "rule clarity"; and "rapport" is measured in COLLES by "affective support". Yet, SEEQ and other class climate instruments continue to be studied or used separately, as the latter are part of the literature on learning environments, whereas SEEQ is considered to be part of the literature on effective teaching, and indicators of quality education (Marsh, 2007; Marsh & Roche, 1997; Ramsden, 1991a). As a result, one worrying implication of the above separation in the literature, surrounds perpetuating the false notion that classroom quality and climate cannot be seen as equivalent or implicative of each other. A discussion on climate versus quality was presented by Allodi (2010), and will be covered in later sections.

Lastly, what distinguishes SEEQ from other instruments, is the process of identifying salient factors which was based on psychometric properties as opposed to aligning with learning theories (Coffey & Gibbs, 2001). That is, SEEQ factors were established by analysing previous student and teacher evaluations (Marsh, 2007) and how these might have been associated with a range of educational outcomes such as student achievement. Further, the instrumentation process of SEEQ meant that the 9-factor model was not established on the grounds of theoretical or empirical frameworks, but only statistical. Therefore, it would be interesting to establish whether similar constructs to SEEQ can be identified if students were asked about their views of a quality education experience, which is a qualitative technique that will be used in this doctoral research.

Table 2.2

Description of Tertiary Data Collection Instruments, Factors Measured, and Sources for Identifying Salient Dimensions

Instrument	Factors	Sources for identifying salient dimensions
The Constructivist On-Line Learning Environment Survey (COLLES; Taylor & Maor, 2000)	Professional relevance Reflective thinking Interactivity Cognitive demand Affective support Interpretation of meaning	• Literature review • Salience to Moos' dimensions
The Distance Education Learning Environments Survey (DELES; Walker & Fraser, 2005)	Instructor support Student interaction Personal relevance Authentic learning Active learning Student autonomy	• Literature review • Salience to Moos' dimensions
The Science Laboratory Environment Inventory (SLEI; Fraser & McRobbie, 1995)	Student cohesiveness Open-endedness Integration Rule clarity Material environment	• Literature review • Combining subscales from various instruments • Validation process with tertiary students and teachers • Validation process with secondary school students and teachers • Salience to Moos' dimensions
The College and University Classroom Environment Inventory (CUCEI; Fraser, Treagust, & Dennis, 1986; Nair & Fisher, 2001),	Personalisation Innovation Student cohesiveness Task orientation Individualisation Cooperation Equity	• Literature review • Researcher observations • Teacher interviews • Consistency with secondary school instruments • Validation process with tertiary teachers and students • Salience to Moos' dimensions

The University Mathematics Classroom Environment Questionnaire (UMCEQ; Yin & Lu, 2014)	Support Satisfaction Difficulty Cooperation Competition Innovation Autonomy Discipline	• Literature review • Consistency with other climate instruments • Salience to Moos' dimensions • Validation process with Chinese tertiary students
The Course Experience Questionnaire (CEQ; Lizzio, Wilson, & Simons, 2002; Ramsden, 1991a)	Good teaching Clear goals and standards Appropriate assessment Appropriate workload Independence Generic skills	• Literature review • Combining subscales from various instruments
The Student Evaluation of Student Quality (SEEQ; Coffey & Gibbs, 2001; Marsh, 1982)	Learning/Value Instructor enthusiasm Organisation/Clarity Group Interaction Rapport Breadth of coverage Examination/Grading Assignments/Readings Workload/Difficulty	• Psychometric analyses of tertiary student and teacher evaluations

General remarks on tertiary class climate self-report questionnaires. When examining the procedures undertaken to develop the various instruments introduced above, across educational levels, one pattern found was that most instruments either did not consider student perspectives when salient constructs were identified for inclusion in the questionnaire or student views were treated as a secondary step following experts' opinions on what class climate instruments should measure. This was evident when reviewing the scale development procedures of various instruments such as the COLLES, SLEI, CEQ, and CUCEI (Fraser & McRobbie, 1995; Nair & Fisher, 2001; Ramsden, 1991a; Taylor & Maor, 2000). Therefore, within the current literature with the exception of a few instruments such as the WIHIC, it seems that the process of determining what goes into, and hence what is left out of, the learning environment questionnaires heavily depends on either the expertise of the researchers and classroom teachers, but does not necessarily consider student perspectives.

Perhaps, this trend (i.e., largely excluding student perspectives when developing evaluative tools) is not unique to the learning environments research area. For example, Keeley, Smith, and Buskist (2006) created a teacher behaviours check-list, aimed at improving the professional development of tertiary teaching staff. In their study, Keeley et al. (2006) developed a check-list that enabled teachers to rate each other, or it could be used for students to rate their teachers, in order to identify the in-class explicit behaviours teachers exhibited that could enhance student learning outcomes. An exploratory factor analysis using 313 tertiary students in the United States suggested that these behaviours could be categorised into two subscales which were 'Care and Support', and 'Professional Competence and Communication Skills'. However, Keeley et al. (2006) relied mostly on the expert opinions of researchers and teachers identified as outstanding when developing the tool. It must also be noted that the link between investigating student evaluations of teacher behaviours using this tool, and the overall climate that teachers help co-construct has not

been established in the literature as yet, despite existing evidence that theorises such links to exist (e.g., Aldridge & Rowley, 1998; Fraser, 1998, 2002; Fraser & McRobbie, 1995; Raviv et al. 1990;Yarrow & Millwater, 1995). That is, positive evaluations of teacher behaviours are likely to be associated with positive levels of achievement and satisfaction with the learning environment.

Other instruments such as the CUCEI did take into account staff as well as *tertiary* students' views, but also aimed at having "consistency with *secondary*-school instruments" by aligning their questionnaire subscales with ones "contained in existing instruments for the *secondary*-school level" (Fraser & Treagust, 1986, p. 40). Similarly to the argument presented earlier, this raises a number of threats to the relevance and applicability of CUCEI to a range of tertiary learning environments, and the extent of similarity between secondary versus tertiary climate factors. This is important to investigate to avoid any threats to the validity of conclusions made when instruments are validated using cross-level criteria.

When considering the WIHIC, a learning environment questionnaire initially designed for use at the secondary level, Fraser (2012) described it as "the most frequently used classroom instrument around the world today" (p. 1205) for a range of reasons detailed in his review of the learning environment research. Some of these reasons included the strong theoretical background and rationale behind the salient scales in that questionnaire, the combination of personal and collective perceptions of the class measured by the questionnaire, the comprehensive statistical analyses over large and diverse populations of secondary school students, and the validation process of the instrument which involved interviewing secondary school science students about their views of their classroom environments in general. Therefore, in order to design a tertiary learning environments questionnaire that is as common and easy to use as the WIHIC tool, any newly developed questionnaire would need to capture student views of the various aspects of the classroom

that could be measured, as well as the researcher's understanding of the theoretical framework underpinning the development of such a questionnaire. In doing so, the instrumentation process would become student oriented, while maintaining its empirical and theoretical grounds. This is the approach taken in the current thesis.

So far, this chapter has presented a conceptual framework for understanding the classroom climate, or learning environment, and how it has been typically measured in the current literature. It has been shown that the current tertiary class climate questionnaires either have not included student perspectives during the instrumentation process, or they have used those perspectives as cross-checks to fulfil procedural needs, rather than as an initial step in designing the questionnaire. Incorporating student views from the outset has been argued to be important given the significant associations established in previous studies between student climate views and outcomes. The next section reviews some key elements that comprise this thesis, by first introducing findings related to the tertiary class climate area, and then discussing the current body of work around the relations between student perceptions of the tertiary class climate and student educational and academic outcomes. This discussion will then be followed by summarising the literature gaps that this thesis will aim to address.

Tertiary Learning Environments

Studies of tertiary learning environments are relatively few in comparison to studies carried out at the pre-tertiary levels. Even fewer studies have examined how student perceptions of the learning environment are formed, and mediate or moderate other psychosocial beliefs. This observation is in spite of previous arguments made in the literature for the potential links between tertiary class climate views and the overall well-being of students and their performance in these classes (Nair, 2003; Nair & Fisher, 1999), given such relations have already been established at the pre-tertiary level. Moreover, Booth (1997) and

Ramsden (1991b) have argued that the learning experience of students in tertiary classrooms has been found to be important when investigating what a preferred setting in tertiary classrooms was. That is, in studies where university students have been asked to comment on their preferred learning settings and expectations of a conducive learning environment, they have placed great emphasis on student-teacher interactions, student involvement with the learning tasks and assessments, and the inter-personal relationships that their professors had with them (Alt, 2017; Booth, 1997; Ramsden, 1991). Therefore, it is possible that the way students evaluate the learning environment is influenced by their initial expectations of the teaching-learning practices that are likely to take place in the classroom.

In saying so, the majority of the available literature has moved away from attempting to define the learning environment as a construct, and more towards examining how it is associated with a range of outcome variables (Alt, 2017; Yarrow & Millwater, 1995). As a result, there is now a shortage of research at the tertiary level designed to investigate how different psychosocial beliefs interact to influence the formation of student views of the learning environment. This is important given the available literature suggesting a strong and positive association between tertiary learning environments perceived as positive and enhanced student outcomes (Fraser, 2002; Hattie, 2012), which will be discussed next. Understanding how students form judgements about the learning environment could move researchers a step closer towards understanding how a positive impact on such judgements of the learning environment could be made. This is especially since studies have established meaningful connections between tertiary students' climate perceptions and greater levels of perceived degree of teaching quality (Ramsden, 1991), class cohesion and involvement (Henderson, Fisher & Fraser, 2000), and performance (Hattie, 2009; Walberg, 1979).

Associations between the Classroom Climate and Educational Outcomes

Despite the infrequent publication of studies involving tertiary learning environments, the available ones are supportive of the connections between a positively viewed class climate and student outcomes, which will be discussed next. One common pattern across the studies reviewed in this chapter is that they are mostly quantitative and either descriptive or exploratory (e.g., Alt, 2017), with fewer ones employing longitudinal, quasi-experimental, experimental, or mixed-methods designs. This was one reason why the doctoral research reported in this thesis employed a mixed-method approach to explore the tertiary learning environment. The lack of experimental studies in educational research is not surprising, given the methodological issues associated with forming control versus experimental groups of students nested within classrooms and schools (Cobb et al., 2003). It is difficult to randomly assign students to classes. This leaves room for longitudinal, quasi-experimental research to flourish in future studies.

The available exploratory studies include one by Alt (2015) who showed that strong and positive views of the learning environment significantly predicted students' academic self-efficacy beliefs (i.e., beliefs about own performance and accomplishing tasks in a given domain) in Social Science courses. In their study, a critique of the CLES, designed to measure constructivist learning environments at the secondary level, was presented and followed by a modified version to explore constructivist environments but at the tertiary level. However, whereas the relations above indicated a moderate-to-strong connection between the academic self-efficacy beliefs and climate perceptions of 167 tertiary students in Australia, Alt (2015) used an instrument that was initially developed for distance learning environments (i.e., conducted online; Tenenbaum, Naidu, Jegede, & Austin, 2001) to investigate "Problem-Based Learning (PBL)" environments that were informed by constructivist theory. In other words, the rationale for choosing an instrument that may not

have been relevant to Problem-Based Learning environments was not clearly indicated by Alt (2015), and it poses questions regarding the suitability of the instrument used within tertiary constructivist environments. Additional studies that address the above critique are suggested, given the importance of alignment between the nature of environments investigated and the tool used to do so (Logan, Crump, & Rennie, 2006), and to avoid threats to the validity of inferences drawn from the relations reported by Alt (2015). This is especially since another study by Alzubaidi, Aldridge, & Khine (2016) also found statistically significant relations between the academic self-efficacy beliefs and climate perceptions of 994 tertiary students in Jordan, except the relations found in Alzubaidi et al.'s (2016) study were weak.

The issue of ensuring the relevance between the climate dimensions measured and the tools that enable accurate measurement of those dimensions seems to be replicated in another study by Bi (2015). In that study, the learning environment views of 1,000 undergraduate tertiary students in China studying English were captured using the WIHIC, a commonly used instrument for secondary school learning environments. Although the author argued that the questionnaire had been modified through field testing to suit the Chinese context, no additional information was provided regarding the field testing process, and whether the field testing had been done with teachers or students. In spite of this limitation, the large sample size in that study enabled the investigation of how a suite of climate perceptions may be related to student motivational beliefs, using canonical correlations. Bi (2015) showed that higher levels of perceived task orientation and involvement were moderately related to higher levels of perceived intrinsic interest, social responsibility, and individual development. The same study also revealed that higher levels of perceived teacher support (emotional and academic) were significantly, albeit weakly, associated with higher levels of perceived motivation to learn English as well as achievement. That is, student views of tertiary learning environments were shown to have had a significant positive association with student

motivational beliefs and achievement. The findings above by Bi (2015) are promising, as they suggest that student views of the climate may be related to other psychosocial variables alongside achievement, which is another underlying reason for the investigation of various psychosocial variables within the same tertiary context in this doctoral research.

Another study by Maherzi (2011) explored the climate perceptions of 137 university students in Saudi Arabia alongside their motivational beliefs. However, it must be noted that although Maherzi (2011) used a class climate instrument that was pre-established, information regarding the details of that instrument were omitted and only details about the salient factors were included (teacher communication style, and feedback; $\alpha = .67$ for both factors). Keeping in mind the marginally acceptable levels of internal consistency, the study showed that student perceptions of the classroom climate were significantly associated with student motivation, such that perceptions of autonomy positively predicted the three types of intrinsic motivation measured in that study (intrinsic motivation to know; intrinsic motivation to accomplish, and intrinsic motivation to experience stimulation), with these relations being weak-to-moderate. The same study (Maherzi, 2011) also revealed that teacher control positively predicted student amotivation levels, as well as other forms of motivation such as external regulation and introjected regulation. Again, these relations were also found to be weak-to-moderate.

The finding that perceptions of the class climate were significantly related to student motivational beliefs was also demonstrated by Myers and Claus (2012). In their study, Myers and Claus (2012) found that that 174 university students' motivation for communicating with their instructors was positively related to their perceptions of the classroom climate, measured by self-report perceptions of peer academic support and cooperation, with these relations being medium in size ($.43 < r < .32$; $p < .001$). Examining the results from both studies suggests a clear and positive connection between perceptions of class climate and

motivational beliefs. However, neither of these studies measured achievement as an outcome variable as part of their exploratory design. Therefore, given the evidence above, it was decided to investigate students' tertiary climate perceptions and motivational beliefs, alongside their achievement in the current thesis, which will be discussed later.

Moreover, medical education researchers have been increasingly paying attention to how the psychosocial climate may be related to the performance of students in their classes. In a study involving 391 undergraduate students in a nursing programme (Rania, Siri, Bagnasco, Aleo, & Sasso, 2014), statistically significant and moderate correlations were found between student self-report perceptions of the classroom climate, self-esteem, well-being, and peer relationships. The authors concluded their article by suggesting the need for more educational interventions to examine the possibility of improving the quality of tertiary classroom climates (Rania et al., 2014). Indeed, using a quasi-experimental design, Koohestani and Baghcheghi (2016) demonstrated that student perceptions of the classroom climate, measured by the CUCEI, could be experimentally enhanced by changing the teaching techniques used by university instructors in a small cohort of nursing students (n = 38). However, given the small sample size as well as the lack of a control group utilised in the study above (Koohestani & Baghcheghi, 2016), it may be worthwhile to further investigate Rania et al.'s (2014) suggestion for future research to use a larger and more diverse sample size. Indeed, it is important to ensure that Rania et al.'s (2014) suggestions for future research are considered, in order to ensure that a range of study designs are being employed in the learning environments research area.

However, an exception to the long list of exploratory or descriptive studies that have been previously carried out within the field of the class climate, is a large-scale longitudinal study by Kim and Lundberg (2016), who examined a range of psychosocial variables among 5,169 American undergraduate students and found weak-to-moderate relations. The authors

concluded that, controlling for student demographics such as gender and ethnicity, student perceptions of student-teacher interactions were significantly related to greater levels of classroom engagement, belongingness, perceived self-challenge (i.e., the adoption of mastery goals), and greater rates of cognitive skills development by the time the students reached final year of university. These findings are promising because they suggest a potential longitudinal influence of climate factors, such as student-teacher interactions, on students' academic trajectories. Studies such as this one confirm the need for more studies that utilise longitudinal or multivariate data which can move the field beyond what has been the more typical exploratory studies.

Moreover, a study involving 273 undergraduate architecture students from Nigeria showed that controlling for demographics such as year of study, gender, and age of students, student perceptions of the learning environment predicted students' performance and accounted for 22% of its variance (Oluwatayo, Aderonmu, & Aduwo, 2015). The authors concluded that students with positive perceptions recorded better grades than those who perceived their learning environments as more negative. These findings are in line with those of other studies that have been conducted employing a similar exploratory design, for example, one that included a sample of 508 medical students from India (Mayya & Roff, 2004) and, another, 226 medical students from India (Abraham, Ramnarayan, Vinod, & Torke, 2008). In both these studies, students who reported positive views of their tertiary class climate scored substantially higher marks than those who did not. Therefore, there seems to be some evidence in support of the positive influence tertiary learning environments can have on student motivational and self-beliefs, as well as achievement, across disciplines and controlling for demographic variables such as the ones mentioned above (see also Gilbert, Musu-Gillette, Woolley, Karabenich, Strutchens, & Martin, 2014; Jelas, Azman, Zulnaidi, & Ahmad, 2016). As discussed earlier, there also appear to be long-term relations

between students' perceptions of their student-teacher interactions, and their perceived levels of classroom engagement, belongingness, perceived self-challenge, as well as their rates of cognitive skills development (Kim & Lundberg, 2016). Despite these observations, studies investigating the tertiary climate have remained infrequent, which motivated the topic of the current doctoral research.

The argument that studies investigating tertiary learning environment are limited is not new, and has been previously voiced by Allodi (2010; see also Alansari, 2012, 2011). In an analysis of the body of literature concerning research in higher education, Allodi (2010) offered a range of possible explanations for the neglect of social-psychological studies in tertiary education. These explanations included the over-emphasis on discipline and managing student behaviour in previous studies as opposed to the overall state of the learning environment (Alberto & Troutman, 2012; Good & Brophy, 2008). It was further suggested by Allodi (2010) that practitioners and researchers alike may not necessarily equate 'climate' with 'quality', as the traditional view has been to equate the latter with pedagogical and instructional knowledge, and this body of research therefore interfered with researchers investigating the social and psychological state of their classrooms. However, given that there is no evidence to support this dualistic approach to climate versus pedagogy, Allodi (2010, see also Dewey, 1997) suggested that such a belief was potentially a misconception that needed to be further addressed in the literature. In doing so, it would be possible for psychosocial studies in higher education to flourish.

The infrequency of tertiary climate studies. In order to illustrate the under-representation of tertiary climate studies in the literature, a small-scale systematic review was conducted in addition to the wider comprehensive review being presented in this chapter. To do so, studies published in the last ten years (2006–2016) in the most prominent and leading journal in the field, *Learning Environments Research*, were examined to investigate the

percentage of published papers that focused on tertiary learning environments in particular. A total of 214 papers were downloaded and categorised based on their educational level of focus (i.e., tertiary, secondary, or primary and early childhood). Papers that utilised samples from out-of-school contexts (e.g., museum education), and non-empirical ones (e.g., reviews) were categorised as 'other'. Studies that recruited participants from more than one sector (e.g., primary and secondary school aged-students), were re-categorised based on the emphasis or focus of the literature reviewed in that paper. Therefore, no papers included in the 'other' category contained university-aged students as part of their sample. Finally, percentages were calculated and comparisons made between tertiary-focused versus pre-tertiary-focused studies, and are presented in Table 2.3 below.

Table 2.3

Percentage of Papers Published in Learning Environments Research Journal by Educational Level of Focus

Educational Level of Focus	*N*	Percentage
Tertiary	63	29.4%
Secondary	96	44.9%
Primary and Early Childhood	36	16.8%
Other	19	8.9%
Total	214	100%

As can be seen from Table 2.3 above, just over a quarter of all 214 papers published over the period of ten years (29.4%) were focused on tertiary learning environments, whereas 61.7% of papers (n = 132) were carried out at the pre-tertiary level (i.e., secondary, primary, and early childhood). These tertiary studies included ones that explored the linear relations between climate views and outcomes, as well as ones that focused on developing instruments or replicating existing ones in different contexts (e.g., developing different versions of a questionnaire or translating it into another language). Findings from this exercise, in

conjunction with the arguments made by Allodi (2010) on the infrequency of tertiary climate studies, provide another reason for investigating the social-psychological state of tertiary environments, and examining relations with outcomes such as student achievement, motivation to learn, and beliefs about success.

So far, this chapter has covered the theoretical framework that underpins the current understanding of class climate as a psychosocial construct, the frequently used tools for investigating various class climates, and the literature surrounding tertiary learning environments (which is the main focus of this thesis). It has been shown in previous sections that the class climate literature has often been of a quantitative nature, employing exploratory or descriptive self-report designs, to investigate the relations between climate perceptions and typically a single outcome variable being another psychosocial variable (e.g., academic self-efficacy, alzubaidi, Aldridge, & Khine, 2016) or achievement (Oluwatayo, Aderonmu, & Aduwo, 2015). What has also been alluded to in the last section is the potential relations between climate views and a range of other self-beliefs and perceptions about learning and performance (Ramsden, 1991; Henderson, Fisher & Fraser, 2000; Hattie, 2009; Walberg, 1979). One particular relation that is being investigated in this thesis which has not been typically investigated in previous tertiary studies is the relations between student self-expectations and class climate perceptions. A discussion of student self-expectations, including the rationale behind investigating its potential links with learning environment views at the tertiary level, is covered next.

Self-Expectation Beliefs and the Learning Environment

As will be discussed in this section, it is important to investigate tertiary students' self-expectation beliefs given the existing literature that has established strong ties between such beliefs and achievement in the schooling years (Corbett, Wilson, & Williams, 2002; Rubie-Davies, Peterson, Irving, Widdowson & Dixon, 2010; Skaalvik & Skaalvik, 2004; Van

Eerde & Thierry, 1996). There has been less emphasis on investigating similar relations at the tertiary level (for an exception which will be discussed later, see Jones & Grieneeks, 1970). Previous research has shown that strong and positive students' self-expectation beliefs serve as powerful predictors of student achievement and success (Rubie-Davies et al., 2010). That is, self-expectation beliefs, which encompass a set of predictions regarding students' current or future levels of performance, could motivate students to design steps allowing them to achieve their goals in alignment with the expectation beliefs that they hold about their current or future level of performance (Rubie-Davies et al., 2010; Rubie-Davies, 2007). The reporting of specific expectations (ranging from high to low) regarding learning and performance has been associated with certain learning behaviours that students engage in which help them to reach high levels of achievement or hinder their chances of success (Babad, 1998). In particular, expectations for success have been positively associated with greater levels of student-teacher interactions, student effort, and task engagement in previous research (e.g., Corbett, Wilson, & Williams, 2002).

Moreover, such learning behaviours have been shown to be related to the amount of learning and emotional support students are exposed to (Babad, 2009), as well as to the amount of control, persistence and effort these students exhibit in classrooms. Skaalvik and Skaalvik (2004), for example, showed that students who reported higher levels of performance- or self-expectations demonstrated higher levels of intrinsic motivation, and argued that these students were more likely to be motivated in areas they felt confident in mastering (see also Bandura, 1989). In other words, high self-expectations could facilitate the adoption of positive perceptions of mastery and foster intrinsic motivation, leading to increased effort and persistence (Ames, 1992) and to enhanced student achievement (Hattie, 2009).

However, it must be noted that many of the studies reported above were carried at the pre-tertiary level, and there is a lack of studies that investigated similar patterns at the post-secondary level. To illustrate, one of the few studies that could be located which found statistically significant correlations between tertiary students' self-expectation beliefs and achievement was published more than 40 years ago (i.e., Jones & Grieneeks, 1970) and this study has been infrequently cited since then. In addition, a recent master's thesis project (Houston, 2016) was located in which the self-expectations of 592 undergraduate psychology students in the United States were found to be significantly correlated with their perceived peer expectations, mother expectations, father expectations, college GPA, and course grade. These relations were found to be moderate-to-strong. Despite Houston's (2016) study following the traditional or linear manner of exploring relations in the literature, it revealed strong bivariate relations between a number of psychosocial beliefs, and showed that self-expectations have a significant association with achievement, albeit associations of a small-to-moderate size. Further, because of its quantitative design as well as linear method of analysis, Houston (2016) did not explore how students' self-expectation beliefs were formed. Because few studies have investigated the predictive ability of self-expectations on student outcomes and how these self-expectations may have been influenced by other classroom variables, this thesis will build on the existing yet limited literature on tertiary students' self-expectations, and investigate relations with student views of the class climate. This investigation is important to carry out given the existing research at other education levels which has shown connections between high self-expectation beliefs, and exhibiting greater effort and persistence, and performance (e.g., Corbett, Wilson, & Williams, 2002; Houston, 2016; Wooten, 1998).

One study by Wooten (1998) was located in the literature that examined relations among tertiary students' self-expectation beliefs, learning behaviours, motivation, and

achievement. The relations above were investigated using a multi-group structural equation model on a sample of 271 accounting students, who were further divided into “traditional” (i.e., 24 years or younger) versus “non-traditional” (25 years or older) students. This was part of the study’s aim, to assess the strength of the relations for traditional versus non-traditional students. Wooten (1998) hypothesised a model in which student self-expectations and learning behaviours would positively predict motivation and effort, which would positively predict performance for both groups. Indeed, the results showed that self-expectations significantly predicted student motivation for traditional and non-traditional students; student learning behaviours significantly predicted the motivational levels of traditional and non-traditional students; and students’ perceived effort predicted the performance of both traditional and non-traditional students.

However, despite reporting strong regression estimates, the study had a number of limitations that pose a serious threat to the inferences drawn. These include that the goodness-of-fit indices did not meet acceptable levels of reliability (TLI < .90, NFI < .80); the lack of reporting on internal consistency indicators such as Cronbach’s alpha values; the extraction and use of a single-item general motivation question out of the whole subscale (Tubbs & Dahl, 1991) without providing a rationale for doing so; and the writing of six new items intended to measure student learning progress without providing any theoretical or empirical evidence for the underlying construct Wooten (1998) intended to capture by those six items. Moreover, the study above, was conducted with a specific sample of accounting students, used confirmatory factor analyses on new items that had not been explored in previous literature, which suggested that an exploratory factor analysis would have been more appropriate to conduct (Thompson, 2004). Given the range of limitations discussed above, it is difficult to trust the conclusions put forward by Wooten (1998). Nonetheless, the findings in Wooten’s (1998) study offer a different perspective and suggest a potential

relation between students' psychosocial beliefs and achievement, as shown by the significant relations found in that study. Therefore, capturing a more diverse sample of tertiary students, using a robust and reliable questionnaire to capture students' self-expectations and motivational beliefs, is suggested in future studies and constitutes one of the research gaps that will be addressed in this thesis.

Some studies have shown that students carry pre-conceived expectations about the type of environment they will be in at the tertiary level based on the features or characteristics of the learning environments they were previously exposed to in their secondary schooling years (e.g., McInnis, James & Hartley, 2000). Nevertheless, other studies have demonstrated that students were aware that university life and study would be relatively different from secondary school, yet their self-report expectations of the tertiary learning environment did not align with what their university teachers considered to be realistic (Crisp, Palmer, Turnball, Nettelbeck, Ward, LeCouteur, Sarris, Strelan & Schneider, 2009). For example, university teachers thought that the amount of feedback students demanded as well as the time to return marked coursework was unrealistic (students expected marked work to be returned within a week), and that expectations should be discussed early in the first semester to modify such expectations. Students also expected staff to be available for support outside of class time whereas staff reported that such an expectation was unreasonable, and that they only expected to be available during their working hours. Crisp et al. (2009) also showed that students who expected university study to be different from secondary school reported expecting to have greater independence, more freedom, and staff reading and commenting on their work on a regular basis.

Student expectations of tertiary learning environments. Findings regarding university-student expectations require additional and robust investigation, and not a lot of research has been dedicated to investigating discrepancies between student expectations of

the tertiary environment and what students actually experience, as well as possible reasons for why these discrepancies could emerge. Whereas some studies have suggested that student expectations of tertiary environments are very specific and consistent across various disciplines (e.g., Sander, Stevenson, King, & Coates, 2000); exploring student self-expectation beliefs along with other psychosocial constructs (e.g., examining students' self-expectations versus their expectations of tertiary environments) is rare, and there have not been many studies that have captured student self-expectation beliefs across disciplines, in line with Sander et al.'s (2000) argument. This is despite the accumulating evidence at the pre-tertiary level suggesting strong and multiple links between positive and high self-expectation beliefs reported by students and positive classroom outcomes measured by achievement and various attitudinal scales (e.g., Skaalvik & Skaalvik, 2004; Rubie-Davies, 2010). An exception to this argument is a study conducted by Zimmerman, Schmidt, Becker, Peterson, and Surdick (2014) who argued that "the expectations of [university] instructors and students shape the learning environment" (p. 3). However, despite such a quote, the authors measured the course and self-expectations, academic self-efficacy, engagement levels, and the perceived instructor-student relationship of 9,300 university students, but not their learning environment views. Nonetheless, the study concluded by arguing for the benefits of understanding student self-expectations, alongside a range of psychosocial variables, in order to foster positive learning environments at the tertiary level. These benefits included enhanced classroom interactions, clarity of instruction and communication, and higher levels of perceived academic self-efficacy (Zimmerman et al., 2014).

Studies that have attempted to position and link self-expectation beliefs to other types of beliefs and self-perceptions include ones conducted by Skaalvik and Skaalvik (2004) and Rubie-Davies (2006, 2010) at the pre-tertiary level, and Zimmerman et al.'s (2014) large study at the post-secondary level. In these studies, a number of psychosocial constructs were

investigated alongside expectation beliefs including student academic self-concept, intrinsic motivation, self-esteem, verbal and mathematics self-concept, and academic self-efficacy. The results showed statistically significant relations among these constructs, as well as their relations to student achievement. Although these studies were mainly conducted within school settings, the results signalled the importance of carrying out similar studies at all educational levels. This is further supported by another study conducted at the secondary level, where the self-expectations, academic self-concept, and motivational beliefs of 7,729 students were shown to positively predict student achievement in both mathematics and science (Suarez-Alvarez, Fernandez-Alonso, & Muniz, 2014).

In their study, Suarez-Alvarez et al. (2014) used self-report questionnaires to measure students' general academic motivation and academic self-expectations. The questionnaires were developed and validated prior to conducting the main analyses. Suarez-Alvarez et al. (2014) showed that, using hierarchical linear multiple regressions, mathematics achievement was significantly predicted by students' academic self-concept, socioeconomic status, and self-expectations. In the same study, it was also found that science achievement was significantly predicted by students' academic self-concept, socioeconomic status, self-expectations. Whereas all the relations found above were positive and weak-to-moderate, the authors found that students' general motivational beliefs negatively predicted their achievement in both science and mathematics. However, Suarez-Alvarez et al. (2014) did not provide possible reasons for the negative relations between general motivational beliefs and achievement in both subjects. This is especially since the reported correlation coefficients between motivation and achievement in the study were positive for both subjects. Lastly, the statistically significant and moderate correlations reported by Suarez-Alvarez et al. (2014) between students' self-expectations and motivational beliefs, mathematics achievement, and science achievement suggest that replication at the tertiary level would be useful. It would be

interesting to determine whether similar patterns could be established among tertiary students. The investigation of multiple psychosocial variables within the same tertiary context is a research direction that will be addressed in the current doctoral thesis.

Overall, studies where multiple types of beliefs are investigated in the same context remain limited in numbers, despite the statistically and practically significant relations found among these variables in previous research. If anything, the significant results above point to the observation that the beliefs-achievement relationship may not necessarily be linear or univariate and, therefore, these relations require further study. In doing so, it would be possible to explore changes in student achievement through exploring the interaction of a set of beliefs as moderating student achievement or as mediating the link between one belief and achievement.

Given the strong ties established at the pre-tertiary level between self-expectation beliefs and a variety of motivation variables, as well as between motivation factors and achievement, it is worthwhile to explore how student motivation is related to student climate perceptions and outcomes at the tertiary level. This will be explored in the following section.

Academic Motivation and the Learning Environment

Within the last 50 years, a number of social-cognitive frameworks have been developed to describe how student motivation influences the process of learning (Weiner, 1992). Each of these frameworks has identified various factors related to motivation and learning within classroom settings (e.g., Gilbert, Musu-Gillette, Woolley, Karabenick, Strutchens, & Martin, 2014; Alexander, 2006). The term *motivation* refers broadly to an internal process or energy that explains the variations in human behaviour over time (Wentzel, 2003; Keller, 2010).

Current studies on motivational theories are moving away from looking at motivational constructs in isolation, and more towards examining the relations between

student motivation alongside student cognitive and affective outcomes (Partin & Haney, 2012). Social-cognitive theories and frameworks also stress the causal role of mental structures and how beliefs influence student motivation. That is, these theories emphasise how a student's *internalised* beliefs, attitudes, and knowledge are translated into learning behaviours reflecting motivation to achieve (Wentzel & Wigfield, 1998, 2009; Keller, 2010). Therefore, motivation is seen as a cognitive process, facilitated through teaching and learning, which starts from student beliefs and ends with student achievement (Boekaerts, Pintrich & Zeidner, 2000). The next section explores the theoretical and empirical literature on achievement goal orientation, which is the motivational theory used in this doctoral research. Achievement goals are being increasingly studied because of their significant association with, if not impact on, a number of students' cognitive, emotional, and behavioural measures. For example, task-goals have been shown to be negatively correlated with test anxiety (Ku, Dittmar, & Banerjee, 2012), whereas self-goals have been shown to be positively correlated with the adoption of mastery goals and higher achievement rates (Mouratidis, Vansteenkiste, Lens, Michou, & Soenens, 2013).

It must be noted that the achievement goals model has evolved over the past three decades, starting with a 2-factor model through to the latest 6-factor model that will be used in this study. Therefore, the following section will cover the chronological evolution of the achievement goals model, followed by a discussion of the literature that has used the most recent iteration in tertiary studies. It will be argued that, although achievement goal theory is widely used, only a few studies have used the 3 x 2 model to investigate tertiary students' achievement goals. Even fewer studies have investigated the relations between achievement goals, self-expectations, and class climate perceptions in the same context alongside achievement.

Achievement goal orientation. Indeed, motivated learners seem to achieve substantially better than those who are less motivated (Goodenow, 1993; Marsh & Yeung, 1997; Bong, 2001). In studies where student motivation have been examined alongside student achievement across various educational levels, statistically significant relations have been found and attributed to a number of factors including the types of goals students set for their achievement (Wentzel & Wigfield, 2009). Goal types or orientations reflect students' beliefs about developing, versus demonstrating, ability or competence, as well as their implicit views of intelligence (Dweck, 1986). These concepts form the basis for achievement goal theory (Dweck & Leggett, 1988). According to this theory, not all students set similar goals in the classroom. Some choose to pursue ability *development* (mastery goals) as their primary purpose when introduced to new tasks, whereas others choose to pursue ability *demonstration* (performance goals) when introduced to such tasks. The distinction and study of mastery versus performance goals was popular in the 1980s when those two types of goals were seen as dichotomous or opposite in terms of conceptualisation as well as relations with achievement (i.e., mastery associated with positive outcomes versus performance associated with negative outcomes; Senko, Hulleman, & Harackiewicz, 2011). However, over time, the notion of an "either or" model of achievement goals was revised in the 1990s, with researchers such as Midgley et al. (1998) arguing for a re-look into performance goals in particular when they found mixed findings linking performance goals with both positive and negative student outcomes.

Midgley et al. (1998) argued for the existence of three types of achievement goal orientations: Mastery goal orientation, performance-approach goal orientation, and performance-avoid goal orientation. The main distinction between the latter three types of orientation is whether students wish to develop competence and mastery, demonstrate competence, or avoid demonstrating incompetence (Midgley et al., 1998). When students are

oriented to mastery goals, Midgley et al. (2000) argued that they seek to develop their competence, perceive learning as an end in itself, and are task-focused. Although the attention is focused on the self, when students are oriented to either performance-approach or performance-avoid goals; performance-avoid goals have been mainly associated with either maladaptive patterns of learning or lower achievement gains than those who adopt other goals (see also Eppler & Harju, 1997; Midgley et al., 1998). For example, a study conducted by Chen (2015), which included a sample of 371 Chinese university students, showed that mastery goals positively predicted life satisfaction, whereas only performance-avoid goals negatively predicted positive affect. Another study which included a sample of 366 Pharmacy students showed that negative associations were only found between performance-avoid goals and student preference for teachers who encouraged rigorous thinking and self-direction (Alrakaf, Sainsbury, Rose, & Smith, 2014). The above relations were not found to be significant for performance-approach or mastery goals. In addition to the studies above, significantly lower levels of achievement have also, and only, been found for students who were focused on not being identified as incompetent as opposed to those who were focused on demonstrating competence in the classroom (Wolters, 2004; Midgley et al., 1998; Eppler & Harju, 1997).

Therefore, while the original framework consisted of two main dimensions (i.e., mastery versus performance goals), conceptualising performance goals as either performance-avoid or performance-approach constituted the next iteration of the achievement goals model, given the varied implications of the two types on student beliefs and achievement. For example, in a study involving 203 university students (Ranellucci, Hall, & Goetz, 2015), a structural equation model illustrated the benefits of mastery goals for students' emotions, whereas performance-approach goals predicted less critical thinking, and performance-avoid goals predicted higher levels of perceived anxiety, boredom, and lower

achievement gains. Another study conducted in Taiwan analysed questionnaire responses of 431 university students and showed that mastery goals negatively predicted student motivation for academic dishonesty (Yang, Huang, & Chen, 2013).

Despite the emergence of the 3-factor model of achievement goals, many theorists continued to see it as a "performance versus mastery" model, with more recent studies arguing for the need to move towards a "multiple goals" model (e.g., Elliot & Moller, 2003) where all goals could be conceptualised as having positive or negative influences on student outcomes. As a result, Elliot and colleagues have been instrumental in publishing studies that further conceptualise and measure achievement goals as four unique constructs: Mastery-avoid, mastery-approach, performance-avoid, and performance-approach goals (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). Whereas the three original goals have remained conceptually the same, Hulleman et al. (2010) described the focus of mastery-avoid goals as to "avoid being unable to master a task or activity, failing to learn or develop skills … or being unable to live up to one's recognised potential" (p. 426). Because the concept of mastery-avoidance is relatively new in the achievement goals literature, only a few studies have investigated its relation with other outcome variables (e.g., Coutinho & Neuman, 2008). To illustrate, Moller and Elliot (2006) conducted a review of the relations between the 2 x 2 achievement goals model and a range of outcome variables and concluded that, despite the limited literature utilising that theory, performance-goals had been reported in their review as the most consistent and strongest predictor of student outcomes compared to the other three goals. Further, the authors argued that, overall, mastery-avoidance and performance-avoidance were associated with the most negative outcomes such as increased anxiety, lower achievement gains, and the adoption of surface level cognitive processing skills (Moller & Elliot, 2006).

However, the same group of colleagues who introduced the 2 x 2 model of achievement goals (see Elliot, Muryama, & Pekrun, 2011) then refined the model into a 3 x 2 taxonomy. In the most recent iteration, goal orientations were further categorised into six types of goals depending on how students defined competence and whether their aim was to approach success or avoid failure. The shift to a 3 x 2 model was due to the argument that the current conceptualisation of mastery-approach goals included two different standards for evaluating competence: task-based and self-based standards. Elliot et al. (2011) further argued that, using the same rationale, performance-approach included another two standards for evaluating competence: other-based and task-based standards. As a result of unpacking the different standards, or sources, that individuals may use to evaluate their own competence, it was decided to theorise a 6-factor achievement goals model. This was followed by a second study within the same publication that examined the goodness-of-fit indices for a 3 x 2 model against a number of alternative models, and found that the hypothesised 3 x 2 model was superior to all other tested models, using a confirmatory factor analysis technique on a sample of 319 undergraduate students in the United States. Lastly, the six factors with the 3 x 2 model, have all demonstrated acceptable levels of internal consistency ($\alpha > .83$).

Therefore, the 3 x 2 achievement goals model suggested that students could focus on getting a task right versus avoid doing the task incorrectly (task-approach versus task-avoidance goals); attain self-competence versus avoiding self-based incompetence (self-approach versus self-avoidance goals); or outperform others versus avoiding other-based incompetence (other-approach versus other-avoidance goals). Using the model above, a follow-up study by Mascret, Elliot, and Cury (2015) validated the 6-factor model and established significant links between task-goals, in particular, and a range of positive beliefs, such as interest and competence among undergraduate students.

In their study, Mascret et al. (2015) used the 3 x 2 achievement goals model to investigate the relations between the types of goals that 679 undergraduate students in a sports education class in France reported adopting, their conceptions of athletic ability (i.e., whether students had an incremental versus entity view of athletic ability), perceived competence, and interest. All factors demonstrated acceptable levels of internal consistency, as reported in the study ($\alpha > .70$), with a confirmatory factor analysis supporting a 6-factor solution to be used in subsequent analyses. It was later found that, whereas there were no gender differences in student responses, there were no statistically significant relations between the adoption of task-avoidance goals, self-avoidance goals, and the other psychosocial variables investigated in the study. However, perceived competence was positively correlated with task-approach goals and other-approach goals; interest was positively correlated with task-approach goals and self-approach goals; adopting an incremental view of athletic ability was positively correlated with task-approach goals and self-approach goals; and adopting an entity view of athletic ability was positively correlated with other-approach goals and other-avoidance goals. The above relations were found to be weak-to-moderate.

Interestingly, an entity view of athletic ability was mainly associated with other-oriented goals, whereas an incremental view of athletic ability was mainly associated with self- and task-oriented goals in Mascret et al.'s (2014) investigation. Previous studies have found that students who adopted more incremental beliefs also had significantly higher levels of achievement and perceived competence (Gonida, Kiosseoglou, & Leondari, 2006), whereas those who adopted more entity beliefs were found to have a more "flat" academic trajectory than their peers (i.e., slower rate of achievement gains; Blackwell & Trzesniewski, 2007). Therefore, it may be that understanding the types of achievement goals students adopt will help researchers understand the academic trajectory of those students and ways to lift it.

Nevertheless, similarly to the majority of the studies reported earlier, Mascret et al. (2015) utilised a correlational design in their study, which restricts the authors from concluding causation from the weak relations found in their study. Further, because Mascret et al. (2015) did not measure achievement, it was not possible to test the relations between students' psychosocial beliefs and their achievement. Therefore, examining the association between a range of psychosocial variables, including achievement goals, and student achievement is suggested for future research and is also addressed in the current doctoral study.

Current research on achievement goal orientation is flourishing, and Maehr and Zusho have (2009) argued that this is because setting goals creates motivational systems or steps for students to engage in throughout the learning process. That is, achievement goal orientations are likely to influence students' self-regulation and metacognitive strategies, interest in task engagement, levels of anxiety, likelihood of help-seeking when needed, task choices, and academic performance (for an extensive discussion see Maehr & Zusho, 2009). Therefore, achievement goals are being increasingly studied because of their significant association with, if not impact on, a number of students' cognitive, emotional, and behavioural measures. For example, task-goals have been shown to be negatively correlated with test anxiety (Ku, Dittmar, & Banerjee, 2012), whereas self-goals have been shown to be positively correlated with the adoption of mastery goals and higher achievement rates (Mouratidis, Vansteenkiste, Lens, Michou, & Soenens, 2013). It may be that, by developing competence and self-goals in particular academic domains, students were likely to build a firm sense of efficacy in that domain, leading to a repertoire of prior mastery experiences which were likely to strengthen their confidence in that academic domain (Bandura, 1989; Bong & Skaalvik, 2003). Interestingly, no tertiary studies were located in the literature that explored student class climate views and how these fostered the adoption of specific achievement goals, using Elliot et al.'s (2011) 3 x 2 model, alongside achievement. Given the findings discussed above

suggesting significant links between various achievement goals, learning behaviours, student beliefs, and performance (Fryer, Ginns, & Walker, 2014; Mascret, Elliot, & Cury, 2015; Maehr & Zusho, 2009; Pulkka & Niemivirta, 2013), it is important to replicate similar studies at the tertiary level and explore how tertiary climate perceptions may be related to the adoption of specific goals, alongside other psychosocial variables and achievement, to better understand the factors that help or hinder tertiary students' opportunities to learn. It is anticipated that such future research directions will be addressed via this doctoral research. The next and final section of this chapter re-visits the literature gaps that were signalled throughout the review, which will then lead to introducing the main research questions underpinning the current investigation.

Research Questions

A number of gaps in the literature have been signalled throughout the review presented above. These gaps formed the basis for this doctoral research. They include the under-representation of a theoretical and empirical body of work that distinguishes the tertiary climate as a unique context for learning processes and outcomes; the under-representation of student views and voice that guide the development of class climate instruments; and the lack of mixed-method and qualitative studies that explore the interplay of various psychosocial variables within the same tertiary context, which may be related to student achievement.

As a result and a response to the gaps identified above, this doctoral project employed a mixed-method sequential design underpinned by three major interconnected research questions aimed at investigating the social psychology of the tertiary classroom. Each research question corresponded to a study which was carried out as part of this doctoral project. The studies, as guided by the research questions below, included investigating various variables seen as self or *individual* factors such as student self-expectations and

motivational beliefs; variables seen as classroom or *contextual* factors such as student assessments of the overall classroom climate; and variables seen as *outcomes* such as student academic achievement. The research questions, therefore, were:

1. What qualities or characteristics do tertiary students want to experience in their learning environments?
2. What are the psychometric properties of the new learning environment instrument developed to measure the qualities or characteristics that tertiary students identified as contributing to the tertiary classroom climate?
3. What are the relations between student perceptions of the learning environment, motivational and self-beliefs, expectation beliefs, and student achievement?

The following three chapters will present the three studies designed to address the corresponding research questions above. Chapter Three details the first study, which used semi-structured interviews to explore student conceptions of tertiary learning environments. This was followed by a quantified taxonomy of student climate perceptions which were categorised with respect to type (qualities or behaviours), focus (teacher or student), and influence (positive or negative). Then, Chapter Four presents the second study, which used the findings of Study One to create and validate a quantitative survey instrument designed to measure student tertiary climate views. Following on from the second study, Chapter Five presents the third and final study, which validated the instrument developed in Study Two and then used this instrument to examine student perceptions of the class climate in relation to student self-expectations, motivational beliefs, and self-reported achievement. A discussion of the limitations and future research directions is included at the end of each study as well as in the final chapter. Lastly, a general discussion of the findings from all three studies is presented in Chapter Six, including a discussion of the significant contributions that this doctoral research adds to the theoretical and empirical body of the existing international literature.

CHAPTER THREE

FROM THE IDEAL TO THE DREADED: UNIVERSITY LEARNING ENVIRONMENTS (STUDY ONE)

This chapter presents the first of three studies in this doctoral research project. The study explored student conceptions of typical, ideal, and dreaded tertiary learning environments using a qualitative data analytic approach, followed by a quantified taxonomy of the student conceptions that arose from the data. The results of this study will be used to create and validate a learning environment questionnaire designed to measure student conceptions of tertiary learning environments. The resultant questionnaire would be employed in further investigations comprising Studies Two and Three of the thesis. Therefore, the research question pertaining to the current study was: What qualities or characteristics do tertiary students want to experience in their learning environments?

Method

Participants

A total of 24 undergraduate students from one large university in New Zealand were selected to participate in semi-structured interviews. Of these participants, 14 were female students (58.3%). Students identified as New Zealand European (45.8%), Asian (29.2%), Māori (4.2%), Pasifika (4.2%) and Other (16.7%). To account for the differences in learning environments by discipline, a diverse sample of students was selected from six different faculties: education (n = 7, 29.2%), arts (n = 6, 25%), science (n = 5, 20.8%), law (n = 3, 12.5%), business (n = 2, 8.3%), and medical and health sciences (n = 1, 4.2%). The participants had had an average of 2.67 years of study (SD = 1.37) at their university.

Materials

Semi-structured interviews were carried out with the 24 participants. The decision to conduct the interviews in a semi-structured manner was because of the type of data required to answer this study's research question. Minichiello, Aroni, Timewell, and Alexander (1990; see also Breakwell, Hammond, Fife-Schaw, & Smith, 2006) argued for a continuum of interviewing methods, ranging from structured to unstructured interviewing techniques. While structured interview methods are standardised with pre-determined responses for participants to choose from, unstructured interview methods are non-standardised, allowing for in-depth and non-restricted responses (i.e., responses are flexible and not pre-established, with general and open-ended interview questions). In the current study, all participants were expected to give flexible and open-ended responses to their perceptions of different types of learning environments (e.g., small versus large learning environments, and ideal versus typical versus dreaded learning environments). Because a semi-structured procedure was being employed, this meant that the interview protocol needed to pose constraints, with the interview questions guiding the participants to think of specific learning environments, without giving them pre-determined responses to choose from. As a result, the semi-structured interview method was deemed appropriate for the research design of this study.

The interviews were audio-recorded and transcribed by the researcher. Qualitative analyses enabled the researcher to understand student conceptions of the university classroom culture and the different practices that took place in small versus large, and dreaded versus typical versus ideal learning environments, at the tertiary level. The interviews were guided by a set of key open-ended questions (Mutch, 2013) and key interview techniques such as prompting and probing were also used to gain an in-depth understanding of the answers provided by participants. Prompts such as "Why?" or "What do you mean?", and probes such as "What are the students doing in the class?" or "What does the teacher do in the

class?" were used to ensure that participants were able to explain and justify their responses, as well as expand on them. It has been found that in studies where prompting and probing techniques have been used during interviews, participants are more likely to provide critical and relevant insights to the questions, as these techniques of prompting and probing have been shown to facilitate higher-order thinking skills (e.g., Brown, 1986; Smith, Chen, & Liu, 2008).

At the university in which the study took place, small learning environments such as laboratories and tutorials could include up to 40 students, depending on the subject. Hence small learning environments were defined as ones having 40 students or fewer, whereas large learning environments such as lectures or large interactive classes were classified as ones having more than 40 students. Therefore, participants were first asked to comment on their views of typical, ideal, and dreaded large learning environments, and then to do the same for small learning environments. This is important given the findings of Clarke (1995) who argued for a negative association between class size and learning outcomes, suggesting that students may perceive small and large classes differently (see also Cuseo, 2007; Ehrenberg, Brewer, Gamoran, & Willms, 2001). Therefore, it was decided to differentiate responses by class size. Further, studies of pre-tertiary learning environments have shown that student conceptions of expected, preferred, and actual learning environments might not always align (see Fraser, 2002, for a review of pre-tertiary learning environment studies). This led to the proposition that tertiary students' conceptions of those environments may also not align, and that it was important in this study to capture both the negative and positive aspects of student conceptions by exploring student views of typical, ideal, and dreaded learning situations. As a result, the key interview questions were (see Appendix B for the complete interview protocol):

1. When you think about a typical large learning environment, what do you see?

2. When you think about an ideal large learning environment, what do you see?
3. When you think about a dreaded large learning environment, what do you see?
4. When you think about a typical small learning environment, what do you see?
5. When you think about an ideal small learning environment, what do you see?
6. When you think about a dreaded small learning environment, what do you see?

Procedures

First, Ethical approval was gained for this study (Ref. 012236) from the University of Auckland Human Participants Ethics Committee (UAHPEC). Following approval, all eight faculty deans were contacted to gain their approval to approach course coordinators in their faculties. Six faculty deans agreed for the researcher to approach course coordinators: science, arts, law, medical and health sciences, education, and business. Course coordinators were then contacted in those six faculties to gain their approval to approach undergraduate students during class time and provide them with information sheets about being involved in this research project. The sampling procedures for courses and, consequently, participants are detailed below.

Because it was important to recruit student participants at different stages of their studies who had attended both small and large classes, a stratified purposive sampling technique (Punch, 2009) was used when choosing which courses, and hence course coordinators, to approach. This technique involved identifying a pool of potential participants with specific eligibility criteria (e.g., students who have attended a range of small and large classes throughout their programme of study), who were also assigned into year groups or strata. In the case of this study, each group or stratum represented a year level within a faculty.

All courses taught within the academic semester in which this study took place were scrutinised before approaching course coordinators. It was decided that, within each year

level, eight randomly selected courses would be approached about being involved in this study. The choice of eight corresponded to a minimum of two gender groups and a minimum of four ethnic groups, given the diverse demographics of students at that university, and the potentially varying experiences in different learning environments. All six faculties offered more than eight courses at each year level, and the typical length of undergraduate degrees in those faculties was three to four years.

Eight random undergraduate courses from each year level (ranging from first to fourth year courses) in all six faculties were chosen by downloading a list of all courses on offer, assigning them numbers, and using a computer software program to generate eight random numbers, corresponding to eight courses, at each year level. This was done for each faculty separately. As a result, an email invitation was sent out to 192 course coordinators about involving their students in this study, of which 24 course coordinators (12.5%) replied and agreed for the researcher to approach students during class time and provide them with information sheets about the research project. This low response rate was not unexpected as previous studies have shown that web-based research invitations are likely to yield response rates as low as 13% (for a study on the differences in response rates by mode of data collection, see Dillman, Phelps, Tortora, Swift, Kohrell, Berck, & Messer, 2009).

The information sheets for students included a brief account of the research project, its aims and duration, what was expected of participants, along with the contact details of the researcher for those who wished to take part in the research project. This meant that students needed to self-select to be involved in the study. Those students who agreed to participate in the research project were provided with participant information sheets and consent forms indicating their agreement to be interviewed and audio-recorded. All interviews were scheduled and conducted within one academic semester (i.e., four months) in one of the

university meeting rooms. Following data collection, all interviews were transcribed and coded. The data analysis started, as detailed in the next subsection.

Data Analysis Plan

Before analysing the data, an independent rater was asked to re-code three randomly chosen transcripts of the 24 interview transcripts to examine the reliability of the data coding process. The coding of the independent rater was then compared against the researcher's initial coding, and both were used to calculate a Cohen's kappa statistic of inter-rater agreement as a measure of data reliability, and to ensure that the qualitative data coding process did not result in substantial measurement error. Landis and Koch (1977) argued for the use of Cohen's kappa (Cohen 1960, see also Cohen, 1968) as it takes into account the probability of random agreement among raters which could inflate the value of kappa incorrectly. Calculating kappa can be done using the formula:

$$\kappa = 1 - \frac{1 - p_0}{1 - p_1}$$

where p_0 represents the observed proportion of agreement among raters, and p_1 represents the hypothetical probability of raters agreeing by chance. Cohen's kappa can also be calculated using the statistical software package SPSS.

As a result, three kappa values were calculated for each of the three transcripts, as shown in Table 3.1 below. Landis and Koch (1977) provided guidelines for interpreting kappa statistics (ranging from 0 to 1) such that a coefficient's value between .41 and .60 indicates moderate agreement, values between .61 and .80 indicate strong agreement, and values above .81 indicate almost perfect agreement. Therefore, the kappa coefficients found in this study suggest high levels of data reliability ($\kappa > .80$).

Table 3.1

Cohen's Kappa Coefficient for the Three Transcripts Analysed for Inter-Rater Reliability

	κ	Standard Error	95% Confidence Interval
Transcript 1	.87***	.05	(.97, .77)
Transcript 2	.81***	.06	(.93, .69)
Transcript 3	.85***	.05	(.95, .75)

Note. ***p < .001.

Given the rich nature of the qualitative data collected from the interviews, a thematic analysis approach was used for identifying, analysing, and reporting themes within the data (Braun & Clarke, 2006). This was needed because the aim of the study was to group, or compartmentalise, the rich data into meaningful units (i.e., themes and subthemes) that described the multifaceted nature of tertiary learning environments, which is what a thematic analysis allows for. Punch (2009) described this type of analysis as an attempt to "find and conceptualise regularities in the data" (p. 190). In the context of this study, a theme represents a data category in relation to the research question (e.g., teacher qualities, or student behaviours), and a subtheme would represent a specific aspect (e.g., teacher passion, or student note-taking) that fell under that category. Braun and Clarke (2006) identified six phases of thematic analysis that described the process by which the emerging themes were explored, refined, and finalised. These phases are detailed in Table 3.2 below.

Table 3.2

Description of the Six Phases of Thematic Analysis

Phase	Description of the Phase
1. Familiarise yourself with the data	Transcribing, reading and re-reading the data while noting down initial codes.
2. Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes	Checking if the themes work in relation to the coded extracts and the entire data set. A thematic 'map' of analysis at this stage is recommended.
5. Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6. Producing the report	Selection of vivid, compelling extract examples, final analysis of selected extracts relating the analysis to the research question and literature.

Note. This table is adopted from Braun and Clarke (2006).

The second part of the data analysis plan involved creating a codebook using a Microsoft Excel spreadsheet, where all the codes (i.e., the collated data of similar features) were grouped under the main themes and subthemes found for each of the different types of learning environments investigated. Then, the frequency of occurrences of each subtheme and theme were recorded for each type of learning environment. In doing so, the researcher was able to identify which themes and subthemes occurred more frequently in small or large environments, as well as in dreaded, ideal, or typical environments. Lastly, percentages of codes related to a particular environment were calculated and tabulated in the results section to allow for comparisons across the types of learning environments.

Results

Student Conceptions of Tertiary Learning Environments

Figure 3.1 below shows a graphic representation of the five main themes found after analysing the student transcripts in this study. The need to create separate themes for behaviours and qualities was evident throughout the analysis, especially since, throughout the interviews, students clearly distinguished between teachers who *did* (behaviours) and teachers who *were like* (their qualities). Students also used similar language when describing what their peers *did* in class, and what they *were* like. Therefore, it was important to make the distinction between dispositions or qualities that these students or teachers had, and the behaviours or practices they engaged in or exhibited during class time. Further, students described a third set of teacher characteristics related to the overall state and shape of the learning environment, such as how teachers made use of the physical environment to facilitate learning, their instructional pacing, and their movement. These were identified as an additional theme for teachers labelled classroom management comprising instructional climate and physical climate.

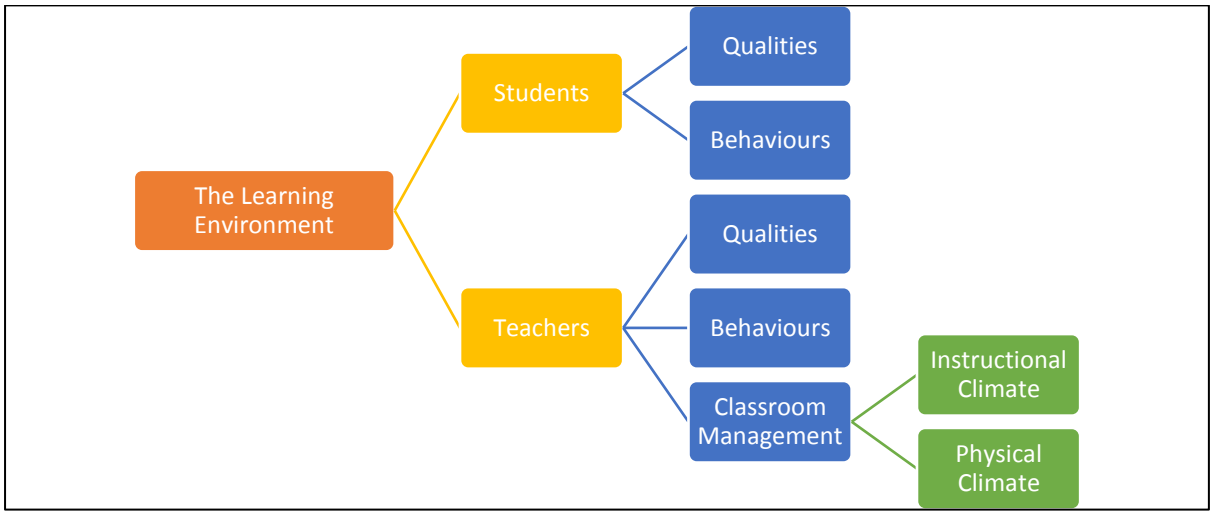

Figure 3.1. A thematic analysis of student conceptions of tertiary learning environments.

Table 3.3 lists the subthemes found from analysing student transcripts, which fall under each of the five main themes of student qualities, student behaviours, teacher qualities,

teacher behaviours, and classroom management (instructional and physical). The following sections will explore each of these subthemes, along with student quotations that illustrate and represent the meaning of each subtheme.

Table 3.3

Subthemes Identified from Analysis of Student Conceptions of Tertiary Learning Environments

Themes	Subthemes
Student Qualities	Interest Shyness (-)
Student Behaviours	Note-taking Thinking process Asking questions Student–student interaction Student involvement Paying attention Forced participation (-) Distraction (-)
Teacher Qualities	Passion Going off topic (-) Intimidating attitude (-) Boring delivery style (-) Lack of interest (-) Monotone style (-) Lack of content knowledge (-)
Teacher Behaviours	Assessing student knowledge Asking questions Involving students Multimodal teaching Picking on students (-) Use of technology (-) One-way teaching (-)
Classroom Management – Instructional	Teacher movement Instructional pacing Misfit between context and pedagogy (-)
Classroom Management – Physical	Class physical arrangement Class size (-)

Note. The negative sign indicates students discussing only negative aspects of that subtheme.

Student Qualities.

Interest versus disinterest. Of the 24 students, 16 spoke about student interest, or disinterest, in the content of the course and how that influenced the way the learning environment was viewed. One student explained: "The lecturer is talking to 200, 300, or 400 students, and I feel like that person can't grab the attention of everybody. People lose interest" (Student 18). While Student 18 was suggesting that students were more likely to lose interest in larger classes due to distractions, other students considered that these distractions could happen in either small or large learning environments: "Students with laptops get distracted because the lecture content is not interesting enough for them to stay on topic. Or they just want to see something quickly online and then get back to the lecture topic" (Student 4). Therefore, student interest seems to be associated with the physical space of the environment, as well as the relevance of material taught in that class. Another student added: "Being able to link concepts to life, [and] keeping class content relevant to what we do, definitely helps students stay interested" (Student 10).

Shyness. Of the 24 students, 20 spoke about what they considered to be a strong barrier to student–teacher interaction, which was shyness or hesitation to contribute to class discussions. One student argued that "it's very unlikely that you would ask a question when there are so many people. People get shy" (Student 23). When asked whether they thought class size influenced students to be more or less shy, another student responded: "Even 20 people is enough for some people to shut down and be shy. Sometimes I wish there was actually a little bit of mothering going on" (Student 10).

Student Behaviours.

Note-taking. According to 18 out of 24 students, "taking notes is a big thing" (Student 17). Students described the various methods they used to manage the information flow during class time such as typing notes, highlighting, and recording the lecturer's voice

using personal devices. Another student added: “The students are usually multitasking. They are Facebooking, typing up notes in a blank document, or often would just type their notes in between the notes they get from the lecturer” (Student 5). When asked whether these note-taking behaviours were common across courses, a student replied: “You will always have this funny mix between students who are annotating the lecture slides and taking notes, and then some students who are just zoned out” (Student 7).

Thinking process. Although 19 out of 24 students described the state of their class peers during class time as “thinking”, when asked to explain further how they came to conclude that their peers were thinking and analysing class material, more than half of them could not explain nor confirm whether those peers were tuned in or out. For example, a student explained how he thought in class: “Sometimes I’m actually thinking about what’s being said or talked about … But there seems to be gaps in the lectures where you’re just not doing any thinking. The lecturers are talking still but you’re just falling asleep” (Student 1). Further discussion with students identified student distraction as another major subtheme that hindered their thinking process, which will be addressed later.

Asking questions. Of the 24 students, 18 spoke about asking questions during class as integral to the learning process, and to the way learning environments were viewed. In various learning environments, “the students are focusing on asking questions, asking questions about new hypotheticals and new ideas.” (Student 3). This was a subtheme that students wanted to take place more often in their learning environments: “I would like to see students asking more questions in class” (Student 22).

Student–student interaction. Another strong subtheme found as part of student behaviours was the interaction among students in class, with 22 out of 24 students discussing the benefits of having this kind of interaction and how it shaped the outcomes of that class. For example, “you kind of get to know the students more, and not just strangers in the class

learning together" (Student 23). Further, 10 students spoke about student–student interaction as a tool for engaging students. When asked to elaborate on the meaning of students being "engaged", a student responded: "Students being 'engaged' would be addressing and discussing, or letting us [students] have discussions in the class. Actually, yeah, some lecturers let you do that and discuss within groups in the lecture" (Student 2).

Student involvement. It was not surprising to hear 23 out of 24 students talking about their involvement in class conversations and discussions, and how in some courses "students will be participating for most of the class" (Student 24), and how "they [students] talk more with tutors" (Student 11). As will be explored later in this chapter, students appreciated situations where they were involved in class activities and discussions, and dreaded other situations where student input was neither expected or asked for.

Paying attention. Of the 24 students, 18 described their peers in class as either paying attention or not. For example, when asked to think of large or small typical learning environments, Student 1 responded with "Students are listening to the lecture" and Student 8 responded with "I see students paying attention." Although it was assumed that students would associate paying attention with ideal learning environments, this subtheme was not a major contributor to student views of ideal environments, as will be explored later in this chapter.

Forced participation. Of the 24 students, 14 students described various learning environments where they were pressured or forced to participate in class activities and discussions. These students described learning environments where students were randomly chosen on the spot every week and pressured to answer questions related to class material. Thus, forced participation was seen as a characteristic of these environments. A student explained: "Being picked on the spot is awkward, especially when you have to participate but you have not prepared much" (Student 17).

Distraction. The majority of students (22 out of 24) described how student distraction was so frequent in some classes to the point where "the students are either all on their phones, or talking. Distractive talking." (Student 2). Further, when another student was asked about the ideal learning environment, s/he said: "As with the students, I'd like them to be quiet. Obviously a whisper here and there is okay, but you can't have them talking the entire time and distracting everyone" (Student 4). In other words, this subtheme was mainly viewed by students as a negative aspect of learning environments.

Teacher Qualities.

Passion. Of all 24 students, 11 talked about teacher passion as one of the qualities that determined how learning unfolded in the classroom. In particular, students explained passionate teachers as being excited about teaching, as well as enjoying the teaching and learning process. Students differentiated between a topic being interesting, and having a teacher who was passionate about teaching and interested in teaching them. For example, Student 19 explained: "Ideally you would have lecturers who are knowledgeable, passionate, excited and energetic. You know. They bring the learning alive" (Student 19). Students were particular about their understanding of passionate teachers, what passion entailed, and how to tell if their teacher was passionate or not.

> I think you get the really monotone lecturers. They're not so flash. But then you get the enthusiastic ones who enjoy the topic and enjoy lecturing. You kind of get the feeling that some of them are there to do research and not lecturing. (Student 1)

Going off topic. Of the 24 students, 6 students talked about teachers going off topic, not focusing on the main learning objectives or outcomes of that class. When asked to elaborate, a student replied: "When they [lecturers] are just standing there talking all over the

show, way off topic" (Student 20). This subtheme was discussed by all six students as a negative contributor to the learning environment.

Intimidating attitude. Of the 24 students, 6 talked about the intimidating attitude of some teachers they had encountered at their university, and how this attitude had impacted the way they interacted with their class peers and the teacher. For example, when a student was asked to discuss their views of a dreaded large environment, the response was: "Having a lecturer that is intimidating or makes you feel like an ass if you ask questions, because they always say 'feel free to ask any questions' but, you know" (Student 6). Therefore, it may be that student shyness to contribute to class discussion was related to how teachers respond to, or address, student contributions in the class.

> I have been actually in some of these classes where you are kind of scared of answering the question … in some cases, the tutor might have been a bit intimidating. So you don't want to answer because you'd be worried their reply might be a bit condescending. It kind of forces you to stay silent. (Student 23)

Boring delivery style. Eleven out of 24 students described some of their teachers as either boring, or having a boring delivery style. When asked to explain, a student said: "The lecturers are just reading off the slides! I feel like that is a waste of time because I can do this at home. And the students would just be sitting there bored or just sitting there on Facebook" (Student 22). It may be that student judgement of a boring delivery style is predicated on whether students are tuned in or not, as well as how teachers present the content to students.

> Just everyone being really, really, really bored, and the interaction is just one-way from the lecturer which is actually what happens in our classes … I wouldn't say it's the content, so it is probably more the lecturer and the way they deliver the content. (Student 6)

Lack of interest. Surprisingly, 13 out of 24 students commented on how some of their teachers did not seem interested in teaching them. As one student put it, "I guess some lecturers just don't want to be there [in class]" (Student 8). One student in particular shared an example of their teacher who did not seem interested in teaching them, such that he would regularly leave class earlier than expected:

> They [lecturers] put aside two hours for the class, and we are prepared to stay there for the whole two hours, but when it gets to 40 minutes the lecturer says he has got to go. He just did not want to be there. (Student 20)

Monotone style. Of the 24 students, 10 explained how "some lecturers would just be monotone" (Student 23). Specifically, students commented on the tone or voice of their teachers and how that played a role in getting their attention, especially in large learning environments: "Sometimes the lecturer talks, but nobody listens because of their voice" (Student 11).

Lack of content knowledge. As part of their discussion of dreaded environments, 16 out of 24 students discussed learning environments they had been in where they believed their teachers lacked the content knowledge needed to teach that class. A student commented: "I find it frustrating when lectures are made up, and lecturers are really making it up on the spot … and you're thinking: What the hell am I supposed to be writing down here?" (Student 10). What was also apparent in this subtheme was how easy it was for students to judge whether or not their teachers had the appropriate content knowledge to teach the course, as well as how it could affect the students' attitudes towards the learning environment (e.g., causing heightened levels of frustration or anxiety).

> When you ask a question and the tutors are not sure and they don't acknowledge they're not sure and then they try to answer. And you get those tutors every now and

then, and everyone in the room understands the question and can tell the tutor doesn't understand the question. Which is fine but as long as the tutor acknowledges that he doesn't know. (Student 5)

Teacher Behaviours.

Assessing student knowledge. More than half of the students (15 out of 24) talked about how teachers review class material with them and make sure they understand the content introduced. "It's when lecturers check your understanding and see what you know" (Student 10).

Asking questions. Of the 24 students, 20 talked about their teachers asking questions during class time, irrespective of class size, duration, or topic: "Asking questions, getting responses" (Student 22).

Involving students. More than half of the students (19 out of 24) discussed how some of their teachers went out of their way to make sure that student input was always present during class time. That is, "the teacher pays attention to the students and asks for their feedback or comments" (Student 24). Therefore, these learning environments were characterised by students as having lots of student input and discussions.

Multimodal teaching. Almost all students (23 out of 24) viewed ideal learning environments as ones where the teacher would use a variety of teaching methods to keep them interested and attentive throughout the semester. For example, "The lecture delivery would be more interesting with the help of multimedia like videos and images" (Student 11). Another student added: "Like in my stats courses they used to use clickers. Even though that was minimal but it was still good. The students were so engaged that they didn't need to be on their phones" (Student 2).

Picking on students. Of all 24 students, 7 described how some teachers call on students to answer questions in the class. Students explained that whenever it was the case that a teacher would pick on students, they would be doing it consistently as part of their teaching style. For example:

> A lecturer at the front asking and picking on people or asking dead obvious questions. It's like the worst when they ask dead obvious questions to answer but no one is in the mood. Because no one wants to be that person who's answering such an obvious question. And especially if there's just one person, or a couple of people, who usually tend to answer these questions. (Student 5)

Use of technology. Although the majority of students (20 out of 24) commented on their teachers' use of technology in the classroom, they mainly referred to teachers' full-reliance on technology to deliver the course content, or teachers' failure to operate the technology. For example, a student argued that "some lecturers spend most of their time sorting out how to work computer issues" (Student 22). Other students suggested that their learning environments and content delivery were heavily reliant on basic technology: "The lecturer would come in and he/she would have PowerPoints and they would just talk with their PowerPoints. We have a lot of guest lecturers as well and they would do the same" (Student 6).

One-way teaching. Students used the term "one-way teaching" (Student 8) when describing the behaviours their teachers engaged in. A total of 18 out of 24 students explained dreaded learning environments, for example, as ones where teachers taught one-way, in the sense that they did not seek nor expect student input during class, creating a teacher-centered environment where students were passive rather than active learners. When describing typical learning environments, a student explained: "Usually there's not much

interaction in my classes, very few lecturers like interaction during the actual lecture" (Student 2). Another student used one of their tutors as an example of this approach: "[The tutor saying] just 'read this', and you're [the student] just going through something, or you're just listening to someone talk all the time as opposed to participating in an activity or discussing your ideas or your understanding" (Student 1).

Classroom Management.

Movement versus fixed positioning (instructional climate). Half of the students (12 out of 24) started by describing the location of their teacher relative to themselves, and whether teachers walked around the class or stayed at the front, when asked about their views of learning environments. For example, one student described their teacher as "standing in front of the class, next to the computer" (Student 8), and another student explained that "he/she [the teacher] doesn't really move around much" (Student 4). Therefore, teacher movement was one of the first aspects that students recalled about their learning environments.

Instructional pacing (instructional climate). Ten out of 24 students discussed instructional pacing (i.e., the pace of teaching and instruction), and how they would hesitate to contribute to class conversations or discussions if they felt the pace was too fast for them. It was important to students that the instructional pacing was appropriate, relative to their levels of understanding and speed of information processing. In other words, instructional pacing was considered appropriate by students "when the conversation goes neither too fast nor too slow" (Student 7).

Misfit between context and pedagogy (instructional climate). Half of the students (12 out of 24) described a misfit between their expectations of teaching practices in some learning environments, and what actually took place in these environments. For example, a student explained that a dreaded learning environment would be one where teachers treated

small learning environments similarly to large ones: “It is so annoying when they teach small classes like a lecture style rather than a tutorial—when there is no discussion. Because then what is the point? Aren’t we supposed to differentiate between the two?” (Student 2). Another student described this misfit as a disconnection between what needs to be taught, and how it could be taught: “Just the tutor talking about what they need to talk about and not asking questions, and everyone is really antisocial and just doing their own work and not helping each other” (Student 3). In others, the misfit between the context of learning and pedagogy of teaching was what students picked up on as a negative aspect of learning environments.

Physical arrangement (physical climate). Similar to describing teacher movement around the class, all 24 students described the physical layout of their learning environments, and how these were used to facilitate the teaching and learning practices in those environments. For example, one student explained: “Usually there is one teacher far away. Usually far away, down, and most of the students are surrounding him in a stadium. Kind of looking down at one person talking. There will be two big projector screens” (Student 7). When asked about the extent to which the physical arrangement of the classroom facilitated the learning process, a student responded: “When you look around a lecture theatre, I think it’s just the first four rows that are actually engaged” (Student 22).

Class size (physical climate). The majority of students (22 out of 24) discussed class size as an important aspect of the learning environment. For example, whereas some students described their classrooms to be “decently sized” (Student 19), others raised concerns about their class’ sizes being “really big” (Student 23). For example, a student argued: “My classes are all packed out. Way too many students are put into one room” (Student 4). Student responses about class size tended to be more negative, with more than half of the students complaining about the current sizes of their learning environments.

A Taxonomy of Learning Environments

In this section, the percentages of behaviours and qualities that fell under each of the five themes have been tabulated for each type of learning environment investigated in this study. These percentages were also broken down by type (i.e., whether the behaviours or qualities were coded as positive or negative) and by focus or source (i.e., whether the behaviours or qualities were related to the teacher or students). This was done to investigate the make-up of learning environments, and to examine which theme(s) explained the most variance in each of the different types of environments. To do so, Evans's (1996) guidance was used when interpreting whether the tabulated proportions accounted for very small (0%–4%), small (5–15%), medium (16%–35%), large (36%–62%), or very large (63%–100%) agreement in the way learning environments were perceived by students. For example, if 60% of the recorded behaviours or qualities in a given environment were related to the teacher, then this would be interpreted as a large proportion.

Table 3.4 below shows the make-up of overall learning environments as perceived by students. Students attributed a large proportion (60%) of what happened in their classes to teacher-related factors. Interestingly, students also described a large proportion (41%) of what happened in these same classes as negative. Of these negative aspects, a medium proportion (27%) was attributed to teachers, whereas a small proportion (14%) was attributed to students. These aspects will be further explored in later sections of this chapter. In terms of the themes found, teacher and student behaviours explained the largest proportions (29% and 32% respectively) with these being mainly positive behaviours such as asking students questions, involving students in class discussions, as well as allowing student note-taking, and engaging with class materials during class time.

Table 3.4

Proportions of Agreement Related to the Overall Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	3%	9%	13%
Teacher Behaviours	23%	6%	29%
Classroom Management	7%	12%	18%
Student Qualities	2%	6%	8%
Student Behaviours	24%	7%	32%
Focus or source			
Teachers	33%	27%	60%
Students	26%	14%	40%
Total	59%	41%	100%

Note. N = 812 responses.

Large learning environments. The composition by theme, type, and focus for large learning environments was found to be similar to that for overall learning environments (see Table 3.5), in the sense that teachers were still perceived as contributing very largely (64%) to what happened within large tertiary classrooms, which students described as largely containing negative behaviours and qualities (48%). When asked whether these large learning environments varied across disciplines or courses, Student 8 responded: “I think often they [large learning environments] feel a lot more formal and standardised. They all sort of feel the same across lots of different courses.” All other proportions ranged between very small and medium (i.e., 0–35%) suggesting that all themes and subthemes contributed similarly to the formation of large learning environments, as perceived by students.

Table 3.5

Proportions of Agreement Related to the Large Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	5%	12%	17%
Teacher Behaviours	20%	7%	27%
Classroom Management	6%	14%	21%
Student Qualities	2%	6%	9%
Student Behaviours	18%	9%	27%
Focus or source			
Teachers	31%	33%	64%
Students	20%	15%	36%
Total	52%	48%	100%

Note. N = 453 responses.

Small learning environments. One of the stark differences between small and large learning environments (as shown in Table 3.6) was the smaller proportions of negative themes found in this type of environment (31%, a medium proportion) when compared with the large proportion of negative behaviours and qualities found when students spoke about large learning environments. Both, teachers and students, were perceived by students as contributing to a similarly large extent to what happened in small learning environments (55% and 45%, respectively), with more perceived positive behaviours and qualities than negative ones (36% and 34%, respectively).

Table 3.6

Proportions of Agreement Related to the Small Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	2%	5%	7%
Teacher Behaviours	26%	6%	32%
Classroom Management	7%	9%	15%
Student Qualities	1%	6%	7%
Student Behaviours	33%	6%	38%
Focus or source			
Teachers	36%	20%	55%
Students	34%	11%	45%
Total	69%	31%	100%

Note. N = 359 responses.

Typical learning environments. Typically, teachers were reported as contributing largely (60%) to what happened within tertiary classrooms, which students described as mostly containing negative behaviours and qualities (40%). Interestingly, this was a pattern that was found in large and overall learning environments as well. Further, alongside student and teacher behaviours (33% and 27% respectively), classroom management accounted for a medium proportion of what students reported happened within tertiary classes (24%, see Table 3.7).

Table 3.7

Proportions of Agreement Related to the Typical Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	1%	8%	9%
Teacher Behaviours	22%	5%	27%
Classroom Management	10%	14%	24%
Student Qualities	1%	7%	8%
Student Behaviours	26%	7%	33%
Focus or source			
Teachers	33%	27%	60%
Students	27%	13%	40%
Total	60%	40%	100%

Note. N = 344 responses.

Ideal learning environments. Perhaps it was not surprising that students' perceptions of the ideal learning environment contained no negative themes, with students perceiving that both teachers and students contributed similarly to what went on in their classes (53% and 47% respectively, both large proportions, see Table 3.8), as well as the behaviours and qualities that they contributed within these learning environments (78% teacher and student behaviours, a very large proportion).

Table 3.8

Proportions of Agreement Related to the Ideal Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	10%	0%	10%
Teacher Behaviours	36%	0%	36%
Classroom Management	8%	0%	8%
Student Qualities	5%	0%	5%
Student Behaviours	42%	0%	42%
Focus or source			
Teachers	53%	0%	53%
Students	47%	0%	47%
Total	100%	0%	100%

Note. N = 260 responses.

Dreaded learning environments. Also unsurprisingly, it was found that 100% of all themes and subthemes reported in relation to student perceptions of dreaded learning environments were negative (see Table 3.9). A very large proportion (69%) of these negative themes and subthemes were attributed to teacher qualities (23%), teacher behaviours (24%), and the ways in which teachers managed their classrooms (23%). Negative student qualities (13%) and student behaviours (18%) accounted for small and medium proportions of these dreaded learning environments respectively.

Table 3.9

Proportions of Agreement Related to the Dreaded Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	0%	23%	23%
Teacher Behaviours	0%	24%	24%
Classroom Management	0%	23%	23%
Student Qualities	0%	13%	13%
Student Behaviours	0%	18%	18%
Focus or source			
Teachers	0%	69%	69%
Students	0%	31%	31%
Total	0%	100%	100%

Note. N = 208 responses.

Large Learning Environments

Large typical. Overall, large typical learning environments were viewed by students as “too large spaces” (Student 2) where the use of technology (e.g., use of PowerPoint slides) was common and teacher movement was limited. In these environments, students described the teaching approach as one-way, with their peers being on either end of the spectrum, that is, either paying attention or being distracted. Table 3.10 below complements this finding by suggesting that a very large proportion of what took place in large learning environments was teacher-related or teacher-initiated, with a large proportion of these behaviours or qualities (41%) being viewed as negative by students.

Table 3.10

Proportions of Agreement Related to the Large Typical Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	1%	11%	12%
Teacher Behaviours	14%	8%	22%
Classroom Management	9%	22%	30%
Student Qualities	0%	9%	9%
Student Behaviours	18%	9%	27%
Focus or source			
Teachers	24%	41%	65%
Students	18%	18%	35%
Total	41%	59%	100%

Note. N = 198 responses.

Large ideal. Although student and teacher qualities and classroom management accounted for small proportions of student conceptions of large ideal learning environments (see Table 3.11), teacher and student *behaviours* accounted for medium and large proportions (36% and 33% respectively). When asked about large ideal learning environments, students explained they wanted to be in classes where teachers involved students in class discussions, regularly asked questions, and used a range of teaching methods throughout the semester. Students also imagined classes where students equally contributed to the teaching and learning practices in their classes. When asked how that would look, students explained that, ideally, they would be paying attention, thinking about class material, responding to teacher questions and initiating class conversations when given the chance.

Table 3.11

Proportions of Agreement Related to the Large Ideal Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	14%	0%	14%
Teacher Behaviours	36%	0%	36%
Classroom Management	9%	0%	9%
Student Qualities	8%	0%	8%
Student Behaviours	33%	0%	33%
Focus or source			
Teachers	59%	0%	59%
Students	41%	0%	41%
Total	100%	0%	100%

Note. N = 140 responses.

Large dreaded. To students, a large learning environment was dreaded "when there is no payoff for going" (Student 8). Unlike the other types of learning environments investigated in this study, teacher behaviours and teacher qualities accounted for 52% of how students conceptualised large dreaded environments (see Table 3.12). Further, a very large proportion (70%) of the behaviours and qualities taking place in large dreaded environments were attributed to the teacher of that class. Students described large dreaded learning environments as ones having teachers with a monotone and boring delivery style, who lacked the content knowledge and the interest to teach them. Interestingly, Student 20 described this type of environment as the one where "students are on Facebook or watching sports."

Table 3.12

Proportions of Agreement Related to the Large Dreaded Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	0%	29%	29%
Teacher Behaviours	0%	23%	23%
Classroom Management	0%	18%	18%
Student Qualities	0%	10%	10%
Student Behaviours	0%	19%	19%
Focus or source			
Teachers	0%	70%	70%
Students	0%	30%	30%
Total	0%	100%	100%

Note. N = 115 responses.

Small Learning Environments

Small typical. Unlike large typical learning environments where the percentage of negative behaviours and qualities was higher than the positive ones, a very large proportion of behaviours and qualities reported in small typical environments was described by students as positive (84%, see Table 3.13) and the perceived contribution was shared by both teachers (45%) and students (39%). Students described small typical learning environments as hubs, in the sense that the physical arrangement of these classes facilitated greater discussions, with students surrounding their teacher and engaged in ongoing conversations with them.

Table 3.13

Proportions of Agreement Related to the Small Typical Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	1%	3%	5%
Teacher Behaviours	33%	1%	34%
Classroom Management	11%	3%	14%
Student Qualities	2%	4%	6%
Student Behaviours	37%	3%	40%
Focus or source			
Teachers	45%	8%	53%
Students	39%	8%	47%
Total	84%	16%	100%

Note. N = 146 responses.

Small ideal. As with large ideal learning environments, teacher and student behaviours as reported by students accounted for large proportions of student views of small ideal learning environments, with student behaviours explaining 53% of these views (see Table 3.14). Also, teachers and students contributed similarly to how these ideal environments were positively viewed (46% and 54% respectively, both being large proportions). Overall, small ideal learning environments were described by students as ones where teachers asked students questions, involved them in class discussions and sought their input, used a variety of teaching methods throughout the semester, and regularly assessed or reviewed student understanding of the topics taught. Further, in these environments, students perceived that they were engaged with the teacher; thinking about class material, asking questions, interacting with their peers, and providing their input to class discussions. Interestingly, whether students were paying attention or not was not an aspect that students focused on when talking about small ideal environments.

Table 3.14

Proportions of Agreement Related to the Small Ideal Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	4%	0%	4%
Teacher Behaviours	35%	0%	35%
Classroom Management	7%	0%	7%
Student Qualities	2%	0%	2%
Student Behaviours	53%	0%	53%
Focus or source			
Teachers	46%	0%	46%
Students	54%	0%	54%
Total	100%	0%	100%

Note. N = 120 responses.

Small dreaded. Table 3.15 shows a similar pattern to the one found in large dreaded learning environments, where the largest proportion of negative behaviours and qualities (68%) was attributed to the teacher. Each of the five themes contributed a small to medium proportion towards student views of small dreaded environments. Although students in this study did not reach a consensus on what made a small learning environment dreaded (i.e., they gave varying responses), many of them said that “it really depends on the tutor” (Student 23). The two most discussed subthemes in relation to small dreaded environments were teacher lack of content knowledge and the one-way teaching approaches that some teachers used. Students also described these environments as ones where students felt distracted, hesitant, or forced to contribute.

Table 3.15

Proportions of Agreement Related to the Small Dreaded Learning Environments as Perceived by Students by Theme, Type, and Focus

	Type		
	Positive	Negative	Total
Themes			
Teacher Qualities	0%	15%	15%
Teacher Behaviours	0%	25%	25%
Classroom Management	0%	28%	28%
Student Qualities	0%	16%	16%
Student Behaviours	0%	16%	16%
Focus or source			
Teachers	0%	68%	68%
Students	0%	32%	32%
Total	0%	100%	100%

Note. N = 93 responses.

Discussion

Student Conceptions of Learning Environments

This study found more than 20 different subthemes, that constituted various tertiary learning environments as reported by students, whereas the current literature tends to conceptualise these environments as having a lot fewer variables (5–7 variables on average) and hence measuring fewer aspects of what actually takes place in these environments (Fraser, 2002). Therefore, the decision to analyse fewer variables may have led researchers to underestimate the multidimensional nature of tertiary classrooms.

However, despite the relatively larger number of factors found in this study, the results from the thematic analysis revealed some subthemes similar to the ones often investigated in tertiary learning environments (Nilson, 2010). For example, both innovation and student involvement are factors measured by the CUCEI (Fraser, Treagust, & Dennis,

1986), which is a tertiary learning environment instrument, although, the factor "student involvement" was dropped from the instrument in later iterations (Nair & Fisher, 2001).

The results also revealed subthemes that were not typically studied within learning environments such as student interest, teacher attitudes, and instructional pacing. For example, Lizzio, Wilson, and Simons (2002) used two factors only (student perceptions of teacher quality and workload) as indicators of the general state and shape of tertiary learning environments. Further, Waldrip and Fisher (2003) only focused on teacher interactions with students as a measure of tertiary learning environments, using the Questionnaire on Teacher Interactions (QTI) instrument. This is despite the QTI not being designed initially for measuring learning environments at the tertiary level (Wubbels & Brekelmans, 2005). It would be interesting to examine which of the QTI variables predict student outcomes in future studies, given the instruments were originally designed to measure learning environments at different educational levels.

Overall Learning Environments

It was interesting to find that 60%, a large proportion, of what took place in tertiary learning environments, in terms of qualities and practices, was attributed to the teacher. This may be because, as students grow older and progress through the schooling years to tertiary education, the focus shifts from regulating student social behaviour to regulating higher order thinking skills and fostering student independence (Alansari, 2015). Therefore, the finding in this study that a large proportion of tertiary classroom variables was attributed to the teacher rather than students raises questions about the degree to which students are taking ownership of their learning. The finding in this study also raises questions about whether the current practices at a tertiary level foster the sense of independence that the literature claims students develop by the time they begin their tertiary education.

It is worth noting that many of the teacher and student behaviours found in this study are to do with fostering a positive sense of class cohesion and establishing relationships (e.g., asking questions and responding to student queries, student–student interaction, involving students in class discussions, and moving around the class; Cooper & Garner, 2012). This finding is interesting because it is not typical of studies on tertiary education to look into social-psychological constructs like these, despite their strong relationship with student achievement at all educational levels (Fraser, 2002; Fraser, McRobbie, & Tobin, 2012; Hattie, 2009). Therefore, this finding suggests that the social-psychological state of the classroom is still important at the tertiary level of education, as it constituted a large proportion in the current study of how students conceived their learning environments, and contributed to the differences between how ideal and dreaded environments were viewed by students.

Large Versus Small Learning Environments: Does Class Size Matter?

Small learning environments had fewer negative themes, with less teacher control (indicated by fewer teacher-initiated behaviours), and more student positive behaviours. Given these findings, one may argue for a potential relation between increasing class size, negative views of the learning environment, and the increased presence of negative teacher themes. This raises the question of whether tertiary teachers are equipped with the techniques and strategies to teach in large settings. The emphasis here is on techniques because most of the negative subthemes found in this study were related to negative teacher behaviours which are observable, measurable, and probably changeable.

In the literature, increasing class size had been identified as having a small and negligible direct effect on student achievement (Cohen's d = .20, Hattie, 2012), and a large indirect effect on a range of teacher practices such as their class management techniques, questioning behaviours, giving homework, beliefs about improving student performance, and

class grouping (Bourke, 1986; Mosteller, 1995). Although these findings are from studies conducted at the pre-tertiary level of education, it may be that the increased negative views about large tertiary environments are due to similar factors affecting teacher behaviours in tertiary classrooms. Further, Hornsby and Osman (2014) argued that large learning environments are more likely to affect the quality and educational experience of students within their tertiary institutions which is harder to capture by simply measuring class sizes against student achievement outcomes. Therefore, the relations between teacher factors, class size, and educational outcomes at the tertiary level are worthy of further exploration.

Cuseo (2007) conducted a review of studies on the relation between class size and tertiary educational outcomes, where he presented eight arguments for why tertiary institutions should move towards smaller learning environments and cut back on larger classes:

1. Large classes increase staff reliance on a “lecturing” mode of delivery.
2. Large classes reduce student involvement.
3. Large class sizes reduce the quality and frequency of teacher interaction.
4. Large classes reduce the depth of thinking for students.
5. Large classes reduce the depth and breadth of course objectives, assignments, and learning outcomes.
6. Large classes reduce student academic achievement outcomes.
7. Students report less course satisfaction in larger classes.
8. Students give lower overall ratings to larger courses.

However, Cuseo’s (2007) review mainly included correlational studies only (i.e., large classes were only associated with the eight findings above), with insufficient reporting of sample sizes and effect sizes. Therefore, further empirical evidence to test the claims above is suggested, and whether or not class size affects the above class practices and outcomes is

yet to be determined. Nonetheless, Cuseo's (2007) finding that class size may be related to teacher practices (e.g., teacher interaction, and mode of delivery) is consistent with the results found in this study. Again, this suggests further research is needed on the relations between teacher and student variables that influence the learning process and outcomes.

Large Typical Learning Environments

In this study, what students viewed as "typical" did not seem to be what they preferred to have in their large classes, as there were more negative themes reported in these large typical environments than in large dreaded environments. This finding could imply that students have experienced more large classes that were seen as dreaded rather than ideal. The discrepancy in student perceptions of typical versus ideal learning environments is similar to the discrepancies reported in the existing literature in student perceptions of actual and preferred classroom environments across all education levels including tertiary (Fisher & Fraser, 1983; Fraser, 1982, 1984; Hofstein & Lazarowitz, 1986; Nair & Fisher, 2001; Yuen-Yee & Watkins, 1994). However, investigating tertiary learning environments in the literature has been traditionally done with small classes (e.g., Nair & Fisher, 2001), and less emphasis has been given to investigating large learning environments because of the difficulties associated with engaging larger masses of students in evaluating their learning environments (Cuseo, 2007).

Although discrepancies in student perceptions of typical versus preferred environments have been well-documented in the literature since the 1980s (e.g., Fisher & Fraser, 1983), the development and validation of "typical" and "preferred" versions of existing data collection instruments is a recent shift of focus in the literature, with a continuous emphasis on developing data collection instruments for pre-tertiary learning environments (for an exception, see Yeh, Huang, Chan, & Chang, 2016). For example, Aldridge, Dorman, and Fraser (2004) gathered secondary school data on actual and preferred

perceptions of class environments, as reported by students, but used that data to test the psychometric properties of the data instrument rather than investigate differences in reported perceptions.

Similarly, Dorman (2008) gathered secondary school data on actual and preferred forms of the What Is Happening In this Class (WIHIC) questionnaire for the purposes of evaluating the psychometric properties of two versions of that questionnaire, as opposed to investigating discrepancies in student perceptions. Therefore, it may be that studies on the alignment between preferred and actual tertiary learning environments, or between typical and ideal, would flourish within the next decade once a robust data collection instrument is validated to examine these environments. It would be interesting to see whether student perceptions of dreaded, typical, or ideal learning environments predicted student achievement in these environments. This is important to investigate because of recent studies such as the one by Yeh, Huang, Chan, and Chang (2016) which showed that the congruence between preferred and actual learning environments, as perceived by university nursing students in Taiwan, was significantly associated with enhanced learning outcomes measured by achievement and self-efficacy in nursing education (see also Könings, Brand-Gruwel, & van Merrienboer, 2005).

One finding that was unique to large typical and small dreaded environments was the medium-sized proportion of student agreement that classroom management mattered in how these environments were viewed. In the case of large typical learning environments, students placed an emphasis on teacher movement, overcrowded classes, instructional pacing, and how teachers used the physical environment. In other words, the instructional state and physical shape of tertiary classrooms constituted an important part of how students typically viewed their learning environments. This is consistent with a number of studies conducted at the tertiary level which have shown that (a) the physical climate of tertiary environments

contributed to the effectiveness of instruction (Choi, van Merrienboer, & Pass, 2014; Evans & Stecker, 2004); and that (b) the instructional climate of tertiary environments was found to influence student learning strategies and examination results (Lonka & Ahola, 1995).

Large Ideal Learning Environments

To students, an ideal large learning environment was a student-centred one where students took ownership of their own learning, and were involved in class conversations. Ideal large learning environments were seen by students in this study as more interactive than the ones perceived by them as typical or dreaded. Interestingly, despite students acknowledging that it must have been difficult for teachers to interact with large masses of students at the one time, they still wanted to see more interaction in these large classes. This may be because they recalled teachers who managed to keep them interested and involved in class activities and discussions despite being put in a large learning environment. This finding is consistent with other studies conducted at the tertiary level where students reported a preference for interactive and collaborative learning environments that fostered cohesion (e.g., Clark & Baker, 2009; Nair & Fisher, 2001). The findings from the current study are consistent with the findings of a recent literature review that argued for an increased adoption of higher order thinking skills in student-centred learning environments at the tertiary level (Baeten, Kyndt, Struyven, & Dochy, 2010).

However, a study by Muller (2013) warrants caution when assuming that *all* students prefer an interactive learning approach in tertiary learning environments, as she found that business students in her sample preferred independent and self-directed learning over collaborative learning processes in the classroom. Interestingly, Muller (2013) also reported that the Māori and Pasifika students in her sample had shifted from having a preference for collaborative and cohesive learning environments to a preference for the aforementioned independent and self-directed learning environments “in order to adjust and fit into the

environment which is emphasised by the University in order to obtain academic success in this institution" (p. 78). Students from collectivist cultures (such as Māori and Pasifika) have been reported in the literature to have a strong preference for collaborative, interdependent, and cohesive learning environments that aligns with their cultural orientation (Auyeung & Sands, 1996; Joy & Kolb, 2009; Macfarlane, Glynn, Cavanagh, & Bateman, 2007). Therefore, this raises questions about whether ideal learning environments are likely to vary between disciplines and/or tertiary institutions, a topic which can be explored in future studies.

Large Dreaded Learning Environments

It was found in this study that large dreaded learning environments were the only type of environment where the largest proportion of its make-up was attributed to the qualities of the teacher. That is, while large learning environments were seen by students as ideal when positive teacher behaviours were exhibited, these large environments were seen as dreaded when negative teacher qualities and attitudes were dominant instead. Although there have been studies in the literature showing the importance of teacher dispositions and qualities, and how they influence the learning environments that these teachers create (e.g., Bullard, 2014; Faulkner & Latham, 2016), the majority of these studies examined pre-tertiary learning environments from early childhood to secondary. There are, however, a few studies showing that university students reported a stronger preference towards having teachers who possessed positive qualities such as enthusiasm, topic expertise, and engaging delivery style, and placed less emphasis on other factors such as course workload and interactive teaching style (e.g., Alrakaf, Sainsbury, Rose, & Smith, 2014). The Alrakaf et al. (2014) study also showed that the more students valued the aforementioned qualities, the less they adopted a performance-avoid approach (i.e., motivation to learn to avoid appearing incompetent).

Given that the qualities found in the study by Alrakaf et al. (2014), which students reported valuing the most, were the same qualities found in the current study to explain student views of large dreaded environments (e.g., lack of enthusiasm, lack of content knowledge, and boring delivery style), it may be that teacher qualities play a significant role in how students perceive their learning environments and achievement goals, even at the tertiary level. This is important since Alrakaf et al. (2014) also found a relation between student perceptions of teacher qualities and the adoption of performance-avoid goals, which were found to predict increased anxiety, boredom, and lower achievement gains and self-efficacy among tertiary students (Kayis & Ceyhan, 2015; Ranellucci, Hall, & Goetz, 2015). A greater understanding of how various social-psychological variables are influenced by student perceptions of tertiary learning environments is therefore suggested for future research.

Small Typical Learning Environments

The difference between small and large typical learning environments was the increased emphasis on positive behaviours by both students and teachers, as indicated by the increased percentage of positive behaviours recorded for small typical environments. Further, unlike large typical environments, there was greater agreement that students exhibited more positive learning behaviours in small typical environments than did teachers. This was perhaps expected. In this study, students often referred to their small learning environments as tutorials, where students meet with a tutor and delved more deeply into what was discussed during lectures by responding to discussion questions, reflecting on reading material and, in some courses, linking the lecture material to course assessments. Therefore, it may be that the increased student behaviours recorded in small typical learning environments was due to the normalised, or pre-established, expectations of increased student

activities in small environments, as opposed to large ones. Students did not discuss being involved in many activities in large learning environments.

However, 84% of behaviours and qualities recorded for small typical learning environments were positive, as opposed to only 41% of those in large typical learning environments. Therefore, it seemed that students preferred small tertiary learning environments, where both students and teachers contributed similarly to the overall make-up of these environments, and students did more than just pay attention and take notes. This raises questions about the expected practices and qualities of teachers *and* students in small versus large environments, and whether the current expectations of student involvement in small versus large classes needs to be challenged in order to create large learning environments that can be viewed as similarly desirable to the small ones (see Cuseo's 2007 review discussed earlier on the effect of class size on student outcomes).

Small Ideal Learning Environments

In this study, students' perceptions of small ideal learning environments were not focused on class management or students keeping quiet and being passive learners. Rather, these environments were about students interacting and leading the learning process, which may explain why student attention was not one of the behaviours found associated with small ideal environments. It may be that keeping quiet and paying attention were associated with large rather than small environments because of what students said about being shy or hesitant to contribute in large classes, and the intimidating attitude of some teachers. It may also be that in smaller settings, students were more likely to get a chance to talk and discuss ideas, and felt they were not taking up someone else's time by asking questions, as one student explained was what happened in large learning environments. The finding that small ideal environments were focused on students interacting with each other as opposed keeping quiet may also be due to what was discussed earlier about the nature of small learning

environments serving as an opportunity for students to discuss and share ideas in the institution in which the study took place. Nonetheless, these findings are consistent with those of Eom, Wen, and Ashill (2006) who revealed statistically significant relations between student-to-student interaction, student-to-instructor interaction, and student satisfaction. Further, student perceptions of ideal small learning environments are consistent with other studies conducted at the tertiary level where students reported greater desirability for interactive learning environments with greater student input (Clark & Baker, 2009; Nair & Fisher, 2001).

Small Dreaded Learning Environments

The findings in this study suggested that students dreaded small learning environments where teacher control and dominance was prevalent (i.e., more teacher behaviours and qualities reported in these environments), and student involvement was minimal. This was the same pattern found in large dreaded environments, suggesting that a "dreaded situation" might not be a function of class size. Rather, it may be that student views of dreaded environments are influenced much more by instructional practices, and the extent to which students are involved and encouraged to participate in class. Interestingly, studies conducted at the pre-tertiary level have shown that a stronger sense of teacher control and dominance in class interactions is associated with a higher sense of teaching self-efficacy, as well as higher levels of student motivation among a sample of secondary school teachers and students (Wubbels, Brekelmans, Mainhard, den Brok, & van Tartwijk, 2015). This is interesting since teacher control and dominance were perceived by students in this doctoral study as part of a dreaded learning experience (i.e., a negative outcome). Therefore, these constructs are worthy of further exploration, especially alongside a range of social-psychological variables to test whether teacher control and dominance are related to different classroom outcomes at different education levels.

The finding in this study that teacher *qualities* contributed the most to large dreaded environments, whereas teacher *behaviours* contributed the most to small dreaded environments is another result to ponder. However, the lack of studies on *dreaded* tertiary learning environments in particular makes it difficult to propose potential explanations for this emerging pattern. Researchers have often framed their research questions in a positive way (e.g., investigating effective as opposed to ineffective practices; or investigating ideal/desirable as opposed to dreaded/undesirable learning situations) in order to avoid deficit thinking and foster solution-oriented thinking. This was evident when studies on ideal versus typical learning environments were discussed earlier (e.g., Fisher & Fraser, 1983; Nair & Fisher, 2001; Yuen-Yee & Watkins, 1994). However, investigating dreaded learning environments in this study enabled exploring variables which were only revealed when students were specifically asked to reflect on dreaded learning situations. For example, teachers' lack of content knowledge, and teachers' intimidating attitude were only discussed by students in this study as part of their views of dreaded learning environments.

Limitations

It may be that the negative views related to teachers in this study were due to students being more "harsh" or critical about their teachers, and less about their peers or themselves. Whereas students discussed three subthemes related to negative student behaviours and qualities, they discussed 11 negative teacher subthemes. So this imbalance is worthy of further investigation. A follow up observational design where student conceptions were compared against teacher observations and class outcomes may address this limitation. Although this may be seen as a limitation, previous literature had shown a similar pattern where students have tended to attribute failure to others, such as their teachers and parents, and placed less emphasis on themselves as contributing to their own lack of success (Peterson & Irving, 2008; Peterson et al., 2011). Therefore, it is not surprising the students in this study

discussed more negative themes related to their teachers than to themselves. Lastly, given the qualitative nature of this doctoral study, the views of the 24 students may not necessarily be representative of a broader group of students. As a future research direction, follow-up large-scale quantitative studies are suggested to enable drawing broad inferences about students' views of tertiary learning environments.

Implications for Future Research and Practice

The need for a data collection instrument that captures the complexity of tertiary learning environments is suggested throughout this thesis, and the findings in the current study are humble steps towards reaching that goal. Researchers and educators could make use of an interview schedule like the one used in this study when investigating student feedback about learning environments. It would be interesting to see whether the themes and subthemes found in this study can be used to create an observation protocol, or a checklist, for teachers to conduct peer observations for the purposes of enhancing practices (similar to Pianta's work on the CLASS instrument in the early childhood to secondary education sectors; see Hafen et al., 2015; La Paro, Pianta, & Stuhlman, 2004; Pianta & Hamre, 2009).

It would also be interesting to see whether a robust quantitative data collection instrument can be created to measure student views of tertiary learning environments using the themes found in this study, and how these may relate to other psychosocial variables and student outcomes. This is important in order to establish whether "ideal" corresponds to "effective", and "dreaded" corresponds to "ineffective". Developing a robust quantitative data collection instrument is also important in order to examine whether or not the student conceptions of ideal versus dreaded environments found in this study are simply preferences that do not influence class outcomes. Given the statistically significant relation between typical–ideal congruence in student perceptions and tertiary classroom outcomes reported by Yeh et al. (2016), a modest correspondence between "ideal" and "effective" could be

proposed. However, this correspondence may have been due to the small and discipline-specific sample used in their study (124 nursing students in a Taiwanese university), which means that the results will not necessarily be similar when investigating those relations across a diverse New Zealand population of students in various disciplines. Therefore, collecting data from a large and diverse sample of students is suggested for future research.

Conclusion

The numerous suggestions for future research directions are testimony to the significant contribution of this study to the field, and how it can be seen as a stepping stone towards a better understanding the social-psychological state and shape of tertiary learning environments. The purpose of this study was to explore student conceptions of tertiary learning environments, employing a qualitative data analytic approach followed by a quantified taxonomy of the student conceptions that arose from the data. It was found that various behaviours and qualities, exhibited by both teachers and students, made up student conceptions of the typical, ideal, and dreaded learning environments. These conceptions were further explored between small and large learning environments. Overall, the findings in this study suggested that tertiary learning environments were:

1. Multidimensional: They encompassed a wide range of teaching and learning practices.
2. Multifocal: They ranged from being teacher-driven to student-driven.
3. Dynamic: They were constantly evolving in relation to the students and teachers who existed as members of those environments, the attributes they possessed and expressed, and the ways in which they approached teaching and learning in those environments.
4. Psychosocially entrenched: They were driven by a variety of social-psychological constructs.

In other words, these findings provided an understanding of the variables that mattered to tertiary students and supported their learning. The qualitative nature of this study, and the consequent small sample size used to deeply explore student voice, also provided a clear platform for the next challenge in this doctoral research project. The two studies that follow examined whether the behaviours and qualities found in this first study could be used to create a quantitative data collection instrument that measures the views of larger groups of tertiary students about tertiary learning environments, and whether these variables significantly influence student psychosocial or academic outcomes.

CHAPTER FOUR

TERTIARY LEARNING ENVIRONMENTS: INSTRUMENT DEVELOPMENT (STUDY TWO)

This study, the second of three in this doctoral research project, used the findings of Study One to create and validate a quantitative survey instrument designed to measure student evaluations of tertiary learning environments. Specifically, this study aimed to develop an instrument that could be used to compare student perceptions of their learning environments in relation to student outcomes in Study Three. To fulfil this aim, the present study employed a quantitative cross-sectional design to test the psychometric properties of a newly developed questionnaire designed to measure tertiary learning environments (see Appendix D for the final version of the questionnaire used). Therefore, the research question pertaining to the current study was: What are the psychometric properties of the new learning environment instrument developed to measure the qualities or characteristics that tertiary students identified as contributing to the tertiary classroom climate?

Method

Participants

A total of 711 undergraduate students from a large university in New Zealand participated in this study. Of the participants, 73.8% were female (*n* = 525) and 54.4% self-identified as New Zealand European (*n* = 387), 24.5% as Asian (*n* = 174), 8.2% as Pasifika (*n* = 58), 4.6% as Māori (*n* = 33), and 8.3% Other (*n* = 59). Students reported belonging to six different faculties: education and social work (*n* = 255, 35.9%), arts (*n* = 296, 41.6%), science (*n* = 50, 7%), business (*n* = 103, 14.5%), medical and health sciences (*n* = 4, 0.6%), and creative arts and industries (*n* = 3, 0.4%). Finally, 35.7% of students indicated that they were

in their first year (*n* = 254), 27.3% in their second year (*n* = 194), 11.7% in their third year (*n* = 83), and 25.3% in their fourth year (*n* = 180) of undergraduate study.

Procedures

Ethical approval was first gained for this study (Ref. 015294) from the University of Auckland Human Participants Ethics Committee (UAHPEC). Following approval, all eight faculty deans were contacted to gain their approval to approach course coordinators in their faculties. Five faculty deans agreed for the researcher to approach course coordinators: science, arts, medical and health sciences, education, and business. Course coordinators were then contacted in those five faculties to gain their approval to approach undergraduate students during class time and provide them with information sheets about being involved in this research project. The sampling procedures for courses and, consequently, participants are detailed below.

To ensure that a wide range of students from different year levels and disciplines were represented in the final sample, a purposeful sampling procedure was used to select courses. To do so, a list of all available courses from the five faculties mentioned above was downloaded. Then, an email invitation was sent out to all first, second, third, and fourth year course coordinators within each faculty. These invitations included information sheets that described the overall aims of the doctoral project, as well as consent forms to be signed and returned if course coordinators consented for the research to take place with students enrolled in their courses. In total, 10 course coordinators responded agreeing for the researcher to approach their students.

Students were approached during a lecture session with participant information sheets and the questionnaire. After the research was explained to the students, those who decided to participate were asked to complete the anonymous questionnaire during the scheduled lecture

break. Participating students were asked to return their completed questionnaires into a box placed at the back of the classroom.

The final sample included ten courses. As detailed in Table 4.1, although there were 1,567 students enrolled across the 10 courses, only 55.8% (*n* = 874) of those students were present in class on the day of the study. Of the students present, 81.4% (*n* = 711) consented to participate and returned a completed questionnaire. It is acknowledged that the class attendance rates reported above, as well as the fact that only 10 course coordinators from a potential pool of over 200 courses accepted the research invitation, may have posed threats to the generalisability of findings. These issues will be further discussed in the limitations section of this chapter.

Table 4.1

Survey Response Rates by Course

Course ID	# Enrolled	# Attendance	% Attendance	# Collected	% Collected
1	141	120	85.11	111	92.50
2	283	132	46.64	121	91.67
3	63	33	52.38	33	100.00
4	207	110	53.14	102	92.73
5	275	160	58.18	125	78.13
6	71	20	28.17	19	95.00
7	58	32	55.17	32	100.00
8	50	30	60.00	27	90.00
9	61	35	57.38	32	91.43
10	358	200	55.87	107	53.50
Total	1567	874	55.78	711	81.35

Note. Mean response rate in this study was 88.50 (*SD* = 13.72).

Scale Development

Following Fraser (1986), instrument development in this study included three phases: first, salient dimensions or factors were identified; second, items were written; and third, the items were field tested and subjected to item analysis. These phases were adopted to guide

the instrument development procedures in this study, and will be discussed in the following subsections.

Identifying salient dimensions. Fraser (1986) argued that, within the learning environment literature, "the initial identification and definition of the dimensions are based primarily on the investigators' intuitive understanding of the dimensions to be assessed … the validity of intuitive scales rests heavily on the subjective opinions of the investigators" (p. 22). Other researchers have also identified their salient dimensions by analysing data and portfolios of teachers who were seen as outstanding (e.g., the Teacher Behaviours Checklist; Keeley et al., 2006). However, in taking this approach, the instrument development procedures become researcher-centred rather than student-centred. That is, the focus shifts from investigating student voice and its role in creating student-centred environments that enhance the academic learning of students, which is the crux of this doctoral research. Therefore, it was decided to keep the focus on student identification of the salient dimensions of these learning environments, to better understand how student views were related to their academic achievement. Therefore, the results from the Study One thematic analysis (see Figure 3.1 and Table 3.3) were used to deduce the dimensions of tertiary learning environments to be empirically tested in this study. The themes found in Study One (e.g., teacher behaviours and qualities, student behaviours and qualities, and classroom management) constituted the overarching dimensions of learning environments, and the subthemes found constituted the specific behaviours or qualities that students conceptualised as major aspects of these environments.

Item writing. Punch (2009) described the item writing phase as the process of translating theoretically sound constructs into a set of items that explicitly measure a construct and that construct only (see also Breakwell et al., 2006; Devellis, 1991). In addition to careful attention to the *content* of each item, the process of item writing involves

making decisions on the *number* of items required to capture the complexity of each construct. Costello and Osborne (2005) provided a discussion on the number of items per construct or factor, where the recommended minimum number of items in factor analysis studies was three per factor. If there are additional items above what might be considered necessary to measure a construct, reliability tests can then be used to investigate if the items are measuring what they are supposed to measure to a high degree of accuracy, and low-reliability items can be dropped from the final version of the instrument (Aberson, 2010; Fabrigar & Wegener, 2011; Schumacker & Lomax, 2010). Given that the findings from Study One revealed a large number of qualities or behaviours that students identified as associated with their learning environments, it was decided to write three to four items per subtheme to avoid developing a lengthy questionnaire that could lead to cognitive fatigue or a large percentage of missing data.

As indicated, once the number of items per construct was agreed upon, the second part of the item writing process involved making decisions on the content of each set of items per construct. In that way, each set of items should accurately encompass the meaning of the latent construct it represented (Edwards & Bagozzi, 2000). The subthemes found in Study One were used to inform the writing of items such that student examples and descriptions documented in the interview transcripts were translated into easy-to-complete questionnaire items. For example, one of the interviewees in Study One described their teacher as "standing in front of the class, next to the computer" (Student 8). Therefore, this quotation guided the write-up of items such as "the lecturer walks around when teaching" and "the lecturer stays at the front", which represented items measuring the extent to which teachers moved around during class. Another example was the items "I am usually thinking about the material discussed during the lecture" and "I am usually processing information given to us during the lecture", which were guided by student quotations such as: "Sometimes I'm

actually thinking about what's being said or talked about" (Student 1). As a result, a total of 90 items were written for testing.

Item scoring and field testing. Questionnaire items were scored on a 7-point Likert scale ranging from 1 for "strongly disagree" to 7 for "strongly agree", with a midpoint score for "neither agree nor disagree". The decision to adopt a 7-point scale was to provide respondents with more options to choose from. Having more options can result in a greater spread and hence variance in mean scores, especially when compared with item responses on 3- or 5-point Likert scales (Finn, 1972). However, Dawes (2008) argued that greater scoring options may result in smaller kurtosis and skew values (i.e., distribution of the data is likely to be flatter given the wider spread of the data), especially as the number of responses increases (Pallant, 2007; Tabachnick & Fidell, 2007). Therefore, the distribution of the data was examined before conducting the main analyses for this study.

Once the questionnaire items were finalised, consideration was given to improving the face and content validity of these items. This was seen as an important step in the scale development procedures given the "apparent lack of consistency in the literature in terms of how researchers use the opinions of expert judges in aiding the decision of whether or not to retain items for a scale." (Hardesty & Bearden, 2004, p. 105). Although Nunnally and Bernstein (1994) argued that the distinction between both types of validity was not always clear in the literature, they defined content validity as the extent to which a set of items represented a theoretically sound content domain, and face validity as the extent to which a set of items reflected what they were expected to measure. Therefore, understandably, face validity is strengthened by the content validity of the scale items.

A group of three doctoral supervisors in the area of educational psychology participated as expert judges, where each offered feedback on the clarity and content of all 90 items. All three expert judges were familiar with the topic, and well-informed about the

results from Study One and aims of the current study. Based on the critique offered by the three expert judges, some items were dropped or re-written before the questionnaire was finalised for this study (see Appendix D for the final version of the questionnaire). The process of editing items involved removing items with multiple clauses; including terminology that tertiary students from different cultural backgrounds could easily reflect on; and including items to which students from various disciplines could relate.

To make sure that the questionnaire was easy to read and could be completed within a short time frame, it was decided to treat the first data collection as a pilot run. This was important given the data collection instrument was new and had not been used before. Whereas the instrumentation procedures are discussed in a later subsection, the pilot testing and data collection procedures are described below. During this pilot testing, a timer was kept on to monitor how long it took students to complete the questionnaire. The time to completion of the questionnaire ranged from 6 to 10 minutes, with one student completing it in 11 minutes.

The first course coordinator who agreed to take part in this research, after ethical approval had been gained, also agreed for students to give feedback regarding the questionnaire items and design during the last 5 minutes of the lecture once their questionnaires were returned to the box at the back of the classroom. Of 141 enrolled students, 120 were present. In total, 92.5% (n = 111) of students completed and returned the questionnaire. Students were specifically asked to comment on the readability and relevance of the questionnaire items to the learning environment they were evaluating; none had any corrections or feedback for improving the instrument. That is, students did not find any item confusing, irrelevant, or hard to read. Therefore, it was decided to include the data from those 111 students as part of the overall data collection process. Once the scale development

phase was completed, the data collection procedures, as described in the procedures subsection, started.

Data Analysis Plan

Presenting the results of the exploratory factor analysis followed the guidelines provided by Ford, MacCallum, and Tait (1986) who argued that the procedures involved with factor analyses must be "presented clearly in enough detail for informed review, replication, and accumulation of knowledge" (p. 311). This included reporting on information such as the factor model, communalities, rotational method, eigenvalues for all factors (if applicable), percentage of variance accounted for (if using orthogonal rotation), factor loading, descriptive statistics and correlation matrix, computer program package used, and the pattern matrix when oblique rotation was used. Further procedural guidelines suggested by Pallant (2007) on running exploratory factor analyses were also followed when conducting these analyses.

All the analyses conducted for this study were completed using the statistical software IBM SPSS Statistics 22. An exploratory factor analysis (EFA) using the principal components analysis (PCA) extraction method and an orthogonal, direct oblimin, factor rotation were selected. The chosen methods of extraction and factor rotation were deemed appropriate given the assumptions that item responses may have shared sources of error which may not necessarily be unique to individual factors (Pallant, 2007; Tabachnick & Fidell, 2007), and that the constructs measured in the questionnaire were not independent (i.e., correlated). Based on the EFA results, means and standard deviations of the questionnaire factors were then created, along with Cronbach's alpha reliability estimates. The results of these analyses are presented in the results section which follows.

Results

Exploratory Factor Analysis

Multiple criteria were used to determine the number of factors to retain within the data. While Beavers et al. (2013) argued that retaining more factors than are needed is "less detrimental to the analysis than eliminating factors that are needed" (p. 7), they also argued that having too many factors may result in weak factor loadings. Conversely, choosing an oversimplified factorial structure with one or two factors only may undermine the complexity of the data (Pett, Lackey, & Sullivan, 2003). Therefore, the decision to retain or eliminate factors needed to be based on theoretical relevance and not just statistical tests (Costello & Osborne, 2005; Fabrigar & Wegener, 2011; Fabrigar, Wegner, McCallum, & Strahan, 1999). To do so, four "rules of thumb" were adopted from the literature (Costello & Osborne, 2005; Tabachnick & Fidell, 2007) to inform the process of retaining items and/or factors in the data: (a) retaining factors with corresponding eigenvalues greater than 1 (i.e., the Kaiser criterion) or by plotting these eigenvalues to investigate the corresponding scree plot and retaining factors with three or more items only; (b) dropping items with loadings less than .32 (e.g., if less than 10% of the variance was shared with other items within the same factor); (c) dropping items if they cross-loaded with other items; and (d) dropping items from a specific factor if that item was conceptually incongruent with the remaining items.

A total of four iterative steps were made where items or factors that did not meet the above criteria were removed, leaving 67 items extracted from 14 factors. When another iteration was run forcing the analysis to extract 13 factors only, a whole factor was removed as opposed to merging it into another conceptually sound factor. Therefore, it was decided to retain and further examine the 14-factor model for this study.

An additional set of measures was used to determine the factorability and strength of the relations between the data and the extracted 14-factor model. The EFA results suggested

that the shared variance (i.e., communalities) ranged between .47 and .88, indicating an acceptable fit between the data and model. Although item communalities are considered high when their values are greater than .80, Velicer and Fava (1998) argued that it is common in social science research for these communalities to range from .40 to .80, and that items with communalities less than .40 should be closely examined.

Further, Bartlett's Test of Sphericity was significant ($p < .001$) and Kaiser-Meyer-Olkin's (KMO) Test of Sampling Adequacy was .92. According to Beavers et al. (2013), a statistically significant test result for the Bartlett's test provides evidence that the correlation matrix is non-singular (i.e., a factor matrix can be extracted), and the KMO's value shows that the items share a very high degree of common variance. Typically, KMO values between .50 and 1 are acceptable, with higher values indicating greater common variance, and lower values indicating that additional items or factors should be removed before proceeding (Ferguson & Cox, 1993). Lastly, Table 4.2 below shows the total variance explained by 14 factors (70.18%), which is considered satisfactory in social science research (Hair, Anderson, Tatham, & Black, 1998).

Table 4.2

Total Variance Explained by the 14-Factor Model

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	17.53	26.16	26.16
2	5.80	8.66	34.82
3	3.43	5.12	39.94
4	3.15	4.71	44.65
5	2.62	3.91	48.56
6	2.22	3.32	51.88
7	2.01	3.01	54.88
8	1.75	2.61	57.49
9	1.64	2.45	59.94
10	1.56	2.33	62.27
11	1.46	2.18	64.46
12	1.33	1.98	66.43
13	1.28	1.91	68.64
14	1.23	1.84	70.18

Questionnaire Measures: Identifying Salient Dimensions

Following the exploratory factor analysis, once the factorial structure of the instrument was verified, it was decided to involve additional expert judges in the process of verifying and labelling each of the 14 extracted components from a conceptual point of view, before proceeding to verify these components from a statistical point of view. To do so, a group of 14 expert judges was formed, comprising doctoral supervisors, postgraduate students, school teachers, and university lecturers in the area of educational psychology. The group was provided with the pattern matrix (see Table 4.3) resulting from the EFA, and asked to label each of the 14 components by simply looking at the items within each component. The group was also asked to comment on whether there were any items they perceived as incompatible with the rest of the items within each factor. By the end of the discussion, all components were named and there were no disagreements on the labelling or meaning of specific items or factors.

Table 4.3

Pattern Matrix for the 14 Extracted Components

	Component													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
7.The lecturer's voice is dull/monotone.	.68													
1.The lecturer is enthusiastic.	-.67													
80.The lecturer's tone is always the same/unchanging.	.66													
54.The lecturer's voice is boring.	.64													
52.The lecturer is energetic.	-.64													
84.The lecturer's teaching style is boring.	.61													
26.The lecturer is excited to teach.	-.60													
86.The lecturer is boring.	.58													
87.The lecturer presents the class material in a boring way.	.57													
60.The lecturer enjoys teaching.	-.51													
32.The lecturer enjoys talking about his/her topic.	-.48													
10.Student discussions are common.		.90												
8.Interactions between students are common.		.89												
6.Students interact with each other.		.84												
19.Students participate and share ideas.		.77												
34.Students contribute to class discussions.		.76												
16.Students are involved in discussions.		.74												
4.Students usually ask questions.		.59												
13.Students do not interact with the teacher.		-.51												
42.I usually take notes.			.94											
45.I usually write notes.			.92											
37.I usually write down information discussed.			.86											

33.There are way too many students.	.92						
28.Too many students are put into one space.	.89						
11.The number of students is too large.	.87						
69.I feel shy when asking or answering questions.		.91					
74.I hesitate to ask questions.		.89					
41.I would rather not ask questions.		.72					
78.Students are forced to interact with the lecturer.			.75				
51.Students are forced to participate.			.74				
59.The lecturer puts students on the spot to answer questions.			.74				
68.Students are pressured to interact with the lecturer.			.65				
47.The lecturer picks on some students to answer questions.			.63				
55.The lecturer randomly chooses students to answer questions.			.58				
36.The pace of teaching is either too slow or too fast for me.				-.92			
35.Conversations go either too slow or too fast for me.				-.85			
40.The lecturing is either too fast or too slow for me.				-.83			
57.The lecturer walks around when teaching.					.85		
31.The lecturer moves around.					.81		
15.The lecturer stays at the front.					-.67		
62.Students keep talking during the lecture time.						.80	
85.Students distract each other.						.79	
79.Students do not pay attention to what the lecturer is saying.						.71	
71.The seating arrangement allows for interaction between students and the teacher.							.94
65.The physical setting (the seating, tables, etc.) allows for student–teacher interaction.							.87
81.From where I am sitting, it is easy to interact with the lecturer and other students.							.71
76.The lecturer’s content knowledge is limited.							-.67
67.The lecturer usually goes off track.							-.66
73.The lecturer does not focus on the main topic of the lecture.							-.62

70.The lecturer is not interested in teaching us.	-.59			
18.The lecturer does not know his/her topic very well.	-.55			
83.The lecturer is not interested in the topic he/she is teaching.	-.52			
39.The lecturer goes off topic.	-.52			
49.The lecturer looks down on students.	-.48			
58.The lecturer is not friendly.	-.47			
89.The lecturer is intimidating.	-.46			
72.The lecturer knows how to use technology to aid the learning process.		.83		
17.The lecturer knows how to use the technology provided.		.82		
90.The lecturer knows how to incorporate technology with his/her teaching.		.78		
14.The lecturer checks that students understand the topic discussed.			.85	
44.The lecturer makes sure we understand the materials.			.79	
5.The lecturer checks for our understanding of the content.			.78	
61.I find the content interesting.				.65
82.I find the topics taught interesting.				.63
50.I am usually thinking about the material discussed during the lecture.				.62
24.I usually think about what is being said.				.58
46.I am usually processing information given to us during the lecture.				.46

Note. Rotation converged in 13 iterations, and all item loadings were above .45.

Following the discussion with the group of experts on the conceptual understanding of the instrument structure, descriptive statistics were calculated for each of the 14 labelled factors. Negatively worded items were reversed prior to creating factor means. These statistics can be seen in Table 4.4. Further, Cronbach's reliability coefficient (alpha) was calculated as a measure of internal consistency between the items nested within each factor. These coefficients are also presented in Table 4.4, and ranged from .75 to .95, indicating good internal consistency between items within each factor. The alpha coefficient, in turn, indicated that the factor structures could be used reliably for further analyses.

Table 4.4

Descriptive Statistics and Cronbach's (Alpha) Reliability Coefficients by Factor

Factor	*M* (*SD*)	α	Range		Skew	Kurtosis
			Potential	Actual		
Teacher Delivery Style	5.59 (1.14)	.95	1–7	1.27–7	-.97	.65
Student Interactions	4.86 (1.16)	.93	1–7	1.13–7	-.54	.00
Note-taking	5.59 (1.31)	.93	1–7	1–7	-1.54	2.72
Class Overcrowding	3.04 (1.46)	.92	1–7	1–7	.51	-.43
Student Reticence	4.41 (1.45)	.80	1–7	1–7	-.24	-.50
Forced Interactions	2.64 (1.03)	.81	1–7	1–6.33	.55	.08
Instructional Pacing	4.52 (1.38)	.90	1–7	1–7	-.33	-.22
Teacher Movement	3.73 (1.26)	.75	1–7	1–7	-.03	-.36
Student Distraction	3.36 (1.33)	.79	1–7	1–7	.21	-.55
Physical Environment	4.06 (1.40)	.83	1–7	1–7	-.06	-.54
Teacher Ineffective Practice	2.00 (.87)	.89	1–7	1–6.30	1.46	2.88
Teacher Technological Competence	5.60 (1.04)	.80	1–7	1–7	-.94	1.05
Checking for Student Understanding	4.99 (1.19)	.88	1–7	1–7	-.72	.51
Cognitive Engagement	5.51 (.94)	.86	1–7	1.60–7	-.80	.81

Note. *N* = 711 for all factors.

Further, an additional test of convergent validity was used where the factor inter-correlations were examined. This was due to the earlier assumption that the factors extracted from the data were likely to be correlated (i.e., not independent). Table 4.5 below shows that most of the factor inter-correlations were significant at the .001 level, ranging from .08 to .69, indicating a substantial convergence, or overlap, among the factors.

Table 4.5

Pearson's Bivariate Correlations among the 14 Factors

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Teacher Delivery Style	–													
2. Student Interactions	.47***	–												
3. Note-Taking	.11**	.05	–											
4. Overcrowding	-.28***	-.20***	-.10**	–										
5. Student Reticence	-.10**	-.10**	.04	.02	–									
6. Forced Interactions	-.25***	.06	-.06	.25***	-.01	–								
7. Instructional Pacing	.41***	.22***	-.02	-.30***	-.17***	-.23***	–							
8. Teacher Movement	.30***	.30***	-.04	-.03	-.07	.12**	.09*	–						
9. Student Distraction	-.35***	-.18***	-.11**	.39***	.14***	.17***	-.34***	-.09*	–					
10. Physical Environment	.16***	.34***	.07	-.24***	-.11**	.08*	.03	.14***	-.19***	–				
11. Ineffective Practice	-.69***	-.31***	-.11**	.36***	.11**	.47***	-.43***	-.11**	.38**	-.08*	–			
12. Technological Competence	.48***	.21***	.22***	-.18***	.06	-.26***	.24***	.15***	-.25***	.07*	-.44***	–		
13. Checking for Understanding	.48***	.57***	.11**	-.19***	-.08*	-.02	.23***	.28***	-.29***	.28***	-.36***	.28***	–	
14. Cognitive Engagement	.59***	.40***	.36***	-.30***	-.14***	-.10**	.36***	.18***	-.31***	.22***	-.46***	.41***	.40***	–

Note. ***$p < .001$, **$p < .01$, *$p < .05$.

Discussion

The purpose of this study was to develop a quantitative survey instrument for assessing students' evaluations of tertiary learning environments that produced reliable and valid responses. As detailed, this was done by translating the qualitative themes and subthemes found in Study One into a 90-item quantitative instrument and administering it to 711 undergraduate students. The data collected were than used to analyse the factor structure of the instrument, and to better understand the underlying relations between the items developed in this study. The results supported a 14-factor model with 67 items.

The 14-factor solution found in this study draws attention to the many facets of tertiary learning environments. It must be noted, however, that the number, type, and range of factors found in this study are unorthodox when compared with those of existing tertiary learning environment instruments. Evidence of this unorthodox factor structure can be seen in Table 4.6, which displays the factors or subscales of existing instruments that measure similar environments to the ones investigated in this study. As this comparison indicates, existing surveys measure 6 to 8 factors on average, whereas the survey developed in this study measures 14 factors. Although the statistical properties of the 14-factor instrument showed acceptable levels of reliability, it may not be desirable to use a lengthy survey covering a large number of characteristics. Therefore, finding a more parsimonious solution to that indicated in this study is one idea worthy of further exploration, in order to develop a practical and time-efficient survey.

A list of the factors found in this study that overlap conceptually with the ones established in previous surveys are also noted in Table 4.6. It was important to examine this aspect because different authors may label factors differently even though they capture similar underlying constructs. For example, class or student interactions are also measured by CUCEI and SEEQ, whereas teacher (in)effective practice is measured by QTI, CEQ, and

SEEQ. Instruments that measure innovative learning environments such as the Constructivist On-Line Learning Environment Survey (COLLES; Taylor & Maor, 2000), or ones that measure specialist environments such as the Science Laboratory Environment Inventory (SLEI; Fraser & McRobbie, 1995) were excluded from the table because the current study focused on learning environments conducted face-to-face using typical classroom settings such as lecture theatres.

Table 4.6

Comparison of Existing Survey Subscales/Factors with the Factors Found in This Study

Instrument	Subscales/Factors	Overlapping factors with this study's instrument
College and University Classroom Environment Inventory (CUCEI; Nair & Fisher, 2001)	Personalisation Involvement Student Cohesiveness Satisfaction Task Orientation Innovation Individualisation	Student Interactions Teacher Delivery Style
Questionnaire of Teacher Interactions (QTI; Coll, Taylor, & Fisher, 2002)	Leadership Helping/Friendly Understanding Student Responsibility/Freedom Uncertainty Dissatisfaction Admonishing Strictness	Checking for Understanding Teacher Delivery Style Ineffective Practice
Course Experience Questionnaire (CEQ; Lizzio, Wilson, & Simons, 2002)	Generic Skills Good Teaching Clear Goals Appropriate Assessment Appropriate Workload Independence	Teacher Delivery Style Ineffective Practice
Student Evaluation of Student Quality (SEEQ; Coffey & Gibbs, 2001; Marsh, 1982)	Learning Enthusiasm Organisation Group Rapport Breadth	Cognitive Engagement Teacher Delivery Style Instructional Pacing Student Interactions Ineffective Practice

Note. QTI was originally developed for use in secondary school environments, but recent studies have validated the instrument using tertiary student samples (Coll, Taylor, & Fisher, 2002).

Overall, six factors found in this study were considered to overlap conceptually with ones found in previous studies (i.e., boring delivery style, ineffective practice, student interactions, cognitive engagement, instructional pacing, and checking for understanding). In contrast, eight factors seemed to be different or theoretically distinct from the ones previously explored in tertiary learning environments. This raises questions about the importance or relevance of the factors that overlapped and that were, therefore, often measured by different survey instruments, versus the ones which were newly introduced to the literature through this study's findings. It may be that the non-overlapping factors (e.g., note-taking, technological competence, and physical environment) were seen as less influential on tertiary students' learning and hence were not explored in previous tertiary environment studies. Even so, although the physical environment, for example, was not measured in any of the survey instruments mentioned in Table 4.6, other authors have argued for the importance of the physical arrangement of the class on student interactions and learning (Gremmen, van den Berg, Segers, & Cillessen, 2016). Therefore, further exploration of the influence of these different factors on student outcomes is suggested to support or reject the claim that the factors often measured by survey instruments are more influential on student outcomes than the factors that are rarely measured.

When comparing the instrument developed in this study with instruments previously established, one significant contribution that this survey introduces to the literature is the range of the factors that measure student and teacher behaviours and qualities. The CUCEI mainly measures student-related behaviours and qualities (e.g., the extent to which students are satisfied with their environments or are involved in class discussions; Nair & Fisher, 2001), whereas both QTI and SEEQ focus on teachers and effective teaching practices or interactions (Marsh & Bailey, 1993). Further, the CEQ measures aspects of the classroom that are either administrative or institute-driven factors (e.g., workload, assessment, and

generic skills taught or achieved; Lizzio et al., 2002). Therefore, the survey developed in the current study brings a broader range of factors together that are not typically examined as part of a single instrument, such as the physical setting (climate variable), cognitive engagement (student variable), teacher delivery style (teacher variable), and instructional pacing (climate variable). This instrument also measured a range of behaviours (e.g., student reticence and class interactions) as well as qualities (e.g., delivery style, and technological competence) within the same learning context. Therefore, it would seem worthwhile to examine the extent to which different behaviours or qualities predict classroom cognitive and affective outcomes in order to establish their ranking of relevance to student learning outcomes.

Limitations

The first, and perhaps most worrisome, limitation of the study concerns the response rate. Although, the participation rate was high among those present in the class on the day the survey was conducted (81.4%), nearly half of the students (44.2% across all classes sampled) were not present. This low attendance rate may be explained by several factors. Most notably, at the university in which this study took place, lecture attendance is voluntary, and many courses offer lecture recordings for students who are unable to attend. Regardless of the reasons, this relatively high absentee rate constitutes a non-response bias (Wild & Seber, 2000), and presents a threat to the validity of inferences made from the study results. In future studies, it is recommended that researchers use both in-person and online questionnaires to overcome this issue. However, Baruch and Holtom (2008) warned that taking such action could compromise the response rate, because the average response rate for online questionnaires is lower (38.9%, *SD* = 15.1) than that for questionnaires conducted face-to-face with the participants (62.4%, *SD* = 16.9). Nevertheless, it is possible that a combination of both face-to-face and online delivery of the questionnaires could have improved the participation rate.

A second limitation, also related to the sample, concerns an over-representation of students from social science and humanities disciplines (77.4% completing arts, education or social work degrees), when compared to those studying life sciences, business, medical and health sciences, and creative arts. Moreover, only 10 course coordinators from five faculties responded agreeing for the research team to approach their students, which suggests that the data may not be representative of a broad sample of students across all undergraduate courses. Therefore, it could be that the exploratory factor analyses may have yielded a different factor solution if students from a wider range of disciplines were recruited. In future studies, a larger sample size with students from a wider range of disciplines is suggested to overcome this limitation. In doing so, measurement invariance techniques could be undertaken to investigate whether the factor solution found in this study is replicable, and hence relevant, to learning environments across faculties and/or disciplines.

Finally, the use of self-report data to measure student beliefs and achievement in this study may be seen as a threat to the reliability of the data collection and the validity of the inferences made from its results. However, Lance and Vandenberg (2009) have argued that the use of self-report data does not pose a threat to the validity of measures nor to the interpretations of findings given the strong positive correlations found between self-report and actual data, as well between those two types of data and outcomes (see also Ewell & Jones, 1993). Babad (2009) further argued that, in the use of self-report data when investigating the social psychology of the classroom, it is not uncommon for the researcher to assume an objective stand on a subjective matter such as student views of the learning environment. Moreover, it is hoped that the relatively large and diverse sample of participants involved in the current study would ensure its robustness, as well as the reliability of the self-report measures used within it.

Implications for Future Research and Practice

This study's focus on creating a survey instrument that captured as many dimensions as possible of tertiary learning environments meant it could be a lengthy process for students to complete all questionnaire items. It may, therefore, be more desirable for tertiary teachers to have a short-form version of the questionnaire that could be completed within a shorter time frame. This would make the questionnaire more practical for use in situations where students had limited time to evaluate their courses. The development of a short-form version would be worthy of exploration in future studies.

Further, the 14-factor solution found in this study is not necessarily the most parsimonious solution. Instead, the questionnaire that resulted from the exploratory factor analysis captured much complexity, yet satisfied the statistical and theoretical rules of thumb when using an exploratory factor analysis technique. Therefore, future studies should focus on investigating alternative or parsimonious factor solutions that still capture the complexity of the tertiary learning environment. Lastly, a short-form version of this instrument constitutes another future research direction stemming from this study's findings.

Conclusion

Developing a learning environment questionnaire by using student voice to guide the conceptualisation of these environments was the second objective of this research project. The resulting 14-factor instrument provides a means for researchers to investigate the extent to which student voice can be reliably used in the instrumentation of learning environment questionnaires, and also to investigate whether the instrument could serve as a feedback tool to gain reliable insights on student learning experiences. Specifically, now that the instrument has been created, the challenge is to examine which of these 14 factors predict student outcomes such as self-reported achievement, expectations, and motivational beliefs. Analysing the views students hold about their learning environment in association with a

range of psychosocial beliefs could provide further empirical evidence of the importance of the questionnaire developed in the current study. Further, understanding the relations between student views of the 14 factors identified earlier and student outcomes could inform future iterations of this instrument, by providing an understanding of which variables matter in terms of predicting student outcomes. Thus, the next chapter presents the third and final study in this doctoral project where student evaluations of their tertiary learning environments were investigated alongside other psychosocial variables and achievement.

CHAPTER FIVE

PREDICTING OUTCOMES: THE ROLE OF STUDENT PERCEPTIONS OF THE LEARNING ENVIRONMENT ON REPORTED SELF-BELIEFS AND ACHIEVEMENT (STUDY THREE)

The aim of this third and final study was to validate the survey instrument developed in Study Two through a confirmatory factor analysis, and then, provided the model fit was good, to then use it to examine student perceptions of the class climate in relation to student self-expectations and motivational beliefs, and to self-reported achievement. An exploratory cross-sectional design was employed in this study with a different sample of undergraduate students from those who participated in the earlier studies. Therefore, the research question pertaining to the current study was: What are the relations between student perceptions of the learning environment, motivational and self-beliefs, expectation beliefs, and student achievement?

Method

Participants

A total of 751 undergraduate students from a large university in New Zealand participated in this study. Of the participants, 75.4% were female (*n* = 566), and 52.2% self-identified as New Zealand European (*n* = 392), 26.6% as Asian *(n* = 200), 8.5% as Pasifika (*n* = 64), 4.4% as Māori (*n* = 33), and 8.3% Other (*n* = 62). Students reported belonging to six different faculties: arts (*n* = 358, 47.7%), education and social work (*n* = 177, 23.6%), business (*n* = 154, 20.5%), science (*n* = 46, 6.1%), medical and health sciences (*n* = 9, 1.2%), and creative arts and industries (*n* = 7, 0.9%). Of these students, 38.6% indicated that they

were in their first year (*n* = 290), 35.2% in their second year (*n* = 264), 15.6% in their third year (*n* = 117), and 10.7% in their fourth year (*n* = 80) of undergraduate study.

Procedures

The data collection procedures for this study were similar to those described in Study Two, as both studies used the same design and sampling procedures. However, whereas Study Two was conducted during the second semester (August–November) in 2015, Study Three was conducted at the first semester (March–June) of 2016. First, ethical approval was gained for this study (Ref. 015294) from the University of Auckland Human Participants Ethics Committee (UAHPEC). Following approval, all eight faculty deans were contacted to gain their approval to approach course coordinators in their faculties. Six faculty deans agreed for the researcher to approach course coordinators: science, arts, medical and health sciences, education, and business. Course coordinators were then contacted in those six faculties for their approval to approach undergraduate students during class time and provide the students with information sheets about this research project.

A purposeful sampling procedure was used to select courses. A list of all available courses from the six faculties mentioned above was downloaded. Then, an email invitation was sent out to first, second, third, and fourth year course coordinators within each faculty. These invitations included information sheets that described the overall aims of the doctoral project, as well as consent forms to be signed and returned if coordinators consented for the research to take place with students enrolled in their courses.

As with the Study Two procedures, students were approached during a lecture session with participant information sheets and the questionnaire. After the research was explained to the students, those who decided to participate were asked to complete the anonymous questionnaire during the scheduled lecture break. Participating students were asked to return their completed questionnaires into a box placed at the back of the classroom.

The final sample included 20 courses. As detailed in Table 5.1, although there were 2,300 students enrolled across the 20 courses, only 42.1% (n = 969) of those students were present in class on the day of the study. Of the students present, 77.5% (n = 751) consented to participate by returning a completed questionnaire. Because the questionnaire was anonymous, in line with the ethical guidelines of UAHPEC, students did not need to complete a consent form. There were two courses (Course ID 17 and 18) where the response rate was substantially lower than in the other courses; for those two courses, the course lecturers had started their classes late, resulting in a shortened lecture break. This may have meant students from those two courses did not have enough time to complete all items within the reduced time-frame and, as a result, chose to not return the questionnaires. Nevertheless, those who did respond to the questionnaire were able to complete all items in the time available.

Table 5.1

Survey Response Rates by Course

Course ID	# Enrolled	# Attendance	% Attendance	# Collected	% Collected
1	10	3	30.00	3	100.00
2	17	11	64.71	11	100.00
3	19	13	68.42	13	100.00
4	36	16	44.44	16	100.00
5	103	25	24.27	20	80.00
6	7	5	71.43	5	100.00
7	30	13	43.33	13	100.00
8	67	16	23.88	16	100.00
9	87	36	41.38	34	94.44
10	58	34	58.62	32	94.12
11	70	39	55.71	39	100.00
12	109	58	53.21	54	93.10
13	100	70	70.00	42	60.00
14	436	277	63.53	238	85.92
15	144	68	47.22	58	85.29
16	67	27	40.30	24	88.89
17	344	100	29.07	55	55.00
18	341	100	29.33	29	29.00
19	35	13	37.14	11	84.62
20	220	45	20.45	38	84.44
Total	2300	969	42.13	751	77.50

Note. Mean response rate in this study was 86.74 (*SD* = 18.75).

Measures

The following subsection present three measures: a questionnaire about tertiary learning environments, a two-factor measure of student self-expectation beliefs, and a 3-by-2 measure of achievement goals.

Tertiary learning environments questionnaire. The current study used the newly developed 67-item learning environment questionnaire from Study Two, which measures 14 different aspects of tertiary environments (teacher delivery style, student interactions, note-taking, class overcrowding, student reticence, forced interactions, instructional pacing, teacher movement, student distraction, physical environment, teacher ineffective practice, teacher technological competence, checking for student understanding, and cognitive

engagement). Items were scored on a 7-point Likert scale ranging from 1 for “Strongly Disagree” to 7 for “Strongly Agree”, with 4 being the mid-point (i.e., “Neither Agree or Disagree”, see Appendix D for the full version of the questionnaire). Study Two showed that the data captured by the questionnaire demonstrated acceptable levels of reliability and structural validity, and it was therefore used in this study with a new sample of students to examine their views of class climate, along with separate measures of their self-expectations and motivational beliefs, and self-reported achievement. (For a list of all items in the questionnaire, as well as the alpha coefficients by factor, see Tables 4.3 and 4.4 in Chapter Four).

Student expectation beliefs. For the current study, two factors were adapted from Rubie-Davies and Alansari (2017) to measure student self-expectations of success and workload (see Table 5.2). Whereas the factor “self-expectations” was adopted as is, the second factor, “workload expectations”, was slightly modified to suit the age group of the participants in this study. This was important to do since Rubie-Davies and Alansari (2017) initially developed the factors for use with primary-aged students. Therefore, before the main analyses were completed, the items for workload expectations were re-written and a confirmatory factor analysis conducted to determine the structural validity and reliability of the two-factor model, given the different class setting and age-group of students sampled in this study. For example, one item that was originally written as “I am expected to do work that is too hard for me to do” was modified to “In this course, I am expected to do work that is far beyond what I can do”.

Table 5.2

Student Expectation Beliefs' Subscales and Items

Factor	Items
Self-expectations	1. I expect to do well in this course. 2. I think I will do well in this course. 3. I expect to do better in this course than others in my class.
Misplaced Workload Expectations	4. I am expected to do too much work in this course. 5. My lecturers/tutors expect too much of me in this course. 6. In this course, I am expected to do work that is far beyond what I can do.

Achievement goal orientation. The 3-by-2 model of achievement goals was adapted from Elliot, Murayama, and Pekrun's (2011) Achievement Goal Questionnaire (AGQ), with six factors measuring student goal orientation (see Table 5.3 for a list of all items). This 3-by-2 taxonomy suggests that achievement goals can be categorised depending on how students define competence (i.e., relative to self, task, or others), and whether their aim was to approach success or avoid failure. Therefore, the model suggested that students could focus on getting a task right versus avoiding doing the task incorrectly (task-approach versus task-avoidance goals); attaining self-competence versus avoiding self-based incompetence (self-approach versus self-avoidance goals); or outperforming others versus avoiding other-based incompetence (other-approach versus other-avoidance goals). The 6-factor model demonstrated acceptable levels of internal consistency ($\alpha > .75$ for all 6 factors; Elliot, Murayama, & Pekrun, 2011) and structural reliability (χ^2 /(df) = 192.71, $p < .01$; TLI = .94; CFI = .95; SRMR = .07; AIC = 330.71), using two samples of 126 undergraduate psychology students in Germany, and 310 psychology undergraduate students in the United States. No data were available indicating test-retest reliability.

Table 5.3

Achievement Goal Orientation Subscales and Items

Subscale	Item
Task-approach goal	1. To get a lot of questions right on the assessments in this class. 2. To know the right answers to the questions on the assessments in this course. 3. To answer a lot of questions correctly on the assessments in this course.
Task-avoidance goal	4. To avoid incorrect answers on the assessments in this course. 5. To avoid getting a lot of questions wrong on the assessments in this course. 6. To avoid missing a lot of questions on the assessments in this course.
Self-approach goal	7. To perform better on the assessments in this course than I have done in the past on these types of assessments. 8. To do well on the assessments in this course relative to how well I have done in the past on such assessments. 9. To do better on the assessments in this course than I typically do in this type of situation.
Self-avoidance goal	10. To avoid doing worse on the assessments in this course than I normally do on these types of assessments. 11. To avoid performing poorly on the assessments in this course compared to my typical level of performance. 12. To avoid doing worse on the assessments in this class than I have done on prior assessments of this type.
Other-approach goal	13. To outperform other students on the assessments in this class. 14. To do well compared to others in the class on the assessments. 15. To do better than my classmates on the assessments in this class.
Other-avoidance goal	16. To avoid doing worse than other students on the assessments in this class. 17. To avoid doing poorly in comparison to others on the exams in this class. 18. To avoid performing poorly relative to my fellow students on the exams in this class.

Student Achievement. The self-report method was used to capture student achievement, whereby students indicated on the questionnaire the typical marks or grades they had received at the university. Students indicated their achievement levels on a 7-point Likert scale (1 for “Less than 40%”, 2 for “Between 40% and 50%”, 3 for “Between 50% and 60%”, 4 for “Between 60% and 70%”, 5 for “Between 70% and 80%”, 6 for “Between 80% and 90%”, and 7 for “90% and above”) that was intended to mirror the grading scheme used at the university in which the study took place. It is acknowledged that the use of self-report

data could pose a threat to the validity of inferences made from the study findings, and this will be addressed in the limitations subsection later.

The Conceptual Model

Given the literature review and research question related to this study (see Chapter Two), a conceptual model was proposed, as shown in Figure 5.1 below. This model was empirically tested in the current study. The conceptual model posits that student views of their learning environments (i.e., the contextual factors) may have an influence on student motivational and expectation beliefs (i.e., the individual or "self" factors), as well as on achievement (i.e., performance). Given very few studies have found significant links between tertiary students' expectation beliefs and achievement (e.g., Jones & Grieneeks, 1970), with more recent studies establishing relations between their goal orientations and achievement (e.g., Church, Elliot, & Gable, 2001), it was hypothesised that the expectation and motivational beliefs measured in this study, albeit measured differently, may still be related to student self-reported achievement. Finally, it was hypothesised that student views of the learning environment were likely to be associated with student self-beliefs (Chionh & Fraser, 2009; Church, Elliot, & Gable, 2001), and student achievement (Rozario & Taat, 2015).

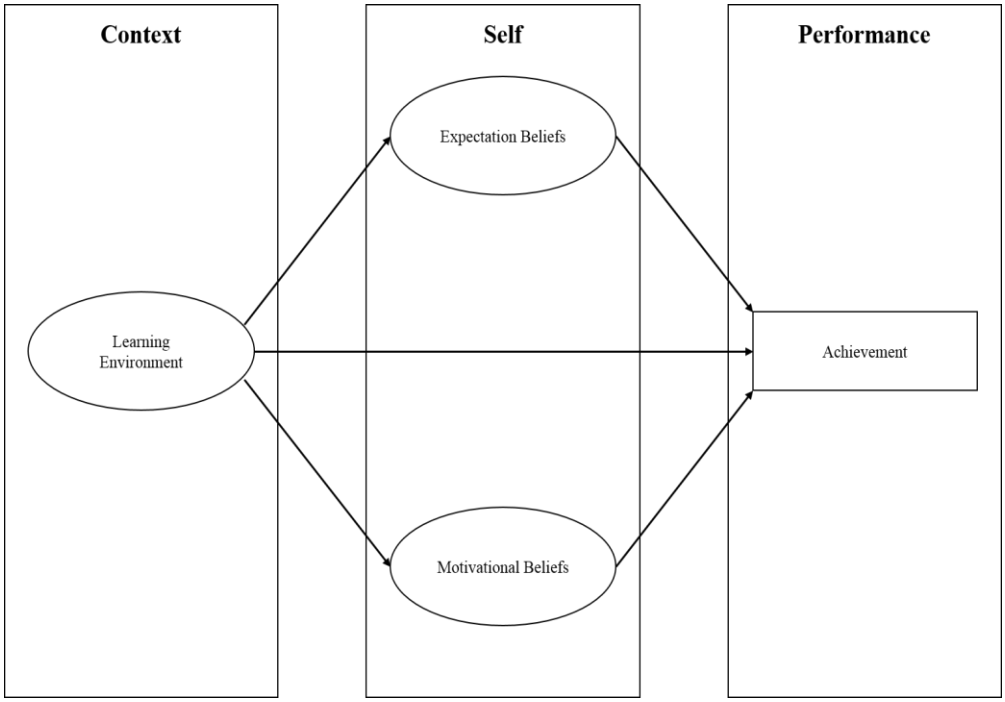

Figure 5.1. Conceptual model showing the hypothesised relations between the variables investigated in this study.

Data Analysis Plan

This study used confirmatory factor analysis (CFA) and structural equation modelling (SEM) techniques, following the procedures provided by Byrne (2010), and based on the maximum-likelihood estimation method. The factor structure of the variables investigated in this study have all been explored in previous studies, as described under the Measures section. So, the focus was on confirming the structure of the latent variables (i.e., evaluating the reliability of the measurement models) used in this study before proceeding with exploring the relations among the variables. Conducting a CFA first was important to verify that each measurement model, leading to the final structural equation model, showed good model fit and represented the data well.

Further, this study followed the guidelines presented in the literature (e.g., Schreiber, Nora, Stage, Barlow, & King, 2006) that provide information for carrying out and reporting results from CFA or SEM techniques. These include (a) clear and succinct research questions that dictate the use of CFA and SEM; (b) clear theoretical rationale that drives the

empirical model; (c) sufficient descriptive statistics that allow future researchers to re-produce the analyses; (d) graphical representation of the hypothesised and final models used in SEM; (e) parameter estimates (e.g., standardised regression weights and squared multiple correlations), including a range of goodness-of-fit indices to assess model specification and the extent to which the hypothesised model fits the data collected; (f) information on any modification procedures made before proceeding with the analyses; and (g) a discussion of the implications or inferences made from the CFA or SEM results.

Although researchers disagree on which fit indices can best describe the model specification, the general consensus in the literature is to use a range of indices such that the limitations or biases of one index can be covered by another index. For example, the root mean square error of approximation (RMSEA) is affected by model parsimony (i.e., higher RMSEA values are found for more complex models), whereas the comparative fit index (CFI) and Tucker-Lewis index (TLI) are affected by sample size and degrees of freedom (i.e., lower CFI and TLI values are found in smaller sample sizes; Byrne, 2010; Meade, Johnson, & Braddy, 2008), and Gamma Hat is unaffected by model complexity or misspecification (Fan & Sivo, 2007). Further, chi-square values are sensitive to sample size and often yield a statistically significant result (Hooper, Coughlan, & Mullen, 2008) indicating "badness" of fit with larger sample sizes. Hooper et al. (2008) also suggested that there is no agreement on what constitutes acceptable normed chi-squared (χ^2/df) values, as these acceptable values can range from 2–5 (see also Tabachnick & Fidell, 2007). Therefore, a range of fit indices (χ^2/df, TLI, CFI, Gamma Hat, SRMR, and RMSEA) will be reported in the results section of this chapter. The acceptable levels of each of those indices were adopted from a number of reviews on goodness-of-fit indices (e.g., Hooper, et al., 2008; Marsh, Hau, & Wen, 2004; Schreiber et al., 2006) and were used to determine the fit of the measurement and structural equation models presented in the results section. Specifically, the criteria for acceptable

levels of fit are: a non-significant chi-square value; χ^2/df < 3.0; TLI, CFI, and Gamma Hat > .90; SRMR < .05; and RMSEA < .08.

Based on the CFA results, means and standard deviations for the questionnaire factors were calculated, along with Cronbach's alpha reliability estimates and Pearson's bivariate correlations. These preliminary descriptive analyses were then followed by examining the relations between the variables investigated in this study using SEM techniques. The results of these tests are presented in the results section which follows. All analyses in this study were conducted using the statistical software IBM SPSS Statistics 22 and AMOS.

Results

Confirmatory Factor Analyses

Validating the learning environments subscales. The 14 factors found in Study Two were examined in the current study using a confirmatory factor analysis technique. In doing so, items with loadings less than .32 (e.g., less than 10% of the variance was shared with other items within the same factor) were dropped, and only factors with three or more items were retained for further examination (Costello & Osborne, 2005; Tabachnick & Fidell, 2007). As a result, a 10-factor model constituted the hypothesised model adapted from the previous study. The factors that were dropped from the Study Two final model were *student reticence, teacher movement, physical environment*, and *student distraction*.

Table 5.4 below describes the fit indices of the hypothesised model (which had 10 factors) versus three alternative models: a unidimensional model where all items loaded onto one factor, a 2-factor model where student-related items were loaded separately from teacher-related items, and a 5-factor model based on the qualitative results from Study One that suggested five underlying themes of learning environments (student behaviours, student qualities, classroom management, teacher behaviours, and teacher qualities). The CFA results suggested that the 10-factor solution was superior to the alternative models tested,

with strong unique loadings (standardised regression weights > .70, see Figure 5.2), acceptable levels of internal consistency (see Table 5.8), and standardised multiple correlations ranging from .50 to .90 indicating moderate to strong shared variance among the 32 items representing the 10 factors. No post-hoc modifications were conducted. Therefore, this solution was retained for further analyses (see Table 5.5 for a list of all 32 items).

Table 5.4

Goodness of Fit Indices for the Default (Hypothesised) versus Alternative Models

	χ^2 (df)	χ^2/df	TLI	CFI	Gamma Hat	SRMR	RMSEA
Acceptable Values	$p > .05$	< 3	> .90	> .90	> .90	< .05	< .08
Default 10-factor Model	796.79 (419)***	1.90	.97	.98	.99	.03	.04
Alternative 1-factor Model	10514.03 (464)***	22.66	.36	.40	.71	.14	.17
Alternative 2-factor Model	8512.32 (451)***	18.87	.47	.52	.79	.13	.15
Alternative 5-factor Model	6761.19 (454)***	14.89	.59	.62	.82	.16	.14

Note. ***$p < .001$.

Table 5.5

Learning Environment Subscales and Items Following the CFA Results

Factor	Items
Ineffective Practice	1. The lecturer is not interested in teaching us. 2. The lecturer's content knowledge is limited. 3. The lecturer is not friendly. 4. The lecturer is not interested in the topic he/she is teaching.
Instructional Pacing	5. Conversations go either too slow or too fast for me. 6. The pace of teaching is either too slow or too fast for me. 7. The lecturing is either too fast or too slow for me.
Technological Competence	8. The lecturer knows how to use technology to aid the learning process. 9. The lecturer knows how to incorporate technology with his/her teaching. 10. The lecturer knows how to use the technology provided.
Class Interactions	11. Students are involved in discussions. 12. Students participate and share ideas. 13. Students contribute to class discussions.
Overcrowding	14. Too many students are put into one space. 15. There are way too many students. 16. The number of students is too large.
Boring Delivery Style	17. The lecturer's teaching style is boring. 18. The lecturer is boring. 19. The lecturer presents the class material in a boring way. 20. The lecturer's voice is boring.
Note-Taking	21. I usually take notes. 22. I usually write notes. 23. I usually write down information discussed.
Cognitive Engagement	24. I usually think about what is being said. 25. I am usually thinking about the material discussed during the lecture. 26. I am usually processing information given to us during the lecture.
Checking for Understanding	27. The lecturer checks for our understanding of the content. 28. The lecturer checks that students understand the topic discussed. 29. The lecturer makes sure we understand the materials.
Forced Interactions	30. Students are pressured to interact with the lecturer. 31. Students are forced to interact with the lecturer. 32. Students are forced to participate.

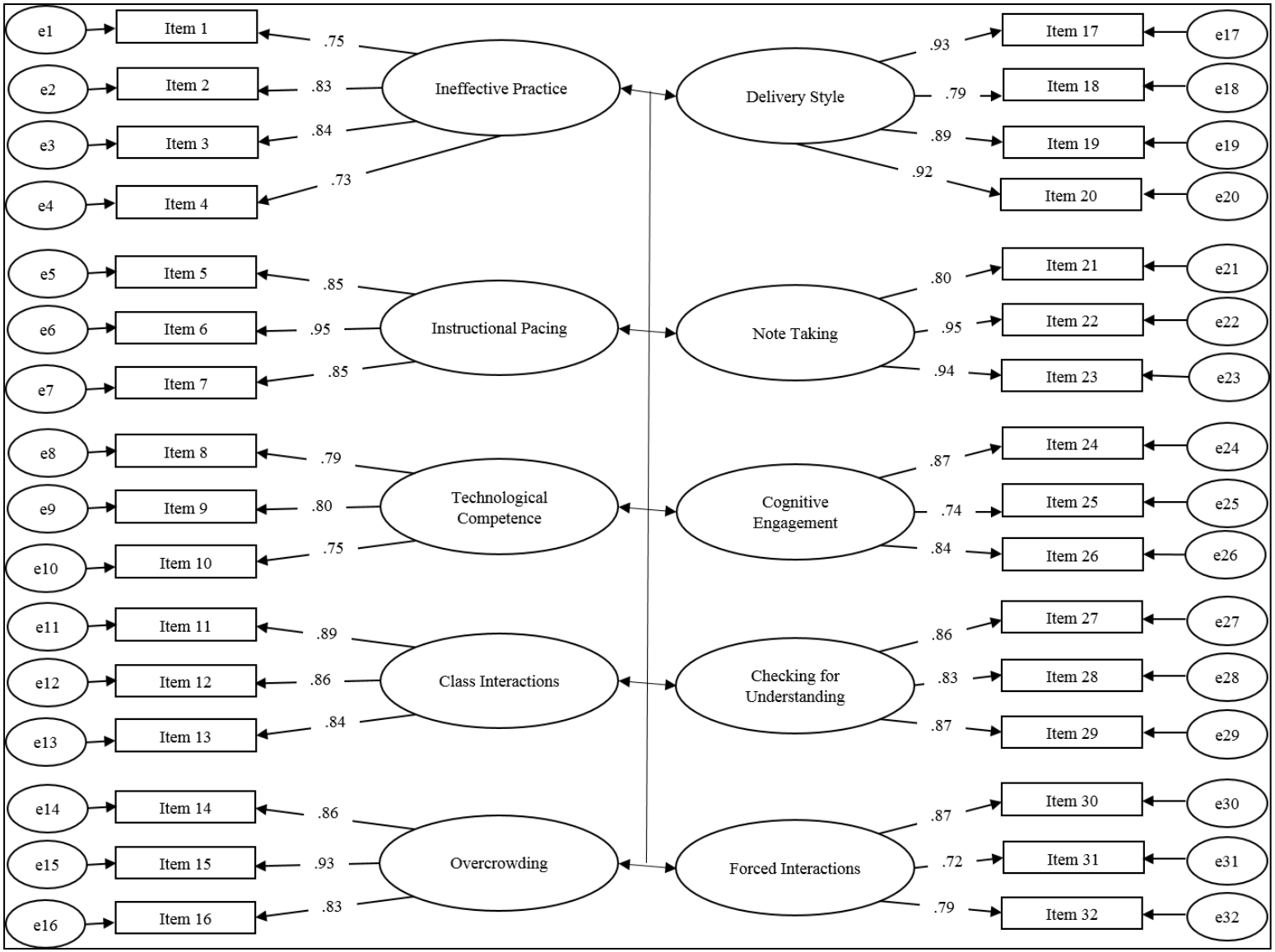

Figure 5.2. A schematic diagram of the intercorrelated 10-factor CFA model showing the standardised regression weights for each item.

Validating the student expectation beliefs subscales. Table 5.6 below presents the fit indices for the two expectation factors measured in this study, and shows acceptable fit to the data. The results also showed that items loaded uniquely on each factor (standardised regression weights > .50, see Figure 5.3), acceptable levels of internal consistency (see Table 5.8), and standardised multiple correlations ranging from .32 to .74, indicating moderate shared variance among the items representing the two factors. No post-hoc modifications were conducted. Therefore, this solution was retained for further analyses (see Table 5.2 for a list of all items measuring student self-expectation beliefs).

Table 5.6

Goodness of Fit Indices for the Two Expectation Beliefs Factors

	χ^2 (df)	χ^2/df	TLI	CFI	Gamma Hat	SRMR	RMSEA
Acceptable Values	$p > .05$	< 3	> .90	> .90	> .90	< .05	< .08
Expectations (2 factors)	41.27 (8)***	5.16	.96	.98	.99	.04	.07

Note. ***$p < .001$.

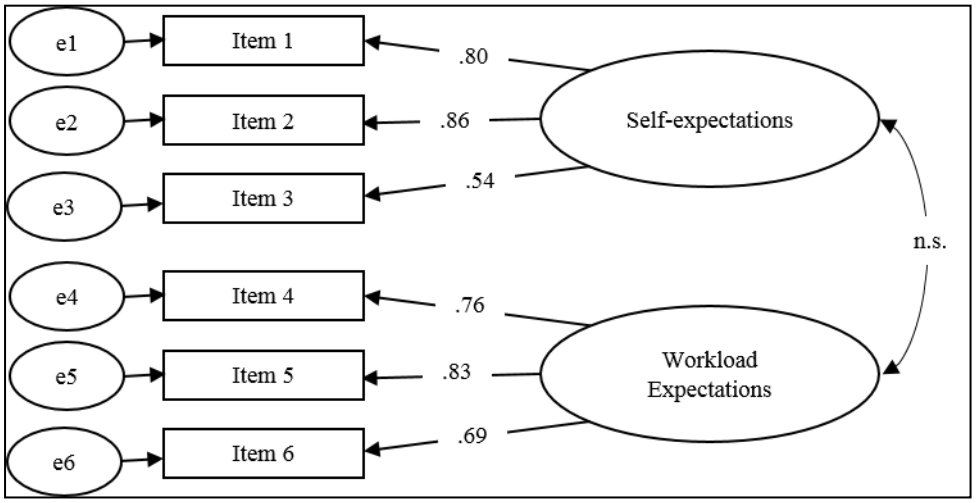

Figure 5.3. A schematic diagram of the 2-factor CFA model showing the standardised regression weights for each item.

Validating the Achievement Goal Questionnaire (AGQ) subscales. Following Elliot et al. (2011), a 6-factor CFA model was explored in this study. However, the fit indices for this hypothesised model indicated unacceptable levels of data-to-model fit (e.g., normed chi = 6, RMSEA > .08, see Table 5.7). Therefore, it was decided to test alternative models to explore different fit indices using different models. Elliot et al. (2011) suggested other possible models which they also tested: a "definition" model, where items were grouped based on their focus (i.e., task, self, or others); a "valence" model, where items were grouped based on their orientation regarding success-approach or failure-avoidance, and a further model where the success-approach factors only were tested (i.e., task-approach, self-approach, and other-approach). This was because the wording of success-approach versus failure-avoidance items suggested that the two groups of factors may in fact be inverses or opposites of each other. For example, a sample item from the subscale task-approach is "To get a lot of questions right on the assessments in this class", whereas a sample item from the subscale task-avoid is "To avoid getting a lot of questions wrong on the assessments in this course". Therefore, an "approach-only "model was also tested. Other viable models discussed by Elliot et al. (2011) included ones in which items for self-approach and self-avoid (Sep/Sav), task-approach and task-avoid (Tap/Tav), or other-approach and other-avoid (Oep/Oav) loaded together. These were also tested as alternative models in this study.

Table 5.7 below presents the fit indices for the various models described above, which supports a 3-factor solution with the success-approach factors only. The results also showed that items loaded uniquely on each factor (standardised regression weights > .79; see Figure 5.4), acceptable levels of internal consistency (see Table 5.8), and standardised multiple correlations ranging from .62 to .87, indicating strong shared variance among the items representing the three factors. No post-hoc modifications were conducted. Therefore, this 3-

factor solution was retained for further analyses (see Table 5.3 for a list of the items measuring the three success-approach subscales).

Table 5.7

Goodness of Fit Indices for the Achievement Goal Questionnaire Subscales for the Default (Hypothesised) Versus Alternative Models

	χ^2 (df)	χ^2/df	TLI	CFI	Gamma Hat	SRMR	RMSEA
Acceptable Values	$p > .05$	< 3	> .90	> .90	> .90	< .05	< .08
Default 6-factor Model	827.71 (120)***	6.90	.92	.94	.96	.03	.09
"Definition" Model	1539.60 (132)***	11.66	.86	.88	.91	.05	.12
"Valence" Model	5594.27 (134)***	41.75	.46	.53	.72	.18	.23
Tap/Tav	1109.04 (125)***	8.87	.90	.92	.95	.04	.10
Sap/Sav	1061.72 (125)***	8.49	.90	.92	.95	.04	.10
Oap/Oav	1215.23 (125)***	9.72	.89	.91	.94	.04	.11
Approach-only Model	95.51 (24)***	3.98	.98	.99	.99	.03	.06

Note. ***$p < .001$.

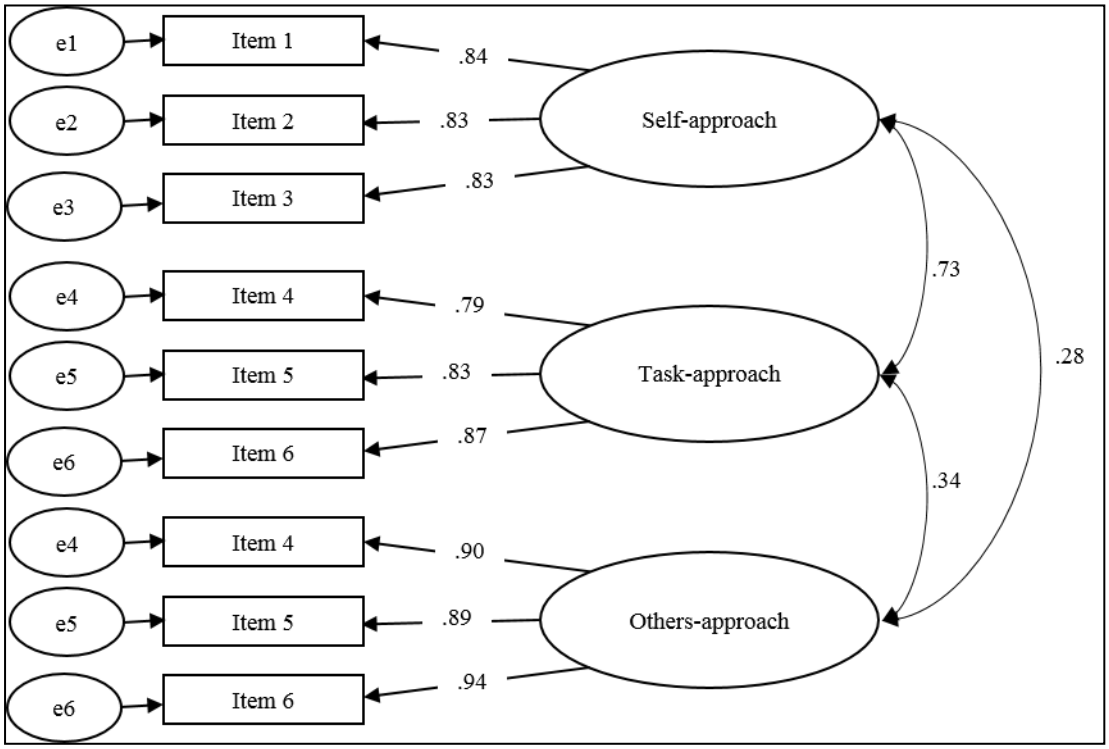

Figure 5.4. A schematic diagram of the 3-factor CFA model showing the standardised regression weights for each item.

Descriptive Statistics

Following the CFA results, means, standard deviations, and Cronbach's alpha coefficients, were calculated for all factors identified earlier and are presented in Table 5.8 below. Also, Pearson's bivariate correlations among these factors were calculated and are presented in Table 5.9. The Cronbach alpha coefficients calculated in this study suggested good internal consistency between items within each factor. That is, the factor structures could be used reliably for further analyses. Further, most correlations between the factors ranged from .10 to .50, with no values exceeding .70, indicating that multicollinearity was probably not an issue when exploring relations among the variables (Weston, Crossley, McCarthy, & McNamara, 2011).

Table 5.8

Descriptive Statistics and Cronbach's (Alpha) Reliability Coefficients by Factor

Factor	*M* (*SD*)	α	Range		Skew	Kurtosis
			Potential	Observed		
Boring Delivery Style	5.46 (1.40)	.93	1–7	1–7	-.87	.08
Class Interactions	4.70 (1.26)	.90	1–7	1–7	-.40	-.19
Note-Taking	5.65 (1.28)	.92	1–7	1–7	-1.39	2.01
Overcrowding	3.01 (1.46)	.91	1–7	1–7	.69	-.12
Forced Interactions	2.70 (1.23)	.83	1–7	1–7	.78	.31
Instructional Pacing	4.45 (1.44)	.91	1–7	1–7	-.13	-.55
Ineffective Practice	1.89 (.97)	.86	1–7	1–7	1.66	3.43
Technological Competence	5.59 (1.01)	.82	1–7	1–7	-.88	.95
Checking for Understanding	4.93 (1.21)	.89	1–7	1–7	-.47	.02
Cognitive Engagement	5.42 (1.01)	.86	1–7	1.67–7	-.70	.41
Self-expectations	5.12 (.97)	.75	1–7	1–7	-.65	1.40
Workload expectations	3.40 (1.20)	.80	1–7	1–7	.40	.10
Task-approach goals	5.65 (.99)	.87	1–7	1–7	-.69	.71
Self-approach goals	5.50 (1.11)	.87	1–7	1–7	-.81	.99
Others-approach goals	3.78 (1.64)	.93	1–7	1–7	.09	-.86

Note. *N* = 751 for all factors.

Table 5.9

Pearson's Bivariate Correlations among the 15 Questionnaire Factors

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Boring Delivery Style	–														
2. Class Interactions	.33***	–													
3. Note-Taking	.25***	.13***	–												
4. Overcrowding	-.23***	-.13**	-.10*	–											
5. Forced Interactions	-.26***	.12**	-.10*	.12**	–										
6. Instructional Pacing	.45***	.13**	.05	-.29***	-.22***	–									
7. Ineffective Practice	-.69***	-.27***	-.25***	.30***	.38***	-.34***	–								
8. Technological Competence	.38***	.14***	.27***	-.14***	-.19***	.26***	-.41***	–							
9. Checking for Understanding	.48***	.55***	.24***	-.14***	-.01	.26***	-.37***	.30***	–						
10. Cognitive Engagement	.45***	.29***	.49***	-.19***	-.10**	.24***	-.39***	.36***	.42***	–					
11. Task-approach Goals	.10**	.10**	.24***	-.03	0.00	.01	-.15***	.14***	.17***	.30***	–				
12. Self-approach Goals	.12**	.18***	.24***	-.01	0.00	.03	-.15***	.15***	.22***	.28***	.64***	–			
13. Others-approach Goals	-.05	.04	-.02	.07*	.16***	-.02	.05	.01	.08*	.04	.32***	.26***	–		
14. Self-expectations	.17***	.17***	.04	-.04	.03	.15***	-.22***	.18***	.25***	.24***	.29***	.25***	.38***	–	
15.Workload Expectations	-.30***	-.06	-.06	.32***	.23***	-.36***	.34***	-.18***	-.14***	-.22***	.00	.08*	.11**	-.04	

Note. ***$p < .001$, **$p < .01$, *$p < .05$.

Exploring Relations: A Structural Equation Model

Figure 5.5 shows a schematic diagram of the empirical model built in this study, with fit indices indicating the model met the acceptable thresholds (χ^2 /(df) = 2.32, $p < .001$; TLI = .94; CFI = .95; Gamma Hat = .99; SRMR = .04; RMSEA = .04), with the exception of the significant chi-square value, and numerous statistically significant paths between the variables. As discussed earlier, it was expected to find a significant chi-square value given the large sample size used in this study (Hooper et al., 2008). For the purposes of presenting the results in a clear and succinct manner, different sections of the model have been presented under subsections below as follows: (1) learning environment variables predicting self- and workload expectations; (2) the mediating effects of student expectation beliefs on the relations between learning environment views and achievement; (3) learning environment variables predicting achievement goals; and (4) the mediating effects of student motivational beliefs on the relations between learning environment views and achievement. As a measure of effect size, Cohen's (1988) conventional guidelines for determining the strength of relations between two variables (i.e., 0.1 for "small" or "weak", 0.3 for "medium" or "moderate", and 0.5 for "large" or "strong") were used when interpreting the strength of the standardised regression coefficient paths found in this study (Nakagawa & Cuthill, 2007).

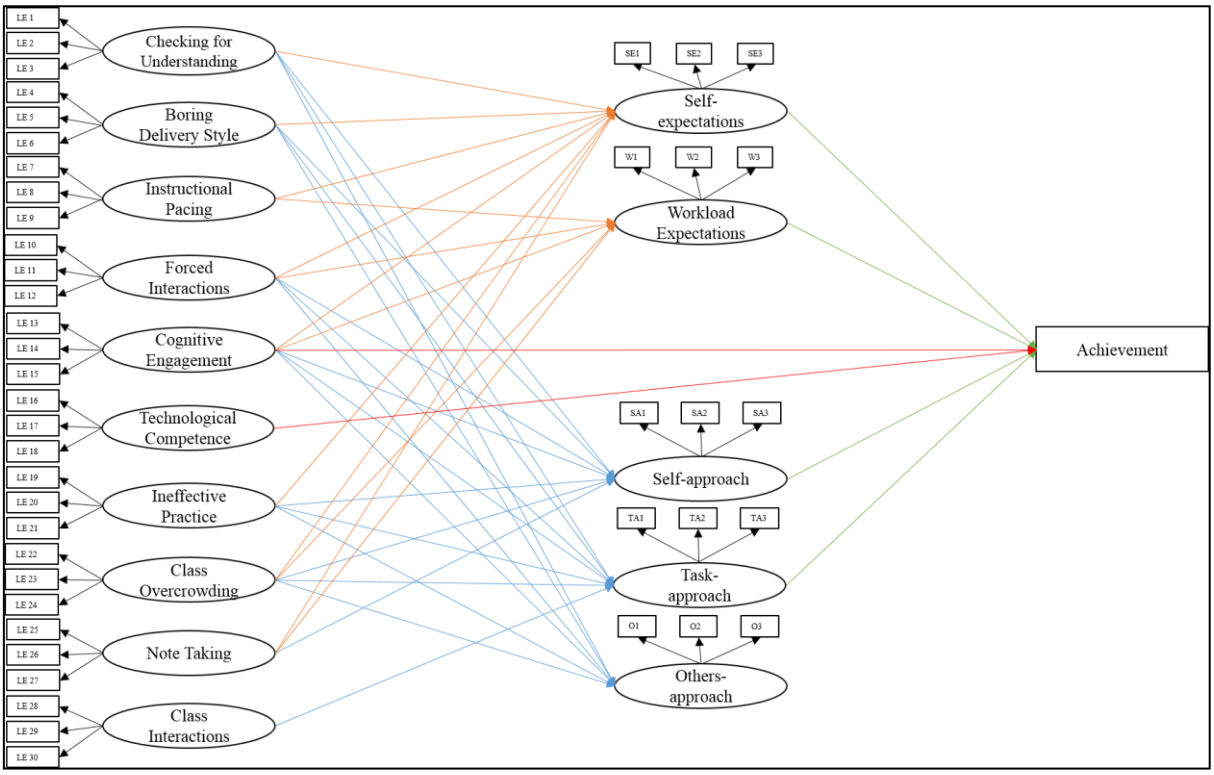

Figure 5.5. A schematic diagram of the full structural equation model explored in this study showing the statistically significant paths only.

Learning environment variables predicting self- and workload expectations.

Figure 5.6 is a schematic diagram indicating the standardised regression weights for each of the statistically significant paths between the learning environment variables, expectation variables, and achievement only. There were no statistically significant relations between student ratings of class interaction and achievement. However, the results showed that higher levels of perceived self-expectations were predicted by higher ratings of teachers' boring delivery style ($\beta = .42$, $p < .001$), students' cognitive engagement ($\beta = .33$, $p < .001$), forced student interaction ($\beta = .21$, $p < .001$), teachers' checking-in on student understanding ($\beta = .22$, $p < .001$), class instructional pacing ($\beta = .13$, $p < .01$), class overcrowding ($\beta = .13$, $p < .01$), as well as lower ratings of teacher ineffective practice ($\beta = -.58$, $p < .001$) and note-taking behaviours ($\beta = -.16$, $p < .001$). Following Nakagawa and Cuthill's (2007) guidelines for interpreting the size of beta weights, it can be seen that teachers' boring delivery style and

ineffective practice were respectively moderate and strong predictors of student self-expectations, whereas students' reported levels of cognitive engagement, forced student interactions, and checking-in on student understanding were moderate predictors of these self-expectations. Lastly, class instructional pacing, overcrowding, and student note-taking behaviours were weak predictors of student self-expectations.

The results also showed that higher levels of perceived workload expectations (i.e., course workload that is perceived as too much for students to manage) were predicted by higher levels of forced student interaction ($\beta = .13$, $p < .05$), class overcrowding ($\beta = .13$, $p < .001$), note-taking behaviours ($\beta = .10$, $p < .05$), and lower ratings for class instructional pacing ($\beta = -.24$, $p < .001$) and cognitive engagement ($\beta = -.11$, $p < .05$). However, most of these variables were weak predictors of workload expectations, with the exception of instructional pacing which was a moderate predictor of these expectations.

The mediating effects of student expectation beliefs on the relations between learning environment views and achievement. The expectation beliefs investigated in this study acted as full, partial, and non-mediating variables between student views of the learning environment and achievement. To start with, the relation between 7 out of the 10 learning environment variables (checking for understanding, boring delivery style, ineffective practice, forced interactions, class overcrowding, note-taking, and instructional pacing) and achievement were fully mediated by student self-expectation beliefs, with the latter beliefs positively predicting student achievement ($\beta = .19$, $p < .001$; a weak-to-moderate predictive ability). Moreover, student self-expectation beliefs were found to be partial mediators of the relations between cognitive engagement and achievement, with the direct path from cognitive engagement to achievement carrying less weight ($\beta = .18$, $p < .01$; a weak-to-moderate predictive ability) than the indirect path between the two variables. Lastly, self-expectation beliefs were found to be non-mediators of the relations between student rating of teachers'

technological competence and achievement, with the direct path between the latter two being statistically significant ($\beta = -.13$, $p < .01$; a weak predictive ability).

Workload expectations in this study were found to fully mediate the relations between 4 of the 10 learning environment variables (forced student interactions, class overcrowding, note-taking behaviours, and instructional pacing) and achievement was fully mediated by workload expectations, with the latter belief negatively predicting student achievement ($\beta = -.14$, $p < .01$; a weak predictive ability). Moreover, workload expectations were found to be partial mediators of the relations between cognitive engagement and achievement, although the direct path from cognitive engagement to achievement seemed to carry more weight ($\beta = .18$, $p < .01$; a weak-to-moderate predictive ability) than the indirect path between the two variables (see Figure 5.6). Lastly, workload expectations were found to be non-mediators of the relations between student rating of teachers' technological competence and achievement, with the direct path between the latter two being statistically significant ($\beta = -.14$, $p < .01$).

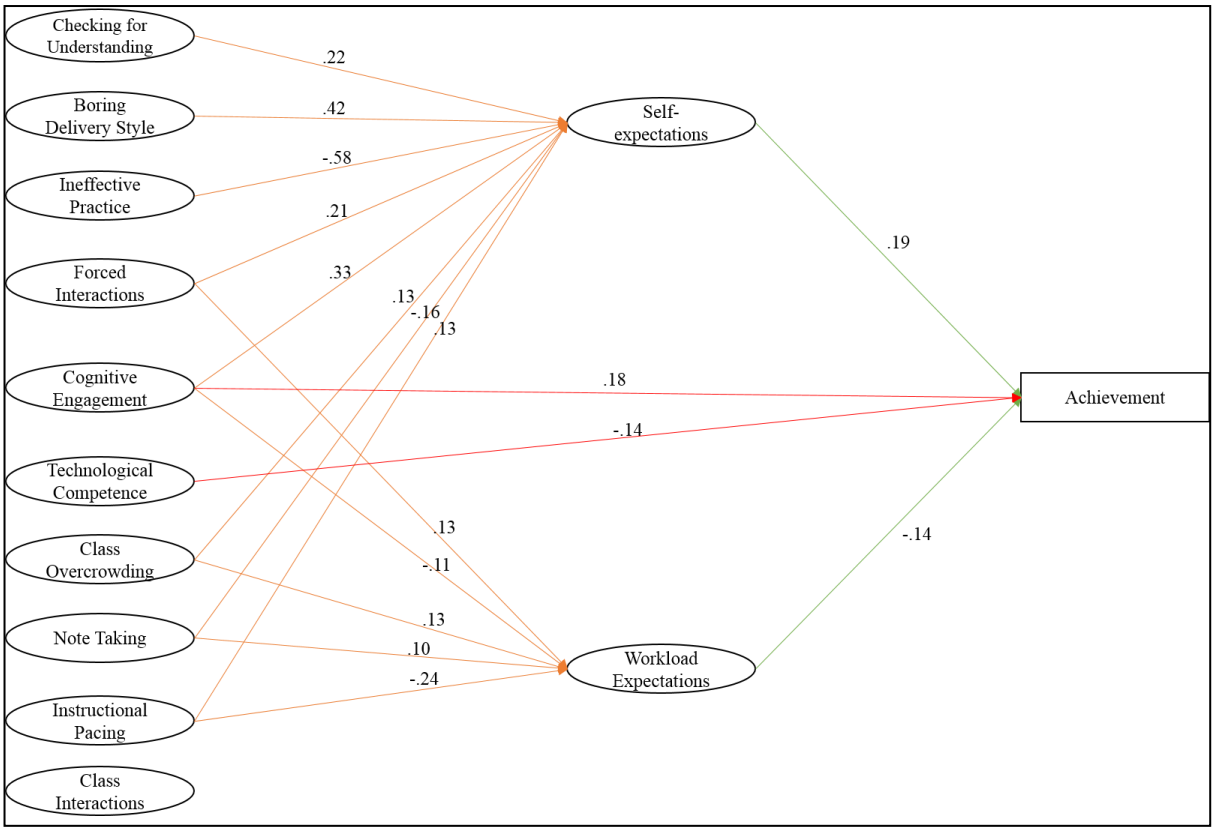

Figure 5.6. A schematic diagram of the showing the standardised regression weights for the statistically significant paths only between learning environment variables, expectation variables, and achievement.

Learning environment variables predicting achievement goals. Figure 5.7 is a schematic diagram indicating the standardised regression weights for each of the statistically significant paths between the learning environment variables, motivation variables, and achievement only. The results showed that higher levels of reported self-approach goals were predicted by higher ratings of teachers' boring delivery style ($\beta = .42$, $p < .001$), students' cognitive engagement ($\beta = .30$, $p < .001$), teachers' checking on student understanding ($\beta = .17$, $p < .01$), forced student interaction ($\beta = .15$, $p < .01$), class overcrowding ($\beta = .13$, $p < .01$), and note-taking behaviours ($\beta = .10$, $p < .05$), and lower ratings of teacher ineffective practice ($\beta = -.49$, $p < .001$). The size of the standardised beta values reported above indicated that teacher ineffective practice was a strong predictor of self-approach goals, whereas teachers' boring delivery style was a moderate-to-strong predictor of the latter goals. Further, students' cognitive engagement was found to be a moderate predictor of self-

approach, with the remaining variables being either weak-to-moderate predictors (i.e., checking-in on students' understanding, and forced student interaction) or weak predictors (i.e., class overcrowding, and student note-taking behaviours) of self-approach goals.

Second, higher levels of reported task-approach goals were predicted by higher ratings of teachers' boring delivery style ($\beta = .42$, $p < .001$), students' cognitive engagement ($\beta = .38$, $p < .001$), teachers' checking on student understanding ($\beta = .15$, $p < .01$), and class overcrowding ($\beta = .11$, $p < .01$), and lower ratings of teachers' ineffective practice ($\beta = -.57$, $p < .001$), forced student interaction ($\beta = -.19$, $p < .001$), and class interactions ($\beta = -.11$, $p < .05$). The predictive ability of the variables mentioned above varied from being very strong (i.e., ratings of teachers' ineffective practice), moderate-to-strong (i.e., teachers' boring delivery style, and students' cognitive engagement), weak-to-moderate (i.e., checking-in on student understanding, and forced student interaction), to weak (i.e., class interactions) predictors of task-approach goals.

Lastly, higher levels of reported others-approach goals were predicted by higher ratings of teachers' boring delivery style ($\beta = -.38$, $p < .001$), forced student interaction ($\beta = .27$, $p < .001$), teachers' checking on student understanding ($\beta = .19$, $p < .01$), students' cognitive engagement ($\beta = .16$, $p < .01$), class overcrowding ($\beta = .14$, $p < .01$), and lower ratings of teachers' ineffective practice ($\beta = -.36$, $p < .001$). Moreover, teachers' boring delivery style and ineffective practice were moderate-to-strong predictors of others-approach goals, and class overcrowding was a weak predictor of the latter goals. All other variables were weak-to-moderate predictors of others-approach goals.

The mediating effects of student motivational beliefs on the relation between learning environment views and achievement. Because the path indicating the relations between other-approach goals and achievement was non-significant, the mediating effects of self-approach and task-approach goals only were investigated. Similar to the expectation

variables, student motivational beliefs acted as full, partial, and non-mediators of the relation between student views of the learning environment and achievement. However, as will be discussed next, the predictive ability of student expectation beliefs were generally weak or weak-to-moderate.

First, self-approach goals were found to be fully mediating the relations between 7 of the 10 learning environment variables (checking for understanding, boring delivery style, ineffective practice, forced interactions, class overcrowding, note-taking, and instructional pacing) and achievement, with self-approach goals negatively predicting student achievement ($\beta = -.14$, $p < .01$; a weak predictor). Further, self-approach goals were found to be partial mediators of the relations between cognitive engagement and achievement, with the direct path from cognitive engagement to achievement carrying less weight ($\beta = .18$, $p < .01$; a weak-to-moderate predictor) than the indirect path between the two variables (see Figure 5.7). Lastly, self-approach goals were found to be non-mediators of the relations between student ratings of teachers' technological competence and achievement, with the direct path between the latter two being statistically significant ($\beta = -.14$, $p < .01$; a weak predictor).

Task-approach goals were found to be fully mediating the relations between 6 of the 10 learning environment variables (boring delivery style, forced interactions, ineffective practice, class overcrowding, checking for student understanding, and class interactions) and achievement, with task-approach goals positively predicting student achievement ($\beta = .18$, $p < .001$; a weak-to-moderate predictor). Further, task-approach goals were found to be partial mediators of the relations between cognitive engagement and achievement, with the direct path from cognitive engagement to achievement carrying less weight ($\beta = .18$, $p < .01$; a weak-to-moderate predictor) than the indirect path between the two variables (see Figure 5.7). Lastly, task-approach goals were found to be non-mediators of the relations between

student ratings of teachers' technological competence and achievement, with the direct path between the latter two being statistically significant (β = -.14, $p < .01$; a weak predictor).

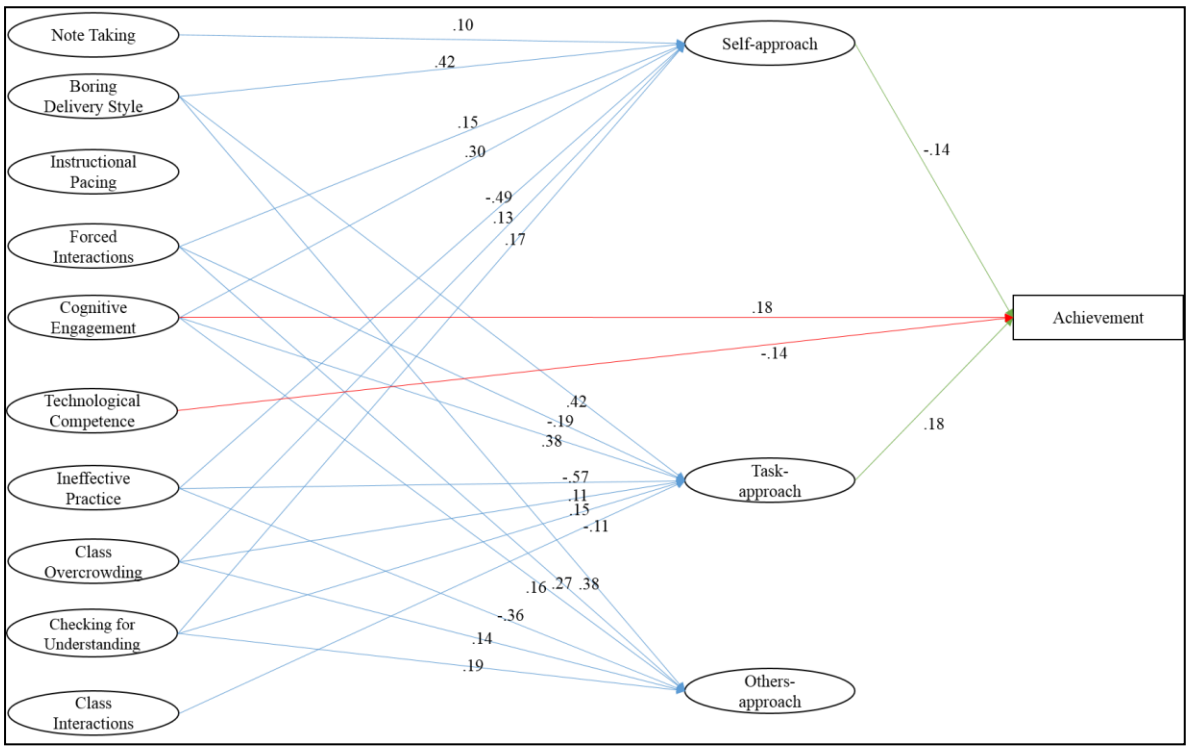

Figure 5.7. A schematic diagram of the showing the standardised regression weights for the statistically significant paths only between learning environment variables, motivation variables, and achievement.

Discussion

Confirming Factor Structures

The purpose of this study was to validate the learning environment survey instrument developed in the previous study, and use it to investigate student views of their learning environment alongside their self-expectations, motivational beliefs, and self-reported achievement. A 10-factor learning environment model demonstrated acceptable levels of internal consistency, structural validity, and reliability, as shown in the current study. Within the instrument, there were some variables commonly found and used in the literature as part of existing class climate instruments such as class interactions, ineffective practice, and delivery style (Coffey & Gibbs, 2001; Coll, Taylor, & Fisher, 2002; Lizzio et al., 2002).

Although other studies may have labelled the factors differently, the underlying or conceptual underpinning of these variables is similar. For example, whereas this study's instrument measures student perceptions of teacher ineffective practice and boring delivery style, the CEQ measures an equivalent variable labelled as "good teaching", and SEEQ measures another set of equivalent variables labelled as "rapport" and "enthusiasm". However, both the CEQ and SEEQ measure the positive version of the aforementioned variables (i.e., this study's instrument captures the reverse or negative form of those measured in CEQ and SEEQ). There were also variables included in the current class climate measure that are not typically explored within the context of class climate research such as cognitive engagement, which is often explored as part of the motivation and engagement literature (e.g., Martin, 2007; Pike & Kuh, 2005; Skinner & Belmont, 1993), and variables such as class size and technological competence which are studied in isolation from the class climate literature. Therefore, the newly-developed instrument brought together student and teacher behaviours and qualities from different research areas. These various variables were jointly investigated in the current study since they were found in the first study to be integral to student conceptions of tertiary learning environments, and were therefore used to inform the development and validation of the present class climate instrument.

The 3-by-2 achievement goals model. As part of the current study's confirmatory factor analyses, it was found that the 6-factor model of achievement goals structure did not meet acceptable levels of structural reliability when used with a New Zealand sample of students. It must be noted that the 3-by-2 model of achievement goals is still in its early stages of development as an empirically robust construct (Vansteenkiste, Lens, Elliot, Soenens, & Mouratidis, 2014), with Vansteenkiste et al. (2014) arguing that the move from a 2-by-2 to a 3-by-2 model (i.e., from four to six factors) should not result in a loss of

parsimony. However, in the current study, it was found that only a 3-factor model fitted the data well as indicated by the goodness-of-fit indices presented in the results section earlier.

Although it could be that New Zealand students viewed “approach” and “avoid” items as ends of the same continuum, it is worth noting that the sample for this study consisted of students from diverse cultural backgrounds (52% European versus 48% non-European) whereas Elliot et al.’s (2011) two samples consisted of students mainly from European backgrounds (Americans and Germans). There was no mention of students from other ethnic backgrounds in Elliot et al.’s study. It may be that this difference in findings signals a potential cultural variance in the way the instrument works, with the possibility of alternative factor structures being found with respect to students from different nationalities. Conducting measurement invariance tests by ethnicity would be an area for future research stemming from this finding, as the findings of the current study highlight the importance of conducting and validating research tools in different cultural locations.

The Influence of Tertiary Learning Environment on Student Self-Beliefs and Outcomes

This study found statistically significant relations between the contextual, self, and performance factors investigated in this study, which confirmed the hypothesised conceptual model introduced earlier: Contextual learning factors appeared to explain some of the variance in how students saw themselves as motivated and success-oriented, which then influenced how they performed in their learning contexts. Much like the existing literature (e.g., Bi, 2015; Gilbert et al., 2014; Jelas, Azman, Zulnaidi, & Ahmad, 2016), most learning environment variables in the current study positively predicted the motivational and expectation beliefs of students, as well as their performance, in similar patterns to the ones reported in previous studies conducted in either tertiary or pre-tertiary settings. For example, the more engaged students perceived themselves to be, the higher their self-expectations of success were, the more manageable they perceived their course workload to be, and the

higher the achievement rates they reported. The following subsections will discuss the statistically significant relations found between tertiary climate views, self-beliefs, and outcomes. Specifically, the subsections will focus on patterns, anomalies, and significant and strong class climate predictors of self-beliefs and outcomes. This will be followed by discussing variables with a moderate or weak predictive ability on the aforementioned variables.

Keeping students engaged, and avoiding ineffective practice, is important. An examination of the standardised regressions weights (beta) values suggested that teachers' ineffective practice and their poor delivery style demonstrated a strong predictive ability on student self-beliefs, whereas students' cognitive engagement was the variable that was found to interact with most variables investigated in this study including achievement. Perhaps it was not unexpected to reveal that teacher practice was integral to student beliefs and outcomes even at the tertiary level, since the relations between tertiary teaching practice and student outcomes is well documented in the literature (Biggs, 1989; Dalton, 1998; Ho, Watkins, & Kelly, 2001; Kane, Sandretto, & Heath, 2004). When interviewing university instructors on their effective teaching practices or strategies, Hativa, Barak, and Simhi (1999) found that these strategies could be categorised into lesson organisation, lesson clarity, and enhancing the classroom climate. This was further supported by a follow up study (Hativa et al., 2001) that found not only exemplary tertiary teachers were well prepared and had positive rapport with their students, but they also stimulated students' engagement and motivation in class.

Technological competence. It was found in this study that technological competence did not interact with student self-beliefs, and negatively predicted student achievement. Nevertheless, technological competence was found to be a weak predictor of the variables mentioned above. This may be due to teachers over-relying on technology, or using it to

substitute rather than complement their teaching techniques, which was then reflected in lower achievement rates. Previous studies have argued that teacher use of technology may be a function of how prepared teachers feel they are to integrate it into their teaching (Albion, 1999; Lee & Tsai, 2010), as well as a function of their attitudes towards its efficacy on student outcomes (Holden & Rada, 2011). This is important given Lei's (2010) argument that the role of technology on student achievement is predicated on the quality of technology use and the ways in which it is implemented in tertiary learning environments. Therefore, the lack of statistically significant influences of teacher technological competence on student self-beliefs and outcomes may be related to the ways in which teachers used, or did not use, technology in their learning environments. Because this study did not measure the extent or ways in which technology was incorporated into tertiary teaching-learning practices, it is suggested that such variables be controlled for in future studies to better understand their influence(s) on tertiary learning environments and student outcomes.

Boring delivery style. It was unexpected to find that the more students rated their teachers' style as boring, the higher their expectations of success were and the more motivated they were, as measured by their self-expectation beliefs and achievement goals. This finding is contrary to previous arguments made by McGarr (2009), who suggested that 'boring' lectures were likely to leave students frustrated, and be seen as ineffective. However, McGarr (2009) also argued that a "traditional" lecturing style was mainly concerned with information delivery and coupled with minimal student engagement and the expectation that students would navigate their own way through the body of knowledge delivered to them following lecture time (Black, 2005; Isaacs, 1989; Moore, Armstrong, & Pearson, 2008). Therefore, it may be that a tertiary learning environment characterised as boring, or delivered in a boring style, was perceived by students as a common traditional teaching technique in this study. This may have led students to normalise a tertiary learning

environment facilitated by a teacher who stands in front of a lecture theatre and delivers information with minimal innovation or engaging style, and hence students expected to further engage with the learning material following the lecture time and during tutorials. Moreover, the lack of links found between teacher technological competence and student outcomes may have also suggested that a traditional teaching style was employed in these classes, and may help explain the statistically significant and strong links found between teachers' boring delivery style and student self-beliefs. Nevertheless, as suggested earlier, measuring technology use and controlling for a variable such as this in future studies is recommended in order to better understand the arguments made above.

Encouraging "talk time". In this study, forced student interactions were significantly associated with higher levels of motivation and self-expectation beliefs, with the standardised regression weights indicating a weak-to-moderate path between the variables mentioned above. The positive influence of forced interactions on student self-beliefs may be due to students having benefitted from forced peer discussions and sharing of ideas despite their preferences against this strategy. That is, being forced or pressured to interact during class time by the lecturer may have proven to be a useful strategy, as indicated by its significant links to their increased motivation and expectation beliefs. Despite the existing literature that suggests positive benefits of class interactions both face-to-face (Valls & Kyriakides, 2013) and online (Bettinger, Liu, & Loeb, 2016) on student achievement, there is a paucity of literature that has investigated the influence of *forced* interactions on student learning at the tertiary level, as the emphasis in previous empirical studies has typically been on positive student–student or student–teacher interactions. Regardless, the finding in this study suggested that future research could potentially investigate the different types of class interactions that could predict student beliefs and outcomes.

Workload and self-expectation beliefs. Overcrowded classrooms with misplaced pacing and cognitive disengagement predicted higher levels of misplaced workload expectations which, in turn, negatively predicted achievement in this study. In previous studies, workload expectations were typically investigated on a spectrum of difficulty (e.g., workload expectations ranging from easy to difficult) as opposed to misplacement (e.g., workload expectations ranging from realistic to unrealistic), with results from these studies suggesting small and positive relations between workload difficulty and other climate variables and achievement (Marsh et al., 2009). Whereas the size of the relations found in this study aligned with the small size previously found by Marsh et al. (2009), the direction of the relations differed. That is, misplaced workload expectations were found to be negative predictors of a range of climate factors as well as achievement.

Marsh (2007, see also Marsh & Roche, 1997) argued that student perceptions of workload difficulty had often been studied in higher education research, where workload difficulty was found to be positively correlated with student evaluations of teaching effectiveness. However, Marsh (2007) made the distinction between course workload that was perceived as difficult yet valuable to students, and "bad" course workload that was perceived as difficult and a waste of time and value to students. Only "bad" course workload was linked with negative or low evaluations of tertiary teaching effectiveness. Therefore, it may be that students perceiving their workload to be unrealistic or too much for them is a result of that course work being considered as invaluable or irrelevant to those students. And so, investigating students' views of course workload, and how they differentiate between workload that is valuable versus invaluable, realistic versus unrealistic, and easy versus difficult is worthy of future investigation. This is especially since Marsh (2007) showed that perceptions of workload were linked to student evaluations of teaching effectiveness, and the latter has been strongly associated with tertiary students' outcomes (e.g., achievement).

The study findings also showed that, the more classes were rated as crowded, the higher the self-expectations reported by students. Studies on the self-expectations of tertiary students are scarce in the literature, albeit showing positive relations to achievement (Jones & Grieneeks, 1970), with Jin and Cortazzi (2006) suggesting that these expectations were dynamic and contextual. That is, students were likely to alter their own expectations of success in relation to the learning context in which they were situated, as well as the interactions taking place in these contexts. Therefore, it is possible that students in overcrowded classes were more likely to rely on themselves than the teacher, hence reporting stronger perceptions of self-expectations, as the time teachers spent with students was likely to decrease as class size increased (Blatchford, Moriarty, Edmonds, & Martin, 2002). However, the small size of the relations in this study, in line with previous studies (Marsh, 2007), suggested interpreting this finding with caution and indicated the need for further qualitative studies to better understand such a pattern.

Small but meaningful connections to student motivation. With respect to achievement goals, one of the findings was that self-approach goals negatively predicted achievement, whereas task-approach goals positively predicted achievement, and others-approach did not have a significant influence on student achievement. In other words, being motivated to do better on course assessments relative to students' performance on prior tasks (i.e., task-approach goals) trumped their motivation to simply do generally well for the sake of self-improvement (i.e., self-approach). However, both of the statistically significant relations stated above were considered weak, given the size of their corresponding beta weights. This finding contradicted the existing literature that found intrinsic, or self-based, goals to be related to positive variables such as mastery and better performance (Mouratidis, Vansteenkiste, Lens, Michou, & Soenens, 2013), and extrinsic, performance, or task-based goals to be related to negative variables such as test anxiety (Ku, Dittmar, & Banerjee, 2012).

Another study found statistically significant positive correlations between task-goals and interest, perceived competence, and adopting an incremental view of intelligence among 302 undergraduate students in a sports education programme (Mascret, Elliot, & Cury, 2015). The same study also found statistically significant positive correlations between self-goals and interest, as well as adopting an incremental view of intelligence. All correlations in the above study ranged from .15 to .27, indicating a weak-to-moderate size of the association. Therefore, similar to the findings from the current study, Mascret et al.'s (2015) study found small or moderate relations between achievement goals and other student outcomes, but with task- and self-goals both predicting those outcomes in the same positive direction. One possible reason for the differences in patterns found in the current study could be the wider range of students investigated (751 undergraduate students from six faculties in four different year levels in a New Zealand university, versus 302 undergraduate students from one programme in a French university). Alternatively, it may be that students' task-approach goals in this study were informed by prior performance or course assessments (e.g., marks received from previous assignments in the course influencing how motivated students were to do well in the remainder of the course), whereas their self-approach goals may have been informed by an ideal, over-confident, or unrealistic view of what they would like to achieve by the end of the academic year.

Concluding comments. Overall, the current study revealed statistically significant relations between the learning environment variables used in this study and a range of outcome variables, with these relations ranging from direction (positive or negative), size (weak to very large), and influence (direct or indirect). Moreover, the study results provided a better understanding of how learning environment views shape student self-beliefs, which had an influence on achievement, as shown in this study. Many of the learning environment factors were mediated by student motivational and self-expectation beliefs, which needs to be

taken into account when investigating the relations between class climate and student outcomes in future studies. As this study has shown, many class climate factors were not directly associated with achievement. Previous studies that have reported insignificant relations between climate and outcomes employed linear and simple A-predicts-B analyses. But, perhaps, learning environment views have an indirect role in how student outcomes are achieved, as shown by this study where most relations between climate and achievement were mediated by self-expectations, workload expectations, self-approach goals, and task-approach goals. Therefore, findings from this study open a platform for investigating other self-beliefs that could also mediate the relations between climate and outcomes other than, or alongside, the ones explored in this study.

Limitations and Future Research Directions

One of the main limitations of this doctoral study is the use of self-report data to measure student beliefs and achievement in the current study. However, Lance and Vandenberg (2009) have argued that the use of self-report data does not pose a threat to the validity of measures nor to the interpretations of findings given the strong positive correlations found between self-report and actual data, as well between those two types of data and outcomes (Ewell & Jones, 1993). Babad (2009) further argued that the use of self-report data when investigating the social psychology of the classroom was rather common. Using this method, the researcher assumes an objective stand on a subjective matter such as student views of the learning environment. Moreover, it is hoped that the relatively large and diverse sample of participants involved in the current study would ensure the robustness and validity of these self-report measures.

As was the case with Study Two, the issue of low attendance was prevalent among the courses surveyed in this study, where more than half of the students (57.9%) were not present in the class on the day the survey was conducted. Therefore, particular attention needs to be

paid to non-response bias in future studies by allowing for a number of questionnaire delivery modes (e.g., face-to-face and online), and brainstorming ways to engage a wider range of students to take part in any future study. Nonetheless, the response rate found in this study (77.5%) is still considered to be higher than the average response rate of 62.4% (*SD* = 16.9) for surveys delivered in-person or mailed back by participants, as well as higher than ones typically found in research conducted within the education sector (49%, *SD* = 24.1; see Baruch & Holtom, 2008).

It is also acknowledged in this study that the majority of student participants were completing degrees in social sciences and humanities disciplines (71.3% completing arts, education or social work degrees), when compared to those studying life sciences, business, medical and health sciences, and creative arts. Therefore, in future studies, a larger sample size with students from a wider range of disciplines is suggested to overcome the potential threats of having a non-representative or skewed sample of undergraduate tertiary students.

Lastly, the lack of a follow-up qualitative design to investigate the emerging patterns and results from this study means only speculations can be made regarding potential explanations for why such results were found. This is especially since the majority of studies on learning environments are based on quantitative measures, and relatively little is known about how and why views of learning environments are formed (Goh & Khine, 2002). Therefore, follow-up exploratory studies will form a future research direction succeeding this doctoral project.

Conclusion

Investigating student views of learning environments in Study One, followed by an instrumentation focus in Study Two, were foundational to the conceptual and empirical models developed and tested in this third and final study. The aim of the study was to investigate the relations between students' learning environment views, self-expectations and

motivational beliefs, and their achievement. The results confirmed the structure of a new 10-factor learning environment questionnaire which was then used for subsequent analyses. Given the range of findings discussed earlier, it has been argued that the original tool used in this study enabled understanding of the ways in which students' views of their environments contributed to their beliefs as learners situated within these environments, and how these beliefs about success, workload, and performance explained some variance in their achievement. The next and final chapter will include a summary of findings from the three studies underpinning this doctoral research, followed by a general discussion that contextualises these findings as part of an overall narrative.

CHAPTER SIX

A GENERAL DISCUSSION

This final chapter seeks to bring together the findings from all three studies, and tells a story about why and how this doctoral research provides significant contributions and insights into the social psychology of the tertiary classroom. In doing so, this thesis builds and expands on the theoretical and empirical work cited in previous chapters. Further, as will be discussed later, this thesis makes unique contributions to the ways in which student-centred tertiary learning environments are conceptualised and measured, by introducing new class climate factors and investigating their relations with a range of self-beliefs as well as self-reported achievement. A revisit of the three studies is presented below, followed by a general discussion of the findings, the theoretical and educational implications of these findings, along with the limitations of the this thesis.

Student Views of Learning Environments: From Conceptions to Conceptualisations

First, this doctoral project started with a qualitative study with the aim of understanding the qualities or characteristics that 24 tertiary students experienced and reported as related to their typical, ideal, and dreaded learning environments. Using a thematic analysis technique, a range of themes and subthemes were found and classified based on their type (qualities versus behaviours versus managerial aspects), source (teacher versus student elicited), and influence (positive versus negative). Despite the varied conceptions of typical, ideal, and dreaded learning environments, it was clear from the findings how multidimensional, multifocal, dynamic, and psychosocially entrenched students viewed each of these learning environments to be. Therefore, the findings from Study One provoked a range of new research directions that include investigating which of the qualities

or behaviours found in that study were likely to be shared or experienced by a wider range of students. This was important to ponder given the relatively small number of participants typically involved in qualitative in-depth interviews.

The research direction introduced at the end of the previous paragraph constituted the underlying challenge of Study Two, which aimed at developing an instrument that could be used to compare student perceptions of various learning environments. This was needed before examining the relations between climate and outcomes, in order to establish a measure that was relevant and applicable to students across faculties, disciplines, and courses. In doing so, the measure enabled the capturing of reliable data that could be used to reveal insights about what was happening within and across tertiary learning environments. Following the scale development procedures discussed in Chapter Four, a total of 711 undergraduate students were asked to complete the newly developed questionnaire in order to examine its psychometric properties. In line with the Study One conclusion on tertiary learning environments being multifocal and multidimensional, the results from Study Two supported a 14-factor model. Whereas having 14 factors is neither parsimonious nor typical in class climate research, perhaps this solution attests to the complexity of student climate perceptions and introduces new challenges surrounding (a) the replicability and relevance of these 14 factors when new participants are recruited and invited to evaluate their environments using the same instrument; and (b) the predictive ability of these climate factors on classroom relationships and outcomes.

The challenges above constituted the aims of the third and final study in this doctoral project which was to validate the survey instrument developed in Study Two, and then to use the instrument to examine student perceptions of the class climate in relation to student self-expectations and motivational beliefs, as well as to self-reported achievement. Study Three was conducted with a new sample of 751 undergraduate tertiary students. The results of this

study led to the achievement of two overarching goals: Confirming the learning environments questionnaire structure with 10 factors, and exploring the direct versus indirect relations of climate perceptions with reported self-beliefs and achievement.

A 10-factor learning environments questionnaire. Figure 6.1 below illustrates the combined findings of all three studies, whereby the 10 learning environment factors explored and validated in Studies Two and Three were mapped on to the thematic analysis diagram established in Study One. That is, the combined findings represent an empirical mixed-method model of how students conceptualise the state and shape of their tertiary learning environments. Indeed, it is not the intention to present the results as *the* "top ten" tertiary climate factors that influence classroom structures and outcomes. Instead, this thesis presents *one* of many sets of factors that may influence how teacher and learning practices are received and perceived by students. As noted in the limitations sections of Studies Two and Three, it may be that these factors are mainly representative of social science students (e.g., arts and education) given the larger representation of these students in both samples. Therefore, this doctoral project is a step towards understanding the most parsimonious, yet representative, set of tertiary climate factors that give researchers and practitioners sufficient information regarding what is happening in a given learning environment, how the climate of that class might be enhanced, and from where to start that process of improvement.

What also distinguishes this newly developed instrument is the clarity and explicitness of the nature of variables measured in that instrument. For example, determining ways to improve the technological competencies, the pace of teaching, or reducing forceful interactions all involve explicit techniques or behaviours which can easily be taught to teachers as a step towards enhancing their classroom climate. As a result, the final 32-item version of the questionnaire is likely to attract teachers and researchers to use it given these

features of the questionnaire, as well as the speed with which it can be completed (i.e., 5–10 minutes).

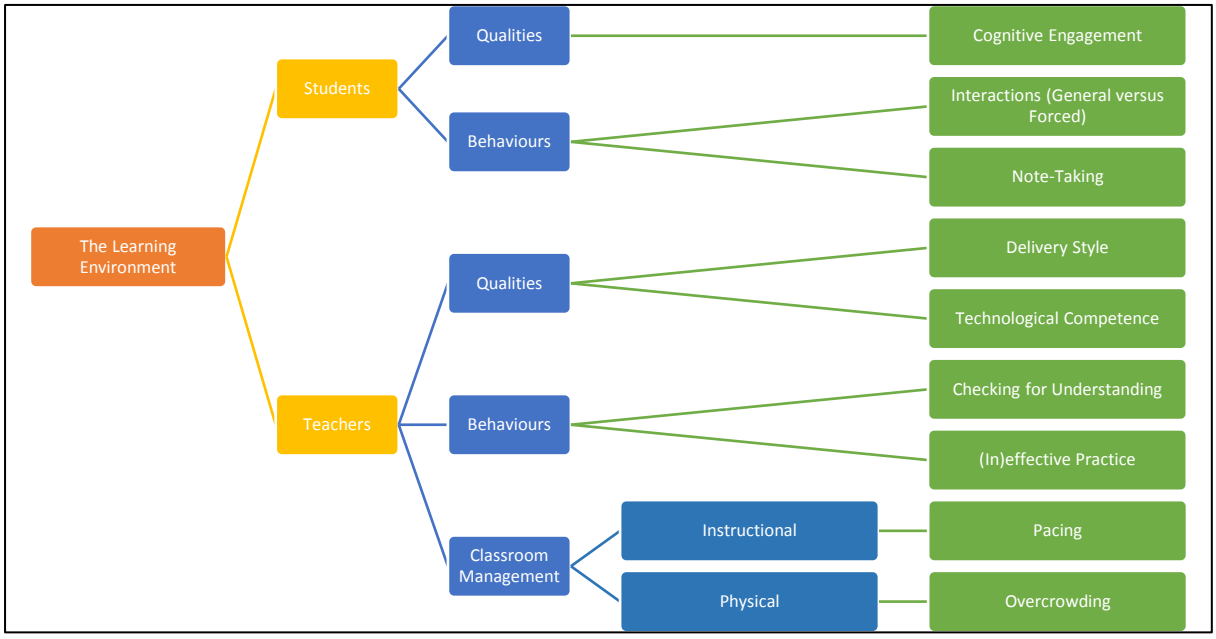

Figure 6.1. An empirical model of student conceptions of tertiary learning environments.

In addition, this doctoral research contributes to the existing body of literature by adding new climate factors and aligning them within Moos' tri-dimensional model of class climate. This was important to do in order to grow the body of literature on tertiary learning environments and shed light on new, or different, aspects that could be theorised and measured in these environments. This became clearer following Study One's in-depth interviews with students and how they perceived their typical, ideal, and dreaded classrooms. Such conversations with students, as well as with the supervision team behind this project, resulted in Table 6.1 below which provides a conceptual understanding of the 10 climate factors along with how they fit under Moos' theory of class climate.

When mapping the learning environment factors found in this thesis on to Moos' model, one observation that stood out was how these variables were spread across the three dimensions in terms of their focus or type. For example, all three dimensions contained

negative and positive factors. Also, in each of the three dimensions, at least one teacher-related construct was contained. Perhaps, similar to the arguments made in previous chapters, this table makes it clear that teachers do have a great influence on how learning environments are perceived as supportive of or hindering student growth needs, how classroom relationships are formed (Alansari, 2015), as well as how these environments are managed (Rogers, 2003), even at the tertiary level. Therefore, it seems worthwhile to investigate in future studies the extent to which teachers view themselves as contributors to the overall climate of their classes. This is important to conduct since previous studies have shown that the views of teachers and students do not always cohere in terms of what is happening, or needs to happen, in their classes (Alansari, 2011, 2012), with such misalignment in perceptions being related to significantly lower levels of satisfaction and achievement (Fraser, 2002; Yarrow & Millwater, 1995).

Table 6.1

Aligning the Class Climate Factors Validated in this Thesis with Moos' Tri-Dimensional Model of Class Climate

Dimension	Factor	Definition
Relationships	General Class Interactions	The extent to which in-class discussions are frequent or common
	Checking for Understanding	The extent to which teachers assess student learning and understanding of the topic presented during class time
	Forced Class Interactions (-)	The extent to which students are forced by teachers to respond and contribute to in-class discussions
	Boring Delivery Style (-)	The extent to which in-class instruction is seen as boring or uninteresting to students
Personal Growth	Note-Taking	The extent to which students are recording or managing information presented during class time
	Cognitive Engagement	The extent to which students are processing, thinking about, and reflecting on material presented during class time
	(In)effective Practice (-)	The extent to which teachers' content and teaching knowledge facilitates in-class effective learning
System Maintenance	Technological Competence	The extent to which teachers use technology to aid understanding and delivery during class time
	Instructional Pacing (-)	The extent to which teachers manage their instruction or content delivery with respect to time and tempo
	Class Overcrowding (-)	The extent to which classroom size is not conducive to the teaching—learning practices taking place during that class

Note. The negative sign means all items within that factor are negatively worded.

The direct and indirect influences of the classroom climate on student self-beliefs and outcomes. The second overarching goal achieved in Study Three was to do with bringing together a number of psychosocial constructs that are not often studied within the same context in the literature. For example, despite previous studies exploring the relations between student motivational beliefs and perceptions of class climate (e.g., Ku et al., 2012; Mouratidis et al., 2013), no study could be located that had looked at student self-expectations as well as achievement goals in the same context and how these self-beliefs may be related to student climate perceptions. Regardless of the direction or size of the relations presented and discussed within Study Three, it was evident that the perceived climate of a given class was significantly associated with how students perceived their motivational levels and the extent to which they expected to succeed in these classes which, in turn, were significantly related to their achievement rates. This finding is important as it suggests that self-beliefs might be a function of how the classroom is perceived by students. In other words, the key to understanding how students form self-beliefs might be in understanding first the ways in which learning environments are fostered by teachers and experienced by students. This is especially since the majority of studies on learning environments are exploratory or descriptive ones, and relatively little is known about how students form their views of learning environments (Goh & Khine, 2002).

The findings in Study Three that the climate may have direct and indirect influences on a range of student self-beliefs and outcomes also suggests that researchers need to move away from investigating linear relations between variables (e.g., A-leads-to-B only) and instead consider the relations, or interactions, among a combination of psychosocial constructs that influence classroom cognitive and affective outcomes. Reviewing the literature on the associations among various psychosocial variables suggests that already a lot is known about which *individual* variables may have an influence on an *individual* or a

specific outcome (e.g., Clarke & Frazer, 2003; Fraser, 2002; Hadjioannou, 2007; Jin & Cortazzi, 2006; Marsh, 2007). What is suggested by this thesis, however, is to start questioning which *set* or *suite* of variables is likely to influence a *range* of outcomes more strongly than others. In doing so, it is hoped that the literature would become refined over time to focus on the psychosocial constructs that are more likely to strongly affect, and not just predict, student learning outcomes.

Exploring Learning Environments from a Student Perspective

Although some studies have conducted instrument development projects that aimed to identify salient tertiary learning environment dimensions, the challenge to use student voice in the process has remained outstanding. When learning environment variables were assumed to align with the perspective of expert researchers or practitioners, the range and type of variables explored stayed largely the same (e.g., Keeley et al., 2006; Lizzio et al., 2002). In other words, new instruments continued to measure outdated, or already established, variables. This has continued to be the case even though the landscape of tertiary education has been transformed (Keesing-Styles, Nash, & Ayres, 2014), with many class climate factors that used to take place within the physical borders of a classroom no longer being so pertinent (O'Flaherty, & Phillips, 2015). To add, when class climate views were explored in this thesis from the perspective of students, new aspects were found to be relevant to these tertiary environments that had not been explored in previous climate studies (e.g., teacher movement, technological competence, and overcrowding). Therefore, the findings from this thesis support arguments made in previous studies that student voice can be used as a reliable source of data for understanding, as well as enhancing, the overall learning experience of students (Blair & Valdez-Noel, 2014; Grebennikov & Shah, 2013; Howitt & Wilson, 2015), provided teachers engage and perceive that source of data as credible and

supportive of improving tertiary practice (Bourke & Loveridge, 2016; Russell, Malfroy, Gosper, & McKenzie, 2014).

Limitations

It is crucial to articulate what the findings from this doctoral project represent as well as what they do not, given the limitations discussed at the end of each study chapter. This is further supported by the argument that most studies are bound to have limitations that restrict the extent to which generalisations and claims can be made from their findings (Wild & Seber, 2000). Limitations such as the reliance on self-report data, the exploratory design of the study that allows for investigating associations not causations, as well as the over-representation of social science students have already been addressed in previous chapters and taken into account when discussing the study findings. However, one limitation to the overall design of this project is the lack of a follow-up qualitative design to investigate the emerging patterns and results from Studies Two and Three, meaning that possible reasons to explain the findings could only be speculated upon. Further, despite the aim of this project to investigate student voice and views of tertiary learning environments, the lack of teacher voice and views as a comparison measure can still be seen as a limitation (i.e., there is no capturing of the "other side" of the story). This is especially important given the few studies that have revealed significant misalignment between student and teacher views of the classroom climate at the tertiary level (Yarrow & Millwater, 1995). Therefore, it is suggested in future studies to involve both teachers and students in class climate research, and include a qualitative follow-up study that could enable understanding about why and how any significant relations found emerged the way they did.

Reaching Multiple Audiences: Implications for Research and Practice

Numerous directions for future research have been suggested as part of the discussion sections of Studies One through to Three. Arguably, the true value of any research project

possibly lies within the researcher's ability to reach out and communicate to multiple audiences regarding the significance and importance of their work, as well as how it makes a difference to their educational experiences. In the case of this thesis, investigating the social-psychological state of the classroom as experienced by its students is seen as important, and informative, to multiple audiences discussed below.

Importance and Implications for Scholars. This research is seen as important because it gave various insights into researching tertiary classroom settings. This was conducted to address a number of gaps in the current literature, as well as to provide possible reasons for the ways in which students performed and the kinds of beliefs students held about their own learning. This was evident in the results of Study Three, where the variance in student self-expectation beliefs, workload expectations, self-motivational goals, and achievement were explained by a range of climate factors such as student cognitive engagement, teacher delivery style, and (in)effective practice. Therefore, the major significance of this research project which will inform future researchers lies within the discussion of its findings in relation to tertiary education. Often, and as shown in the literature review, research on the social psychology of the classroom and on how various psychosocial variables influence learning in classrooms is conducted at the pre-tertiary education level, with limited research at the post-secondary level. Therefore, this thesis informs researchers that more research is needed to distinguish how pre-tertiary learning environments are conceptualised and measured compared with post-secondary ones. This involves investigating whether there are other types of self-beliefs that interact to influence student outcomes (e.g., achievement), as well as investigating how these self-beliefs are influenced by the context in which teaching and learning practices are taking place.

As discussed earlier, many researchers use similar learning environment instruments for measuring student perceptions of both the secondary and tertiary learning environment, as

the subscales used in these instruments overlap (Fraser, 1998, 2002). That is, there seems to be an underlying assumption of similarity between the learning environments constructs measured at both levels. However, the findings from this thesis suggest that conclusions made about the nature of tertiary learning environments are not necessarily similar to the ones made about the nature of the pre-tertiary learning environment as explored by the available theoretical and empirical literature in the field. Therefore, there is a greater need for scholars to examine whether class climate as well as other psychosocial factors can be distinguished, or used interchangeably, within and across education levels.

Importance and Implications for Teachers. Understanding what it is about a particular classroom that may result in differential or patterned views could result in elevating student and teacher experiences of their classrooms (Alvidrez & Weinstein, 1999; Babad, 2009; Brekelmans, Brok, Tartwijk, & Wubbels, 2005; Rubie-Davies, 2011). In other words, this research is seen as important to teachers because it provides feedback information regarding how students view the learning environment they co-constructed. This is further supported by the findings from Study One that showed students perceived an ideal learning environment to be co-constructed, whereas the same students attributed 69% of behaviours and qualities taking place in dreaded environments to their teachers. Further, understanding the social-psychological aspects of learning environments informs teachers how they are perceived in the eyes of their students, and whether such views are formed due to certain beliefs such as classroom expectations or motivational factors. Feedback information based on student and teacher views of the learning environment have been shown to have significant positive change on its climate and outcomes (Hattie, 2009; Fraser, 2002). In fact, at times when teachers have been made aware of how their students conceived them, as well as their teaching practices, significant changes in teacher beliefs and practices have been evident, accompanied by a positive influence on student learning and outcomes (e.g., Fraser

& Deer, 1983; Woods & Fraser 1996). However, such studies have only been conducted at the pre-tertiary level. Therefore, it is hoped that the current large-scale research project will provide teachers with an overall picture of what is happening in their tertiary classrooms, and how those teachers and their teaching practices are viewed in the eyes of their students.

The current research also aimed at introducing a model that explains multiple links between student self-expectations, perceptions of the learning environment, motivational factors, self-beliefs, and student achievement. As found in Study Three, classroom outcomes, measured by self-reported achievement, was not only related to student views of the learning environment but also to their self-expectations, workload expectations, task-approach goals, and self-approach goals. Therefore, this research argues that the way teachers construct their classrooms is likely to have an influence on how students view themselves as learners in these classes as well as on their achievement. It is hoped that these research findings will make teachers aware of what is happening in the learning environment, what they could do to improve the cognitive and affective outcomes of that environment, and the various climate aspects they could potentially improve to strengthen their students' positive self-beliefs and outcomes. Lastly, whereas a number of studies have argued that teachers may be inaccurate estimators of their classrooms' reality (i.e., they either overestimate or underestimate the classroom experience of students; Alvidrez & Weinstein, 1999), it is hoped that sharing the findings of this research with teachers can help them develop a more realistic, as well as accurate, estimation of their classroom reality and student experiences in that classroom.

Importance and Implications for Students. This research is seen as important to students because it provided a voice for their views of the type of learning environment that would support and further enhance their learning. Although teachers endeavour to create a positive learning environment in which relationships, interactions, and hence educational outcomes are seen as ideal, they fail to predict the type of learning environments in which

students' preferred environments are aligned with the ones they experience. To illustrate, a number of studies have shown that when students were asked to evaluate the learning environment they were in, statistically significant differences between their views of the preferred and actual views of the learning environment were evident (e.g., Nair & Fisher, 2001; Raviv et al., 1990).

Further, whenever student views of the preferred learning environment were similar to those of the actual learning environment, higher levels of student achievement have been reported across various educational levels (Fraser, 1986, 2002; Fraser & Deer, 1983; Fisher, Fraser & Bassett, 1995; Woods & Fraser, 1996; Yarrow & Millwater, 1995). However, questions regarding the variables and constructs that count as important in the learning environment, and whether a certain set of variables is enough to investigate when examining the learning environment, remained unanswered in the literature, and thus became a source of motivation for writing this thesis. The research started by allowing students to communicate to the researcher which classroom climate variables were seen as more "important" than others in typical (or actual), ideal (or preferred), as well as dreaded classroom settings. If teachers had this information, they could then focus on creating learning environments that were closely linked to what students valued, and hence wanted to experience, in their classrooms. By investigating the social psychology of the classroom, this doctoral research aimed to move towards a student-focused inquiry process. It is argued that, in doing so, students' views of their preferred learning environments could be aligned with their views of the actual learning environment as a step towards elevating their positive classroom experiences (Fraser, 2002). In turn, such arguments encourage future research to focus on experimentally changing classroom cultures and practices and measuring any associated changes in student views and outcomes.

Not only does this research push for a student-focused learning process, but asking students to assess their learning environments, along with reporting on their personal expectations and motivational beliefs, may have allowed for students to employ various metacognitive skills (i.e., thinking about their own thinking) regarding what is happening in their classrooms. The data collection instruments that were used in this research required students to explain how they perceived and evaluated certain psychosocial aspects of their classrooms, including their expectations of their own achievement at the end of the academic year. Therefore, when seen as a self-reflective exercise, the ways students think about responding to such aspects may have facilitated internal cognitive processes and made them more aware of their thoughts and the current teaching–learning practices taking place in their classrooms (Schunk & Zimmerman, 1998). Therefore, reflecting on social and psychological factors that take place in classrooms may develop or improve students' metacognitive skills which are essential for learning, as well as help them develop a realistic idea of their self and learning beliefs.

Conclusion

It took four years, three studies, two methods of inquiry, and a total of 1,486 students to argue for the value and importance of investigating the "tertiary climate" from a social-psychological perspective. This thesis makes a significant contribution to the fields of learning environments and social psychology of education by revealing insights into the interrelated nature of climate, self, and outcomes. This thesis also provides insights into the multidimensional, multifocal, and dynamic nature of tertiary learning environments by exploring the classroom qualities or behaviours that potentially shape how the climate is perceived by students. Such insights have led to the development of a new learning environments questionnaire which, in turn, has enabled the investigation of multiple psychosocial variables within the same context.

Although this thesis attempted to generate an overall picture of what is effective teaching practice with tertiary students, and which behaviours or qualities predicted their self-beliefs and outcomes, the work is not yet complete. This thesis aimed to provoke the reader to think about what could be done in future research projects following the exploration of tertiary learning environments in this doctoral project. One aspect of the thesis that can be thought of as a limitation as well as a point of discussion is the lack of, and hence the need for, experimental studies that investigate the extent to which tertiary climates can be enhanced (for an exception, see Yarrow & Millwater, 1995). This is especially to avoid saturation of literature or findings, by over-relying or mainly focusing on descriptive studies in this research area. Therefore, this thesis concludes with a positive outlook: It is powerful to realise that the way students conceive and perceive their classes could influence their beliefs about success, motivation, and learning. Indeed, it is even more powerful to realise how much teachers have an influence on such processes by simply acting, reacting, and interacting in these human learning societies. Thus, realising how much research can still be done to elevate the experiences of teachers and students in these learning societies is truly exciting.

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APPENDICES

Appendix A

Participant Information Sheets, and Consent Forms for Study One

Appendix B

Interview Protocol for Study Two

Appendix C

Participant Information Sheets, and Consent Forms for Studies Two and Three

Appendix D

Questionnaire

APPENDIX A

Faculty of Education
74 Epsom Avenue,
Epsom
Phone: 3737550 Ext 82496
The University of Auckland
Private Bag 92019
Auckland, New Zealand

PARTICIPANT INFORMATION SHEET
(Course Coordinator)

Project title: Exploring student conceptions of university learning environments: From the dreaded to the ideal

Principal Investigator: Associate Professor Christine Rubie-Davies, Faculty of Education
Tel: +64 9 3737 599 Extn 82974

Co-investigator: Dr Jason Stephens, Faculty of Education
Tel: +64 9 3737599 Extn 46409

Researcher: Mohamed Alansari
I am Mohamed Alansari, a doctoral student in the Faculty of Education. I am conducting research for my PhD thesis in Education, supervised by Associate Professor Christine Rubie-Davies and Dr Jason Stephens, at the Faculty of Education, the University of Auckland, New Zealand.

Project description and invitation
The aim of this study is to explore student perceptions of the tertiary learning environment, and how students characterise a learning environment that supports or hinders their learning. This is a qualitative research study, with student interviews being the main data collection instrument. I intend to conduct the research at the University of Auckland and to examine the perceptions of various undergraduate students from different faculties. The views and teaching practices of your teaching staff will not be evaluated, as this research is primarily concerned with tertiary student views of the learning environment and what contributes to their learning. This study could reveal interesting results and future research directions, which would contribute to my understanding of the tertiary learning environment, as well as help me put together a new data collection instrument to investigate such an environment for the second part of my doctoral research project. Therefore, I would like to seek your permission to invite students enrolled in your course to participate in my study.

Project Procedure
Participation in the study is entirely voluntary and I ask for your assurance that participation or non-participation by students will not affect their relationship with you or the department. Students who do agree to participate will be interviewed and audio-recorded, and each interview should take no longer than an hour. This will be indicated in their Participant Information Sheets (PIS) and Consent Forms (CF).

Data storage and future use
The data will be stored in a locked cabinet on university premises for 6 years. After 6 years, all information will be destroyed by shredding the paper records and any remaining digital files will be deleted. The data will be used for my Doctoral thesis and may also be used for academic purposes, that is for presentations at conferences and submissions to academic outlets such as journals and books.

Right to Withdraw from Participation
Participants have the right to choose whether or not to participate in the study, as participation is entirely voluntary. Participants will also have the right to go through their transcribed interview and confirm whether any part of it needs to be changed or altered. This will be explicitly communicated to participants via their PIS and CF. Also, participants may withdraw participation at any time without giving a reason

Anonymity and Confidentiality
Student participants will expose their identity to the researcher only, which is why anonymity is not possible in this research. This will be explicitly communicated to them via their PIS and the CF they will have to sign prior to participating in this research. However, participants will be given an absolute assurance that their data will be reported anonymously.

Confidentiality is completely guaranteed, as the data collected from participants will be collated and reported anonymously, and the researcher will not be exposing the identity of any participant when reporting the findings from the interview data.

A summary of the study findings can be provided for you upon request following the completion of the research in February 2016.

Contact Details:

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Head of School:
Associate Professor Christine Rubie-Davies
Phone : +64 9 3737 599 Extn 82974
E-mail: c.rubie@auckland.ac.nz

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142. Telephone 09 373 7599 Extn. 83711.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 29th July 2014 for 3 years, Reference Number 012236

Faculty of Education
74 Epsom Avenue,
Epsom
Phone: 3737550 Ext 82496
The University of Auckland
Private Bag 92019
Auckland, New Zealand

CONSENT FORM
(Course Coordinator)

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

Project title: Exploring student conceptions of university learning environments: From the dreaded to the ideal

Principal Investigator: Associate Professor Christine Rubie-Davies, Faculty of Education

Co-investigator: Dr Jason Stephens, Faculty of Education

Researcher: Mohamed Alansari

I have read the Participant Information Sheet, and understood the nature of the research and why students enrolled in my course have been selected to participate. I have had the opportunity to ask questions and have them answered to my satisfaction. I have understood that participation in this research is entirely voluntary.

☐ I agree that students enrolled in _____ and can take part in this research.

☐ Participation or non-participation by students will not affect their relationship with the department.

I understand that:

☐ I am free to withdraw students from participating at any time without giving a reason.

☐ Confidentiality will be completely guaranteed to students.

☐ If any provided information is reported or published, it will be in a way that does not identify students or their tutors as a source of the information.

☐ Student interviews will be recorded and, once transcribed, available for participants to access, review, and/or change if they wish to do so.

☐ Data will be kept for 6 years, after which they will be securely destroyed.

☐ I wish / do not wish to receive the summary of findings.

If yes please provide your Contact details:
_____
_____

Name _____
Signature _____ Date _____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 29th July 2014 FOR (3) YEARS REFERENCE NUMBER 012236

Faculty of Education
74 Epsom Avenue,
Epsom
Phone: 3737550 Ext 82496
The University of Auckland
Private Bag 92019
Auckland, New Zealand

PARTICIPANT INFORMATION SHEET
(Student)

Project title: Exploring student conceptions of university learning environments: From the dreaded to the ideal

Principal Investigator: Associate Professor Christine Rubie-Davies, Faculty of Education
Tel: +64 9 3737 599 Extn 82974.

Co-investigator: Dr Jason Stephens, Faculty of Education
Tel: +64 9 3737599 Extn 46409

Researcher: Mohamed Alansari
I am Mohamed Alansari, a doctoral student in the Faculty of Education. I am conducting research for my PhD thesis in Education, supervised by Associate Professor Christine Rubie-Davies and Dr Jason Stephens, at the Faculty of Education, the University of Auckland, New Zealand.

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The aim of this study is to explore student perceptions of the tertiary learning environment, and how students characterise a learning environment that supports or hinders their learning. This is a qualitative research study, with student interviews being the main data collection instrument. I intend to conduct the research at the University of Auckland and to examine the perceptions of various undergraduate students from different faculties. The views and teaching practices of your teachers will not be evaluated, as this research is primarily concerned with your views of the learning environment and what contributes to your learning. This study could reveal interesting results and future research directions, which would contribute to my understanding of the tertiary learning environment, as well as help me put together a new data collection instrument to investigate such an environment for the second part of my doctoral research project. Therefore, I would like to invite you to participate in my study.

Project Procedure
Participation in the study is entirely voluntary and I have the assurance from your course coordinator that your participation or non-participation will not affect you relationship with your lecturers, tutors, or the department. If you agree to participate, you will be interviewed and audio-recorded. Each interview should take no longer than an hour. In particular, the interview questions will be around:

1. What are your views of a typical, dreaded, and ideal university lecture environment?
2. What are your views of a typical, dreaded, and ideal university tutorial session?

Data storage and future use
The data will be stored in a locked cabinet on university premises for 6 years. After 6 years, all information will be destroyed by shredding the paper records and any remaining digital files will be deleted. The data will be used for my Doctoral thesis and may also be used for academic purposes, that is for presentations at conferences and submissions to academic outlets such as journals and books.

Right to Withdraw from Participation
You may choose to participate or not in the study, as participation is entirely voluntary. You may go through your transcribed interview and confirm whether any part of it needs to be changed or altered. Also, you may withdraw participation at any time without giving a reason and withdraw any data traceable to you up to three weeks from completing the interview.

Anonymity and Confidentiality

Your identity will be exposed to the research team only, which is why anonymity is not possible in this research. However, you will be given an absolute assurance that their data will be reported anonymously.

Confidentiality is completely guaranteed, as the data collected from participants will be collated and reported anonymously, and the researcher will not be exposing the identity of any participant when reporting the findings from the interview data.

A summary of the study findings can be provided for you upon request following the completion of the research in February 2016.

Contact Details:

Mohamed Alansari
Phone: (mobile) +64 2102458476
E-mail: mmah054@aucklanduni.ac.nz

Supervisors:
Associate Professor Christine Rubie-Davies
Phone : +64 9 3737 599 Extn 82974
E-mail: c.rubie@auckland.ac.nz

Dr Jason Stephens
Phone: +64 9 3737599 Extn 46409
E-mail: jm.stephens@auckland.ac.nz

Head of School:
Associate Professor Christine Rubie-Davies
Phone : +64 9 3737 599 Extn 82974
E-mail: c.rubie@auckland.ac.nz

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142. Telephone 09 373 - 7599 Extn. 83711.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 29th July 2014 for 3 years, Reference Number 012236

Faculty of Education
74 Epsom Avenue,
Epsom
Phone: 3737550 Ext 82496
The University of Auckland
Private Bag 92019
Auckland, New Zealand

CONSENT FORM
(Student)

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

Project title: Exploring student conceptions of university learning environments: From the dreaded to the ideal

Principal Investigator: Associate Professor Christine Rubie-Davies, Faculty of Education

Co-investigator: Dr Jason Stephens, Faculty of Education

Researcher: Mohamed Alansari

I have read the Participant Information Sheet, and understood the nature of the research and why I have been selected. I have had the opportunity to ask questions and have them answered to my satisfaction. I have understood that participation in this research is entirely voluntary.

☐ I agree to take part in this research.

I understand that:

☐ I am free to withdraw participation at any time without giving a reason and to withdraw any data traceable to me up to three weeks from completing the interview.

☐ Confidentiality will be completely guaranteed.

☐ My interview will be audio-recorded and transcribed.

☐ I will have the chance to go through my transcribed interview and confirm whether any part of it needs to be changed or altered.

☐ If any provided information is reported or published, it will be in a way that does not identify me as a source of the information.

☐ Data will be kept for 6 years, after which they will be securely destroyed.

☐ I wish / do not wish to receive the summary of findings.

If yes please provide your Contact details:
_____
_____

Name _____

Signature _____ Date _____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 29th July FOR (3) YEARS REFERENCE NUMBER 012236

Faculty of Education
74 Epsom Avenue,
Epsom
Phone: 3737550 Ext 82496
The University of Auckland
Private Bag 92019
Auckland, New Zealand

PARTICIPANT INFORMATION SHEET
(Faculty Dean)

Project title: Exploring student conceptions of university learning environments: From the dreaded to the ideal

Principal Investigator: Associate Professor Christine Rubie-Davies, Faculty of Education
Tel: +64 9 3737 599 Extn 82974.

Co-investigator: Dr Jason Stephens, Faculty of Education
Tel: +64 9 3737599 Extn 46409

Researcher: Mohamed Alansari
I am Mohamed Alansari, a doctoral student in the Faculty of Education. I am conducting research for my PhD thesis in Education, supervised by Associate Professor Christine Rubie-Davies and Dr Jason Stephens, at the Faculty of Education, the University of Auckland, New Zealand.

Project description and invitation
The aim of this study is to explore student perceptions of the tertiary learning environment, and how students characterise a learning environment that supports or hinders their learning. This is a qualitative research study, with student interviews being the main data collection instrument. I intend to conduct the research at the University of Auckland and to examine the perceptions of various undergraduate students from different faculties. The views and teaching practices of your teaching staff will not be evaluated, as this research is primarily concerned with tertiary student views of the learning environment and what contributes to their learning. This study could reveal interesting results and future research directions, which would contribute to my understanding of the tertiary learning environment, as well as help me put together a new data collection instrument to investigate such an environment for the second part of my doctoral research project. Therefore, I would like to seek your permission to approach course coordinators in your faculty and invite students enrolled in their course to participate in my study.

Project Procedure
Participation in the study is entirely voluntary and I ask for your assurance that participation or non-participation by students will not affect their relationship with you or the department. Students who do agree to participate will be interviewed and audio-recorded, and each interview should take no longer than an hour. This will be indicated in their Participant Information Sheets (PIS) and Consent Forms (CF).

Data storage and future use
The data will be stored in a locked cabinet on university premises for 6 years. After 6 years, all information will be destroyed by shredding the paper records and any remaining digital files will be deleted. The data will be used for my Doctoral thesis and may also be used for academic purposes, that is for presentations at conferences and submissions to academic outlets such as journals and books.

Right to Withdraw from Participation
Participants have the right to choose whether or not to participate in the study, as participation is entirely voluntary. Participants will also have the right to go through their transcribed interview and confirm whether any part of it needs to be changed or altered. This will be explicitly communicated to participants via their PIS and CF. Also, participants may withdraw participation at any time without giving a reason

Anonymity and Confidentiality
Student participants will expose their identity to the researcher only, which is why anonymity is not possible in this research. This will be explicitly communicated to them via their PIS and the CF they will have to sign prior to participating in this research. However, participants will be given an absolute assurance that their data will be reported anonymously.

Confidentiality is completely guaranteed, as the data collected from participants will be collated and reported anonymously, and the researcher will not be exposing the identity of any participant when reporting the findings from the interview data.

A summary of the study findings can be provided for you upon request following the completion of the research in February 2016.

Contact Details:

Mohamed Alansari
Phone: (mobile) +64 2102458476
E-mail: mmah054@aucklanduni.ac.nz

Supervisors:
Associate Professor Christine Rubie-Davies
Phone : +64 9 3737 599 Extn 82974
E-mail: c.rubie@auckland.ac.nz

Dr Jason Stephens
Phone: +64 9 3737599 Extn 46409
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Head of School:
Associate Professor Christine Rubie-Davies
Phone : +64 9 3737 599 Extn 82974
E-mail: c.rubie@auckland.ac.nz

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142. Telephone 09 373 7599 Extn. 83711.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 29th July 2014 for 3 years, Reference Number 012236

Faculty of Education
74 Epsom Avenue,
Epsom
Phone: 3737550 Ext 82496
The University of Auckland
Private Bag 92019
Auckland, New Zealand

CONSENT FORM
(Faculty Dean)

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

Project title: Exploring student conceptions of university learning environments: From the dreaded to the ideal

Principal Investigator: Associate Professor Christine Rubie-Davies, Faculty of Education

Co-investigator: Dr Jason Stephens, Faculty of Education

Researcher: Mohamed Alansari

I have read the Participant Information Sheet, and understood the nature of the research and why students enrolled in my course been selected to participate. I have had the opportunity to ask questions and have them answered to my satisfaction. I have understood that participation in this research is entirely voluntary.

☐ I agree that course coordinators in my faculty can be approached regarding their students taking part in this research.

☐ Participation or non-participation by students will not affect their relationship with the department.

I understand that:

☐ Confidentiality will be completely guaranteed to students.

☐ If any provided information is reported or published, it will be in a way that does not identify students or their tutors as a source of the information.

☐ Student interviews will be recorded and, once transcribed, available for participants to access, review, and/or change if they wish to do so.

☐ Data will be kept for 6 years, after which they will be securely destroyed.

☐ I wish / do not wish to receive the summary of findings.

If yes please provide your Contact details:
_____
_____

Name _____
Signature _____ Date _____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 29th July 2014 FOR (3) YEARS REFERENCE NUMBER 012236

APPENDIX B

THE UNIVERSITY OF AUCKLAND
FACULTY OF EDUCATION
Te Kura Akoranga o Tāmaki Makaurau
Incorporating the Auckland College of Education

Interview Protocol Form

Interviewee: _____

Interviewer: _____

Protocol Sections:

A: Introductory Protocol

B: Interview Background

C: Interview Questions

D: Interview Wrap Up

E: Post Interview Comments and/or Observations

A: Introductory Protocol

Hello _____. Thanks for joining me today. My name is _____ and I will be conducting the interview today. How are you going today? [fill with appropriate response]

You have been selected to speak with me today because you wished to share what you know about the university learning environment. Our research project as a whole focuses on student views of the learning environment, and what factors help or hinder learning in that environment. This research project will also look at student beliefs and how these are related to their assessments of the learning environment as well as achievement. Our study does not aim to evaluate your views or experiences. Rather, we are trying to learn more about the university learning environment, and hopefully learn about teaching–learning practices that help improve student learning at the university.

To facilitate my note-taking, I would like to audio tape our conversation today. For your information, only researchers on the project will be privy to the recordings which will be eventually destroyed after they are transcribed and the project has been completed. Please sign the consent form [if they have not already done so]. Essentially, this form states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time without giving a reason, and (3) your interview will be audio-recorded and transcribed. Thank you for your agreeing to participate.

I have planned this interview to last no longer than one hour. During this time, I have several questions that I would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete the questioning.

B: Interviewee Background

Tell me more about yourself (year level, degree, major, ethnicity, etc).

How long have you been a student in this university?

How often do you attend your lectures and tutorials?

What kind of grades do you typically earn?

How important your studies are to you relative to other aspects going on your life (e.g., friends, relationships, family, work, sports, etc.).

C: Interview Questions

Let's agree that a 'large' classroom means one that has 40 or more students, and a 'small' classroom means one that has less than 40 students.

When you think about a typical large learning environment, what do you see? Please describe what you envision in as much detail as possible.
Prompts: What's the lecturer doing? What are students doing? What's the general mood in the room? What is the "sense of community" like?
Probes: Why is that? What do you mean? Could you tell me more?

When you think about an ideal large learning environment, what do you see? Please describe what you envision in as much detail as possible.
Prompts: What's the lecturer doing? What are students doing? What's the general mood in the room? What is the "sense of community" like?
Probes: Why is that? What do you mean? Could you tell me more?

When you think about a dreaded large learning environment, what do you see? Please describe what you envision in as much detail as possible.
Prompts: What's the lecturer doing? What are students doing? What's the general mood in the room? What is the "sense of community" like?
Probes: Why is that? What do you mean? Could you tell me more?

When you think about a typical small learning environment, what do you see? Please describe what you envision in as much detail as possible.
Prompts: What's the tutor doing? What are students doing? What's the general mood in the room? What is the "sense of community" like?
Probes: Why is that? What do you mean? Could you tell me more?

When you think about an ideal small learning environment, what do you see? Please describe what you envision in as much detail as possible.
Prompts: What's the tutor doing? What are students doing? What's the general mood in the room? What is the "sense of community" like?
Probes: Why is that? What do you mean? Could you tell me more?

When you think about a dreaded small learning environment, what do you see? Please describe what you envision in as much detail as possible.
Prompts: What's the tutor doing? What are students doing? What's the general mood in the room? What is the "sense of community" like?
Probes: Why is that? What do you mean? Could you tell me more?

D: Interview Wrap Up

Is there anything else you would like to add? Do you have any questions? Your Participant Information Sheet includes all the relevant information regarding the project as well as our contact details should you have any further queries.

On behalf of the research team, I would like to thank you for participating in this research project. We really appreciate it.

E: Post Interview Comments and/or Observations:

APPENDIX C

Faculty of Education
74 Epsom Avenue,
Epsom
Phone: 3737550 Ext 82496
The University of Auckland
Private Bag 92019
Auckland, New Zealand

PARTICIPANT INFORMATION SHEET
(Faculty Dean)

Project title: Tertiary learning environments: An instrument development study.

Principal Investigator: Professor Christine Rubie-Davies, Faculty of Education
Tel: +64 9 3737 599 Extn 82974.

Co-investigator: Dr Jason Stephens, Faculty of Education
Tel: +64 9 3737 599 Extn 46409

Researcher: Mohamed Alansari
I am Mohamed Alansari, a doctoral student in the Faculty of Education. I am conducting research for my PhD thesis in Education, supervised by Professor Christine Rubie-Davies and Dr Jason Stephens, at the Faculty of Education, the University of Auckland, New Zealand.

Project description and invitation
This is the second study of my doctoral project, where the aim is to develop a new tertiary learning environment questionnaire based on how students characterised the kind of environment that supported or hindered their learning in the first study of this project. This is a quantitative research study, with anonymous student questionnaires being the main data collection instrument. I intend to conduct the research at the University of Auckland and to examine the perceptions of various undergraduate students in the Faculty of_____ (insert name for each faculty). The views and teaching practices of your teaching staff will not be evaluated, as this research is primarily concerned with tertiary student views of the learning environment and what contributes to their learning. This study could reveal interesting results and future research directions, which would contribute to understanding of the tertiary learning environment. The study will also help me investigate how tertiary student views of the learning environment are associated with student motivational and expectation beliefs, as well as their achievement, for the third part of my doctoral project. Therefore, I would like to seek your permission to invite students enrolled in your faculty to participate in my study.

Project Procedure
Participation in the study is entirely voluntary. Students who agree to participate will be asked to complete anonymous questionnaires, along with some basic demographics. The entire questionnaire should take no longer than 10 minutes to complete. This will be indicated in their Participant Information Sheets (PIS).

Data storage and future use
The data will be stored in a locked cabinet on university premises for 6 years. After 6 years, all information will be destroyed by shredding the paper records and any remaining digital files will be deleted. The data will be used for my Doctoral thesis and may also be used for academic purposes, that is, for presentations at conferences and submissions to academic outlets such as journals and books.

Right to Withdraw from Participation
Participants have the right to choose whether or not to participate in the study, as participation is entirely voluntary. However, please note that once the questionnaires have been completed, participants cannot withdraw their data because identification of particular participants will not be possible.

Anonymity and Confidentiality
Anonymity with respect to student participants is guaranteed. The student questionnaires are anonymous, and once students fill them in there will be no means of identification or tracking down. This will be explicitly communicated to them via their PIS.

A summary of the study findings can be provided to you upon request following the completion of the research in February 2017.

Contact Details:
Mohamed Alansari
Phone: (mobile) +64 2102458476
E-mail: mmah054@aucklanduni.ac.nz

Supervisors:
Professor Christine Rubie-Davies
Phone : +64 9 3737 599 Extn 82974
E-mail: c.rubie@auckland.ac.nz

Dr Jason Stephens
Phone: +64 9 3737 599 Extn 46409
E-mail: jm.stephens@auckland.ac.nz

Head of School:
Associate Professor Lorri Santamaria
Phone : +64 9 3737 599 Extn 46353
E-mail: l.santamaria@auckland.ac.nz

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142. Telephone 09 373 7599 Extn. 83711. Email ro-ethics@auckland.ac.nz.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 18th JULY 2015 FOR (3) YEARS REFERENCE NUMBER 015294.

Faculty of Education
74 Epsom Avenue,
Epsom
Phone: 3737550 Ext 82496
The University of Auckland
Private Bag 92019
Auckland, New Zealand

CONSENT FORM
(Faculty Dean)

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

Project title: Tertiary learning environments: An instrument development study.

Principal Investigator: Professor Christine Rubie-Davies, Faculty of Education

Co-investigator: Dr Jason Stephens, Faculty of Education

Researcher: Mohamed Alansari

I have read the Participant Information Sheet, and understood the nature of the research and why students enrolled in my faculty have been selected to participate. I have had the opportunity to ask questions and have them answered to my satisfaction. I have understood that participation in this research is entirely voluntary.

☐ I agree that course coordinators in my faculty can be approached regarding their students taking part in this research.

I understand that:

☐ Anonymity will be completely guaranteed to students.

☐ Data will be kept for 6 years, after which they will be securely destroyed.

☐ I wish / do not wish to receive the summary of findings.

If yes please provide your Contact details:
_____
_____

Name: _____

Faculty: _____

Signature: _____ Date _____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 18th JULY 2015 FOR (3) YEARS REFERENCE NUMBER 015294.

Faculty of Education
74 Epsom Avenue,
Epsom
Phone: 3737550 Ext 82496
The University of Auckland
Private Bag 92019
Auckland, New Zealand

PARTICIPANT INFORMATION SHEET
(Course Coordinator)

Project title: Tertiary learning environments: An instrument development study.

Principal Investigator: Professor Christine Rubie-Davies, Faculty of Education
Tel: +64 9 3737 599 Extn 82974

Co-investigator: Dr Jason Stephens, Faculty of Education
Tel: +64 9 3737599 Extn 46409

Researcher: Mohamed Alansari
I am Mohamed Alansari, a doctoral student in the Faculty of Education. I am conducting research for my PhD thesis in Education, supervised by Professor Christine Rubie-Davies and Dr Jason Stephens, at the Faculty of Education, the University of Auckland, New Zealand.

Project description and invitation
This is the second study of my doctoral project, where the aim is to develop a new tertiary learning environment questionnaire based on how students characterised the kind of environment that supported or hindered their learning in the first study of this project. This is a quantitative research study, with anonymous student questionnaires being the main data collection instrument. I intend to conduct the research at the University of Auckland and to examine the perceptions of various undergraduate students in the Faculty of_____ (insert name for each faculty). Your teaching practices and those of any other academic staff teaching on your course will not be specifically evaluated, because this research is primarily concerned with tertiary student views of the learning environment and what contributes to their learning. This study could reveal interesting results and future research directions, which could contribute to understanding of the tertiary learning environment. The study will also help me investigate how tertiary student views of the learning environment are associated with student motivational and expectation beliefs, as well as their achievement, for the third part of my doctoral project. Therefore, I would like to seek your permission for me to invite students enrolled in your course to participate in my study.

Project Procedure
Participation in the study is entirely voluntary. At a lecture session, I will present students with their Participant Information Sheets (PIS) and the questionnaire. Having explained the research, students who decide to participate will be asked to complete anonymous questionnaires, along with some basic demographics, during the scheduled lecture break. The entire questionnaire should take no longer than 10 minutes. All questionnaires will be returned to a box placed at the back of the classroom. Students needing more time to complete the questionnaire may take that extra time immediately following class, the collection boxes will be left at outside the lecture theatre doorways for ten additional minutes. This will be indicated in students' PIS.

Data storage and future use
The data will be stored in a locked cabinet on university premises for 6 years. After 6 years, all information will be destroyed by shredding the paper records and any remaining digital files will be deleted. The data will be used for my Doctoral thesis and may also be used for academic purposes, that is, for presentations at conferences and submissions to academic outlets such as journals and books.

Right to Withdraw from Participation
Participants have the right to choose whether or not to participate in the study, as participation is entirely voluntary. However, please note that once the questionnaires have been completed participants cannot withdraw their data because identification of particular participants will not be possible since the questionnaire is anonymous.

Anonymity and Confidentiality
Anonymity with respect to student participants is guaranteed. The student questionnaires are anonymous, and once students fill them in there will be no means of identification or tracking down. This will be explicitly communicated to them via their PIS.
A summary of the study findings can be provided for you upon request following the completion of the research in February 2017.

Contact Details:
Mohamed Alansari
Phone: (mobile) +64 2102458476
E-mail: mmah054@aucklanduni.ac.nz

Supervisors:
Professor Christine Rubie-Davies
Phone : +64 9 3737 599 Extn 82974
E-mail: c.rubie@auckland.ac.nz

Dr Jason Stephens
Phone: +64 9 3737599 Extn 46409
E-mail: jm.stephens@auckland.ac.nz

Head of School:
Associate Professor Lorri Santamaria
Phone : +64 9 3737 599 Extn 46353
E-mail: l.santamaria@auckland.ac.nz

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Faculty of Education
74 Epsom Avenue,
Epsom
Phone: 3737550 Ext 82496
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Private Bag 92019
Auckland, New Zealand

CONSENT FORM
(Course Coordinator)

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

Project title: Tertiary learning environments: An instrument development study.

Principal Investigator: Professor Christine Rubie-Davies, Faculty of Education

Co-investigator: Dr Jason Stephens, Faculty of Education

Researcher: Mohamed Alansari

I have read the Participant Information Sheet, and understood the nature of the research and why students enrolled in my course have been selected to participate. I have had the opportunity to ask questions and have them answered to my satisfaction. I have understood that participation in this research is entirely voluntary.

☐ I agree that students enrolled in _____ and can take part in this research.

I understand that:

☐ I will not be able to ask students to withdraw their data once it has been submitted because it is anonymous.

☐ Data will be kept for 6 years, after which they will be securely destroyed.

☐ I wish / do not wish to receive the summary of findings.

If yes please provide your Contact details:
_____
_____

Name _____
Signature _____ Date _____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 18th JULY 2015 FOR (3) YEARS REFERENCE NUMBER 015294.

Faculty of Education
74 Epsom Avenue,
Epsom
Phone: 3737550 Ext 82496
The University of Auckland
Private Bag 92019
Auckland, New Zealand

PARTICIPANT INFORMATION SHEET
(Student)

Project title: Tertiary learning environments: An instrument development study.

Principal Investigator: Professor Christine Rubie-Davies, Faculty of Education
Tel: +64 9 3737 599 Extn 82974.

Co-investigator: Dr Jason Stephens, Faculty of Education
Tel: +64 9 3737599 Extn 46409

Researcher: Mohamed Alansari
I am Mohamed Alansari, a doctoral student in the Faculty of Education. I am conducting research for my PhD thesis in Education, supervised by Associate Professor Christine Rubie-Davies and Dr Jason Stephens, at the Faculty of Education, the University of Auckland, New Zealand.

Project description and invitation
This is the second study of my doctoral project, where the aim is to develop a new tertiary learning environment questionnaire based on how students characterised the kind of environment that supported or hindered their learning in the first study of this project. This is a quantitative research study, with anonymous questionnaires being the main data collection instrument. I intend to conduct the research at the University of Auckland and to examine the perceptions of undergraduate students in various faculties. This study could reveal interesting results and future research directions, which would contribute to understanding of the tertiary learning environment. This will also help me investigate how tertiary student views of the learning environment are associated with student motivational and expectation beliefs, as well as their achievement, for the third part of my doctoral project. Hence, it may assist lecturers in learning how better to help undergraduate students learn. Therefore, I would like to ask you to participate in this project to help me answer my research questions.

Project Procedure
If you agree to participate, you will be asked to fill in an anonymous questionnaire that will take no longer than 10 minutes during the scheduled lecture break. A box will be placed at the back of the classroom into which all questionnaires can be returned. If you needed more time to complete the questionnaire, you may take that extra time immediately following class, the collection boxes will be left at outside the lecture theatre doorways for ten additional minutes. Participation in the study is entirely voluntary; no one will know whether or not you have taken part in this research because the questionnaire is completely anonymous.

Data storage and future use
The data will be stored in a locked cabinet on university premises for 6 years. After 6 years, all information will be destroyed by shredding the paper records and any remaining digital files will be deleted. The data will be used for my Doctoral thesis and may also be used for academic purposes, that is, for presentations at conferences and submissions to academic outlets such as journals and books.

Right to Withdraw from Participation
You have the right to choose whether or not to participate in the study or to stop completing the questionnaire should you feel uncomfortable, as participation is entirely voluntary. However, please note that once you have completed and returned the questionnaire, you cannot withdraw your data because identification of particular participants will not be possible since there will not be any identifying information on the questionnaires.

Anonymity and Confidentiality
Anonymity is fully guaranteed. The questionnaires are anonymous, and once you fill them in there will be no means of identification or tracking down. No codes or labels that link questionnaire responses directly to your identity will be used.

A summary of the study findings can be provided for you upon request following the completion of the research in February 2017.

Contact Details:
Mohamed Alansari
Phone: (mobile) +64 2102458476
E-mail: mmah054@aucklanduni.ac.nz

Supervisors:
Professor Christine Rubie-Davies
Phone : +64 9 3737 599 Extn 82974
E-mail: c.rubie@auckland.ac.nz

Dr Jason Stephens
Phone: +64 9 3737599 Extn 46409
E-mail: jm.stephens@auckland.ac.nz

Head of School:
Associate Professor Lorri Santamaria
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APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 18th JULY 2015 FOR (3) YEARS REFERENCE NUMBER 015294.

Appendix D

TERTIARY LEARNING ENVIRONMENTS QUESTIONNAIRE

Please circle or write down the appropriate response:

Faculty:	**….....**				
Gender	Male	Female	Other: ……		
Ethnicity	NZ/Pakeha	Māori	Pasifika	Asian	Other: ……

How would you describe the marks you typically receive at the university?

O Mostly above 90%
O Between 80% and 90%
O Between 70% and 80%
O Between 60% and 70%
O Between 50% and 60%
O Between 40% and 50%
O Less than 40%

DIRECTIONS

This questionnaire contains statements about qualities and practices that could take place in this class. You will be asked to indicate your levels of agreement or disagreement with each statement. **There are no right or wrong answers**. Your opinion is what is wanted. Think about how well each statement describes what happens *in this class*.

Be sure to give an answer for all questions. If you change your mind about an answer then cross it out and circle another.

Some statements in this questionnaire are fairly similar to other statements. Do not worry about this. Simply give your opinion about all statements.

	In this class…	**Strongly Disagree**	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**
1	The lecturer is enthusiastic.	1	2	3	4	5	6	7
2	The lecturer raises questions for students to answer.	1	2	3	4	5	6	7
3	The lecturer is interactive.	1	2	3	4	5	6	7
4	Students usually ask questions.	1	2	3	4	5	6	7
5	The lecturer checks for our understanding of the content.	1	2	3	4	5	6	7
6	Students interact with each other.	1	2	3	4	5	6	7
7	The lecturer's voice is dull/monotone.	1	2	3	4	5	6	7
8	Interactions between students are common.	1	2	3	4	5	6	7
9	The lecturer does not like students interrupting him/her.	1	2	3	4	5	6	7
10	Student discussions are common.	1	2	3	4	5	6	7
11	The number of students is too large.	1	2	3	4	5	6	7
12	The lecturer uses a variety of teaching methods.	1	2	3	4	5	6	7
13	Students do not interact with the teacher.	1	2	3	4	5	6	7
14	The lecturer checks that students understand the topic discussed.	1	2	3	4	5	6	7
15	The lecturer stays at the front.	1	2	3	4	5	6	7
16	Students are involved in discussions.	1	2	3	4	5	6	7
17	The lecturer knows how to use the technology provided.	1	2	3	4	5	6	7
18	The lecturer does not know his/her topic very well.	1	2	3	4	5	6	7
19	Students participate and share ideas.	1	2	3	4	5	6	7
20	The lecturer welcomes student questions or queries.	1	2	3	4	5	6	7
21	The lecturer uses a number of teaching strategies.	1	2	3	4	5	6	7
22	The lecturer involves students in class discussions.	1	2	3	4	5	6	7
23	The lecturer asks for student input in class discussions.	1	2	3	4	5	6	7

	In this class…	**Strongly Disagree**	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**
24	I usually think about what is being said.	1	2	3	4	5	6	7
25	The lecturer introduces the content in different ways.	1	2	3	4	5	6	7
26	The lecturer is excited to teach.	1	2	3	4	5	6	7
27	The lecturer expects us to learn whatever material he/she presents.	1	2	3	4	5	6	7
28	Too many students are put into one space.	1	2	3	4	5	6	7
29	Students are given the opportunity to ask questions.	1	2	3	4	5	6	7
30	Students are usually listening to the lecturer.	1	2	3	4	5	6	7
31	The lecturer moves around.	1	2	3	4	5	6	7
32	The lecturer enjoys talking about his/her topic.	1	2	3	4	5	6	7
33	There are way too many students.	1	2	3	4	5	6	7
34	Students contribute to class discussions.	1	2	3	4	5	6	7
35	Conversations go either too slow or too fast for me.	1	2	3	4	5	6	7
36	The pace of teaching is either too slow or too fast for me.	1	2	3	4	5	6	7
37	I usually write down information discussed.	1	2	3	4	5	6	7
38	There are no discussions.	1	2	3	4	5	6	7
39	The lecturer goes off topic.	1	2	3	4	5	6	7
40	The lecturing is either too fast or too slow for me.	1	2	3	4	5	6	7
41	I would rather <u>not</u> ask questions.	1	2	3	4	5	6	7
42	I usually take notes.	1	2	3	4	5	6	7
43	Students are usually paying attention.	1	2	3	4	5	6	7
44	The lecturer makes sure we understand the materials.	1	2	3	4	5	6	7
45	I usually write notes.	1	2	3	4	5	6	7
46	I am usually processing information given to us during the lecture.	1	2	3	4	5	6	7
47	The lecturer picks on some students to answer questions.	1	2	3	4	5	6	7

	In this class…	**Strongly Disagree**	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**
48	Students have the opportunity to ask questions and raise comments.	1	2	3	4	5	6	7
49	The lecturer looks down on students.	1	2	3	4	5	6	7
50	I am usually thinking about the material discussed during the lecture.	1	2	3	4	5	6	7
51	Students are forced to participate.	1	2	3	4	5	6	7
52	The lecturer is energetic.	1	2	3	4	5	6	7
53	Students pay attention to what the lecturer is saying.	1	2	3	4	5	6	7
54	The lecturer's voice is boring.	1	2	3	4	5	6	7
55	The lecturer randomly chooses students to answer questions.	1	2	3	4	5	6	7
56	The lecturer does <u>not</u> stimulate my interest.	1	2	3	4	5	6	7
57	The lecturer walks around when teaching.	1	2	3	4	5	6	7
58	The lecturer is <u>not</u> friendly.	1	2	3	4	5	6	7
59	The lecturer puts students on the spot to answer questions.	1	2	3	4	5	6	7
60	The lecturer enjoys teaching.	1	2	3	4	5	6	7
61	I find the content interesting.	1	2	3	4	5	6	7
62	Students keep talking during the lecture time.	1	2	3	4	5	6	7
63	I do <u>not</u> find the content interesting.	1	2	3	4	5	6	7
64	The lecturer enjoys the topic he/she is teaching.	1	2	3	4	5	6	7
65	The physical setting (the seating, tables, etc.) allows for student–teacher interaction.	1	2	3	4	5	6	7
66	The lecturer does <u>not</u> know the answer to a lot of student questions.	1	2	3	4	5	6	7
67	The lecturer usually goes off track.	1	2	3	4	5	6	7
68	Students are pressured to interact with the lecturer.	1	2	3	4	5	6	7
69	I feel shy when asking or answering questions.	1	2	3	4	5	6	7
70	The lecturer is <u>not</u> interested in teaching us.	1	2	3	4	5	6	7
71	The seating arrangement allows for interaction between students and the teacher.	1	2	3	4	5	6	7

	In this class…	**Strongly Disagree**	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**
72	The lecturer knows how to use technology to aid the learning process.	1	2	3	4	5	6	7
73	The lecturer does not focus on the main topic of the lecture.	1	2	3	4	5	6	7
74	I hesitate to ask questions.	1	2	3	4	5	6	7
75	The lecturer asks students questions.	1	2	3	4	5	6	7
76	The lecturer's content knowledge is limited.	1	2	3	4	5	6	7
77	The lecturer tells us what we are expected to do.	1	2	3	4	5	6	7
78	Students are forced to interact with the lecturer.	1	2	3	4	5	6	7
79	Students do not pay attention to what the lecturer is saying.	1	2	3	4	5	6	7
80	The lecturer's tone is always the same/unchanging.	1	2	3	4	5	6	7
81	From where I am sitting, it is easy to interact with the lecturer and other students.	1	2	3	4	5	6	7
82	I find the topics taught interesting.	1	2	3	4	5	6	7
83	The lecturer is not interested in the topic he/she is teaching.	1	2	3	4	5	6	7
84	The lecturer's teaching style is boring.	1	2	3	4	5	6	7
85	Students distract each other.	1	2	3	4	5	6	7
86	The lecturer is boring.	1	2	3	4	5	6	7
87	The lecturer presents the class material in a boring way.	1	2	3	4	5	6	7
88	Students do not contribute to class discussions.	1	2	3	4	5	6	7
89	The lecturer is intimidating.	1	2	3	4	5	6	7
90	The lecturer knows how to incorporate technology with his/her teaching.	1	2	3	4	5	6	7

	How important are each of these goals to you?	**Not Important At All**	**Not Too Important**	**Slightly Important**	**Moderately Important**	**Important**	**Very Important**	**Extremely Important**
1	To get a lot of questions right on the assessments in this class.	1	2	3	4	5	6	7
2	To avoid incorrect answers on the assessments in this course.	1	2	3	4	5	6	7
3	To perform better on the assessments in this course than I have done in the past on these types of assessments.	1	2	3	4	5	6	7
4	To avoid doing worse on the assessments in this course than I normally do on these types of assessments.	1	2	3	4	5	6	7
5	To outperform other students on the assessments in this class.	1	2	3	4	5	6	7
6	To avoid doing worse than other students on the assessments in this class.	1	2	3	4	5	6	7
7	To know the right answers to the questions on the assessments in this course.	1	2	3	4	5	6	7
8	To avoid getting a lot of questions wrong on the assessments in this course.	1	2	3	4	5	6	7
9	To do well on the assessments in this course relative to how well I have done in the past on such assessments.	1	2	3	4	5	6	7
10	To avoid performing poorly on the assessments in this course compared to my typical level of performance.	1	2	3	4	5	6	7
11	To do well compared to others in the class on the assessments.	1	2	3	4	5	6	7
12	To avoid doing poorly in comparison to others on the exams in this class.	1	2	3	4	5	6	7
13	To answer a lot of questions correctly on the assessments in this course.	1	2	3	4	5	6	7
14	To avoid missing a lot of questions on the assessments in this course.	1	2	3	4	5	6	7
15	To do better on the assessments in this course than I typically do in this type of situation.	1	2	3	4	5	6	7
16	To avoid doing worse on the assessments in this class than I have done on prior assessments of this type.	1	2	3	4	5	6	7
17	To do better than my classmates on the assessments in this class.	1	2	3	4	5	6	7
18	To avoid performing poorly relative to my fellow students on the exams in this class.	1	2	3	4	5	6	7

	In this class…	**Strongly Disagree**	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**
1	I expect to do well in this course.	1	2	3	4	5	6	7
2	I am expected to do too much work in this course.	1	2	3	4	5	6	7
3	I think I will do well in this course.	1	2	3	4	5	6	7
4	My lecturers/tutors expect too much of me in this course.	1	2	3	4	5	6	7
5	I expect to do better in this course than others in my class.	1	2	3	4	5	6	7
6	In this course, I am expected to do work that is far beyond what I can do.	1	2	3	4	5	6	7

Thank you for your time and cooperation ☺ !