

Student Engagement in Campus-based and Online Education

University connections

Hamish Coates



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Student Engagement in Campus-based and Online Education

Universities need to better understand their students. *Student Engagement in Campus-based and Online Education* presents a new analysis of the contemporary student experience. It maps out an approach for understanding online and more general forms of learning in campus-based education.

With illustrative case studies to augment analysis of the student experience, this book:

- reviews the incorporation of online learning into higher education
- pinpoints critical gaps in contemporary understanding and practice
- offers sophisticated mechanisms for assessing and evaluating student engagement
- develops rich pictures of key qualities and styles of student engagement
- advances strategies for leveraging online learning to enhance campus-based education.

Student Engagement in Campus-based and Online Education is an enduring contribution to our understanding of higher education. It addresses a cluster of issues surrounding the quality of the student experience. It offers insights and guidance for faculty and administrators, and will be valuable reading for researchers and academic developers keen to improve their understanding of contemporary student engagement.

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Preface

This book began through a series of conversations with university researchers, students and leaders about campus education and online learning. The conversations took place as part of formal evaluations, while teaching and mentoring undergraduate students, and through various research projects. They exposed areas of uncertainty and interest, and issues in need of investigation.

Key conversations began in 1999 while developing an instrument to measure the quality of teaching and the student experience in higher education. For me, this project highlighted patterns in the complexity of university education, discontinuities between student activities and institutional policies and operations, and the need for more cogent measures of learning and engagement.

The conversations continued through several national and institutional studies focused on measuring and evaluating pedagogy, online learning technologies and national performance indicator systems. Each of these studies fuelled my interest in understanding students' interactions with their universities, and in finding ways to express this in the conversations that run higher education.

The project that seeded this book began in mid-2002 when I began my doctoral studies at the Centre for the Study of Higher Education at the University of Melbourne. The thesis of this book formed through a year of reading, listening, observing and talking about the student experience, online learning, and the principles and practices of assessment and evaluation.

Important aspects of the perspective adopted in this book were formed through my work in a national advisory group charged with identifying a methodology for allocating a fund to reward excellence in teaching and learning in Australian higher education. Playing a role in this group gave me further and timely insight into the interests, pragmatics and politics of higher education leaders and national policy-makers. It provided a useful context for reflecting further on student learning and development, and interpreting the projection of educational ideas into policy.

The conversations and perspectives were further shaped during a fellowship to the Centre for the Study of Higher and Postsecondary Education at the University of Michigan. This visit provided an opportunity to develop and start conversations with leading USA researchers and practitioners. Visiting leading universities

across the USA gave me direct insight into emerging ideas and practices, and an opportunity to road-test the ideas set forward here.

I completed the book while conducting a year-long project to enhance Australia's graduate destination and course experience surveys. Developing key measures of teaching quality and graduate outcomes further underlined the need for developing telling and routine insight into student-level education processes. The extensive and iterative consultation involved in the project also further affirmed the importance of using survey methods to understand how students have conversations with their universities and their learning.

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The doctoral research which provided the foundations for this book was supervised by Professor Richard James at the Centre for the Study of Higher Education, University of Melbourne. Richard provided advice which helped me to engage with and finish the doctoral project. His advice played a formative role in developing my thinking about education, the ideas in this book, and my confidence in taking measured and creative risks with knowledge.

I also owe much to Professor Patrick Griffin of the University of Melbourne, who taught me a great deal about researching education, and about shaping ideas and information in ways relevant to policy and practice.

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Many people have offered views and feedback on the ideas presented in this book. Colleagues and students at Trinity College at the University of Melbourne provided me with opportunities to explore the contemporary university student experience. Many discipline and methodology experts have offered generous and formative feedback throughout the project. The empirical work depended on the generous input from around 1,500 staff and students at four institutions who supported and participated in the interviews and surveys. Feedback from several anonymous referees has helped strengthen many of the key ideas in this book.

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Part I

Trends and dynamics on campus

Engaging learning online and on-campus

A perspective for enhancing higher education

It is almost possible for campus-based students to study online as much as in-person. The penetration of sophisticated online learning technologies into most universities in the last decade allows significant online as well as general engagement in campus-based study. Despite much prediction, however, these technologies have not prompted an exodus from or transformation of the campus. But they do appear to be weaving important online qualities into the more traditional aspects of campus-based university education.

We need to understand how campus-based students engage with the online and general aspects of their university education. This book develops such understanding. It analyses the nature and significance of contemporary student engagement, focusing on the growing influence of online learning management systems in campus education. It presents a suite of theoretically based and empirically validated insights into the engagement of campus-based students who are using online learning systems in their study, and examines how these systems can be applied to improve the quality of university education. Through this, the book works to augment analysis of student engagement, and of the student experience of campus-based online learning. While increasingly significant in higher education, such issues have received surprisingly little attention in either research, policy or practice.

Building on research foundations, the book analyses the emerging dynamics of contemporary student engagement. Contemporary insights about students' engagement in their study represent the culmination of research into the distinguishing characteristics of high-quality student learning and university education. As the engagement idea gains popularity, momentum and traction, there is a need for analysis of its nature and significance, and of its implications for research, policy and practice.

Through its analysis of student engagement, the book addresses the growing need for sustained investigation of how online learning technologies influence campus-based student engagement. Contemporary online learning technologies have the capacity to drive significant and ongoing change in campus-based education. Students are central stakeholders in the educational process, and there

is an imperative to enhance understanding of their role in this core area of higher education.

Working from theoretical and empirical analysis, the book offers insight and guidance for faculty and administrators who want sophisticated and intuitive advice on how to maximise educational returns from large institutional investments in online learning technologies. It advances ideas for enhancing the engagement of students in their learning, and for leveraging online learning systems to improve campus-based students' engagement in learning.

The enduring concern of this book is the way in which campus-based students engage with their university study. While online learning and associated technologies are discussed at length, the book focuses explicitly on 'student engagement'. While developing from general research into student learning and development, student engagement has grown in recent years to be a phenomenon very worthy of study in its own right. In broad terms, student engagement is concerned with the nature of students' involvement with activities and conditions likely to generate learning. Reflecting the work of Astin (1979, 1985, 1993b), Pace (1979, 1995) and Chickering and Gamson (1987), Hu and Kuh (2001a: 3) define engagement as 'the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes'. The phenomenon has achieved recognition in the last decade as a cogent means of guiding higher education research, and of advancing such research into policy and practice.

Student engagement research works from the perspective that education is fundamentally about students creating their own knowledge. While students are seen to be responsible for constructing their knowledge, learning is also seen to depend on institutions and staff generating conditions that stimulate and encourage student involvement (Davis and Murrell, 1993). Engagement is a broad phenomenon which encompasses academic as well as certain non-academic and social aspects of the student experience. At a certain level of analysis, engagement is taken to provide a singularly sufficient means of determining if students are engaging with their study in ways likely to promote high-quality learning.

Contemporary online learning technologies are having a significant influence on campus-based university education. Within the last decade, online technologies have grown from a volatile childhood, to a point at which they are starting to make a serious impression on patterns of learning and teaching in higher education. In many areas, the pervasive adoption and deployment of online learning technologies is challenging many practices and longstanding assumptions of campus-based undergraduate education.

Learning management systems (LMS) are at the forefront of this technological movement. These enterprise-wide systems, such as Blackboard, TopClass/FirstClass and WebCT, have been adopted rapidly and deployed by many universities around the world (OBHE, 2004a; Green, 2005). They integrate a wide range of pedagogical and course administration tools, can be expanded to run virtual universities, and are being used to add a virtual dimension to even the most

traditional campus-based educations. Indeed, it appears to be the ready-made campus environment in which they are having most influence.

Learning management systems, it appears, have been designed to have a diverse influence on the ways in which campus-based students engage with their university study. They have the capacity to change how students collaborate with others, communicate with staff and access the materials which they use to learn. It is commonly assumed that LMS enrich student learning by opening access to a greater range of interactive resources, making course contents more cognitively accessible, providing automated and adaptive forms of assessment, and developing students' technology literacy. Asynchronous online tools allow students to interact with learning materials, their peers and the entire university in ways that are not bound by time or place.

So far, too little attention has been given to this important and emerging aspect of higher education. There appears to have been a tacit reliance on serendipity to produce patterns of use constructive for learning. While online LMS have the potential to affect the core university business of teaching and learning, educational research into online learning is in its infancy. There has been an explosion of studies into online learning in the last decade. In spite of widespread levels of adoption, and although the systems are essentially devices for teaching, most research has focussed on the technical, financial and administrative aspects of online learning systems. While a few meta-analyses and broader conceptualisations of online learning have emerged in recent years, there remains a great need for more educationally focused online learning research to balance the increasing penetration of these systems into higher education.

If online learning systems are changing teaching and campus environments, then it seems reasonable to assume that they are influencing the way campus-based students engage with their study. Despite this possibility, much remains unknown about this aspect of university education. So far, it has not been investigated in suitable depth in either student engagement or online learning research.

While student engagement is growing in significance for higher education, existing research suffers from a number of limitations when considered from the perspective set forward in this book. There are very few published works on contemporary student engagement. Further, most treatments of student engagement have been deliberately utilitarian, and have not explored the conceptual characteristics which underpin the concept. Importantly, student engagement research, in large part, is based on assumptions about campus learning environments which ignore the implications of online learning. Published student engagement research has not investigated online learning as part of the fabric of the contemporary student experience. Despite its penetration into campus education, engagement research has treated online learning technologies as a discrete part of the student experience.

Although research into online learning has flourished in the last few years, published contributions have a number of constraints in terms of advancing understanding of student engagement. Online learning research has focused on

teaching, management, access and specific aspects of learning. Very few studies have focused explicitly on students, or on student engagement. When considered, students have often been treated as ‘users’ rather than as ‘learners’. Many contributions focus exclusively on online learning, and very few works have examined online learning in terms of the broader student experience. There are very few books about campus-based online learning. Although campus-based universities have been the major market for online systems, most existing works focus on distance, lifelong or international student populations. Documented studies have often been based on small-scale and localised evaluations of particular technologies, and appear to be conducted by and for ‘early adopters’. Many such works appear more interested in the technologies than in education. Many books about online learning are highly descriptive and prescriptive, and very few offer a rigorous and pragmatic approach to understanding the emerging educational dynamics. Many studies of online learning lack theoretical contextualisation and empirical validation. This limits their generalisability and explanatory power, and has made many overly dependent on changing contexts and technologies. While a few meta-analyses and broader conceptualisations of online learning have emerged in recent years, there remains a great need for more research to balance the increasing penetration of these systems into higher education.

Thus, despite an explosion of studies in the last decade into student engagement and online learning, there may well be much we do not know about how students engage online with activities and conditions that are likely to promote learning and development. Given the penetration of online learning systems into higher education, however, this is an area of university education which needs to be explored.

The book advances knowledge of this increasingly significant area of higher education. It offers a theoretically based, empirically validated and practical perspective on campus-based and online engagement. The analysis is generalisable, and capable of being operationalised to enhance teaching, research and management in different campus contexts. In addition to responding to current issues and concerns, the book works to enhance interest in understanding how online learning technologies affect student learning and broader aspects of the student experience. It also offers an enduring resource on student engagement and online learning.

The book is distinguished in a number of respects. It presents a rich analysis of campus-based student engagement. It exposes key qualities of campus-based online learning. It develops the much ignored ‘student perspective’ of online learning. The book offers a sustained conceptual and pragmatic analysis of student engagement, and focuses on the online learning management systems common at most universities. It analyses online learning in campus institutions, environments which remain the major market for online education. It presents and explores a practical and generalisable model that can be operationalised to improve campus-based and online education. It provides a sound educational analysis of how online learning can enhance campus-based education. It presents a research-driven approach for monitoring the quality of campus-based online education. In these ways, the book adds to current knowledge in the area of

student engagement and online learning, and provides mechanisms for guiding research into practice.

This book is written for people responsible for leading and managing student learning on-campus. This includes a wide range of people and roles. In places, it is useful to read the book with the perspective of a teacher. In places, the student or learner perspective is more appropriate. At other points, the lens of a department or school manager gives sharper focus to the idea being expounded. The quality manager, institutional planner or statistician are important roles to keep in mind. The book is written to speak to people with responsibility for leading colleges and universities.

Engagement dynamics: tracing patterns in complex ideas

Universities and people are complex. University does not work the same way for all people, and all people do not work the same way at university. The infusion of sophisticated online learning technologies into campus-based education has enhanced the environments in which students learn and stimulated new ways of engaging in university study. This book captures patterns in the complex online and general interactions between learners and universities. It suggests that we should think about student engagement in terms of several key qualities which, in turn, constitute intense, collaborative, passive and independent styles of engagement. These ideas can be traced in early-year students' reflections on their study.

Sophia is in her second year of an information technology course at an outer metropolitan university. In a conversation in the cafeteria, she reflects on how she uses online learning to shape and enrich her campus-based study:

In one of my subjects, one of the tutors got on every day and answered students' questions, and it was really good because I could look at it before exams. I probably wouldn't have asked the question otherwise, because I usually leave things too late. So it was good, because it was there when I needed it.

Online learning adds a social dimension to Sophia's campus-based study. It provides an opportunity for structured pedagogical interaction with teaching staff. It offers a resource for her to tap into conversations about knowledge and learning in ways which extend beyond the classroom.

A comment by Ronald, a second-year business student at the same institution, emphasises a different blend of online and campus-based study:

I think the social interaction in class is great and it helps you to think and it helps you to write. But I think having that time away when you

can just go to the computer and the information is there, that's really fantastic, and you can access it at three in the morning. And obviously that's not possible with the teacher, when you have to just sit there. But I think that I need to be motivated and inspired and get that from a lecturer.

The social situation of campus-based study is important for Ronald. The contact with staff and fellow students stimulates and guides his learning. It gives him support, contexts and challenges that help him to construct knowledge. Unlike Sophia, however, Ronald reports a more independent style of learning online. Ronald is not as stimulated by the social qualities of online learning. Rather, online systems give him ready access to the resources and ideas he needs to learn.

After three semesters studying humanities at a research-intensive university, online learning plays a formative role in Keir's university experience. He talks about using university online learning systems in a discussion room in his university library, saying that:

I always use it to look at my grades, and see how I'm going. Also, some of my subjects have things that I have to do every week, and they also have links to useful information and things like that. The teachers put on links and books that are helpful for your subjects, which makes it good for doing research as well.

Keir has blended online learning into the assessment cycles which propel his learning. His teachers use the technologies to manage the educational supports and challenges they give students. They appear to use online environments to engage students in study beyond class, and to position the curriculum within broader knowledge contexts and research debates.

Even just into her second year, Diana reports a very passive style of engagement with her study:

I prefer more face-to-face...even now with face-to-face we're not really motivated to our study, imagine like with no face-to-face, you wouldn't even go to the site anymore. If it was online, like, I don't think I would ever do it, you would just never have the time. At least with a lecture, although it's not very interactive, at least you're sitting there listening. I wouldn't put the time aside if it was just online.

It seems unlikely, given such a comment, that Diana would use online materials to make lectures more meaningful, to manage her university study, or to improve her understanding of a topic. It is Diana's apparently passive style of engagement rather than the online modality, however,

which appears to be at issue. Her comment suggests that, even in her more general campus-based experiences, she would rarely strive to creatively explore ideas, to seek out resources to help her understand topics, to set high performance standards for herself, or to push herself to understand things she found puzzling. Even though not embraced intensely, it is the campus-based experience which appears to sustain Diana in her studies.

Together, these reflections hint at the dynamics which underpin students' online and general engagement with their study. Student engagement is a complex and motile phenomenon. People engage with university study in different ways at different times, in response to different environmental and individual situations. While it may be difficult or impossible in large institutions to develop direct knowledge of individual students' engagement with their study, it is critically important not to neglect this significant aspect of higher education. The chapters which follow map out the value of exploring the dynamics of engagement, and offer a means for harnessing insights into engagement, and for using these insights to enhance university education.

Focusing the analysis

Understanding how to maximise educational returns from expensive online learning investments is becoming increasingly feasible, and relevant. After a decade of evolution and development, online learning systems have largely been incorporated into routine education operations and behaviours. As the technologies have matured, focus has shifted beyond adoption and deployment considerations towards those of usability, service and enhancement. As well as asking how education can make use of online technology, it has become feasible, and perhaps even more appropriate, to ask how the technology may best be used in the service of teaching and learning.

In an important respect, this book has both a substantive and methodological intent. Substantively, it explores the substance and structure of student engagement. It pursues this work, however, in a way that is likely to render it useful to future higher education research and practice. The intention is to advance understanding in a way that can be applied directly to stimulate and direct theoretical and applied reflection on how contemporary students learn at university. It is for this reason, for instance, that Chapters 5 and 6 explore the calibration and application of a survey instrument that has the capacity to operationalise the proposed engagement model in different institutional settings.

It is important to note, however, that the book offers more than a 'how to' guide for 'using online learning in education'. While the book discusses ideas of direct relevance to those who teach, manage and learn at universities, it offers more than prescriptive suggestions for improving practice. While many such suggestions are offered throughout the book, these are linked with and in many

cases derived from research-driven conversations about underpinning educational phenomena. This approach is intended to develop richer and more nuanced and generalisable insights into the issues at hand.

It is also important to note that the book offers a deliberately internationalised perspective on student engagement. As with the notion of internationalisation itself, this point has several dimensions. While much work was conducted in Australia, the book draws heavily on and speaks directly to conversations taking place in the USA, UK, and other parts of the world. While student engagement is defined in important ways by the environments and cultures in which it occurs, this book seeks to move beyond such localised considerations and focus instead on more generic educational phenomena. The book also provides a foundation for extending discussions about student engagement in campus-based online learning beyond the USA. It advances an understanding formed in the Australian context and, through this, sets out a cross-national perspective for how the phenomena might take shape in other systems.

This book focuses not only on students' involvement in online learning, but also on the more general activities and conditions which constitute campus-based university education. While an important premise pulsing through this book is that there is a progressively blurring distinction between technologically-mediated and face-to-face educational experiences, this distinction remains an important, convenient and necessary one to make. For the purpose of discussion, the terms 'online' and 'general' are used to refer to these modalities of university education. While the term 'online learning' is frequently linked with distance learning, it is used in this book to refer to people's use of electronic computing and often internet-based technology. In this book 'online learning' is not generally used in ways that imply a distance or external mode of study.

Online and general forms of learning are distinguished throughout the book, however the book very much works to integrate research in these areas. While interwoven conceptually and in practice, these topics have to date been treated largely as part of distinct research agendas. This situation has meant that so far there has been little if any analysis of how students engage in campus-based and online learning. This book works to weave together our understanding of these modes of the student experience, to weave online learning into discussions of student engagement, and to weave student experience research into the development of online educational technology.

A number of further steps have been taken to focus the analysis. The book works from what is identified as the most currently advanced conceptualisations of student engagement and online learning. This focuses analysis on particular aspects of the student experience. The book investigates student engagement rather than student learning or development. While these phenomena are closely linked, the book has not sought to develop a theory of academic learning or student development. Relatedly, the book focuses squarely on student engagement, and only incidentally explores the endogenous psychological or exogenous environmental concomitants of the phenomenon. While student engagement is an issue

which draws together a range of stakeholders, this book focuses on engagement from the perspective of the student rather than from that of teachers, support staff, learning environments or institutional contexts. These issues are considered, although students are the primary focus of analysis. The book undertakes a theoretical and empirical analysis of student engagement. It seeks explicitly to investigate the qualities and structures in this phenomenon, rather than to explain differences in engagement between different demographic or contextual groups.

Online learning systems are treated as only an indirect subject of this analysis. While the relevant systems are carefully described and exemplified, the analysis is limited in the extent to which it explores specific technical aspects of the systems. Attention is focused on students' use, knowledge and perceptions of the systems, rather than on the systems themselves. Further, the analysis focuses specifically on student as opposed to staff use of online learning systems. Also important is the book's specific focus on university online learning systems. Thus it does not consider explicitly a range of technologies such as mobile phones, personal email or portable digital assistants which seem to be playing an increasingly important role in contemporary student life.

As more and increasingly diverse students enter higher education, and as university itself continues ongoing change, it is critically important that we understand how students engage with their university study. By investigating the qualities and patterns of campus-based students' general and online engagement, this book advances understanding of this increasingly significant issue. It reports and analyses how students at a particular point in time are interacting with a new form of technology, and how they are using such technology to construct their knowledge. However the value of the book is more than this. It sheds light on how increasingly ingrained technologies are contributing to widespread changes in the way campus-based students interact with their universities.

In particular, it argues that we need to better understand the influence of LMS on campus-based student engagement, so that these powerful technologies can be used to improve university education. Online LMS have been adopted by many campus-based institutions in the last decade, becoming almost ubiquitous in many parts of the world. These systems have profound yet uncertain implications for university education. They have the capacity to influence the management of academic programmes, teaching practices and the way students engage with key aspects of their university experience. This book investigates how the systems may influence students' engagement with their study, and how they might be used to improve campus-based education.

The structure of the analysis

The chapters which follow work together to advance a perspective on understanding, managing and enhancing the online and more general forms of students' engagement with their university study. Each is also designed to make an independent contribution to this perspective, however, and so they can be read

sensibly in isolation or out of sequence. The discussion is organised loosely into three parts. The next three chapters introduce key issues and contexts, and focus on exploring what existing research and practice tell us about students' engagement in the online and more general aspects of campus-based university education. Chapters 5, 6 and 7 are more technical in nature, and discuss the development and properties of a student engagement instrument and typology. The perspectives developed in these earlier chapters are synthesised in Chapters 8 to 11, which focus on suggesting ways in which institutions can work to enhance students' engagement and the quality of higher education.

Brief case studies and quotes from interviews with students are presented throughout the book. These pieces of text weave activity into the ideas, provide snapshots of practice, reinforce and exemplify key points, and project possible futures for the study of engagement.

The next chapter focuses on the idea of 'student engagement', and its significance. Chapter 2 locates student engagement within current conversations about higher education, analyses the nature and development of the concept, and examines its intrinsic and instrumental value. In doing this, the chapter establishes the importance of placing students at the centre of conversations about higher education. Without understanding such engagement, it is difficult to understand the whole student experience, place student learning at the heart of discussions of educational effectiveness, or understand how students are actually going about using valuable resources. By investigating these aspects of student engagement, the book develops knowledge that can be used to understand, manage and improve how students learn.

In Chapter 3, the book presents an analysis of the university environment in which students learn, concentrating on the formative adoption of online LMS by most campus-based institutions. It is argued that online LMS are core elements of online education. The chapter documents the current nature and prevalence of the systems, and discusses reasons for their enduring significance to university education. These systems, it is argued, are and will continue to be important agents of change in the student experience of university. This trend underlies the significance of exploring their formative role in shaping the nature and dynamics of student engagement.

Chapter 4 offers a snapshot of existing research into the online and more general forms of student engagement. This snapshot documents prior work into engagement, and serves as a prelude to the ideas explored in later chapters. A picture is explored of what appears to be the most advanced existing understanding of student engagement, an understanding developed from decades of USA research into the university student experience. A critical review of existing research into online learning is presented to expose existing understanding of this significant aspect of contemporary student life.

Working from this somewhat conceptual exploration, the book turns in Chapter 5 to discuss the development of a series of empirically derived and theoretically based qualities of campus-based and online engagement. These qualities are

advanced as phenomena which provide foundations for informing conversations about educationally important aspects of the student experience. Chapter 5 discusses the development and empirical validation of these qualities, their operationalisation via the Student Engagement Questionnaire (SEQ), and their key ideas. Defining these qualities maps out the constituent parts of the proposed understanding of student engagement.

To play a role in institutional policy and practice, student engagement information needs to summarise core aspects of the student educational experience in ways relevant to institutional staff and students. Such information needs to be captured in meaningful aggregations, and reported in ways which makes clear its relevance and limitations. An effective way of doing this is to collect together discrete phenomena under broad qualities or dimensions of the student experience. Student engagement information can then be reported in terms of the distribution of responses to these variables, or in terms of different types of characteristic patterns of response.

With this intention, the book turns in Chapter 6 to present an empirically validated typology which captures different styles of student engagement. The typology provides a model for investigating and evaluating defined qualities and styles of campus-based students' engagement. It is based on identification of key dimensions which structure relations between the defined qualities of engagement.

Student typologies have a long and influential history in education. While not developed directly from earlier student typologies, the model adds to the tradition of producing generalisable and operationalisable mechanisms for classifying the different ways in which students interact with universities. The typologies produced by Clark and Trow (1966), Astin (1993a) and Kuh *et al.* (2000) are probably the most significant antecedents to the proposed model.

Such models can serve a range of functions. Research-driven typologies can be used to steer colloquial and professional discourse about university students. While seemingly descriptive, this is an important function given the ubiquity of such conversations in higher education. Typologies can help practitioners and researchers achieve clarity from interpretations of otherwise highly complex sociopsychological phenomena. They can help identify and mark out relationships between salient phenomena, and provide structures for the analysis and management of diversity and change. Theoretically based, empirically validated and operationalisable typologies are powerful interpretive devices which provide a foundation for normative and practical forms of description, explanation and prediction.

Chapter 7 weaves the empirical developments into a series of explorations of different approaches for generating, interpreting and applying insights into online and general engagement. After summarising key properties of the SEQ, the chapter exemplifies the use of the instrument in capturing insights into engagement at varying levels. The nature and value of such assessment is considered through analysis of individual, aggregate and more generalised reports of engagement. The value of such diagnoses is exemplified in an analysis of the nature and

dynamics of contemporary campus-based student engagement. Through these activities, the chapter moves from assessment, through evaluation, to interpretation. The broad picture of engagement considered at the end of the chapter provides a foundation for the somewhat normative discussion in the two chapters that follow.

Chapters 8 and 9 bring together ideas from the analytical and theoretical work into a research-driven and practically relevant theory of student engagement. They do this by offering a series of normative pictures of the defined qualities of engagement. Each of these pictures is intended to provide a foundation for advancing conversations about key aspects of student learning and development. Discussion emerges largely from a synthesis of higher education theory and research, but is referenced to current contexts, issues and trends.

The book covers a deliberately wide scope in its analysis of campus-based and online engagement. Chapter 10 distils many of the insights from earlier chapters into suggestions for how institutions, faculty and administrators might engage students to enhance university education. It outlines approaches for leveraging online LMS to enhance campus-based learning, discusses ways for institutions to involve students in the feedback cycles which play a large role in assuring the quality of contemporary university education, and sets out twenty-three opportunities for engaging students in learning.

Chapter 11 closes the analysis. It summarises key points, identifies what needs to be done to further propel work on engagement, and sketches possible ideas and opportunities for development. While contemporary engagement research builds on many findings from the last few decades of higher education research, the phenomenon itself has only just begun to be explored directly.

Student engagement

The contemporary idea of student engagement

Student engagement is an idea that has grown in relevance and sophistication in higher education research and practice in the last few years. The idea represents a culmination of around thirty years of research into student learning, being developed as an efficient means of organising knowledge about key aspects of the higher education student experience. While it retains this function today, increasing use and theoretical elaboration has amplified its salience in conversations about student learning and development. For reasons to be discussed, engagement has become a highly useful mechanism for interpreting the relationship between students and institutions and, more generally, the qualities and dynamics of university education.

In the USA, student engagement is an idea that is being discussed with increasing vigour by academics, administrators and policymakers. An important reflection of this enthusiasm is the USA National Survey of Student Engagement (NSSE). Beginning in only 1999, in 2004 the survey was administered at over 470 USA institutions (NSSE, 2005), and a Canadian version of the survey has been developed. The concept has spread beyond North America, however, with leading edge conversations beginning in other parts of the world (McInnis, 2002). It is likely that the importance of student engagement will continue to increase in the contemporary higher education environment.

Australian higher education presents an interesting case in point. While Australian higher education has been innovative in many respects, the idea of student engagement has yet to be incorporated into national and institutional policy or practice. Some of the most important progressions have been the study of the first year student experience (McInnis *et al.*, 2000) and the development of new scales for the nationally administered Course Experience Questionnaire (McInnis *et al.*, 2001). Despite such developments, considerations pertaining to the student experience have yet to receive the same level of attention and exploration in the Australian system as those concerned with other core areas of university education, such as student equity and finance (Andrews, 1999; James *et al.*, 2003). With increasing emphasis on the quality and efficiency of university

education, it seems likely that student engagement will become more important to consider. The way in which the principles and practices of student engagement have been embraced in the USA hints at what may be possible in systems beyond the USA.

Student engagement is a broad phenomenon which encompasses students' in-class and out-of-class experiences. While the breadth of the phenomenon might, at first glance, make it seem impractical, overly diffuse or unmanageable, it does capture a specific meaning and perspective. At a certain level of analysis, engagement represents a singularly sufficient means of summarising and characterising students' interactions with their study and institutions. Indeed, it has been suggested that engagement is a 'metaconstruct' (Fredricks *et al.*, 2004), that can be used to draw together multifaceted aspects of the student experience. The concept provides a means of gathering together and integrating a diverse range of empirical and theoretical ideas about student development and learning, and work continues on ways to make the concept more internally consistent and increasingly relevant to research, policy and practice. Such generality can come at the expense of specificity, however, and discussions of engagement often involve the compression and conflation of more detailed concepts and distinctions.

The term 'engagement' has many semantic connotations and requires qualification. Depending on context, it can describe processes with different temporal, existential, directional and moral characteristics. Engagement can refer to something that happens in the past, present or future, and to something of either limited or ongoing duration. It can refer to objects or subjects, be they groups or individuals, although logically it requires at least two entities. Depending on the entities involved, it can involve unidirectional, bidirectional or multidirectional connections. Engagement is not an essentially evaluative term, and it can be morally positive, neutral or negative. Barnett (2003: 253) observes that:

Engagement is a coming together, a merging, a fusing. Engagement points to mutual listening, to reciprocity, and dialogue but conducted in a willingness to change. It is the antithesis of separateness, of distance, of incomprehension. Engagement implies not just a coming together but an interaction.

While further conceptual clarification will be undertaken below, it is useful at this point to at least acknowledge the complexities and possibilities latent within the term.

While the concept of student engagement is by no means new to education, what is meant by the term has undergone change over time. Earlier and more behavioural work on student engagement placed much emphasis on 'time-on-task' or 'academic learning time' (Fisher *et al.*, 1980; Brophy, 1983; McIntyre *et al.*, 1983; Berliner, 1984; Astin, 1993b; Admiraal *et al.*, 1999). Astin (1993b: 375), for instance, found that 'The hours per week spent studying or doing homework produces the largest and most numerous partial correlations with student

outcomes. . . . Basically, hours spent studying is positively related to nearly all academic outcomes.’ In recent years, however, engagement has been interpreted in more complex and multifaceted ways. It has been linked with issues concerning belongingness, motivation, community, as well as to the finance and pragmatics of student learning. Definitions of engagement have changed accordingly. Hu and Kuh (2001a: 3) offer a contemporary definition of engagement as ‘the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes’. The current analysis works from this definition, understanding engagement as the involvement of individuals with phenomena that are relevant to and instrumental for their learning.

Student engagement is concerned with the point of intersection between individuals and things that are critical for their learning. Fundamentally, it is based on the constructivist assumption that learning is influenced by how an individual participates in educationally purposeful activities. Learning is seen as ‘a joint proposition’ (Davis and Murrell, 1993: 5), however, in which institutions and staff are responsible for providing students with the conditions and opportunities to become involved. Individual learners tend to be the agents in discussions of engagement, as they are in this book, and primary focus is directed towards understanding their activities and situations. Analysing individuals in this way draws on considerations about the theoretical and practical aspects of learning, the institutional and other environments in which university learning occurs, the materials being learned, and teachers and other pedagogically relevant people. Although discussions about engagement can have quite explicit and useful implications for institutions, the basic concern is about what individual students are doing, and about how they are going about their learning.

Antecedents to conversations about engagement

A challenge to conventional conceptions of quality

The concept of student engagement was developed, in part, as a reaction to and intended improvement on other methods of representing the quality and efficiency of education. While much of the research underpinning this reaction was developed over a decade ago in the USA, it retains its energy and relevance for many current discussions of contemporary higher education. To clarify this reaction, it is helpful to address the perceived limitations of these alternative approaches. This involves considering the limitations of using institution level resources, reputations and teaching processes, and student input and output factors to evaluate the quality of education.

Institutional resources are frequently read as important informal proxy measures of the quality of university education. Despite their frequent popular emphasis, however, institutional resources are only tenuously related to the quality of university education. Two instances illustrate the point. Although

institutional capital and financial resources are commonly used measures of higher education quality, these have little to do with the quality or efficacy of pedagogy or student learning. As Kuh (2003: 24) notes in the USA context, 'students can be surrounded by impressive resources and not routinely encounter classes or take part in activities that engage them in authentic learning'. Human resources, and in particular academic staff qualifications, may be slightly more related to student learning, although they are frequently more related to research and consulting experience. In many countries, it appears to be surprisingly rare for university teachers to have teaching qualifications, or to be promoted on the basis of teaching performance. Beyond certain minimum thresholds, it is difficult to see how institutional resources are linked with learning. Although they offer a prominent and apparently parsimonious means of addressing questions of education quality, their lack of essential connection with student learning means that they may oversimplify or perhaps even misguide analysis.

Institutional reputation is another extremely common although, again, unsatisfactory means of evaluating the quality of university education. As Astin (1985) suggests, evaluations of institutions made according to reputation are frequently based on beliefs and stereotypes rather than evidence, and can be nuanced by marketing and publicity. They can be insensitive and, as with ivy growing on sandstone buildings, may not be responsive to changing educational dynamics or between different areas within institutions. Importantly, as with resources, they are frequently based on criteria such as history, tradition, research performance, and institutional location or partnerships which are only indirectly related to student learning. Despite the popularity of discussions about reputation, they often do not say much about individual students and their learning.

The study of engagement was in large part brought about through the belief that institutional resources and reputations provided inadequate and inappropriate representations of educational quality. In particular, USA researchers interested in student learning and development were frustrated by annual US News and World Report (US News, 2004) rankings of institutions which, although they play a role in students' selection decisions and discussions of collegiate quality, were considered to say little about educational characteristics which have been linked with learning (Pascarella and Terenzini, 1991, 2005; Kuh, 2001b; Pascarella, 2001; Howard, 2002). According to the NSSE (2001: 8), for instance, rankings based on resources and reputations

reduce institutional performance down to a single number that can't do justice to the multiple dimensions that make up excellence in undergraduate education... institutional resources and reputation are the wrong things to measure if estimating the quality of the student experience is the objective.

Pascarella (2001: 20) sums up their limitations, writing that 'within-college experiences tend to count substantially more than between-college characteristics'. While rankings or resources and reputations are entrenched and endorsed by

the most powerful and prominent institutions, the study of engagement was developed to measure, compile and disseminate more sensitive and cogent indicators of educational quality.

A great deal of energy in determinations of the quality of university education is focussed on academic staff and their teaching. This most likely stems from the instructivist assumption that university teaching staff hold much responsibility for student learning. This, in turn, is based on the assumption that high-quality teaching will lead to high-quality learning. As well as being a primary source of standards and expectations, teachers typically select material given to students, determine how students work, and set formative and summative assessments. Along with the accountability of teaching staff to their institutions, such assumptions imply a line of control that is seen to support this approach to quality assurance. By this view, with institutions assuring the quality of pedagogy and teachers assuring the quality of student learning, educational quality is assured.

It seems reasonable to assume that the administration and practice of teaching are more strongly related to educational quality than institutional resources and reputations. Contemporary constructivist theories suggest, however, that learning rather than teaching is what really matters in education. This perspective suggests that the quality of teaching is dependent upon rather than independent of the quality of learning that it engenders. That is, good teaching is taken to be that which leads to good learning. From this perspective, the most significant index of the quality of teaching is whether it has, by some means, generated high-quality learning. Given this, a measure which focuses on teaching alone would provide a significant although insufficient index of the quality of education.

Despite the contingent link between teaching and what students actually gain from courses, measures of teaching quality are a pervasive and growing means of evaluating educational quality. In the last few decades, many institutions around the world have developed internal surveys that can be used to monitor the quality of teaching at the individual subject level. In the UK and Australia, institutions collect feedback from students on their overall course with the Course Experience Questionnaire (Ramsden, 1991). While such activities produce information on teaching performance, by the position outlined above, they say little if anything about the quality of student learning. The appropriateness of the measures is based on the unstated assumption that the provision of 'good teaching', as defined by the instruments and perceived by students, is all that matters in terms of educational quality. More particularly, the assumption implies that neither institutions nor quality management systems are responsible for, or responsive to, the quality of student learning.

Summary measures of student input factors, such as prior academic performance, are frequently used to produce measures of educational quality. At the individual level, prior performance is taken to be a leading indicator of future progress, while institutions typically use prior performance as an index of selectivity and prestige. However, prior academic performance is an insufficient and even inappropriate means of evaluating the quality of education. Indices of

prior academic performance are frequently based on school-level study which tends to involve a different kind of learning to that encountered in higher education. These indices may, therefore, be low in predictive validity. Further, such measures are frequently related to demographic and contextual factors, and may be biased if not read in relation to these. The use of prior indices of learning are also muddled methodologically by differences in school and university assessment practices, and by procedures used to recruit and select individuals into university study. Most importantly, however, is that measures of prior performance say nothing about the contribution of the current institution to the student's academic performance. Without subsequent adjustment and comparison, there is no way to measure how much a student's knowledge or understanding has been value-added by an institution.

Directly measuring students' knowledge appears to provide the most direct and transparent indication of what students have learned, and hence of the quality and productivity of their education. Across the world, there is great contemporary interest in developing and enhancing the measurement of learning outcomes. Regrettably, outcomes can be extremely difficult to work with due to complexities with their specification, measurement and interpretation (Hanushek, 1979; Linke, 1991; Ramsden, 1991; Ewell and Jones, 1993). There seem to be at least four broad reasons why outcome measures of university education are difficult to develop.

First, it can be difficult to determine which outcomes are appropriate to consider. The selection of outcomes is a complex activity which can be highly value-laden. As such, it can be difficult to get consensus about which domains are relevant for a given situation. Even with specification of areas of interest, outcomes can be problematic to define both conceptually and operationally. Although school-level education has had some success in this area, the much larger and more diverse range of learning outputs in higher education present a different challenge altogether. Given the dynamic nature of what is taught at universities, particularly in later years, it may in fact be a hopeless venture to try to specify sensitive yet generalisable measures of learning outcomes.

Second, important educational outcomes can be extremely difficult to measure. Particularly important educational outcomes may be resistant to measurement because of their diffuse or uncertain nature, or because they may take years to manifest. Examples may include the capacity to integrate and apply knowledge, manage workflows, and demonstrate specific values and ethics. Other outcomes may be possible to measure, but not in ways that are generalisable across divergent fields of study while at the same time being sensitive and relevant to local contexts. Examples may include content-specific quantitative, communicative or interpersonal skills. Indeed, measurement considerations may be so critical in the analysis of outcomes that they are decisive in the selection and definition of indicators. If outcomes are to be used to evaluate educational quality, it seems less than ideal that the means of measurement define the ends to be considered.

Third, student assessment tasks and procedures often produce data with a limited capacity to be used beyond the localised purposes for which it was

initially collected. Many tasks are developed by individual teaching staff for specific use in subjects whose content may change from year to year. Staff often develop such resources in relatively short periods of time with limited resources or knowledge of assessment methodology. As a result, student knowledge and skill are often measured using uncalibrated tasks with unknown reliabilities and validities, scored normatively by different raters using unstandardised rubrics then, often with little moderation, adjusted to fit percentile distributions which are often specified *a priori* by departments, faculties or institutions. In the absence of more sophisticated assessment approaches, which without care may indeed be less valuable pedagogically, it seems inappropriate to extend the use of subject level assessment outcomes into broader conversations about higher education quality.

Fourth, even if outcomes can be specified and measured with sufficient reliability and precision, they can be difficult to interpret. While information about outcomes may provide a snapshot of what is happening at a certain point in time, the information may not be sufficient to direct quality assurance and improvement. As Kuh and Vesper (1997: 43) write: 'Outcomes data represent what students demonstrate they know or can do at a certain point in time, but such data do not typically point to student behaviours and institutional practices associated with these outcomes.' The relationships between outcome information and student behaviours or institutional processes may be multidimensional or ambiguous. In changing organisational environments, the lagging information from outcome indicators may lack relevance by the time it is available for interpretation. It is also important that outcome information is read in context. Unless outcomes are adjusted by input and environmental factors, then attempts to construct measures of the extent to which an educational process has been value-adding will be confounded (Woodhouse and Goldstein, 1988; Rowe *et al.*, 1995; Hill and Rowe, 1998). However, this raises contentious questions about how to adjust performance measures, and about determining psychometrically appropriate input measures.

A research development

Student engagement captures a particular research perspective on the study of higher education student learning. In its current expression, the idea can be traced to three key antecedents: Pace's (1979, 1995) 'quality of effort' idea, Chickering and Gamson's (1987) work to document good practices of undergraduate education, and Astin's (1979, 1985, 1993) 'involvement principle'. Reviewing these antecedents exposes much of the contemporary idea of student engagement.

Pace (1979: 127) developed the 'quality of effort' idea from research into student outcomes from higher education. According to this view, while institutions can provide resources and the conditions that give students opportunities to learn, learning is dependent on students making use of such opportunities. The provision of resources is thus necessary but not sufficient for learning. Only student participation is both necessary and sufficient. By this logic, while institutions are

accountable for providing learning opportunities, the ultimate responsibility for learning rests on the students. This, in turn, is reflected in the quality of effort they invest in their study. Quality of effort is a core idea in the College Student Experience Questionnaire (CSEQ) (Pace, 1988, 1990a,b; CSEQ, 2004), ‘an inventory of student activities that contribute to learning and development’ (Pace, 1995: 3), and has become well rooted in conversations about higher education student learning. Work on the CSEQ has done much to outline the activities and conditions linked with student learning and development.

The ‘quality of effort’ idea is based on the perspective that students should ask not what their college can do for them, but what they can get out of their college. In an early persuasive statement, Pace (1979: 127–128) states the idea by writing that:

All learning and development requires an investment of time and effort by the student. What students can gain from the variety of events depends on the amount, scope, and quality of their engagement. As these encounters broaden and deepen, the student’s capacity for growth is enhanced. To document objectively the scope and quality of students’ effort is crucial for understanding growth and development. It is astonishing but true that almost no evaluations of higher education have considered, systematically and diagnostically, the role of student effort in the attainment of desired outcomes. What is the quality of the effort students invest in classroom learning? The range could be from relatively simple cognitive activities, such as taking notes and underlining, to higher-level cognitive activities, such as efforts to explain, organise and go beyond assignments. What is the quality of effort students make in using the library resources? Here the range might be from routine and moderate exploratory use, such as reading an assigned article or using the card catalogue, to greater degrees of independent exploration and focused activity. What is the quality of students’ effort in making contact with faculty members? These efforts could be mainly routine; or they could involve serious discussions about careers, seeking criticism of one’s work, seeking personal counsel. With respect to all the salient facilities and opportunities the college has to offer, one can measure the quality of the effort students invest in using them.

In reporting the development of the CSEQ, Pace (1988: 102) distinguishes ‘quality of effort’ from other psychological phenomena.

Quality of effort is not the same as motivation. Motivation is often described as a general psychological phenomenon. Quality of effort is more specifically an educational activity in relation to specific aspects of the education experience. Nor is quality of effort the same as persistence, for persistence does not include initiative. Nor is quality of effort a personality trait, for scientists and engineers exhibiting high quality of effort in various aspects of their educational experience are quite different in personality from humanists and artists who are also exhibiting high quality of effort.

These important ideas underpin the general perspective on engagement considered in this book, and inform much of the later substantive and empirical analysis.

Chickering and Gamson's (1987) 'seven principles of good practice in undergraduate education' are among the most widely disseminated and influential documents on higher education pedagogy. The principles arose from efforts to make the findings from research into university pedagogy accessible to a wider audience. They were developed to serve as a deliberately abbreviated and generalised series of guides for instructors, students and administrators on basic and achievable ways for improving learning and teaching. Drawing together decades of research into pedagogy, they 'identify key principles which characterise the practices of educationally successful undergraduate institutions' (Gamson, 1991: 7). In addition to their wide distribution, particularly within the USA, the principles provide a distilled framework of research findings, and a foundation for later research on good practices.

Unlike 'quality of effort', the seven principles focus on actions and conditions that can be brought about by staff and institutions. They include:

- encouraging student–faculty contact
- encouraging cooperation among students
- encouraging active learning
- giving prompt feedback
- emphasising time on task
- communicating high expectations
- respecting diverse talents.

Although designed to be self-evident and easy to interpret in practice, the principles represent key ideas derived from substantial theoretical and empirical research. These ideas and the substance which underpins them greatly influence the discussion of engagement throughout the book.

Contemporary student engagement research owes much to work on student involvement. Astin (1985) developed the idea of 'student involvement' as part of a broad perspective on the nature of education. Astin argued that education was essentially a service rather than an industrial production process. The industrial analogy breaks down, he argued, because institutions do not produce students in the same way that factories produce products. Students arrive at institutions as 'fully functioning organisms' and, while they may be 'influenced by their college experience' (Astin, 1993b: 17), they are not produced like a manufactured product. He argued, in contrast, that education can be better understood using a medical or service model. In this light, education is a process of receiving individuals and providing a service intended to enhance or add value to their situation. Unlike the product-focussed industrial production model, the 'talent development model' (Astin, 1985: 60) recognises the subjectivity of the individual agent. From this perspective, educational outcomes are not exclusively

dependent on the environment and processes, but are highly dependent on the behaviour of individuals. Individuals learn by interacting with educational activities. Astin (1985: 133, 134) defined this idea simply, writing that:

Students learn by becoming involved. . . . Quite simply, student involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience. A highly involved student is one who, for example, devotes considerable energy to studying, spends a lot of time on campus, participates actively in student organisations, and interacts frequently with faculty members and other students.

In Astin's analysis, talent development occurs to the extent that individuals involve themselves in activities which lead to learning and development.

Within the overarching conceptualisation of education as a process of talent development, involvement becomes a way of describing the broad range of interactions individuals have with institutions that influence the outcomes of their university study. Astin (1985: 135) articulates his involvement theory in five basic postulates:

- 1 Involvement refers to the investment of physical and psychological energy in various 'objects'. The objects may be highly generalised (the student experience) or highly specific (preparing for a chemistry examination).
- 2 Regardless of its object, involvement occurs along a continuum. Different students manifest different degrees of involvement in a given object, and the same student manifests different degrees of involvement in different objects at different times.
- 3 Involvement has both quantitative and qualitative features. The extent of a student's involvement in, say, academic work can be measured quantitatively (how many hours the student spends studying) and qualitatively (does the student review and comprehend reading assignments, or does the student simply stare at the textbook and daydream?).
- 4 The amount of student learning and personal development associated with any educational programme is directly proportional to the quality and quantity of student involvement in that programme.
- 5 The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement.

These general ideas have been influential, and are particularly relevant to recent conceptions of student engagement. They set out the importance of analysing education in terms of the quality of effort that underpins students' involvement in the good educational practices which lead to learning. Through longitudinal study of college students, Astin (1979, 1993b) has done much to identify and operationalise the nature of these practices.

A number of other important perspectives have made notable advances in defining the theoretical development underpinning student engagement.

Pascarella and Terenzini (1991, 2005), for instance, have offered major distillations of research into student learning and development. The work of Tinto (1993) has emphasised the importance of examining students' integration into the life of their university. Ewell and Jones (1993, 1996) have outlined the warrant and nature of such indicators. Important investigations of educationally relevant beyond-class experiences have been undertaken by Kuh *et al.* (1991), and Kuh *et al.* (1994). These and other developments are considered in discussion through this book.

Making assumptions about student engagement

Any discussion of engagement incorporates a manifest or implicit assumption about the phenomenon of learning. Learning is a complex, ubiquitous and powerful phenomenon addressed in a broad range of often mutually contradictory practices, paradigms and theories. Any assumptions made about learning will heavily influence the contents, dimensions and functionality of a conceptualisation of engagement. They will determine the role of the individual in the learning process, for instance, and steer the definition of the activities with which it is important for students to interact. As a precursor to discussion of engagement, therefore, it is important to declare what is being assumed about learning, even if these ideas are left as a subtext in subsequent analyses.

Many of the activities that constitute engagement reflect the assumption that learning in higher education involves social interaction, an assumption which is consistent with much contemporary educational theory. It is reflected in contemporary anthropological theories of situated or distributed learning which suggest that individuals learn by involving themselves in fields or communities of practice or inquiry (Brown, 1989; Lave and Wenger, 1991; Hutchins, 1995). It is reflected in Laurillard's (2001: 71) idea that academic learning involves 'a continuing iterative dialogue between teacher and student, which reveals the participants' conceptions, and the variations between them, and which in turn will determine the focus for further dialogue'. At the same time, certain aspects of engagement echo the idea of 'reciprocal determinism' central to sociocognitive theory (Bandura, 1989) and also aspects of 'organisational learning' theory (Argyris and Schon, 1977; Levitt and March, 1988). According to such views, learning involves cybernetic processes of dialogical interaction with knowledge that is essentially socially mediated in nature.

Most contemporary studies of engagement are based on the assumption that learning is a process of individual knowledge construction. 'Constructivism' is a pedagogical theory based on a particular understanding of learning and development (Bruner, 1960). Constructivism, as opposed to instructivism, suggests that new knowledge is formed on a foundation of prior knowledge, and that this knowledge, once interlinked and referenced to the prior knowledge, forms a foundation of new prior knowledge (Jonassen and Land, 2000). Constructivism

has antecedents in Piaget's genetic epistemology (Piaget, 1964), in which learning is a process of individual knowledge building which is motivated by learners trying actively to make sense of the world. According to Piaget, learning occurs by individuals transforming information into knowledge through the equilibration processes of adaptation and accommodation. Learning occurs, that is, by individuals actively engaging with knowledge in their own epistemological context. These ideas are not meant to imply a radical epistemological relativism, however, and tend to be tempered by Vygotsky's (1962, 1978) ideas that learning is most effectively conducted in a generative and supportive social context. Hence the idea that learning is seen as a joint proposition, which requires student participation but also depends on institutions and staff providing students with the conditions and opportunities to become involved.

It is useful to define the term 'high-quality learning', which is used throughout this book. The quality of learning might be high because of the way in which it is done, or because of the outcomes that are achieved. It could be said that a student is involved in a high-quality learning process when she or he is engaging in key aspects of her or his university study. In a sense, therefore, the identification and analysis of high-quality learning processes are the subject of this book. While this experiential aspect of learning is important, it is important too that high-quality learning processes lead to high-quality learning outcomes. An emphasis on outcomes is implied in many if not most conversations about learning. The outcomes from learning in higher education are many and varied, and a thorough taxonomic specification is beyond the scope of this book. Important outcomes include graduation, domain-specific knowledge, work activities and career progression, participation in further study, intellectual skills, interpersonal skills and personal qualities. Such outcomes manifest and are measured and reported in different ways in different contexts.

In studying engagement, it is necessary to assume that it is possible to identify activities and conditions that are linked with learning. After adopting a theoretical or practical perspective on learning, it may be possible to list a range of pedagogically beneficial activities and conditions. It is more difficult, however, to identify these as being necessary, sufficient or, at least, enriching for learning. One reason for this is the lack of suitable outcome measures which has meant that, so far, engagement research has largely relied on student 'self-reported' outcomes (e.g. Kuh, 1995). However, even if phenomena could be identified by principle or experiment, the complexity and unpredictability of education would make accurate and reliable generalisation difficult. Indeed, what is meant by 'involvement' may vary between individuals and situations. As Pascarella (1991: 458) notes, change at university is dependent on a 'dynamic web of influences'. For an understanding of involvement to carry any explanatory power, it must focus on things which are seen to be quite fundamental for certain types of learning. While this assumption underpins any discussion of engagement, these uncertainties hint at the importance of considering issues probabilistically and conservatively.

While the engagement perspective implies that learning is a process of interacting with activities, it is not assumed that interaction is an unqualified good. The general proposition, as observed by Tinto (1997: 600), is that ‘the greater students’ involvement in the life of the college, especially its academic life, the greater their acquisition of knowledge and development of skills’. Interaction, however, is not necessarily better for learning. The inherent complexities of learning, of university environments, and of the material being learned, means that it is possible to think of instances where greater interaction does not imply greater learning. Further engagement above certain levels may even be counterproductive, or may show diminishing educational returns. As Astin (1985: 156) writes:

Although the theory of involvement generally holds that more is better, there are probably limits beyond which increasing involvement ceases to produce desirable results and even becomes counterproductive. Examples of excessive involvement are the ‘workaholic’, the academic ‘nerd’ or ‘grind’, and other personality types who manifest withdrawal and obsessive-compulsive behaviour.

This is indeed possible, however in the absence of research which suggests that it is probable, it is assumed for current purposes that greater levels of student engagement generally benefit learning and development.

While engagement is often interpreted in a very behavioural way, perhaps because it has tended to be measured using activity and time-based indices, it can be approached as a much broader phenomenon. Astin (1985: 135) reinforced the behavioural dimension, writing that:

In the sense in which I am using the term, involvement implies a behavioural component. This is not to deny that motivation is an important aspect of involvement but rather to emphasise that the behavioural aspects, in my judgement, are critical. It is not so much what the individual thinks or feels but what he or she does that defines and identifies involvement.

It is possible to conceive, however, that observed behaviour is neither necessary nor sufficient for engagement. Behaviour may suggest that an individual is engaged, when in fact he or she is quite disengaged cognitively or affectively. Conversely, a student may have a high level of psychological engagement without acting outwardly in certain ways. Learning is not just a behavioural phenomenon. If engagement is meant to be a concept that embraces the educationally significant points of intersection between students and their university study, then, from an *a priori* perspective, it is not clear why behavioural, cognitive and affective factors should not be treated in a more synthetic way (Bartko, 1999; Chapman, 2003; Fredricks *et al.*, 2004). Research (Tinto, 1993; Goleman, 1995; Love and Goodsell-Love, 1995) has suggested that, in particular, the affective qualities of engagement should be emphasised.

No assumption is made in this book that engagement is an enduring psychological trait. Indeed, engagement is assumed to be a fairly motile and malleable state (Fredericks *et al.*, 2004). On an intuitive level, it seems likely that there would be links between engagement and personality. Individuals with particular temperaments might be disposed to engage with university study in distinctive ways, or may be inclined to perceive or report their engagement in various ways. Engagement might also be expected to be influenced by a student's development (Perry, 1970, 1988). These links are not investigated or assumed explicitly in this book. Rather, as Laurillard (1979, 1993) qualifies about the phenomenographic distinction between 'deep', 'surface' and 'strategic' learning (Marton and Saljo, 1976a,b; Entwistle, 1987), engagement is taken to be a psychological or sociological state which may vary across contexts and time, and is not linked in an essentialist way with intrinsic qualities of an individual.

No assumption is made that engagement is causally related to learning outcomes. For the activities which constitute engagement to be taken as causes of learning outcomes, they alone would need to be identified as unique, necessary and sufficient conditions for learning. However, it is clear that other demographic, psychological and environmental factors play a formative role in educational outcomes, as suggested in many models of student learning and development (Pascarella, 1985; Tinto, 1993). Also, because studying engagement in a truly experimental way is difficult, if not impossible, uncertainty remains about the directionality of the relationship between engagement and outcomes. Students may engage in activities because they are already performing well, rather than as a means of enhancing future performance. While resisting a strong assumption of causality, it is assumed, as discussed below, that engaging in educationally purposeful activities is a necessary and sufficient condition for learning.

Working from the strength of current research conversations, the current analysis reinforces the primary educational role played by engagement. Indeed, it goes further in this direction than most engagement research. Despite the emphasis placed on engagement, most studies of the phenomenon consider its relationship with academic achievement, and in particular to students' own perceived learning and development outcomes (Pace, 1979; Astin, 1993b; Kuh, 1995; NSSE, 2003). In such circumstances, engagement variables are typically treated in statistical models as explanatory or mediating variables used to predict social, cognitive and affective outcomes. For current purposes, however, it is assumed that, while engagement may 'mediate' (Baron and Kenny, 1986) the influence of these other phenomena, engagement also plays more than a mediating role. That is, engagement is taken to be more than a phenomena subordinated to the effects of other variables. Rather, as contended by Willms (2003), it is taken to be a phenomenon worth studying directly in its own right. The point of this perspective is more analytical than practical. It is not suggested, for instance, that engagement should be conceptualised primarily as an educational outcome, although it is argued below that its intrinsic qualities could be further emphasised. Adopting this

approach distinguishes the current analysis from other explorations of engagement, which typically emphasise the mediating function of engagement.

As mentioned, the concept of engagement embraces a specific understanding of the relationship between students and institutions. Institutions are responsible for creating environments that make learning possible, that afford opportunities to learn. The final responsibility for learning, however, rests with students. The nature and degree of learning is dependent on how the student makes use of her or his environmental resources. As Pascarella and Terenzini (1991: 51) write, 'students must actively exploit the opportunities presented by the environment...the individual plays a central role in determining the extent and nature of growth according to the quality of effort or involvement with the resources provided by the institution'. Student engagement develops from the dynamic interplay between student and institutional activities and conditions.

The perceived significance of engagement

There seem to be three broad reasons underpinning the contemporary significance of student engagement. The first reason is that engagement provides a means of examining 'the whole student experience'. Second, there is an important intrinsic value to engagement for university students and teachers. Third, and perhaps most importantly, studying engagement provides a means of getting information on what students are actually doing, as opposed to what they are supposed or presumed to be doing. Information on actual activities is important, as it helps manage the quality and productivity of university education.

A perspective on the 'whole student experience'

Student engagement is increasingly being seen to provide a valuable perspective on the student experience, capturing and bringing together a wide range of what are perceived to be the educationally meaningful interactions that students have with their universities. It provides a multidimensional perspective that cuts across a number of conventional theoretical or bureaucratic distinctions to provide insight into the diverse ways a student may grow at university. By moving focus beyond bifurcations between institutional environments reified by educational research and practice, it provides a more inclusive and holistic perspective on the student experience. A central component of this is that engagement draws into educational focus students' lives and activities outside of class.

In recent conceptualisations, student engagement is premised upon a dissolution of the conventional distinction between 'formal' and 'informal' instructional environments. Formal academic activities and issues, in particular, are often distinguished from what students do 'outside the classroom' around the campus, in the 'space between the buildings' (OUP, 2004). Similarly, students' lives outside institutions are usually distinguished from even broad discussions of the 'university student experience'. Such distinctions are evident in institutional

structures, the roles and tacit understandings of staff, and in the study of instruction and university education. Recent research, however, has challenged the efficacy and veracity of such distinctions (Kuh *et al.*, 1994; Love and Goodsell-Love, 1995; McInnis, 2002; Sandeen, 2004). In addition to reinforcing the interdependence between the various zones of experience, this research has emphasised the value of pursuing a more holistic understanding of the higher education student experience.

There is a growing awareness of the educational relevance of out-of-class experiences, and of their links with a range of valuable educational outcomes. Out-of-class experiences can contribute to the acquisition of discipline-specific knowledge, higher-order developmental outcomes and, as Tinto's (1993, 1997) work suggests, even the desire to remain studying and persist at university. Kuh *et al.* (1994), for instance, found that experiences outside formal instructional environments contributed to students' critical thinking and generic skills, to their knowledge acquisition, and to a range of interpersonal, practical and social skills. Experiences such as academic interaction with peers and university staff, leadership experiences, participation in extracurricular activities and spending time in libraries and laboratories appear to be particularly important (Kuh *et al.*, 1991). Such research has emphasised the importance of out-of-class experiences for basic educational reasons.

Beyond-class experiences have also been considered important because of their impact on formal academic activities. Recent analyses of the changing dynamics of student behaviour have reinforced the importance of understanding how students spend their time outside class. Marchese (1998) and McInnis (2002) outline a form of 'negotiated engagement', which is characterised by students making independent and explicit decisions about their university study. The perspective suggests that, rather than complementing student life with enriching extracurricular activities, students are managing a lifestyle in which university study plays only a part, and perhaps not even the main part. As captured by Levine and Cureton (1998: 14):

What this means is that higher education is not as central to the lives of today's undergraduates as it was to previous generations. Increasingly, college is just one of a multiplicity of activities in which they are engaged every day. For many, it is not even the most important of these activities; work and family often overshadow it.

From this perspective, students' non-academic activities and commitments can have a significant influence on what they learn at university. This can result in situations where around a quarter of first year students do not have substantial contact with other students on campus, and in which off-campus paid employment can significantly affect learning and the choices people make about their study (Astin, 1985; Pascarella and Terenzini, 1991, 2005; McInnis *et al.*, 2000; McInnis, 2002). Without understanding these dynamics, institutions are under-prepared to

respond in ways that jointly satisfy students and the integrity of the educational process.

On a similar front, it has been argued that understanding how students negotiate their time outside class can help teachers and institutions enhance learning. By knowing how students spend their time out-of-class, institutions are in a better position to leverage this time to enhance learning. This is important given that the time spent learning out-of-class is related to a range of positive educational outcomes (Kuh, 2001b). In addition to improving learning, increasing the pedagogical relevance of out-of-class time may be attractive from a resource perspective in situations where class sizes and teaching loads are growing. Suggestions have been made for how institutions may 'colonise' such time, including the creation of a 'cultivating climate' (Little, 1975), by successfully socialising students during their recruitment (McInnis, 2002), and by providing flexible support to meet the needs of individuals (Kuh *et al.*, 1991). In summary, valuable synergies may be derived from acknowledging the interdependence between what students do inside and outside of class.

While acknowledging the synergies and interplays between the different environments in which students learn, it is important to note that distinctions made for the purposes of research, teaching or management may be largely artificial as far as students are concerned. While there are real educational, administrative and practical differences in the various places individuals learn, such differences may not be of much relevance to learners. As Kuh *et al.* (1991: 184) write, 'what is learned during college is not easily partitioned into courses, friendships, organisations, library work, laboratory assignments, recreational activities, and so on'. While distinguishing between different learning environments may be efficacious for analysis, it can abstract from the experience of the student. For the purposes of developing understanding of how students engage with their learning, therefore, these may be unnecessary or even unproductive distinctions to make.

Examining the whole student experience is becoming particularly important in educational environments that may be becoming more distributed in nature. If the temporal and spatial characteristics of learning are relaxed such that information is available from a range of different sources, then traditional distinctions between learning environments may be irrelevant or absurd. It is difficult to draw conventional distinctions between formal classes and the non-academic life of the student when they access lecture materials in their lounge rooms and come to university campuses and classes to socialise. In its most decontextualised interpretation, in distributed learning environments where students have 'grown up with a digital mindset' (Brown, 2000; Frand, 2000; Green, 2002b), learning is where it happens for a student, rather than where it is proscribed by an institution.

The aforementioned points summarise a rethinking of boundaries conventionally used to partition thinking about 'student learning' and the 'student experience'. They re-emphasise activities which, particularly in systems of mass higher education, have tended to become dissociated from discussions of academic learning and individual development. Much higher education research and

practice has assumed that learning takes place in the classroom, has a cognitive focus and is stimulated by academics. Student engagement is an umbrella concept which organises or collects together a broader range of phenomena, based on the understanding that this assumption is false. Together, the ideas surveyed above suggest that focusing on classroom-based cognitive development alone ignores significant parts of the undergraduate education. Whatever the relative importance of beyond-class experiences, contemporary research findings leave little doubt that the extent to which students engage in beyond-class activities affects what they take from their university education.

The intrinsic importance of being engaged

Student engagement is most frequently considered instrumentally, as a means towards the greater goal of learning. As Shulman (2002) has suggested, however, 'being engaged' can be intrinsically important in itself. Teachers sense this when they succeed in getting students involved in the curriculum. Students feel this when pursuing an activity that they find inherently rewarding. Although perhaps not the primary value of student engagement, this deontological perspective implies that engagement is worthwhile not just as a means to an end, but also as an end in itself.

Leaving aside any later outcomes, engagement represents the extent to which individuals are 'living the life of the university student'. The university is the workplace of the full-time university students. In principle, it should play a major role in their lives, exposing them to people, activities and places that are important agents of personal and professional socialisation and enculturation. Students have the opportunity to encounter sporting, artistic and community service activities, social groups and lifelong partners through involvement in university communities. Conversely, commuter students studying at large urban campuses have the opportunity to spend only an absolute bare minimum amount of time physically located at their university. Engagement represents students' involvement in the life of the university and, conversely, the extent to which they involve the university in their life.

In a more epistemological or existential way, engagement reflects the level of individuals' involvement with their study. At one extreme, highly engaged individuals may represent those in a state of play. Such individuals see interactions with activities as essentially satisfying, precarious, exciting and motivating (Winnicott, 1971; Marsh, 1984; Mann, 2001). At another extreme, disengaged students may be alienated from their work. Alienation can be defined generally as involving some kind of psychosocial inconsistency between individuals and their productive activities. It occurs when individuals do not have a personal investment in what they are doing. While they may be performing a task well, they have no general interest in its purpose, process or outcomes. Alienation seems existentially incompatible with engagement. At their extremes, the phenomena even appear inconsistent. While engaged students would be those who have

entered into an intrinsically satisfying, autonomous and creative relationship with their learning, alienated students would be those who have acquiesced to the demands and prescriptions of course requirements.

The contrast between engagement and alienation is reflected in the phenomenographic tradition of higher education research. In many ways, the distinction is similar to that made between the deep and shallow approaches to study (Entwistle, 1987). Saljo (1982: 117), for instance, writes that ‘one cannot avoid observing the almost perfect way in which a surface orientation meets the criteria of alienation’. Students with a shallow orientation focus on memorising information needed for assessments, treat study as an external imposition, do not attempt to form connections between discrete phenomena, and are unreflective about their study. Conversely, engaged students are closer to those exhibiting a deep approach to their study by constructing meaning in texts, relating new material to current knowledge, drawing connections with everyday experience and examining the logic of arguments. Independent to the outcomes, it is likely that deep or engaged learners have an intrinsically satisfying relationship to their study. The distinction between alienation and engagement is more general than the distinction between deep and surface learning, however, because it refers to more than merely how individuals approach their study.

On a very general existential level, student engagement represents a commitment to an educational process. The rudiments of this idea are found in the early work of Dewey (1974: 5) who wrote that:

The initiative in growth comes from the needs and powers of the pupil. The first step in the interaction that results in growth comes from the reaching out of the tentacles of the individual, from an effort, at first blind, to procure the materials that his potentialities demand in order that they may come into action and find satisfaction.

As suggested by Willms (2003: 9), ‘Engagement is seen as a disposition towards learning, working with others and functioning in a social institution, which is expressed in students’ feelings that they belong at school, and in their participation in school activities.’ Irrespective of outcomes, ‘being engaged’ refers to the kind of existential approach or commitment that is often expected of students. As Shulman (2002: 40) writes, ‘Engagement in this sense is not just a proxy for learning but a fundamental purpose of education.’

A measure of educational quality

Perhaps the greatest significance of student engagement is its capacity to provide a measure of the quality and productivity of university education. There has been a rise of interest over the last ten to twenty years in developing such aggregate indicators of higher education teaching and learning (Coates, 2005a). Student engagement was developed to capitalise on the perceived strengths of student

level process factors. Indeed, it was developed to capture key aspects of university student education and, as such, be a quintessential index of the educational process. Measures of educational processes have been perceived as significant for a number of reasons.

It has been argued that the nature of process factors makes them more relevant to education. Astin (1993b) and Pace (1988) have argued for the *a priori* importance of process factors along these lines. Specifically, they contend that the aims and activities of education are better reflected in a process-oriented rather than an outcomes-oriented form of analysis. The position reflects the view that education is about adding value to students, rather than about producing outputs. It suggests that there is an intrinsic value for education in working to enhance good educational practices.

In a related point, student engagement is seen as important because it focuses discussion about the quality and efficiency of university education squarely on student learning. More specifically, conversations about engagement represent a movement away from the idea of basing evaluations of educational quality on things which may be ancillary or unrelated to learning. Kuh (2001a: 1) sums up the importance of this movement, writing that:

The voluminous research on college student development shows that the time and energy students devote to educationally purposeful activities is the single best predictor of their learning and professional development. The implication for estimating collegiate quality is quite clear. Those institutions that more fully engage their students in the variety of activities that contribute to valued outcomes of college can claim to be of higher quality compared with other colleges and universities where students are less engaged.

It seems unlikely that, at least in the near future, engagement will overshadow considerations of institutional resources, reputations, selectivity or student outcomes in discussions of the quality of education. Further work would also be required to form indices from measures of student engagement that might be factored into quality assurance or improvement activities. The phenomenon of engagement can, however, claim to provide an informed and relevant perspective that counterbalances these views. It might promote the kinds of critical reflection capable of reducing differences between research findings and pedagogical and institutional practices (Terenzini, 1999; Pascarella, 2001) which are likely to develop university education.

One of the major attractions to process factors is that they overcome many of the limitations of outcome factors. As Ewell and Jones (1993) qualify, process factors are used both as direct measures of educational processes, and as indirect or proxy measures of educational outcomes. As Ewell and Jones (1993: 124) write, 'The case for developing indirect indicators to track higher education's progress first rests upon the extreme difficulty of producing direct ones.' If, as considered above, it is possible to identify phenomena which are necessary or

even sufficient for the realisation of certain outcomes, then, as set out by Kuh *et al.* (1997), the analysis of process factors can serve as a proxy for the analysis of those outcomes.

Indeed, researchers have determined that process factors are feasible to identify, measure and interpret. A great deal of work has gone into identifying institutional and individual activities and conditions that are highly related to a range of learning and development outcomes (Astin, 1985, 1990, 1993b; Chickering and Gamson, 1987; Pace, 1988, 1990b; Kuh *et al.*, 1991; Pascarella and Terenzini, 1991, 2005; Ewell and Jones, 1993, 1996; Tinto, 1993, 1997, 1998; Kuh *et al.*, 1997; NSSE, 2003). While the work has been theoretically driven, empirical validation and practical relevance have been seen as essential (Pace, 1988; Pascarella, 2001). In terms of measurement, processes can be much easier to assess than outcomes. While the diffuse, slowly evolving or discipline-specific nature of education outcomes can make them difficult to assess, process factors are typically much more proximal, tangible and ready-to-hand. On a practical level, the measurement of processes often involves individuals who are currently involved in a system, and is thereby more feasible than tracking down former students. Student-level process information has the benefit of being relatively easy to interpret, as the data points directly to specific coincident conditions, activities, procedures and policies. As the relevance of the phenomena being measured has been established before the acquisition of data, it is not necessary to make *post hoc* inferences about the sources of particular results. Rather, information can be applied directly to guide quality improvement and assurance activities. Information on the nature of student involvement in specific activities can be used immediately to pinpoint productive areas and those in need of improvement.

Measuring students' involvement in educational processes provides information on what students are actually doing. While this may appear self-evident, it has a broader significance for educational institutions. Rather than work from assumptions or anecdotal reports about student activities, institutions can make decisions based on information with known reliability and validity. The organisational learning theory of Argyris and Schon (1977) implies that comparisons between actual information with espoused information about conduct are the basis for institutional learning and hence quality improvement. Information about student activities also provides institutions with valuable data for marketing and recruitment. Focussing on what students are actually doing helps institutions become more responsive to student learning needs. Without pertinent information on what students are actually doing, it is difficult to determine strategies for reinforcing, reducing or modifying the provision of learning opportunities that can enhance their performance. Only with accurate and reliable information on what students are actually doing can institutions move beyond taking student activities for granted.

Measures of engagement provide an index of persistence and students' desires to complete their study. Astin (1993b: 71) writes that 'it is evident that quality of student effort is significantly related not only to student growth and

development... but also to student persistence'. Later, Tinto (1997: 600) writes that 'We know that involvement matters. As numerous researchers have pointed out... the greater students' involvement or integration in the life of the college the greater the likelihood that they will persist.' According to Tinto (1993: 69), engagement may be self-perpetuating in the way that:

Students who become involved with faculty and other students are more likely to develop values stressing the importance of involvement with others. Involvement leads to the appreciation of the need for involvement and both lead, in turn, to an increased likelihood that students will continue to be involved in the future.

Such views resonate with contemporary situated learning theories which depict learning as a movement from peripheral to full participation in communities of practice (Lave and Wenger, 1991; Wenger *et al.*, 2002). By engaging in communities, students develop roles, identities and experiences which legitimate their intentions.

As suggested earlier, student engagement provides necessary and sufficient information about learning. Suitable levels of the right kinds of participation are necessary for learning, even if an institution is reputable, well-resourced, teaches the right content and has well-regulated governance and management systems. Alternatively, even outside of optimal institutional environments, student engagement with learning resources and processes may well be sufficient to bring about productive learning. In summary, unlike institutional resources and reputations, student engagement appears to be almost a necessary and sufficient condition for learning, an educational bottom line.

Data on student engagement provides a means for determining the productivity of university education. Along with assertions made by Reich (1992) and Oblinger and Maruyama (1996) that education should be focused on producing individual knowledge, Johnstone (1993) has argued that the most significant and sustainable productivity advances in education will result from enhancing learning outputs rather than manipulating structural factors or refining cost-side productivity. Johnstone (1993: 4) writes that:

We need to focus more on the student and his or her training, and to be a little less preoccupied with, and critical of, the faculty (and all the rest of the administrative, professional, and clerical support staff of our colleges and universities) in our quest for more productivity.

To the extent that the productivity of education is centred around student learning, it is important that students and institutions are doing things which are likely to maximise student performance. Education stops when individual students stop creating their knowledge. Alternatively, education is most productive when individuals are doing the kinds of things which make it most likely that they are

generating high-quality learning. Student engagement data provides information which can be used as a summative index of such productivity. The data can be used diagnostically to manage how students engage with their study with a view to generating more productive educational outcomes.

What's really going on? A student talks about her university engagement

There can be significant differences between the experiences and perspectives of students, and the people who manage, lead and teach in higher education. The following text documents a student being interviewed about how she engages with her study. The excerpt was sampled from a much longer conversation. It is interesting to imagine points of divergence between her perspective and the ideas which are likely expressed in her university's teaching and learning strategies. It is interesting to consider how the salient points in this student's reflections could be captured and used to manage and improve the quality of her university education.

What's the subject you've just been in. Is it post-1945 history?

Yes.

I've always wanted to do something like that. You'd understand what you read in the paper.

That's what I've been finding. It's been really good for that.

What course are you doing?

I'm doing bachelor of teaching primary, and arts.

So two degrees? Are you in first year, second year?

I'm in first, second and third year. I was doing science, and I switched to arts. So I've got first and second year arts subjects, and third year teaching.

How many formal teaching hours would you have in a week... like workshops, lectures, seminars, tutorials, labs, whatever...?

Approximately.

I think about fifteen. I'm, doing about four subjects. It varies a bit each week.

How much time do you spend studying by yourself?

I should be doing more, but I'd probably say about five hours a week.

And how about studying with other people?

I never do.

Is that just the nature of what you're studying, is there more reading rather than group work?

Yeah, I find with arts that it's more just personal opinion, that you get to analyse what you think. And as well as that, because of where I live,

it's quite far away from the university, so it's difficult to study with other people.

How long does it take you to get to uni?

It takes about an hour and a half in peak hour traffic, and about three quarters of an hour normally. On average a bit over an hour.

Do you have a job, like paid employment? How many hours do you work each week?

Yeah, I do twenty-five hours a week.

In-between classes, do you hang around with people much?

No, because there's no set time where everyone's free. I usually just meet people here and there, but then we've always got somewhere else to go.

How often do you speak with academic staff or library staff outside class?

Only rarely, like if I really need help with assignments or something like that. So... only once a month maybe.

So would you go and see them, or give them a phone call?

I actually ring, and sometimes I see them and other times I just email them. Usually I start with email.

Do you find that university is different from secondary school?

Yeah, definitely. I find at school that they give you certain tasks for homework, and you've got to have them in every time you go to class. But here, they wouldn't know if you didn't do it. So, the motivation is more personal. You have to do it because you like it, but at school you do it to please your teacher and get a good report.

Do you find it easier to motivate yourself at university than school?

I find it harder, but when you've got something due, then that week I can really motivate myself. But usually, I find it a bit harder.

Would you prefer it if someone was really structuring it for you, and saying 'do this', 'do that'?

I would, because I would have an idea of what they expect us to do, how much they expect us to read on the topic, and the kind of paper they expect us to turn in.

How about if you encounter a difficulty, like if you don't understand something, or you can't write an idea. Do you find that it's easier to work it out yourself, or go to speak to someone?

Go to speak to someone, definitely.

Do you have many subjects where you have to use the online learning system?

I have one subject in which it's just used a lot. The other ones, it's just used for getting slides before the lecture. In two of my subjects, they want you to get online and do the conferencing. And sometimes I'm not motivated. I've had problems where my computer doesn't work or

I've had to wait to go to the library to do it. I spent an hour one night trying to get this one message up.

Do you use it from home, or from university?

I tried using it at home a couple of times, and it doesn't work, so I have to use it from the library.

How often do you use it?

Quite often actually, because I get a lot of stuff from it. Lecture notes, and once a week to look at class discussion. But because I go to all of the lectures anyway and I write notes, I usually just get all the lectures at the end of the semester before the exam so I have them. But during the semester, I don't actually use the lectures notes from the computer.

Do all of your subjects have the lecture notes up on the web?

Yes.

Do you ever just say 'I'm not going to go to a lecture because I can get it off the web?'

No.

So you tend to still go?

Yes.

There is meant to be 200 people in that lecture you just had, but only 20 were there?

It used to be three-quarters full, now it's sometimes just half full, and often less.

So, are people just getting lectures off the system? Why don't you do that?

I just find it a pain, because I've got the problems getting on, and it takes a while. I actually just like going to lectures, especially history, because they've got the videos and stuff. You can't really get the video from, like, little bits of writing that are, like, just point form of what's in the study guide anyway. So I just like going to lectures to sort of hear what they're saying.

Contemporary campus-based online learning

Student engagement happens in educational contexts. These contexts are important, because they shape the possibilities, limits and patterns of engagement. While the educational fundamentals remain the same, learning at a large commuter institution is likely to look different to learning in a small liberal arts college, and these are likely to differ again depending on whether each campus has a metropolitan or rural location. Conversations about student engagement cannot ignore context, or the systems and dynamics which shape the environments in which students learn.

The idea of context drives this chapter. It presents a perspective on the contemporary university environment in which students learn, and distinguishes online learning management systems (LMS) as important agents of change. The chapter begins by introducing the idea of distributed campus-based learning, the broad perspective on university education that is carried throughout the book. In many ways, the analysis carried throughout the book is an attempt to understand this area of higher education, and it is important to introduce it at this early stage. The chapter continues with an analysis of the development, deployment and significance of online LMS. It moves on to outline the need for a greater educational understanding of these online systems to show, in particular, that much remains unknown about how such systems affect the learning of campus-based students. The chapter concludes by arguing that contemporary student engagement research provides a context for developing understanding of this growing area of higher education.

Distributed campus-based higher education

The last decade has been a time of great change for higher education around the world. Markets have changed with the growth of commercial, corporate and virtual providers of tertiary education, increasing internationalisation, and shifting funding dynamics. The increasing mobility of students and knowledge has enhanced the need to understand the emerging borderless forms of university education. The knowledge and skill development offered by universities have been flagged in conversations about education for all, and linked commercially with analyses of national and regional growth. The demography of university students has changed, with students coming from increasingly diverse national, cultural,

economic, employment and age backgrounds. Even those students once considered 'conventional' are bringing a different perspective to their university education. Higher education is facing increasing pressures to produce 'knowledge workers' (Reich, 1992) who can participate in contemporary developed economies, to respond to perceived commercial and competition dynamics, and to maintain and improve quality standards.

Widespread changes are penetrating campus-based undergraduate education, challenging practices and longstanding assumptions. There has been a loosening of the close, and sometimes historically dependent or intrinsic, connections between on-campus learning and specific locations and buildings. University education is being increasingly freed from fixed institutional timetables and, accordingly, rather than being grouped together in batches, students are being given greater flexibility to vary the rhythms of their learning. Ever more powerful and pervasive information and communications technologies are supplementing or replacing whiteboards, overhead projectors and printed materials. Constructivist pedagogical theories (Bruner, 1960; Jonassen, 1995; Jonassen and Land, 2000) have started to have a real influence on instructional practices in lectures, laboratories and tutorials. Rather than passive recipients of university activities, students are being seen as clients or customers whose needs must be placed at the centre of educational considerations. It is important to note, in particular, the large growth in international higher education and workplace learning in the last decade. Such changes are challenging many conventions and characteristics of campus-based learning.

Contemporary online learning technologies have been identified as particularly important agents of change. Although the mechanics of undergraduate education have been stable for centuries, observers now comment on the inexorable changes precipitated by the new technologies, and even the creation of a 'virtual' or 'digital' academe (de Wolf, 2001; Dutton and Loader, 2002; PIITFRU, 2002; Robins and Webster, 2002). This possibility is suggested persuasively by Gilbert (2001: 1), who, a few years ago, wrote that:

The inherited fabric of higher education is under strain around the world. Increasingly pervasive information and communications technologies are enabling people to think differently about the ways in which higher learning is conceptualised, designed, developed and delivered. In particular, the digital revolution is both creating and servicing a demand for 'virtual' learning environments and novel pedagogies that promise to transform both teaching and learning.

Similarly, de Wolf (2001: 4) contended that:

The instructor-centred, professorial university was a context well suited to the hierarchical society of the 19th and much of the 20th centuries. The new reality is that the contexts in which people live, work and learn have acquired another dimension in the form of a virtual world in which every organisation and individual creates their own virtual context.

Doubtless, online learning technologies are having, and will increasingly have, profound effects on university teaching and learning. Although change has been iterative and gradual (Gilbert, 1995, 1996; Noll, 2002; Guri-Rosenblit, 2005), has been considerably slower and less revolutionary than expected, and has been the subject of exaggerated claims by ‘technozealots who simply view computers as the panacea for everything’ (Noble, 1998: 15), online technologies continue to have a real potential to drive significant and ongoing change in campus-based education.

A great deal has been written by academics, managers and policy-makers about how online learning technologies are changing campus-based education. According to such views, university education is, increasingly, no longer centred around students travelling to campus, attending lectures, sourcing materials from the library, and turning in printed papers to be assessed. Instead, the online learning technologies are interacting with other trends to generate and support new qualities and patterns of campus-based learning. A myriad of new terms have been developed to capture the perceived changes. Campus-based education, it is argued, is becoming ‘hybrid’, ‘placeless’, ‘open’, ‘flexible’, ‘resource-based’, ‘networked’, ‘asynchronous’, ‘distributed’ and ‘borderless’. Although many of these terms have distinct origins and denotations, they are often used to capture similar sentiments, situations and activities. The terms are often used to identify different ways in which there has been a significant blurring of many of the qualities which once distinguished campus-based learning.

‘Distributed learning’ is one of the more theoretically rich concepts being used to analyse changing dynamics of campus-based education. Distributed learning is an idea developed initially during neural network modelling (Rumelhart and McClelland, 1986), and expanded to larger units of analysis in fascinating human factors studies of how humans learn with machines (Hutchins, 1991, 2001; Zhang and Norman, 1994). At a broad theoretical level, the term refers to situations in which knowledge is represented in dynamic associative networks, and in which learning occurs through ongoing dialogical interaction with these networks. The concept is now routinely being used in very loose ways to characterise learning that involves alternatives to face-to-face teaching, learning which takes place beyond campuses, marked internationalisation, mediation by information and communication technologies, interaction with borderless and anarchical knowledge networks, participation in diverse knowledge communities, and changed physical and temporal dynamics (Saltzberg and Polyson, 1995; Dede, 1996, 1998; Tait and Mills, 1999; Oblinger *et al.*, 2001; Dutton and Loader, 2002; Lea and Nicoll, 2002; Vrasidas and Glass, 2002). The idea of ‘distributed learning’ draws together insights from psychology, sociology, anthropology and pedagogy, and provides a rich and sensitive lens for investigating contemporary university education.

The technologically distributed campus learning environment is the context of the analysis in this book. In such environments, knowledge is being represented using multimedia that is interactive and networked rather than modularised, teaching is being extended beyond formal classrooms into virtual learning

environments, and asynchronous online tools are allowing students to interact with learning materials, their peers and the entire university in ways that are not time or place bound. This is the place in which online learning technologies are having most impact (OBHE, 2004a,b; Zemsky and Massey, 2004; Guri-Rosenblit, 2005). At this stage, fully online environments are rich, growing and important areas of activity and possibility, but still occupy only a small portion of the higher education market (Cornford and Pollock, 2002). A much larger number of students, in contrast, are encountering online learning as part of distributed campus-based rather than distance education. Indeed, online learning has almost become ubiquitous in many higher education systems around the world.

Online learning management systems

Online learning systems are at the forefront of the technological changes affecting university education. LMS are the most prominent contemporary exemplification of these systems (Zemsky and Massy, 2004). LMS have evolved rapidly over the last few years into enterprise-wide and internet-based systems, such as WebCT, TopClass/FirstClass and Blackboard, that integrate a wide range of pedagogical and course administration tools. Such systems have the capacity to create virtual learning environments for campus-based students, and are even being used to develop fully online virtual universities. LMS are also often referred to as 'learning platforms', 'learning management software', 'course management technology', 'managed learning environments', 'virtual learning environments', 'course management systems', 'online learning environments', 'digital learning environments', 'content management systems', 'portals' and 'instructional management systems'. For convenience, and to reinforce the secondary emphasis on technology in this book, the generic label 'online learning system' will be used, qualified in appropriate ways as required. Even though the systems themselves are in a constant state of developmental flux, they are becoming ubiquitous at universities around the world, adding a virtual dimension to even the most traditional campus-based institutions.

The development and functionality of online systems

While not the focus of this book, it is useful to provide a brief overview of the development and nature of online LMS in order to contextualise these powerful educational technologies. Contemporary LMS date from the mid 1990s (Robson, 1998; Inglis *et al.*, 2002). An important antecedent was the development of interactive multimedia programmes. While these programmes made it possible for students to work with learning materials on individual computers, they had limited administrative functions, were rarely networked or linked with large databases, or accessible via the emerging internet. The latter half of the 1990s saw the development of computer hardware, databases and networks, and a convergence of technologies that enabled the emergence of systems resembling contemporary

online LMS. These systems contained expanded pedagogical tools, course administration software, and internet-based interactive multimedia, often referred to as 'hypermedia'. Their modularised and packaged nature facilitated commercialisation and more efficient forms of market penetration. Gradually, international standards are being developed as the systems grow in power, reliability and functionality. Among the most important standards are the Instructional Management Systems (IMS) (IMS, 2005) and the Advanced Distributed Learning Sharable Content Object Reference Model (ADL, 2005). Despite such developments, the full potential of online LMS is only starting to be realised. Morgan (2003), Kvavik *et al.* (2004) and Kvavik and Caruso (2005), for instance, note the enhancement of content management capabilities, and a movement towards making the systems increasingly like operating systems that can support a vast range of more specific software tools.

Although online LMS have matured significantly in the last decade, they remain in a state of constant development and their architecture and functionality varies from product to product. Typically, LMS provide a suite of subject and course administration and pedagogical tools of differing sophistication and potential. These include:

- asynchronous and synchronous communication tools such as announcement areas, email, chat, list servers, instant messaging and discussion forums
- content development and delivery capabilities, including learning resources development and learning object repositories
- formative and summative assessment tools allowing submission, multiple choice testing, grade books, collaborative work and feedback
- class and user management facilities that support registering, enrolling, displaying timetables, managing student activities and electronic office hours.

Within limits, the structures, processes and online appearance of the systems can be customised at the individual, subject, course or institutional level. To varying degrees, the systems can be linked with others within an institution, and are often accessed through 'portals' (Franklin, 2004) which provide computer users such as students with a single and individualised point of access to university online resources and services. Different types and levels of support and training are offered with particular systems and typically constitute significant parts of a package or licence agreement.

While LMS are in their early stages of development, important market trends have already emerged. A number of commercial systems have assumed prominence in international markets, mostly notably TopClass/FirstClass (WBT Systems, 2005), NextEd (NextEd, 2005), WebCT (WebCT, 2005), Blackboard (Blackboard, 2005) and Lotus Learning Management System (IBM Lotus, 2005). Together, WebCT and Blackboard account for most of the LMS market. Most LMS were commercialised after originally being university development

projects, rather than as direct results of business development activities. Many institutions have developed their own LMS at some point, and many systems have been designed specifically for European markets (Paulsen, 2003). In recent years, several major USA universities have chosen to release their LMS under open source rather than fully commercial licences. Some of the most prominent open source systems have been gathered together in the Sakai Project (Sakai Project, 2005), and are being developed at wealthy USA institutions such as the University of Michigan, MIT, Stanford University, UC Berkeley, John Hopkins University, Northwestern University, Columbia University and Yale University. These developments have grown in collaboration with a standards development programme called the Open Knowledge Initiative (OKI, 2005). The open source approach has drawn much and ever increasing interest due to its potential to forge genuine industry-wide standards for the first time. While not relevant in this book, it is important to note that industry, vocational training and the public sector have been major markets for learning management technologies.

Adoption and deployment of LMS

The adoption of online LMS by universities has been very rapid. While developed in large part in the USA, in the last ten years the systems have spread through Canadian, UK, Australian, South African, East Asian, Scandinavian and European markets. Their growth is exemplified by the spread of the WebCT and Blackboard LMS, as captured in recent international surveys (Green, 2002a, 2003; OBHE, 2002a,b, 2004a,b). In just under ten years, these two products have grown from in-house developments in North American universities to dominate international markets. According to survey results, around 85 per cent of the 122 institutions in the 20 countries surveyed had an LMS such as WebCT or Blackboard. Together, these brands account for most online learning software in use around the world. OBHE (2004a) also reports a growth in the adoption of in-house and open-source systems to around 11 per cent. USA surveys of campus computing (Green, 2002a, 2005) suggest that the figure in that country may be around 80 per cent. These figures demonstrate the seriousness with which universities around the world are treating the need to deploy online learning systems. Indeed, in a recent discussion of distance education, Oblinger and Kidwell (2000: 34) comment that ‘Higher education appears to be on the verge of getting caught up in a “herd effect,” with institutions all moving in the direction of developing online courses.’

Despite significant adoption by institutions, and much promotion, there does not yet appear to have been overwhelming incorporation of online learning into pedagogy or curriculum. The OBHE (2004a: 9) notes that ‘Although forty percent of [institutions] claimed to have implemented an institution-wide online learning platform, only 17 per cent are shown to have actually integrated online elements into the majority of classroom activity.’ Against this, an Australian survey, Bell *et al.* (2002) found that around 54 per cent of courses contained an online

component. Data from Green (2005) suggest that figures in the USA for four-year institutions are above 40 per cent. In a study of student technology use at 12 USA institutions, Kvavik *et al.* (2004) found that an average of 83 per cent of sampled students had used a LMS, although the figure was around 60 per cent for some institutions, and around 95 per cent for others. While many of these figures are lower than might be expected, the amount of variation between them suggests that this is a complex and unsettled area of higher education.

One of the reasons for uncertainty in this area is that there are often complex patterns of adoption and deployment within institutions. While many institutions have adopted institution-wide platforms, it is not uncommon that multiple LMS are being used within a single institution. Levels of adoption may be influenced by faculty interest or experience (OBHE, 2004a), or by student preference or field of study (Kvavik *et al.*, 2004). Bell *et al.* (2002), for instance, found that penetration is greatest in the areas of commerce, education and health, where there is often strong demand for mixed-mode or off-campus delivery. The same study also found that around 60 per cent of Australian post-graduate courses and only around 25 per cent of undergraduate courses are using a form of online technology. What these insights suggest, is that while market trends paint a picture of blanket use, the real penetration of LMS into university education is complex, and is conditional on a range of demographic and contextual factors.

It seems very likely that the use of online LMS will increase. In line with Morgan's (2003) assessment, a stocktake of e-learning by Zemsky and Massy (2004: iii) notes that 'Only course management systems (principally Blackboard and WebCT) – and PowerPoint lectures (the electronic equivalent of clip-art) have been widely employed.' LMS have the potential to simplify the development of basic online materials, making possible the creation of virtual content by an increasing number of academic staff. Within limits imposed by particular systems, staff are able to develop interactive web pages, upload and integrate digital resources, and develop assessments and spaces for online discussion. Templates are often provided to guide and standardise such activities, and to help reduce workload demands placed on individual staff. Universities are encouraging or requiring each subject to have some kind of web presence, and institutions have policies and incentives to stimulate content development activities. Enterprise-wide LMS are providing a context and impetus for the continued development of structured and detailed online materials.

Why online learning systems are significant to universities

Universities have been quick to adopt contemporary online learning systems, despite the costs, complexities and risks involved. From a university planning point of view, the initial selection of an enterprise-wide online system is an uncertain yet high-stakes and high-risk decision which involves a great deal of technological and institutional forecasting. It can involve dealing with

intertwined educational, administrative and technological issues, the interests of a large and diverse range of stakeholders, and considering new dimensions of established institutional policies and procedures. The management and use of online learning systems can require developing new forms and lines of accountability and control, and considering dimensions of the interface between the academic and the administrative.

Clearly, online learning systems have an appeal which, despite their complexities and risks, has compelled a great many universities to install such a system. Access, cost and quality are three broad reasons commonly given for the contemporary importance of information technology to higher education and the paradigm shift in delivery modes that is underway (Inglis *et al.*, 2002; Daniel, 2003). It is possible to isolate more subtle and specific drivers, however, which seem to have influenced the attractiveness of LMS to universities and driven their rapid uptake (Coates *et al.*, 2005).

First, LMS are seen as offering institutions the means to provide large-scale resource-based learning. Resource-based learning refers to 'an integrated set of strategies to promote student-centred learning in a mass education context, through a combination of specially designed learning resources and interaction media and technologies' (NCODE, 2003). LMS support key aspects of resource-based learning, helping to facilitate course delivery, the identification and use of resources, communication and conferencing, activities and assessments, collaborative work, and student management and support (Ryan *et al.*, 2000). The appeal of resource-based learning has been seen as one of the key reasons why all institutions have moved in the direction of developing online dimensions to teaching.

Second, in a somewhat similar way, it is claimed that LMS bring new efficiencies to teaching. Despite the large upfront capital investments required and the lack of clear and convincing evidence as to their cost effectiveness in traditionally structured institutions (Fisher and Nygren, 2000; Fielden, 2002; Katz, 2003), universities are undoubtedly attracted by perceived opportunities to reduce course management overheads, reduce physical space demands, enhance knowledge management, unify fragmented information technology initiatives within institutions, expedite information access, set auditable standards for course design and delivery, and improve quality assurance procedures (Bates, 1995; Turoff, 1997; van Dusen, 1997; McCann *et al.*, 1998; Brown, 2001; King, 2001; Dutton and Loader, 2002). Johnstone (1993), Oblinger and Maruyama (1996), Reich (1992) and Daniel (1998a) argue, for example, that by supporting more flexible or decentralised learning activities, online learning technologies can be used to dramatically increase the productivity of learning. Although it is still too soon to really tell whether this is the case, such arguments contend that systems such as LMS will bring new economies of scale to higher education.

Third, many practitioners and researchers have suggested that online learning systems provide resources and facilities that can enrich student learning. They are seen to reinforce and enhance a diverse suite of constructivist pedagogies (Jonassen, 1995; Relan and Gillani, 1996; Gillani, 2000; Jonassen and Land, 2000;

Morgan, 2003; Kvavik *et al.*, 2004). Constructivist theorists contend, for instance, that online learning can enrich education by allowing students to access a greater range of resources and materials. It is further argued that internet technologies can be used to make course contents more cognitively accessible to individual learners by allowing them to interact with diverse, dynamic, associative and ready-to-hand knowledge networks. Online systems may also enrich learning by providing automated and adaptive formative assessment which can be individually initiated and administered. Finally, universities may enforce the use of online learning systems for the espoused purpose of developing students' technology literacy.

Fourth, student expectations for advanced technologies are increasing almost as quickly as the technologies are developing. These expectations are leading directly to demands on universities to adopt online learning systems. Green and Gilbert (1995: 12) write that 'growing numbers of college-bound students come to campus with computer skills and technology expectations'. Frand (2000) further argues that contemporary students have an 'information-age mindset', and that their skills and expectations are tacit and profound. In the increasingly competitive higher education marketplace in which students are increasingly perceived as some type of client (Gilbert, 2001; Goddard and Cornford, 2001), these expectations need to be matched or exceeded. It is increasingly expected that institutions embrace leading-edge technologies. Green and Gilbert (1995: 12) write that 'The old competitive reference points describing information resources that used to distinguish between institutions – the numbers of science labs and library books – are being replaced by a new one: information resources and tools available to students.'

Fifth, competition between institutions, and from new entrants into higher education markets, has created pressures to adopt online LMS. Traditionally, distance orientated institutions have embraced new generation technologies and opportunities to reconfigure and expand their programmes (Garrison and Anderson, 2003). More traditionally campus-based institutions have seen the adoption of new technologies as necessary for developing campus environments. University strategic plans, for instance, have asserted that 'despite the magic of the campus... for the campus-based university to survive, the campus experience will have to capture all the pedagogical richness of the new teaching and learning technologies and modalities' (University of Melbourne, 2001). Almost regardless of their history or strategic direction, institutions have seen online learning systems as a means of leveraging the internet to offer some kind of competitive advantage. Universities are being forced to offer the best of both worlds: real and virtual.

Sixth, LMS are sometimes proposed as a key means of responding to massive and increasing demands for greater access to higher education. In responding to pressures from individuals, industry and nations, online systems are perceived as a way of significantly expanding opportunities for accessing higher education (Daniel, 1998a; Goddard and Cornford, 2001). The development of virtual places

for learning is heralded as a key means of overcoming access limitations caused by the lack of physical infrastructure (Johnstone, 1993; Dearing, 1997; Daniel, 1998a; Hanna, 1998; Gilbert, 2000, 2001; O'Donoghue *et al.*, 2001; Duderstadt *et al.*, 2002; Moe, 2002). Perhaps more significantly, however, LMS have also been identified as a means of qualitatively reforming higher education so that it can most effectively confront new types of demand. Analysts contend that without substantial change, traditionally structured universities will be unable to deal with a new era in which they no longer monopolise the provision and certification of tertiary education. Contemporary learning technologies, and LMS in particular, are placed at the heart of these calls for renewal.

Finally, and not least, LMS are part of an important cultural shift taking place in teaching and learning in higher education. As hinted by Agre (2002) and Cornford (2002), LMS offer universities a hitherto undreamt-of capacity to control and regulate teaching. From a managerial perspective, the disorder associated with academic independence and autonomy in the teaching and learning process can appear chaotic and anarchic. The management and leadership of academic communities requires, correspondingly, a high tolerance of uncertainty, but such tolerance is increasingly under pressure in an era of attention to quality assurance and control. In such a milieu, LMS may appear to offer a means of regulating and packaging pedagogical activities by offering templates that assure order and neatness, and facilitate the control of quality. The perceived standardisation or order created in teaching and learning by LMS may be one of the more persuasive reasons for their rapid uptake.

From a survey of 122 institutions in 20 countries, the OBHE generated estimates of the perceived importance of many of these factors. The survey results suggest that on-campus learning and on-campus flexibility are the most important rationales for online learning. Enhancing campus-based education is followed by the ideas of competitive advantage, widening access, supporting distance learning, accessing new international markets, servicing disabled users, supporting existing international markets, enhancing collaboration, cutting costs, accessing existing and new corporate clients, and economic development. Such results reinforce the emphasis of this book on campus-based online learning, and on the desire of and need for institutional managers and leaders to identify and exploit the educational value added by online systems.

Learners not users: refocusing research of online university education

Given the extensible nature of online learning systems and their rapid uptake by institutions, it is likely that they are having, and will continue to have, significant implications for university education. Unlike other financial or human resources management systems recently introduced into universities, online learning systems have the potential to directly affect day-to-day patterns of teaching and learning in unanticipated ways. Despite this, research into the educational aspects

of these systems is still in its infancy. In spite of widespread levels of adoption, and although online learning systems are essentially devices for teaching, most research has focussed on their technical, financial and administrative aspects.

Online LMS have a wide range of implications for university education which are only just beginning to be identified and explored. On paper, at least, LMS have the capacity to influence students' access to learning resources, communication between staff and students, learning experiences, formative and summative assessment, the way academics teach, the creation and even ownership of learning materials, the management of teaching programmes, and students' overall university experience. These are core qualities of campus-based university education.

While these issues are significant and even central to campus-based education, they have been the subject of relatively little research. In efforts to identify salient topics for analysis, there has been an increase in the number of small-scale, localised and descriptive case studies which have, in particular, examined the effects of information and communication technologies on teaching (Merisotis and Phipps, 1999; Kezar, 2000). One index of the maturity of this area of research is that key terms such as 'distance learning', 'open learning', 'flexible learning', 'distributed learning', 'asynchronous learning', 'borderless education', 'virtual learning', 'hybrid teaching', 'ubiquitous computing' and 'online learning' often appear to be treated synonymously in many instances. There are only a few notable exceptions in which more powerful and generalisable frameworks have been developed (Laurillard, 1993; Garrison and Anderson, 2003; Kvavik *et al.*, 2004). Despite considerable practical impact and much exploratory attention in the research literature, therefore, researchers seem to be only just beginning to identify the underpinning practical and theoretical issues and developing explanatory interpretations of the changes taking place.

So far, students have been particularly ignored and taken for granted in online learning research. In most studies of online learning, it appears as if students are treated as unproblematic 'users' rather than as 'learners' who are engaged in the complex and difficult venture of constructing their knowledge. Indeed, LMS companies have held various 'users' conferences – a possibly new term for 'students', 'teachers' and 'educational administrators'. Students have been assumed to be 'digital natives' who have natural aptitude and inclinations for online learning. As is documented in subsequent chapters, even the small amount of research that has focused on educational issues has tended to examine pedagogy rather than student learning. Crook (2002: 105) puts this point succinctly, arguing that:

Within the evolving debate about virtual universities, the voice of one particular stakeholder seems strangely absent. I am thinking of the student. . . . Indeed, it is ironic that, while students are now often regarded as a species of customer, the tradition of interest in customer opinion is rarely applied.

This is further surprising, given claims that while 'the effects of the new educational technologies are already considerable...eventually they will

profoundly alter the student experience in higher education' (Ward and Newlands, 1998: 172). Thus, despite the importance of students in education, and despite the rapid, widespread and substantial uptake of online LMS by universities, not much is known about how the systems are affecting student learning.

The major premise driving this book is that if online learning systems are having widespread effects on university education, then it is likely that they are affecting students. It was noted above that contemporary systems have the capacity to affect how students interact with their peers, teachers, learning materials and university administration. It would seem vital, therefore, to develop knowledge about the general ways in which students are going about learning in distributed campus environments. Much remains to be discovered, however, about how undergraduate students are engaging with activities and conditions that are known to promote their learning and development. Most research into online technologies in higher education either completely ignores or, at most, pays little attention to student issues. Most research on student learning and development is based on unrevised assumptions about university learning environments. This book addresses the need to develop and disseminate understanding in the intersection of these areas.

Despite significant study of student learning and development, and an emerging body of online learning research, many questions to do with the overlap of these areas remain unanswered. Are online learning systems affecting how students understand and integrate into their university communities? By packaging universities into an online environment, do online learning systems make it easier for students to identify and explore institutional resources and services? What are the implications of online learning systems on the academic conversations students conduct with their peers and with staff? Do online learning systems influence the way students manage their learning, document, distribute and apply their knowledge, or the time they spend really trying to understand a topic? What are students' general understandings of and attitudes towards the systems? How do online systems affect the practical dynamics of students' learning? How do online learning systems affect the way students explore and contextualise learning resources, summarise, synthesise and make judgements about their knowledge, confront complexity and work through confusion, and get summative and formative feedback? Do contemporary systems influence students' confidence with and motivation for learning, or their understanding of the significance of what they have learned? Such questions are complex, broad and interrelated.

The above questions resonate intimately with conversations about student engagement. As discussed earlier, such conversations are concerned with the broad range of ways in which students interact with their universities. Student engagement provides an analytical and actionable context within which questions like those raised earlier can be managed, analysed and interpreted. In turn, the questions suggest that there is much we do not know about these aspects of student engagement. In short, it appears that there is much we do not know about the engagement of campus-based students who are using online learning systems.

This book builds on the most currently advanced conceptions of student engagement to offer an understanding of the engagement of campus-based, full-time, early-year undergraduate students who are using online learning systems. It investigates the patterns and processes of students' engagement in a range of educationally purposeful activities. Without such an understanding, it would be difficult to interpret the student experience, place student learning at the centre of discussions of educational effectiveness, and understand how students are actually going about using the resources which institutions provide. Investigating the engagement of students who are using online learning systems makes it possible to develop knowledge that can be used to understand, manage and improve the quality of university education and the student learning experience.

Distributed learning spaces

Contemporary online learning systems are playing a formative role in distributing learning beyond the conventional contexts of instruction. Gradually, the idea of distributed learning is being woven into the intentions, practices and architectures of contemporary university education. The following report by Winston (2005) shows how learning or information commons capture this trend:

The Information Commons is an innovative collaboration between the School of Arts and Sciences, the Office of the Provost, and the Library. It will offer College undergraduates and other students a flexible and supportive environment that will enhance their ability to do research, to experiment with technology and new media, and to practice collaborative learning.

The Commons will house three distinct but closely related resources: the College Tech Center, the Digital Media Lab and Academic Consulting Services. The College Tech Center will provide students with a creative and technology-rich environment in which to hold study groups and work on collaborative projects. The Digital Media Lab will offer students the training, equipment and support they need in order to work effectively with video, audio, web publishing and other digital media. Academic Consulting Services will provide guidance and support to students as they work to improve their skills, effectiveness, and confidence in writing, speaking, research and original inquiry.

There are practical reasons for co-locating these resources at the Information Commons. Each was conceived with the primary goal of enhancing undergraduate education, and each is designed to address particular aspects of collaborative learning. The three resources require

similar types of spaces, and will have complementary operating hours. More importantly, both students and the staff who support them will profit from the synergies that will emerge from working together in this space.

The Information Commons will strengthen ties between the School of Arts and Sciences and the Library. The project will be jointly owned by the School of Arts and Sciences and the Library, and will be overseen by a Governing Board consisting of the Dean of the College, the Vice Provost and Director of the Library, and the Deputy Provost. The Governing Board will appoint a Director (who will also oversee operation of the Digital Media Lab) and a faculty-student Advisory Board. The facilities and services of the Information Commons are designed for flexibility to accommodate changing needs over time, and support new initiatives that can leverage the unique combination of resources found there.

This Information Commons is a quintessential campus-based distributed learning space. It is a technologically enhanced collaborative space which will offer students a range of opportunities for interacting with online and onsite learning resources and communities. While less formal than a classroom, it seamlessly integrates academic and administrative supports with infrastructures required for learning. An important aspect of the Information Commons is that it brings together staff and resources from across the institution into collaborations focused on student learning. It is managed and led by people with diverse perspectives on the learning cycles at the institution. It is an environment focused on engaging students in the dynamics of contemporary campus-based learning.

A snapshot of existing insights into student engagement

Higher education research has uncovered much about student engagement in the last decade or two. While research into the university student experience has been ongoing for some time, it has gained considerable momentum since the early 1990s with the development and dissemination of advanced insights into how best to turn theory into practice. We need to sustain this momentum by working continually to extend the analysis of engagement. For this, it is important to be respectful, honest and open about progress and development.

This chapter synthesises the concerns of the last two chapters. It takes a critical snapshot of what the most currently advanced research has exposed about campus-based and online forms of engagement. While this book seeks in general to synthesise these two aspects of engagement, so far they have largely been treated in separate conversations and explorations of higher education. The following review approaches them independently, therefore, to set out the ideas which researchers and practitioners have felt it important to explore. Much attention is invested in exploring and problematising online engagement, a phenomenon which has received surprisingly little analysis.

Existing research on general student engagement

Student engagement is a phenomenon which can be approached analytically in many different ways. This is partly due to the fluid nature of the phenomenon, but also because there currently exists no consolidated theory which systematically defines its substance and structure. This may be because the phenomenon itself resists theoretical reduction, because attempts to consolidate our understanding of the phenomenon are in the early days, or because any understanding needs essentially to be situated by the context within which it occurs.

A framework is introduced here which marks out an appropriate, contemporary and compelling means of understanding student engagement. While there has been a substantial amount of research into student engagement over the last few years, it appears that the most well-defined framework has been developed as part of the USA National Survey of Student Engagement (NSSE, 2003). For

reporting purposes, the framework divides student engagement into five 'benchmarks'. The five benchmarks include:

- level of academic challenge
- active and collaborative learning
- student–faculty interaction
- enriching educational experiences
- supportive campus environment.

Although these benchmarks are intended to be somewhat independent, they clearly overlap. A supportive campus environment, for instance, is likely to be one which encourages interactions between students and staff and students' participation in enriching education experiences. Active and collaborative learning would likely involve academic challenge. Nevertheless, each dimension speaks to an educationally salient and relatively distinct aspect of higher education.

While keeping such overlaps in mind, it is useful to bring out the main emphasis and distinctive nuances of each benchmark. Although the USA NSSE framework has been developed from decades of research into student learning and development, the framework has not been promoted or explicitly linked with its theoretical and empirical underpinnings. While given some substance by Kuh *et al.*, (2005a,b), one of the most useful approaches to capture the essence of each benchmark, is to work directly from the items used for its measurement and to tap into the conversations which these items have generated.

The 'level of academic challenge' benchmark relates to students' engagement with academically challenging activities, and the extent to which institutions and teaching staff have supported such engagement. 'Academic challenge' is taken to involve students striving perpetually to operate at and push forward the frontiers of their knowledge. This may involve learning new materials, or engaging in increasingly difficult activities.

The NSSE items used to measure the academic challenge benchmark focus on students' behavioural efforts and intentions to move their learning forward. They are asked to indicate how often they 'worked harder than [they] thought [they] could to meet an instructor's standards or expectations' (2004: 33), how many hours they spent preparing for class, how many papers they wrote of specified lengths, and the extent to which they analysed, synthesised, evaluated or applied information or their knowledge. Such items suggest that academic challenge involves students writing long papers, spending a sufficient number of hours preparing for class, and working to convert information into knowledge and understanding.

In the 'active and collaborative learning' benchmark, the NSSE focuses on students' involvement in key intellectual and social activities related to learning. While combined into a single benchmark, it is useful to think about 'active learning' and 'collaborative learning' as two educational ideas. In general, active learning is about students' participation in experiences which involve them constructing new knowledge and understanding. Collaborative learning, by contrast, involves

students learning through appropriately situated conversational interaction about knowledge with their peers. Although dependent on definitions, it seems likely that active learning is a broader concept than collaborative learning. While people can learn actively by themselves without collaboration, collaborative learning would likely involve active engagement.

The questionnaire items used to operationalise the active and collaborative learning benchmark measure how often students ask questions in class, make class presentations, work with peers inside and outside class, participate in course-related community projects and discuss curricula materials outside class. The items emphasise active collaboration rather than independent or intellectual forms of active learning. As such, they really emphasise the situated or social constructivism which underpins the idea of engagement.

The 'student-faculty interaction' benchmark focuses on students' contact with academic teaching and, to a lesser extent academic support staff within and, particularly, beyond formal instructional environments. This benchmark is derived from evidence which suggests that direct individual interaction with faculty provides students with opportunities for developing mentoring relationships, for experiencing vicariously how academic staff approach and acquire new knowledge, for being exposed to target knowledge, and for having the kinds of learning conversations which can really help students learn and develop.

These ideas are multifaceted, as reflected in the items within this benchmark. The NSSE items focus on the frequency with which students discuss assessment processes and outcomes with instructors, meet with faculty beyond class to talk about course materials, receive prompt diagnostic performance feedback, and engage in broader forms of interaction with staff such as research, careers advice or non-coursework activities. The items tap activities which would be initiated by staff, and activities which might be initiated by students. While they cover much substantive ground, they do not emphasise routine in-class interactions, assessment-driven interactions, or more administrative forms of contact. Rather, they pinpoint experiences likely to indicate deeper, broader and more formative pedagogical forms of contact.

The 'enriching educational experiences' benchmark encompasses many of the broader experiences that students may have around the university, particularly those which occur outside of class. These kinds of experiences relate to qualities such as diversity and difference, energy and stimulation, culture, ethics and values, and interpersonal understanding. According to the NSSE (2004: 38), 'Such experiences make learning more meaningful and, ultimately, more useful because what students know becomes part of who they are.' While broad, these are the kinds of activities and conditions which are often used to characterise university education.

The NSSE items bring out the breadth of the idea of 'enriching educational experiences'. They do this by targeting the extent to which students interacted at university with people from other backgrounds, participated in study abroad and exchange opportunities, studied a foreign language, used technology to

communicate with their institution, and participated in cocurricular activities such as internships, volunteer work or beyond-class learning communities. The items target behaviours which would typically lie beyond a student's formal curriculum, and thus with which students may engage irrespective of their course of study. While they are heterogeneous, perhaps even by their nature and purpose, they are intended to capture key aspects of USA students' interaction in the broader offerings of university life.

The fifth NSSE benchmark, 'supportive campus environment', focuses on the degree to which institutions engender conditions that are likely to make student engagement possible and, indeed, probable. This benchmark focuses more on students' perceptions of institutional provision, rather than on students' individual engagement. It is institutions and their staff which are the object of this benchmark. The emphasis, however, is on students' perceptions of their environmental supports.

While universities can support students in many ways, the NSSE items hone in on some of the most important. To what extent, for instance, do students see their environment as helping them cope with noneducational responsibilities, or as providing them with the support they need to prosper in their studies? Many people are involved in the educational process, however the NSSE items focus on student relations with faculty, support staff and peers. Although other forms of social support and institutional infrastructure are no doubt enabling, the NSSE highlights these key relationships as those which are necessary for promoting successful learning.

The framework developed for the USA NSSE has been advanced here as the best existing understanding of student engagement for a number of reasons. First, the framework was developed explicitly as a model of university student engagement. The student experience has been captured and explored through many different patterns over the years. One of the many important advances made by the USA national engagement survey, however, is that it has framed those aspects of the student experience which research has linked conceptually and empirically with productive learning, and has developed and marketed them under the banner of 'student engagement'. Importantly, it has disseminated and promoted the idea of engagement as a phenomenon with value to university faculty, managers and leaders. In important respects, the NSSE framework has centred diverse conversations about the student experience around the concept of 'engagement' and, through this, enhanced the depth and utility of the concept.

Second, as suggested earlier, it appears that the NSSE framework is the most advanced existing conceptualisation of the phenomenon. School-level studies have distinguished cognitive, affective and behavioural components of student engagement (Bartko, 1999; Willms, 2003; Fredricks *et al.*, 2004). While engagement may encapsulate these dimensions, this classification by itself seems too general to translate directly into practice. The NSSE benchmarks were developed specifically to provide levers for linking theoretically driven data with action. Low levels of student-faculty interaction might provide immediate information on the pedagogical dynamics in an academic department. Low levels of academic

challenge, for instance, might hint that students in a particular course are not participating in the kinds of learning experiences or environments which are likely to consolidate and enhance their knowledge.

Third, as the basis for the USA national survey, it has become solidly integrated into higher education conversations. As one index, a search on www.google.com in September 2005 for 'NSSE engagement' returned over 70,000 hits. Particularly in the USA, a considerable amount of energy has been invested in marketing the NSSE to implant it into conversations about institutional and educational quality.

Fourth, the NSSE framework was developed to satisfy the sometimes competing aims of being theoretically plausible, empirically valid and practical. As written in the national report (NSSE, 2001: 10), the benchmarks were developed to be 'easy to understand and have compelling face validity', to 'empirically establish the level of student engagement in effective educational practices', and to 'represent student behaviours and institutional conditions that colleges and universities can do something about'. They have been found to be positively related to satisfaction and achievement on a wide variety of dimensions, and have sound psychometric properties (Kuh *et al.*, 1997; Kuh *et al.*, 2001; NSSE, 2002). Although the framework has not been linked in-depth with its underpinning theoretical ideas, it does provide a parsimonious response to the tensions which tend to drive large-scale research and development.

Fifth, despite any redundancy due to overlaps between the benchmarks, it is likely that the multidimensionality of the NSSE framework enables it to capture the necessary and sufficient components of engagement. Conversely, it seems unlikely that any meaningful coverage of engagement could be captured in a single benchmark. Further, the multidimensionality promotes a system of checks and balances between the benchmarks.

Sixth, as discussed earlier, the framework has evolved out of the accumulation of a substantial amount of research into good or effective practices in undergraduate education, particularly the work of Astin (1985, 1993b), Pace (1979) and Chickering and Gamson (1987). As such, and as argued by those leading the USA NSSE (Kuh, 2003), it presents a cogent distillation of the findings of many decades of research into the key qualities of how university students engage with their learning.

Despite these strengths, the framework summarised earlier is not without its limitations. First, as with engagement itself, the framework is very broad and condenses findings from many different studies into a small number of benchmarks. Such conflation can produce discontinuities at finer levels of analysis. Without sufficient contextualisation, for instance, it is possible that 'working with other students outside class' might involve forms of collusion rather than collaboration. It is also likely, as suggested above, that not all active learning is collaborative in nature. The capacity to ask questions in class and contribute to class discussions is likely to be highly dependent on pedagogy and field of education. It is important to keep in mind the generality in the framework to avoid contradictions arising from such conflation.

Second, although it has been the focus of much activity and has achieved much popularity, the NSSE framework is by no means the last word on engagement. In its current manifestation, engagement is a relatively new educational phenomenon. While not without its essence, engagement is an essentially fluid phenomenon. It is likely to undergo much change as it further applied and developed in research, policy and practice.

Third, to date, most student engagement research has been done in the USA. This is largely because of the strong tradition in the USA of research into student learning processes and broader aspects of the student experience. In consequence, while higher education has generic qualities, certain assumptions and language do not apply directly to other cultures or systems. The form of studying abroad developed in the USA in the last twenty years, for instance, is different in key ways to the exchange or cross-national international experiences of European, Southeast Asian or Australian students. It is far from certain that the pedagogical and social assumptions which underpin collaborative learning and student–faculty interaction hold in different cultures. The word ‘faculty’ is typically used in a different way in the USA than elsewhere. Even the tacit emphasis on a liberal arts education has a distinctly North American feel. Although it seems likely that many aspects of engagement would be necessarily parochial, perhaps even specific to individual institutions, it is important to highlight the enduring and generalisable educational aspects of the phenomenon.

Fourth, while the benchmarks are built on a substantial amount of research, there is, in many instances, no one-to-one mapping between the research and the benchmarks. The framework does present a useful lens for organising research into the student experience, as demonstrated in the development of an annotated bibliography at Texas State University (Texas State University, 2003). Such exercises, however, are not sufficient to capture the rationale and substance of each dimension. Some of the benchmarks integrated diverse findings from higher education research into the student experience, and many insights from the research could be just as easily aligned with more than one benchmark. Most attention so far has been focused on developing the instrumental or operational qualities of the framework, and on weaving it into colloquial conversations about the quality of university education. There has, as yet, been no analytical attempt in higher education research to link this framework with its research foundations and fully flesh out its normative qualities.

Fifth, and perhaps most pertinently for discussion in this book, the NSSE framework has been developed with certain assumptions about the university environment which, it is argued, need to be reconsidered and revised. In many cases, university study, even for full-time students, no longer centres around individuals travelling to campus and developing an identity within a physical campus community. Student mixes have changed, the means of knowledge generation, encoding and propagation have developed, and institutional infrastructures and contexts have been transformed. It appears that many of today’s students learn in environments which may be best understood as distributed

in nature, especially as a result of the powerful organising forces of online technology.

A critical snapshot of research into online engagement

There has been an explosion of studies into online learning in the last decade. Researchers have sought to explore, document and engineer online learning technologies with the same exciting momentum with which the systems have entered educational space. Research in this area has ranged across and interwoven a diverse range of issues from pedagogy, psychology, graphic design, institutional management, finance, risk management and equity to ethics. Much of this research has focused primarily on the technologies involved. The more adventurous investigations, however, have explored and exposed the educational possibilities and implications of the technologies.

Existing insights from online learning research

It seems possible, if not likely, that research into online learning would have developed a means of understanding campus-based students' engagement with online learning systems. Research into online education has focused on many areas in efforts to understand the rapid penetration of online technology into higher education. Extensive review of the major research surrounding contemporary enterprise-wide online learning systems, however, reveals no studies that have a direct substantive overlap with the current analysis.

Despite this, it is instructive to survey the work which has been done. A selection of themes and sample studies is shown in Table 4.1. Many books and papers have been written about the higher education market, different models for higher education and the transformative influence of the technologies. Such works typically present fascinating insights into the broad societal or technological corollaries of online learning in higher education. Many studies have focused on organisational and institutional issues. The vast majority of such studies appear to be evaluations, or the by-products of evaluation and development activities. As such, they expose and formalise many salient phenomena which pervade the introduction of sophisticated online technologies into pedagogy and curricula. Several studies and programmes have analysed the adoption and deployment of online technologies. There has perhaps been less of these than expected, however, perhaps due to the autonomy and complexity of institutions and national systems. Analyses of the equity and ethics of online learning have focused on issues such as social exclusion, the digital divide and computer literacy. Implications of 'virtualisation' for the internationalisation of higher education have been considered, particularly in relation to development and student mobility issues. The financial and economic aspects of online learning have been considered. A large number of studies have investigated online pedagogy, faculty work and academic development. Learning and the student experiences have been addressed, although often in highly focused and compartmentalised analyses of particular issues.

Table 4.1 Themes and sample studies from online learning research

Themes	Sample studies
Systemic implications of online learning	Jensen (1998); Langlois (1998); Brown and Duguid (1996); D'Antoni (2004); Oblinger and Kidwell (2000); Duderstadt (1998); Massy and Zemsky (1995); Anderson and Elloumi (2004); PIITFRU (2002); Ryan <i>et al.</i> (2000); Keegan (2000); Daniel (1998a); Oblinger <i>et al.</i> (2001); Bonk (2004)
Organisational and institutional issues	Smissen and Sims (2002); McNaught <i>et al.</i> (1999); Hanna (1998, 2000); Duderstadt <i>et al.</i> (2002); Daniel (1998a); Twigg (2003); Khakhar (1999)
Technical issues	Franklin (2004); Taylor (2001); Paulsen (2003); Green (1996)
Adoption of online technologies	OBHE (2002a,b,c,d, 2004a,b); Green (2002a); Bell <i>et al.</i> (2002); Katz (2003); Daniel (1998a); Ryan <i>et al.</i> (2000)
Equity and ethics	Barraket <i>et al.</i> (2000); Clarke (2002)
Internationalisation	Farrell (1999); Daniel (1998a); D'Antoni (2004); World Bank (2002)
Financial and economic aspects	Fielden (2002); Fletcher (2003); Jackson (2003); Turoff (1997)
Pedagogy and faculty work	Green and Gilbert (1995); Ansorge and Bensus (2003); Samal and Gopal (2003); Gordon-Smith and Ferguson (2002); Dringus (1999a,b); Beaudin (1999); Palloff and Pratt (1999); Jolliffe <i>et al.</i> (2001); Bonk <i>et al.</i> (2001); Conrad and Ana-Donaldson (2004); Morgan (2003); Anderson and Elloumi (2004); Postle <i>et al.</i> (2003)
Student learning	Laurillard (2002); Carmean and Haefner (2002); Ryan <i>et al.</i> (2000); Crook (2002); Wolfe (2000); Anderson (2000); Fabri and Gerhard (2000); Pena-Shaff and Nicholls (2003); Piskurich (2004); Oliver and Shaw (2003); Flowers <i>et al.</i> (2000)
The student experience	Hara and Kling (2002); Teh (1999); Hamilton and Zimmerman (2002); Picciano (2002); Coomey and Stephenson (2001); Dillon and Gabbard (1998); Garrison and Anderson (2003); Petrides (2002); Moan and Dereshivsky (2002); Palloff and Pratt (2003); Lombard and Ditton (1997); Salmon (2000); Gatz and Hirt (2000); Carswell <i>et al.</i> (2000); Stokes (2000); Conrad and Ana-Donaldson (2004); Meyer (2002); Wilson and Whitelock (2000); Jelfs and Whitelock (2000); Wilkin and Faccin (2003); Yu and Yu (2002); Milliken and Barnes (2002); Selim (2003); Beaudoin (2002); Rovai (2000, 2002a,b,c); Valenta <i>et al.</i> (2001); Todman (2000); Kaminski <i>et al.</i> (2003); Kvakik <i>et al.</i> (2004); Kvakik and Morgan (2004)

While studies of online learning have exposed much about the areas which investigators have felt relevant to explore, and while many inform specific aspects of an understanding of online student engagement, many are limited in their capacity to advance a broad educational understanding of how the systems

influence student learning and development. Rather than present mature conceptual models, it seems that many studies have sought to identify salient phenomena for analysis. Further, many of the studies are focused on the technologies or on teaching, rather than explicitly on students.

Studies which have explored broader aspects of the student experience have focused on students from a range of populations. These populations include post-graduate, mature age, professional or international populations (Stokes, 2000; Beaudoin, 2002; Picciano, 2002; Rovai, 2002a,b), and distance or purely online students (Carswell *et al.*, 2000; Wilson and Whitelock, 2000; Meyer, 2002; Rovai, 2002b). The general findings of such research are not necessarily irrelevant to analysis of the campus-based engagement of early-year students. It is likely, however, that they would require substantial adaptation to be applicable to the population of campus-based undergraduate students of interest in this book.

In addition to any issues regarding substantive relevance, much online learning research has had methodological limitations which have hindered its capacity to produce a generalisable perspective on campus-based online engagement. Very few studies have either been theoretically based or empirically validated in ways which make them appropriate foundations for the analysis of campus-based online engagement.

Many studies are not located within an explicit and generalisable theoretical framework (Carswell *et al.*, 2000; Gatz and Hirt, 2000; Moan and Dereshiwsky, 2002; Kaminski *et al.*, 2003; Wilkin and Faccin, 2003; Conrad and Anadonaldson, 2004; Kvavik *et al.*, 2004).

Most studies of the student experience only focus on a particular aspect, such as email use (Gatz and Hirt, 2000), website navigation (Selim, 2003), computer literacy and preparedness (Stokes, 2000; Kaminski *et al.*, 2003), computer mediated communication (Wilson and Whitelock, 2000), computer anxiety (Todman, 2000), online presence (Lombard and Ditton, 1997; Jelfs and Whitelock, 2000) or learning styles (Stokes, 2001; Valenta *et al.*, 2001).

Many studies are descriptive or prescriptive, and employ no empirical validation (Salmon, 2000; Carmean and Haefner, 2002; Crook, 2002; Hamilton and Zimmerman, 2002; Hara and Kling, 2002; Palloff and Pratt, 2003).

Many studies have methodological limitations, including deficits in sampling such as convenience selection, lack of multi-institutional or multidisciplinary cross-validation, using potentially out-of-date secondary data sets, control group problems, lack of operationalisation and measurement problems (Teh, 1999; Flowers *et al.*, 2000; Salmon, 2000; Valenta *et al.*, 2001; Hamilton and Zimmerman, 2002; Hara and Kling, 2002; Moan and Dereshiwsky, 2002; Petrides, 2002; Picciano, 2002; Rovai, 2002a; Yu and Yu, 2002).

In addition to these apparent limitations, online learning studies often appear to have been conducted by 'early adopters', who appear to read as being uncritical and perhaps even 'interested' in their findings. This lack of scientific distance has been noted by many (Noble, 1998; Merisotis and Phipps, 1999; Flowers *et al.*, 2000; Kezar, 2000; Kuh and Vesper, 2001; Kuh and Hu, 2001b; Milliken and

Barnes, 2002; Zemsky and Massy, 2004). Many studies have not been investigative in nature, but have grown from small-scale and localised evaluations, which have focused on the use of specific technologies in single classes, courses or institutions.

Despite the significance of campus-based online learning, there have been very few theoretically based and empirically validated studies of how students engage in these contexts. A few meta-analyses have emerged (Dillon and Gabbard, 1998; Coomey and Stephenson, 2001). More importantly, two excellent theoretically based and empirically validated frameworks have been proposed. In one of the most important contributions to online education, Laurillard (1993, 2002) advanced a 'conversational framework' for exploring the influence of educational media on learning. More recently, Garrison and Anderson (2003) have advanced a 'conceptual framework' for exploring transactions between the social, cognitive and pedagogical aspects of electronic learning. To a certain extent, these contributions tend to focus exclusively on online learning, rather than on online learning as part of a broader student experience. Although they emphasise the socially situated nature of learning, their focus is on learning rather than the broader aspects of the student experience. Further, the frameworks are not developed specifically as devices to facilitate the investigation of campus-based higher education.

Despite their substantive and methodological limitations, in terms of the current analysis prior online learning studies do provide a wealth of information about those attributes and qualities of online learning which have been seen as educationally important. While researchers have focused on many different technologies, educational contexts and forms of online learning, the content of the literature does provide insights which can contribute to a picture of the characteristics of online student engagement.

Existing insights from student engagement research

While the above analysis has focused squarely on online learning research, it is also possible that student engagement research might have explored the nature and implications of online learning on campus-based education. Despite the ubiquity of the technologies, however, only a small amount of such research has examined the implications of online learning technologies. While a large number of studies have investigated connections between computer technologies and learning, the findings from these have not been synthesised into education research. Student engagement research has yet to embrace the significance of contemporary technologies, and to develop an appropriately revised understanding of the student experience. Brief review of the few studies which have been conducted makes this apparent.

Kuh and Vesper (2001) examined relationships between students' use of and familiarity with information and communication technologies and their self-reported learning gains. From correlational analysis of CSEQ (CSEQ, 2004) data, they found that students who reported becoming more familiar with computers

during their university study showed greater increases on the range of self-reported gains, although there were smaller gains in the areas of general education, art, literature and history. The findings suggest links between familiarity with computers and productive learning, inasmuch as students who use computers are likely to gain more from their university experience. Based on the strength of these findings, Kuh and Vesper (2001: 97) suggest that:

every institution is obliged to determine how students are using information technology and how IT policies and practices affect student learning, not only in areas traditionally linked with computer use (e.g., analytical thinking, scientific developments), but in a range of other important learning and personal development outcomes.

In another study, Hu and Kuh (2001b) analysed university context in an analysis of whether the 'degree of campus wiredness' (Bernstein *et al.*, 2000) influenced students' engagement with good educational practices. The study was conducted in response to the observation that 'relatively few studies have looked specifically at the relationships between computing and information technology and the overall undergraduate experience' (Hu and Kuh, 2001b: 3). Based on analysis of CSEQ data, and data from a survey of campus computing resources, Hu and Kuh (2001b: 15) found that:

Attending a wired campus seems to have positive though trivial in magnitude benefits on engagement in good educational practices. ...the pervasive presence of C&IT [computing and information technology] at more wired campuses as determined in the present study did not have any negative effects, but ranged from benign to slightly positive on the outcome variables of interest.

While their analyses failed to account for the hierarchical structure of institutions (Goldstein, 1999) and their results had small effect sizes, the findings are at least suggestive of the impact of technological resources on the student experience.

Kuh and Hu (2001b) examined links between the use of computing and information technology (C&IT) and the amount of effort students expended in other academic and educationally purposeful activities not involving C&IT technology. The analysed CSEQ items, to which students are asked to respond 'never', 'occasionally', 'often' or 'very often', include: 'Used computer or word processor for paper'; 'Used E-mail to communicate with class'; 'Used computer tutorial to learn material'; 'Joined in electronic class discussions'; 'Searched Internet for course material'; 'Retrieved off-campus library materials'; 'Made visual displays with computer'; 'Used a computer to analyse data'; and 'Developed Web page, multimedia presentation'. Through analysis of 1998 and 1999 CSEQ data, they found in general that 'using C&IT is related in complex, statistically significant ways to the amount of effort students devote to educationally

purposeful college activities' (Kuh and Hu, 2001b: 227). They also examined links between use of C&IT and several academic and general developmental outcome variables, including general education, personal development, science and technology, vocational preparation and intellectual development. They found that different interactions with C&IT were linked with different learning and developmental outcomes. The implications of these findings are very general, and suggest that technology use is both directly related to student outcomes, and that it may mediate the influence of other kinds of activities.

In 2003, the USA NSSE (NSSE, 2003) added eighteen items on information technology to the online version of its survey instrument, the College Student Report. In a correlational analysis of these items, Nelson-Laird and Kuh (2005) found an association between the use of information technology and student engagement. From this, they concluded that information technology might offer additional opportunities for engaging with university study, and that it may well constitute a special form of engagement of its own.

The results of these studies have broad but relevant implications for this book. They suggest that computing resources in the campus environment are linked with students' participation in educationally purposeful activities, and that being familiar with and using computers at university is positively related with a range of academic and general outcomes. Most generally, the studies reinforce the need for further analysis of the effects of computing technologies on students' overall levels of engagement. Hu and Kuh (2001b: 17), for instance, conclude that 'Additional research is needed to corroborate these findings and to better understand the effects of technology use on student learning and personal development.' Upcraft *et al.* (1999: 35) reinforce this perspective, and generate a number of research questions in need of investigation. These are questions such as 'What is the impact of technology on the nature and extent of student learning, both inside and outside the classroom?', 'What is the impact of technology on the campus environment and student culture?', 'How, if at all, is technology affecting the frequency and nature of students' interactions with faculty members, other students, and student affairs professionals?', and 'Is technology's impact different depending on its institutional availability and student accessibility?' In summary, therefore, student engagement research to date has set a foundation for research about C&IT conducted at the level of the overall student experience.

The student engagement studies summarised above simultaneously provide an impetus for further research and evidence that there is still much we do not know about the engagement of students who are using online learning systems such as LMS. As with educational research in general, engagement research has yet to fully understand the significance and implications of these powerful computing technologies.

To date, student engagement research has not put much emphasis on exploring the educational implications of online learning systems. Where such technologies have been considered, they have not been incorporated analytically into research. Many of the studies, such as those outlined above, have been based on secondary

data analyses. In these, data on computing technologies is obtained from just a few survey items of the many which were administered. Even recent NSSE instruments (NSSE, 2003) only include a small handful of very general items about computers. Rather than considering contemporary computing technology as part of the fabric of contemporary university education, it has been treated as a discrete part of the contemporary student experience. Engagement research has treated online learning as optional, adjunct or supplementary to campus-based learning, rather than as an integral part of hybrid or distributed higher education. This superficial approach has placed limits on the kinds of considerations that are possible, and prevented the development of many more subtle kinds of understanding. The brevity of focus has also meant that many aspects of computing technology are not even considered. The issue is much more substantial than this, however. Thus far, student engagement research has only scraped the surface of what needs to be done.

Student engagement research needs to embrace online learning technologies much more seriously. As has been argued, if computing technologies are changing universities, then it is very likely that they are affecting students. Given the scope of the changes underway, it is possible that they may even be changing some very basic qualities of student engagement. This is particularly likely over the last few years, a time in which the technologies have been rapidly developed, adopted and deployed. Rather than playing an incidental role, contemporary online technologies may be engendering new forms and patterns of engagement. Engagement research needs to be sensitive to such a possibility in order to remain relevant to the changing dynamics of university education.

Part II

Empirical strategies for investigating engagement

Measuring student engagement

Student surveys are structured conversations between learners and universities. They help leaders, managers and policy-makers ask specific questions of learners about their university experience. Surveys endorse learners as people with legitimate opportunities to feed back key information into their university learning communities. Surveys should be designed and managed in ways which ensure their relevance, efficiency and integrity.

This chapter maps out the design of the Student Engagement Questionnaire (SEQ) by discussing the definition, nature and operationalisation of several key qualities of student engagement. It begins with a deliberately technical account of the approach used to generate, validate and calibrate scales which measure these qualities. The latter part of the chapter begins a discussion of these qualities, and provides the foundations for the more extensive explorations undertaken later.

Student engagement can be quantified in many different ways. Engagement has been traditionally measured in education using indices of academic learning time. While ‘time on task’ is certainly a necessary aspect of learning, and one reinforced through behaviourally oriented studies of online learning system audit data, even on face value alone it seems too blunt a measure to capture the subtleties of the educational experience, and thus, too blunt to be of much diagnostic or prognostic value. At the other extreme, very rich measures could be obtained through direct naturalistic observation of learners. Such fieldwork, however, would likely be highly intrusive, behaviourally focused, resource-demanding and difficult to generalise. Unlike fieldwork in school education, it would be difficult to carry out in higher education, where students may learn in many diverse environments. One compromise between these alternatives has been to have students use time or activity diaries (Astin, 1985). Such diaries offer a means of gathering rich longitudinal type data from students, although they also place heavy demands on participants. Another compromise has been to use student questionnaires to gather self-report data, an approach which seems to promise an equal level of depth and richness of observation as time diaries, while only making a single brief incursion into students’ time.

Questionnaires are an extremely common means of collecting feedback from higher education students. As documented recently in the UK (Brennan *et al.*, 2003),

questionnaires are a relatively unobtrusive, inexpensive and easy means of gathering representative quantitative data compared with methods such as individual observation or interview. Questionnaires accord with the idea of student engagement, as they enable information to be gathered from students that only students themselves would be likely to know. Under certain conditions (Hu and Kuh, 2001a), multitrait-multimethod studies have shown that student perceptions gathered using questionnaires are a reliable and accurate source of information about the quality of education (Costin *et al.*, 1971; Marsh, 1987, 1990; Ramsden, 1991). A further value of carefully constructed questionnaires is that they are reusable, and can be used to gather data on specified variables over time and in different contexts.

Generating and validating measurable qualities of engagement

The SEQ was developed to provide an efficient and cogent measure of the online and general engagement of campus-based students. An iterative and multifaceted approach was used to develop the instrument. Beginning with a review of prior research, the approach sought ways to maximise the face validity, content validity, construct validity and reliability of the items and scales.

Instrument development began with the most advanced conceptualisation of student engagement, the framework developed for the USA NSSE. As discussed, this framework defines student engagement in terms of five benchmarks: level of academic challenge, active and collaborative learning, student–faculty interaction, enriching educational experiences and supportive campus environment. These benchmarks were developed initially for operational purposes, to measure and report student engagement for the national survey. Analysis of these benchmarks and the underpinning research helped shape a theoretical perspective on engagement. This perspective suggested, for instance, that challenging students academically is a cyclical process which involves diagnostic and prognostic assessment, setting high expectations, and providing challenging opportunities. The perspective captured four key qualities of effective student and staff interactions, basic pragmatics which make such interaction possible, supporting beyond-class contact, focus on broad intellectual or academic issues relevant to students, and managing communication dynamics.

The enhanced framework was used to develop a theoretical picture of campus-based online engagement. The framework was used to conduct a strategic review of online learning research and, through this, to expose phenomena relevant to this increasingly significant but surprisingly under-explored aspect of university education. Despite the lack of any prior framework of campus-based online engagement, the findings of online learning research provided a wealth of information about those aspects of online education which analysts have seen as important for student learning and development. Along with the earlier review, identifying these theoretical qualities provided a basis for the empirical work.

Working from a schedule developed from the documentary reviews, a series of semistructured student interviews were conducted to reflect in a dialogical way with students about their engagement and use of online learning systems. A number of students were sampled from different universities and fields of study for these interviews. The student interviews provided important information for instrument development. The interviews helped develop understanding of students' thoughts and feelings about their engagement with their study and online learning systems. This understanding was used to elaborate key qualities of engagement, adjust the language used to describe certain concepts and determine how to target items. Analysis of the interview data provided a foundation for drafting items and scales to measure key qualities of online and general campus-based engagement.

The draft items and scales were reviewed by a group of subject area and technical experts. These reviews helped to build the face, content and criterion validity of the instrument, reduce language and semantic problems, and gather input from these key stakeholders. People were drawn from a range of discipline areas, and consisted of international experts on student learning and development, technical experts, and individuals involved with setting up and running online learning systems at universities. They were provided with a brief background description of the project, a copy of the draft instrument and a review proforma. The expert feedback was used formatively to develop the items and scales into a draft instrument which was titled the SEQ.

The draft instrument was panelled in a focus group with students drawn from different areas of study. The panelling was undertaken to review the face and content validity of the instruments, as well as check the appropriateness of the language and the length and layout of the instrument. Students were asked to complete the questionnaire, indicate any problems or misunderstandings they had with individual items or the overall instrument, provide their interpretation of each question and its significance, and comment on areas the questionnaire seemed to exclude.

After accounting for the expert and student feedback, an instrument was designed to take 10 minutes for students to complete. A uniform response scale was used for the instrument, ranging from 'never', 'rarely', 'sometimes' to 'often'. A small-scale pilot survey was used to review the psychometric properties of the items and response scale, and the layout and administration procedures.

A multi-institutional student survey was conducted to validate and operationalise the proposed qualities of online and general engagement. Sampling was designed to survey full-time, campus-based, early-year Australian undergraduates. A stratified, three-stage, cluster sampling strategy was used to select sufficient numbers of students to achieve representative and powerful statistical estimates. A total of 1,051 students were surveyed from 17 lectures and large seminar classes in four broad fields of study at four different institutions. Sampled students reported studying for a median of three semesters. Students who reported studying part time were excluded from the analysis.

Congeneric measurement modelling was used to validate and calibrate the SEQ scales. Congeneric modelling (Joreskog, 1971) provides a means of determining the strength of relationship between each item and the targeted latent scale, the extent to which the items form a common scale, and the existence of off-dimensional cross-loadings between items. The modelling began by using PRELIS 2.30 (Joreskog and Sorbom, 1999) to generate polychoric correlation and asymptotic variance–covariance matrices between the ordinal item data for each scale. These matrices were provided to LISREL 8.30 (Joreskog and Sorbom, 1999), which was used to specify the congeneric models and generate parameter estimates using a weighted least squares procedure. The validity of each model was evaluated by examining diagnostic model fit statistics, parameter significance tests, model residuals and modification indices. Parameter estimates were interpreted for good fitting solutions.

The SEQ online and general scales and items are presented in Tables 5.1 and 5.2. The tables show the scale name, a short description of the scale and the item groupings. Item level statistics are also provided, in particular item means (\bar{X}), the standardised loading of each item on its target scale (λ) and each item's residual variance (δ). The response categories were scored from zero to four. All of the parameter estimates were statistically significant and most standardised weights were above 0.60. The residual statistics from the congeneric modelling indicated that the composite scales explained most of the item variance in around half of the items.

An estimate of alpha reliability was computed for each scale. Alpha reliability (Cronbach, 1951) is the most commonly used measure of the internal consistency of a scale. While widely used, it is recognised that alpha generally underestimates scale reliability (Cronbach and Shavelson, 2004). This is particularly the case when scales are composed of a low number of items, when the items load differentially on the common scale as in congeneric models, and when item data is ordinal rather than interval in nature.

Parameter estimates and residual statistics produced during the congeneric measurement modelling were used to calculate an estimate of congeneric scale reliability. Unlike the more conventional alpha statistic, congeneric reliability (Werts *et al.*, 1978; Joreskog and Sorbom, 1989; Reuterberg and Gustafsson, 1992; Raykov, 1997, 1998) is not based on the assumption of tau-equivalence, the assumption that each item contributes equally to the measurement of the common scale. Congeneric reliability, on the other hand, allows for each item to load differentially on its respective scale.

The congeneric reliability estimates were used along with scale standard deviations to calculate the standard error of measurement for each scale. As the standard error of an individual's scale score, the standard error of measurement can be used to develop confidence intervals for a student's score, and thus to provide an index of the accuracy of measurement at the individual level.

Although students are the primary substantive and methodological unit of analysis in analyses of engagement, operational and strategic decisions are made

Table 5.1 SEQ online scales, items and item statistics

	\bar{X}	λ	δ
<i>Online Engagement (OE): the extent to which students use online learning systems to enrich their study</i>			
Online learning systems are a major part of my university education	2.06	0.59	0.65
I used online systems to improve how I learn at university	1.90	0.78	0.39
Online systems helped me to interact better with the university	1.83	0.66	0.57
I used online systems to manage my university study	1.73	0.67	0.55
<i>Online Active Learning (OAL): key ways in which students use online systems to enhance learning</i>			
I used online materials to improve my learning	2.03	0.67	0.55
I used online materials to make lectures more meaningful	1.92	0.68	0.54
I identified expected work standards using online systems	1.76	0.59	0.65
I found that online materials challenged me to learn	1.58	0.58	0.66
I used online feedback to improve my understanding of a topic	1.57	0.60	0.64
<i>Online Social Interaction (OSI): use of online learning systems to support general forms of social interaction</i>			
Teaching staff participated in online discussions	1.46	0.54	0.71
I found it easy to explain my ideas in online discussions	1.13	0.79	0.38
I had helpful online discussions with other students	0.83	0.88	0.23
I met new people when using the online learning system	0.52	0.67	0.55
<i>Online Collaboration (OC): students' use of online systems to work collaboratively with peers</i>			
I used online systems with other students around campus	1.22	0.71	0.50
I used online systems to do academic work with other students	1.20	0.81	0.35
I used online systems to work with other students outside of class	1.12	0.75	0.44
I used university online systems to communicate with other students	1.04	0.71	0.50
<i>Online Teaching (OT): whether teachers use online learning systems to promote effective learning</i>			
Staff used online systems to clarify what was required to do well	1.90	0.57	0.68
Staff used online systems in ways that improved the overall teaching	1.78	0.69	0.53
Academic staff made an effort to communicate with students online	1.76	0.71	0.49
Staff used online systems to provide students with extra assistance	1.75	0.70	0.51
Teaching staff used online systems to tailor activities for students	1.58	0.67	0.56
Teaching staff used online learning systems to discuss interesting issues	1.53	0.73	0.47
<i>Online Academic Relevance (OAR): use of online systems to enhance the relevance and context of study</i>			
Using online systems made my study seem more relevant	1.61	0.84	0.29
Using online learning systems made me feel part of the university	1.56	0.79	0.38
Using online materials helped me put my study in real-world contexts	1.45	0.65	0.58
<i>Online Contact with Staff (OCS): the level and quality of students' online contact with staff</i>			
I used online learning systems to contact academic staff	1.73	0.68	0.54
I found it easy to communicate with staff online	1.69	0.73	0.46
I had individual contact with academic staff online	1.14	0.74	0.46

Table 5.2 SEQ general scales, items and item statistics

	\bar{X}	λ	δ
<i>Constructive Teaching (CT): whether staff inspired and supported active learning</i>			
Materials were presented in a way that I could understand	2.12	0.54	0.71
Staff valued students' ideas and questions	2.11	0.71	0.50
Staff encouraged students to question what was being taught	2.06	0.49	0.76
Academics used teaching approaches that suited students' needs	1.88	0.67	0.55
I felt encouraged to creatively explore ideas	1.81	0.58	0.66
Staff talked about their research in ways that inspired me to learn	1.56	0.58	0.67
<i>Collaborative Work (CW): students' involvement in collaborative activities</i>			
I have worked on group projects with other students	2.07	0.54	0.71
I worked with other students on difficult tasks	2.03	0.72	0.48
I thought about the best way to work collaboratively	1.83	0.49	0.76
I used spaces around campus to study with other students	1.81	0.74	0.45
I helped other students when they were having academic problems	1.75	0.48	0.77
<i>Teacher Approachability (TA): the broad interest of staff in students and student needs</i>			
Staff seemed interested in helping students	2.21	0.73	0.47
Staff were generally approachable	2.15	0.80	0.37
Teaching staff were accessible	1.98	0.80	0.36
Teaching staff made a real effort to interact with students	1.86	0.72	0.49
<i>Supportive Learning Environment (SLE): students' feelings of legitimation within the university community</i>			
Staff respected students' backgrounds, perspectives and needs	2.30	0.59	0.66
The university campus felt like a supportive place to learn	1.96	0.72	0.48
Staff seemed responsive to feedback from students	1.85	0.62	0.61
I felt part of an academic community at university	1.65	0.61	0.63
<i>Student and Staff Interaction (SSI): the level and nature of student-initiated contact with teaching staff</i>			
I had one-to-one conversations with academic staff	1.68	0.80	0.36
I initiated individual contact with a member of academic staff	1.59	0.74	0.45
I sought advice from staff on how to improve my performance	1.55	0.63	0.60
I developed a valuable rapport with a member of academic staff	1.33	0.70	0.52
I met with academic staff outside class	1.27	0.69	0.52
<i>Active Learning (AL): students' efforts to actively construct knowledge</i>			
I set high-performance standards for myself	2.22	0.61	0.63
I tried to make connections between things that I was learning	2.16	0.71	0.50
I pushed myself to understand things I found puzzling	2.14	0.69	0.52
I sought out my own resources to help me understand topics	2.07	0.58	0.67
I thought about the practical applications of material that I studied	2.02	0.68	0.54
I thought about ethical issues related to the material that I studied	1.78	0.55	0.70
<i>Academic Challenge (AC): the extent to which expectations and assessments challenged students to learn</i>			
Assessment tasks challenged me to learn	2.21	0.55	0.70
I was given enough material to keep up my interest	2.09	0.65	0.58
I was encouraged by teachers to go beyond set materials	2.06	0.51	0.74
Academic staff gave me comments on my work that helped me learn	1.90	0.70	0.52
I received feedback quickly enough to improve subsequent work	1.69	0.65	0.57

Table 5.2 Continued

	\bar{X}	λ	δ
<i>Complementary Activities (CA): participation in broadening activities around the campus</i>			
I met people with different perspectives to mine	2.26	0.41	0.16
University resources helped me to develop my non-academic interests	1.18	0.62	0.43
I participated in interesting events and activities around campus	1.17	0.76	0.95
I participated in social clubs and societies with other students	0.96	0.76	0.82
<i>Beyond Class Collaboration (BCC): collaborative work with others outside formal instructional environments</i>			
I talked with students outside of class about study	2.09	0.62	0.62
Students were required to work together outside of class	1.88	0.48	0.77
I used spaces around campus to study with other students	1.81	0.78	0.39
I studied with other students outside of class	1.81	0.72	0.48

at higher levels within institutions. The growing field of multilevel statistical analysis (Hox, 1995; Bosker and Snijders, 1999; Goldstein, 1999) underlines the importance of investigating whether the variable reliabilities obtained when calculated at the student level are consistent at aggregated levels. Classical test theory conceptualises reliability as a function of individuals' responses to items, seeing items as clustered within persons. When this relationship is conceptualised in a multilevel framework it can be extrapolated to relations between different hierarchical levels. Thus the reliability of a scale at an institutional level can be obtained by considering the students as measurement units clustered within institutions (Bosker and Snijders, 1999). Multilevel modelling software (Rasbash *et al.*, 2000) was used to estimate intraclass correlations based on students within lecture groups.

Table 5.3 presents a range of reliability estimates for each of the scales. Table 5.3 shows estimates of conventional Cronbach alpha reliability (α), congeneric reliability (ρ), the multilevel reliability estimate (η) and the scale standard deviation (s). The standardised regression weights in Tables 5.1 and 5.2 suggest that a congeneric rather than tau-equivalent model is the most appropriate for this data. Given this, congeneric reliabilities and scale standard deviations have been used to calculate the standard error of measurement (SEM). As the standard error of an individual's scale score, the SEM can be used to develop confidence intervals for an individual student's score, and thus to provide an index of the accuracy of measurement at the individual level.

The figures in Table 5.3 show a broad similarity between the reliability estimates, and that each of the estimates is close to or above 0.70, a value often used as a benchmark for scales used in large-scale survey work. As anticipated, the congeneric estimate of scale reliability provides stronger evidence for the internal consistency of each of the scales. Each of the multilevel reliability estimates calculated using the intraclass correlation for each scale are high as the average cluster size is very high.

Table 5.3 SEQ scale reliability statistics

	α	ρ	η	s	SEM
OE	0.72	0.77	0.96	0.65	0.31
OAL	0.73	0.76	0.95	0.58	0.28
OAR	0.79	0.83	0.95	0.68	0.28
OT	0.80	0.84	0.94	0.57	0.23
OC	0.75	0.83	0.95	0.71	0.29
OSI	0.69	0.82	0.96	0.68	0.29
OCS	0.75	0.76	0.93	0.76	0.37
CT	0.73	0.77	0.97	0.47	0.40
SLE	0.71	0.73	0.96	0.56	0.41
TA	0.78	0.85	0.97	0.57	0.37
AC	0.71	0.75	0.97	0.51	0.40
AL	0.74	0.80	0.95	0.50	0.39
SSI	0.81	0.84	0.95	0.64	0.37
CA	0.59	0.70	0.94	0.58	0.32
CW	0.71	0.73	0.96	0.53	0.41
BCC	0.72	0.75	0.95	0.60	0.41

Several measures of construct validity are produced during congeneric measurement modelling, including the RMSEA, GFI and TLI fit indices. The root mean square error of approximation (RMSEA) is a standard index. It tests 'how well the model with unknown but optimally chosen parameter values would fit the population covariance matrix if [the model] were available' (Browne and Cudeck, 1993: 144). An acceptably fitting model is expected to have a RMSEA around 0.08 and a good fitting model below 0.05 (Browne and Cudeck, 1993). The goodness of fit index (GFI) provides an alternative measure of model fit. This indicates 'how much better the model fits compared with no model at all' (Joreskog, 1993: 309). Like χ^2 , however, GFI has been identified as being dependent upon sample size. The Tucker-Lewis index (TLI) (Tucker and Lewis, 1973), also known as Bentler and Bonnet's non-normed fit index (NNFI) (Bentler and Bonnet, 1980), has been shown to be the only widely used index relatively independent of sample size (Marsh *et al.*, 1988; Bentler, 1990; Marsh, 1994). The TLI also has a correction for model complexity, so more complicated models which naturally account for more variance do not necessarily produce better fitting models. By convention, good fitting models are expected to have GFI and TLI values above 0.90.

Table 5.4 shows RMSEA, GFI and TLI validity statistics for the SEQ scales. Figures are not shown for the three item OCS scale, as such scales are considered to have a perfect fit to the data within the structural modelling context. Apart from the RMSEA estimate for the OSI scale, these statistics indicate high levels of construct validity for each scale.

Structural equation modelling was used to undertake a partial multitrait-multimethod analysis of the convergent, divergent and hence construct validity

Table 5.4 SEQ scale construct validity statistics

	RMSEA	GFI	TLI
OE	0.00	1.00	1.00
OAL	0.07	0.99	0.90
OAR	0.00	1.00	1.00
OT	0.06	0.99	0.93
OC	0.09	1.00	0.94
OSI	0.13	0.99	0.91
OCS	—	—	—
CT	0.04	1.00	0.95
SLE	0.07	1.00	0.93
TA	0.07	1.00	0.97
AC	0.07	1.00	0.90
AL	0.07	0.99	0.86
SSI	0.04	1.00	0.98
CA	0.07	1.00	0.97
CW	0.06	1.00	0.94
BCC	0.04	1.00	0.98

and invariance of the scales. Building on the congeneric measurement modelling, PRELIS 2.30 and LISREL 8.30 (Joreskog and Sorbom, 1999) were used to calculate the correlations between the engagement scales. Rather than investigate the full range of construct validation procedures outlined by Campbell and Fiske (1959), energy was concentrated on testing for divergent and convergent validity between the scales. Following Marsh and Hocevar (1983, 1984) and Marsh and Grayson (1994), a confirmatory factor analytic approach was used. In particular, the ‘trait-only’ and ‘correlated uniqueness’ models (Marsh and Grayson, 1994: 4003) were tested. The first of these ‘posits trait factors but no method effects’, while in the second ‘method effects are inferred from correlated uniqueness among measured variables based on the same method’ (Marsh and Grayson, 1994: 4003). As the simplest confirmatory factor analytic multitrait-multimethod models, these results can be seen as baseline or minimal conditions for construct validation.

This approach suggests that multiple indicators of the same construct should be substantially correlated with each other but less correlated with indicators of other traits. Divergent validity pertains to the ‘distinctiveness of various factors’ (Marsh and Hocevar, 1984: 343), and manifests when item multidimensionality is low and thus ‘when there is a relative lack of correlation between different traits’ (Marsh and Hocevar, 1983: 231). Divergent validity was assessed through investigating whether:

- there are low correlations between latent factors
- item loadings on latent traits are higher than correlations between other factors
- items from different scales load more highly on their own rather than other scales.

Convergent validity entails ‘agreement among multiple indicators of the same evaluation dimension [trait]’ (Marsh and Hocevar, 1984: 343). That is, convergent validity is reached when items on the same trait define the construct clearly (Crocker and Algina, 1986: 233). Given this, convergent validity was assumed given:

- low item error variances
- high statistically significant item loadings on the common factor
- low correlations between item error variances.

With these specifications, multitrait-multimethod analyses were used to evaluate the validity of the SEQ instrument and its scales.

Table 5.5 shows correlations between the scales, omitting the leading diagonal. The correlations between the online and general scales in Table 5.5 have been bolded. In the tradition of multitrait-multimethod analysis (Campbell and Fiske, 1959), the correlations in Table 5.5 can be used to analyse the convergent and discriminant validity of the scales. In general, the correlations suggest reasonably high relationships between the online scales, and between the general scales, suggesting low divergent validity within the scales pertaining to each modality. There are patterns suggestive of divergence between the scales for each modality. Within the online scales, there seem to be higher correlations among the OE, OAL, OAR and OT scales, and within the OC, OSI and OCS scales. Similarly, within the general scales, there appear to be slightly higher correlations among the CT, SLE, TA, AC, AL and SSI scales, than among the CA, CW and BCC scales. These patterns of convergence support later analyses. Correlations between the online and general scales appear to be very low, suggesting a high level of divergent validity between these modes of engagement.

Table 5.5 Correlations between the SEQ scales

	OE	OAL	OAR	OT	OC	OSI	OCS	CT	SLE	TA	AC	AL	SSI	CA	CW
OAL	0.69														
OAR	0.53	0.68													
OT	0.52	0.65	0.61												
OC	0.30	0.37	0.48	0.34											
OSI	0.23	0.34	0.37	0.37	0.52										
OCS	0.31	0.38	0.33	0.43	0.41	0.46									
CT	0.22	0.29	0.24	0.38	0.09	0.15	0.20								
SLE	0.23	0.30	0.22	0.38	0.14	0.13	0.18	0.66							
TA	0.17	0.22	0.09	0.34	0.06	0.13	0.22	0.67	0.66						
AC	0.21	0.26	0.15	0.34	0.06	0.09	0.16	0.70	0.64	0.65					
AL	0.22	0.25	0.15	0.25	0.07	0.11	0.09	0.50	0.46	0.40	0.53				
SSI	0.02	0.07	0.04	0.14	0.11	0.18	0.18	0.39	0.40	0.42	0.42	0.44			
CA	0.16	0.20	0.20	0.22	0.28	0.21	0.16	0.28	0.30	0.20	0.25	0.23	0.30		
CW	0.19	0.19	0.15	0.17	0.27	0.10	0.11	0.26	0.32	0.19	0.28	0.41	0.28	0.33	
BCC	0.17	0.15	0.10	0.15	0.27	0.09	0.13	0.24	0.32	0.19	0.27	0.39	0.25	0.32	0.77

Scale scores can be computed in a number of ways, each of which reflects varying assumptions about the data and the measurement process. In principle, item response modelling should be used to compute interval scores from the ordinal response data. Although response category data is typically recorded using an interval metric, it is profoundly ordinal in nature. There is no reason to suspect that the psychological or phenomenological distance between adjacent response categories is the same as the distance between others, or that these distances are necessarily consistent across items. Rasch modelling provides a means of converting ordinal response category data into interval measures of the underpinning variable using a log-odds transformation (Wright and Masters, 1982). These measures can be scaled to a meaningful metric, and used in subsequent statistical analyses. While this approach is theoretically efficient, its major limitation is that it is rarely applied in routine practice. An alternative means is to compute factor scores during the congeneric measurement modelling. Factor scores are determined by taking into account the correlation between the observed item and the composite latent factor. One advantage of factor scores is that they weight the contribution of each item to the total score by the strength of association between the item and the latent composite. As with scores calculated using item response modelling, however, they are limited by their lack of appropriateness for routine use.

In practice, surveys are most commonly scored using simple additive approaches which involve taking means or computing total scores. While not the most psychometrically sophisticated approach, such methods make the fewest assumptions about the data and have the advantage of being transparent and easily interpretable in terms of meaningful response scales. Given this, scale scores were computed for each student as the mean of their responses to each scale's constituent items.

For the analyses reported here, scores were calculated for all 1,051 students on each of the seven online and nine general scales. These scores were calculated as the mean of each student's responses to all items in each scale. Statistics in Table 5.6 show the distributions of the scale scores. Table 5.6 presents scale means (\bar{X}), medians (M), standard deviations (s), and measures of standardised skewness (sk) and kurtosis (kt). The minimum (min) and maximum (max) of each scale is also shown. The distributions are also shown as boxplots in Figure 5.1.

The results indicate that the scale means varied between 0.98 and 2.07, and that the median values had a very similar range. The standard deviation of the scales varied from 0.47 to 0.76, and the average standard deviation was around 0.60. The scores for nearly all scales covered the full range from 0.00 to 3.00. As with the items, apart from OSI and CA, most scale score distributions were negatively skewed. The difference between the mean and medians was less than a third of a standard deviation for all scales, and for many scales the difference was only around a tenth of a standard deviation. Normal probability plots confirmed the absence of significant departures from normality. This confirmation of normality is important for subsequent statistical analyses.

Table 5.6 Online and general scale descriptive statistics

	\bar{X}	M	s	min	max	sk	kt
OE	1.88	2.00	0.65	0.00	3.00	-0.37	-0.16
OAL	1.77	1.80	0.58	0.00	3.00	-0.42	-0.07
OAR	1.52	1.75	0.68	0.00	3.00	-0.47	-0.34
OT	1.72	1.83	0.57	0.00	3.00	-0.26	0.00
OC	1.14	1.25	0.71	0.00	3.00	0.19	-0.58
OSI	0.98	1.00	0.68	0.00	3.00	0.45	-0.41
OCS	1.52	1.33	0.76	0.00	3.00	-0.04	-0.53
CT	1.92	2.00	0.47	0.33	3.00	-0.23	0.02
SLE	1.94	2.00	0.56	0.00	3.00	-0.44	0.07
TA	2.05	2.00	0.57	0.00	3.00	-0.48	0.23
AC	1.99	2.00	0.51	0.00	3.00	-0.35	-0.09
AL	2.07	2.17	0.50	0.50	3.00	-0.29	-0.31
SSI	1.49	1.40	0.64	0.00	3.00	0.02	-0.26
CA	1.39	1.25	0.58	0.00	3.00	0.29	-0.18
CW	1.90	2.00	0.53	0.00	3.00	-0.47	0.05
BCC	1.90	2.00	0.60	0.00	3.00	-0.31	-0.12

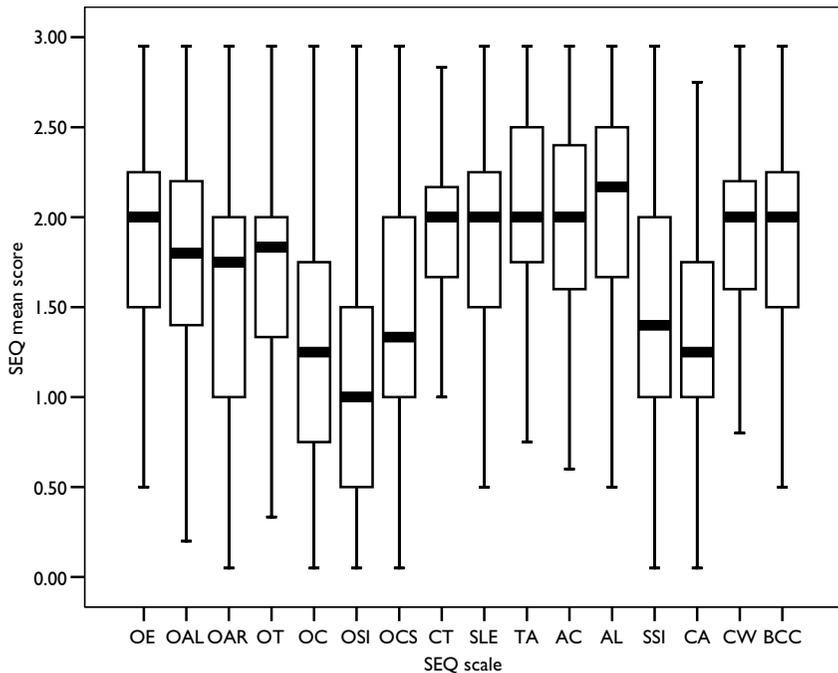


Figure 5.1 Distribution of online and general scale scores.

Defined qualities of campus-based and online engagement

Definition of the SEQ scales has exposed and confirmed a number of the quintessential qualities of students' engagement with campus-based online learning. Seven scales were defined to measure key aspects of campus-based students' use of online learning systems. These scales did not attempt to span the entire range of the student experience. The scales sought to tap those aspects of the student experience which have been augmented, distributed or shaped by online learning systems, to tap distinctively online forms of engagement and to tap students' use of the online systems themselves.

Campus-based online engagement

The online engagement (OE) scale is one of the most significant. This scale provides broad measurement of the extent to which students are using online learning systems to enrich the administrative and educational interactions they have with their university. Online LMS attempt to provide this information using audit data. The OE scale was developed with the understanding that the issue is broader and more substantial than such data could suggest. Although important to determine the level of overall use of online systems, the OE scale was developed as an index of the broad significance of online learning systems in the life of the contemporary campus-based student.

The online active learning (OAL) scale targets key ways in which students may use online learning systems to actively seek challenging learning experiences. As set out in the NSSE framework, getting involved in active and challenging learning is an important part of student engagement. The research literature suggests that the provision of feedback and resources are important aspects of the use of online learning systems. The OAL items probe if online systems are used to identify learning expectations, to access feedback, to engage with challenging learning resources, and to improve and add value to learning. As such, the OAL scale measures basic issues to do with how students use online learning systems to engage with their university learning.

It is possible that students see online systems as broadly significant and integrated into their university learning, but that learning online does not enhance its perceived relevance. It has been suggested, for instance, that people interact with online information in distinctive and perhaps superficial ways, that the online modality generates an online context which may be ancillary to that of the material being studied, or that students may be using online systems to access required information without having to engage with the subtexts and nuances of what they are learning. Although the current analysis did not seek to test these ideas directly, they were acknowledged as subtle yet profound issues to consider in terms of online engagement. In turn, the online academic relevance (OAR) scale was developed to measure the degree to which students found that using

online systems did indeed increase the relevance of their study. The OAR items probe whether students used online systems to expand the significance rather than just the convenience of their study.

While engagement depends on the agency of individual students, teachers play a critical role in generating the conditions which make productive forms of engagement more likely to occur. The online learning research suggests, for instance, that teachers might enhance engagement by increasing their presence in online environments, generating dialogues that capture student interest, and setting clear expectations that challenge each student. The online teaching (OT) scale covers a wide range of issues to do with how teaching staff use online learning systems to purposefully promote student engagement. The items in the OT scale seek student impressions of the extent to which teaching and support staff have used online learning systems to manage and lead different and increased forms of involvement. The items assess the extent to which students perceive that staff set up structured and stimulating online environments that they use to dynamically enhance teaching as well as the interests and involvement of each student.

As summarised in the NSSE framework, educational researchers have identified collaborative work as a significant part of student engagement. The capacity to support and to provide a new medium for collaborative learning is seen to be one of the identified strengths of online learning systems. The online collaboration (OC) scale was developed to integrate these perspectives, and measure how students use online systems to collaborate on and hence to potentially construct academic knowledge with their peers. As part of this, the scale measures whether students have taken their use of online learning systems beyond formal classroom environments and, in particular, to collaborate with other students online around the university campus. As with the other scales, the OC items focus on students' perceptions of whether they have used online systems for specific educational purposes, rather than on the use of particular technologies.

In addition to collaborative learning, online systems have the capacity to support more general kinds of complementary social interactions that form an important part of university study. These are the kinds of interactions likely to take place in learning or information commons. The online social interaction (OSI) scale focuses on the extent to which students perceive that online learning systems support these activities. It focuses on whether students felt they had helpful interactions with others, whether teaching staff participated in online discussions, and on whether they felt comfortable interacting in online discussions. Supporting these more generalised social interactions is a key way in which online learning systems may be used to add value to the campus-based student experience.

Higher education research has identified student contact with staff as one of the most important social dimensions of engagement. Online learning systems include a range of communication features to support and extend such contact. Prior research suggests that the extent to which students use these features can

influence the acquisition of subject-specific knowledge, integration into learning communities and perhaps even higher order kinds of vicarious learning. The online contact with staff (OCS) scale measures the degree to which students initiated such online contact with staff, whether they had individual contact with staff, and whether they found communicating with staff an easy thing to do. Although other scales such as OT and OSI contain items about student and staff communication, the OCS items focus on the agency of the student.

These seven online scales were designed to probe significant aspects of the nexus between online learning and student engagement. The scales were developed through empirical analysis of key phenomena emerging from an integrated review of online learning and student engagement research. Rather than provide solutions to numerous unresolved practical questions, the scales contribute to an understanding of key structures in students' use of online learning systems. They emphasise the overall significance and context of online learning, the extent to which students are using the systems to support active and challenging learning, and how students use the systems to interact and collaborate with staff and peers.

General forms of campus-based student engagement

Nine scales were developed to measure the general engagement of campus-based students. The general engagement scales cover the broad range of issues identified in the review of the higher education literature. While covering the same territory, the scales set out a different arrangement of the issues to that proposed by the NSSE framework. Also, the online and general scales are not parallel. While not contrived, this lack of direct concordance is in line with the investigative rather than evaluative intent of the definition of the engagement qualities.

The constructive teaching (CT) scale seeks students' perceptions of whether teaching staff supported key activities and conditions likely to enhance student engagement. The items stem largely from research into the kinds of things required to generate responsive learning environments. More specifically, the items focus on whether students perceive that staff employed teaching practices that suited student learning and which were likely to encourage constructive inquiry. Although engagement ultimately relies on the agency of the individual learner, it is also a negotiated process in which, to a certain extent, institutions are responsible for creating environments that make learning possible and afford opportunities to learn. The CT scale provides a key measure of students' perceptions of the extent to which this has been the case.

The supportive learning environment (SLE) scale builds on the CT scale by focusing on whether university staff supported students within the university community. The SLE items tap students' perceptions of the reassurance and recognition given to individuals, a determining characteristic of what Little (1975) referred to as a 'cultivating climate'. The items address whether students felt that staff welcomed student feedback and supported individuals' backgrounds,

perspectives and needs. Such ideas are central to the ideas of learning communities and individual talent development. Together, these ideas index students' feelings of being included with others in a community with shared knowledge creation interests.

The teacher approachability (TA) scale measures what the research suggests to be a significant aspect of student engagement. It measures an aspect of the interaction between students and staff, specifically, whether students felt that staff gave them the kind of attention that endorsed them as legitimate members within the university academic community. The TA items range from the basic issue of accessibility, through the higher-order question of approachability, and then to items about the perceived efforts and interests of staff. Accessibility is a fundamental issue. The research suggests that it is those interactions which students perceive as transcending administrative necessity and involving care and concern on the part of staff that are especially important for engaging students in academic communities.

The student and staff interaction (SSI) scale is the flipside of the TA scale. SSI items measure the nature of the contacts initiated by students. The SSI items concentrate specifically on the focus and dynamics of student and staff interactions. The items assess whether students initiated individual contact with staff and, in particular, whether students had the beyond-class meetings which research suggests are particularly significant for student engagement. Further items focus on the quality of communication between staff and students, and on whether the meetings focused on the learning needs of the individual student. The SSI items complement the TA items to measure the degree to which students have contact with staff which is likely to expose them to relevant learning resources, legitimates their involvement in academic communities and exposes them to models for their own engagement.

The student engagement literature identifies academic challenge as central to student engagement and productive learning. Participating in challenging academic activities was identified as the means for individuals to push forward the upper margins of their learning and knowledge. Items in the academic challenge (AC) scale measure students' perceptions of whether they were challenged to learn. As with the TA items, the AC items gauge students' impressions of the extent to which teaching staff acted in ways which encouraged engagement. The items tap whether students were given sufficient tasks to keep them interested and challenged, whether assessments seemed to be targeted towards the upper end of each individual's margin of possible performance, and whether students received feedback that helped them monitor and improve their learning. Together, these phenomena range across a pedagogical cycle which seems to make it likely for students to engage in academically challenging activities.

Contemporary educational theory suggests that the active construction of knowledge is essential to individual learning. The active learning (AL) scale measures the extent to which students learned in an active way. The AL items tap whether students actively sought to develop and construct links between their

knowledge, whether they located their learning in broader practical and ethical contexts, and whether they did in fact seek to engage in challenging academic activities. The AL scale could be conceived as the core measure of student engagement in that it provides a direct measure of the academic involvement or quality of effort of the individual student.

The collaborative work (CW) scale is another measure of the engagement of the individual in activities that research has linked with high-quality learning. The CW items focus on those educational practices that involve students in the discursive negotiation and construction of meaning with other students. Beyond measuring whether students did even work on group projects with other students, the items measure whether there was academic interdependence between group members, whether students took responsibility for teaching others, and whether, at a very general level, they reflected on the process of CW.

Student engagement research has identified beyond-class academic interactions with other students as enriching educational experiences. The beyond-class collaboration (BCC) scale extends the CW scale by measuring whether students have worked with others outside of class and, in particular, around the university campus. Working with other students in groups around the campus suggests that students have formed learning communities and networks that have extended beyond the confines of the formal teaching environment. It also suggests that they have used places around the university campus as spaces in which to talk about their study, and to learn.

The complementary activities (CA) scale measures students' participation in broadening or enriching activities around the university. The scale measures whether students participated in interesting events around campus, participated in student social groups, met students with different perspectives and used university resources to develop non-academic interests. These activities are samples of the non-academic life of the university, which engagement research has identified as contributing to a range of higher-order developmental outcomes of university study.

A model of student engagement

People use models all the time, often without being aware that they are doing so, to structure conversations about universities, teaching and learning. University leaders use structured ideas to tune strategy with institutional dynamics and to promote their institution to government, business and the community. Learners interact with structures all the time, through curricula, assessments, timetables and campus designs. Models help institutional managers frame evaluations, market the strengths of their units, and structure conversations about emerging practices and ideas. Parents and alumni use patterned language to discuss the quality and characteristics of universities. As they prepare and teach, faculty use structures to distinguish student behaviours and expectations, to design courses and to locate their teaching in broader contexts. Researchers use frameworks often, to focus and conduct inquiry, link ideas, locate analysis within fields of knowledge, and clarify assumptions and perspectives. Policy-makers adopt models which enhance their capacity to understand diversity and manage strategies and change. Models fuel the subtext of university life, and frame trends and discussions about higher education. Well-designed and applied models enhance the clarity, efficiency and effectiveness of analysis and practice.

This chapter presents a typological model of the way campus-based students engage with the online and general aspects of their learning. The model adds to the tradition of developing models which have helped investigate, evaluate, manage and teach university students. A number of notable typologies have been developed over the years, including those by Bloom *et al.* (1956), Keniston (1965, 1966), Coleman (1966), Clark and Trow (1966), Newcomb *et al.* (1967), Bolton and Kammeyer (1967), Warren (1968), Holland (1973), Little (1975), Stage (1988), Biggs and Collis (1982), Katchadourian and Boli (1985), Horowitz (1987), Astin (1993a), Chickering and Reisser (1993) and Kuh *et al.* (2000). While not developed directly from existing student typologies, the student engagement typology advances a generalisable and operationalisable mechanism for classifying the different ways in which students interact with universities.

Developing and operationalising a model of engagement

An integrated statistical and educational approach was used to develop the typological model set out below. Cluster analysis and discriminant analysis were the main statistical methods used to investigate the relationships among students' SEQ responses. The results of these analyses were used to identify different patterns in response and hence classify students in terms of different styles of engagement.

Cluster analysis is an exploratory statistical technique which segments respondents into homogeneous groups based on their patterns of response to specified items. Cluster analyses are typically conducted in a sequence of steps (Bailey, 1994; Hair *et al.*, 1995; Gordon, 1999; Everitt *et al.*, 2001). The first step involves partitioning students into cluster groups. While a number of algorithms have been developed for this, Clustan Graphics 5.02 (Clustan, 2001) was used to implement the *k*-means procedure for the current analysis. *K*-means is a non-hierarchical algorithm which tries to identify homogenous clusters of students based on individual characteristics. The relevant characteristics in the analysis were student scores on each of the SEQ scales. An iterative estimation procedure was used to compute the distance between every student and all cluster means, relocate students to their closest cluster and iteratively update cluster means until a stable solution was reached. Although the procedure is exploratory, it does require *a priori* specification of the number of clusters to extract. The analysis was repeated, therefore, to obtain solutions containing a range of different numbers of clusters.

An iterative series of cluster analyses was performed to identify different patterns of student response to the online and general scales. A series of *k*-means analyses was conducted on the general and online scales independently. Independent analysis of the online and general scales was performed in light of the evidence in the psychometric results that they represented two distinct modalities of student engagement. The analyses were specified to extract between two and six clusters. This range was chosen because two is the minimum number of interpretable clusters, whereas six is close to the number of scales being analysed.

The iterative analytical process led to the emergence of patterns of findings replicated across the online and general scales in support of a four cluster solution. The two and three cluster solutions appeared to extract an insufficient amount of variation among the scales. The five and six cluster solutions replicated the four cluster solution, but also appeared to generate redundant clusters which duplicated the patterns manifest in others. The four cluster solution was parsimonious, converged efficiently in twenty iterations and twenty-four iterations for the online and general scales, and generated distinct clusters which could be interpreted and applied meaningfully in terms of the overall understanding of student engagement.

The cluster solutions were interpreted by using graphical methods to examine the centroids or mean scale scores for each cluster group. Examining differences between cluster centroids provided a means of identifying the distinguishing characteristics of each group. Such profiling often involves examining how the cluster groups differ across key demographic and contextual variables. For the current analysis, however, interpretation was focused on analysing the variation across engagement scales.

Scale means for each cluster are shown in Figures 6.1 and 6.2, centred around the overall mean of each scale. Although the scales are categorical variables, following convention with means plots in ANOVA, the means for each cluster have been joined by lines to aid interpretation. Although the cluster analysis was conducted for exploratory rather than deductive purposes, the mean estimates are shown with 95 per cent error bands which have been controlled for multiple comparisons (Goldstein and Healy, 1995), however these are difficult to see due to their small size. In each graph, the kind of engagement characteristic of students with above average levels of engagement on each scale was labelled as 'intense'. Conversely, students with below average means for each scale were labelled as having a 'passive' style of engagement. The remaining middle groups presented an interesting pattern which again replicated across the analyses for the online and general scales. Variation among the scale means for these groups suggested a broad differentiation between the social and academic aspects of university study. In particular, there appears to be an 'independent' style of engagement, which is characterised by students with generally higher than average scores on academic scales (OT, SLE, TA, AC, AL and SSI for general and OE, OAL, OAR and OT for online), but lower than average scores on scales targeting the more social dimensions of university study (CA, CW, BCC for general and OC, OSI, OCS for online). In contrast, 'collaborative' engagement reflects students with slightly below average means on academic scales but above average means on scales representing social phenomena. The scales have been ordered in Figures 6.1 and 6.2 to expose these patterns.

A range of diagnostic statistics were used to evaluate the cluster solutions. One of these was the ratio of between-to-within cluster variance. Although this statistic is an artefact of the clustering process which deliberately seeks to maximise the within-cluster homogeneity and between cluster heterogeneity, the statistic does provide a means of determining the contribution of each variable to the separation of groups. Diagnostic variance ratio (F) statistics for the four cluster solution are shown in Table 6.1. Scales with larger F-values vary more between groups than within groups, and hence do more to distinguish the clusters. The figures reveal greater variation between student scale scores between rather than within-groups. In general, these results support an interpretation of the distinctiveness of each cluster. Figures 6.3 and 6.4 show boxplots of the distribution of distances between each student and his or her respective cluster means. The figures show only a small number of outlying observations in each group. Table 6.2 shows that there are approximately equal numbers of students in each group for the online and general solutions, which supports subsequent discriminant analyses.

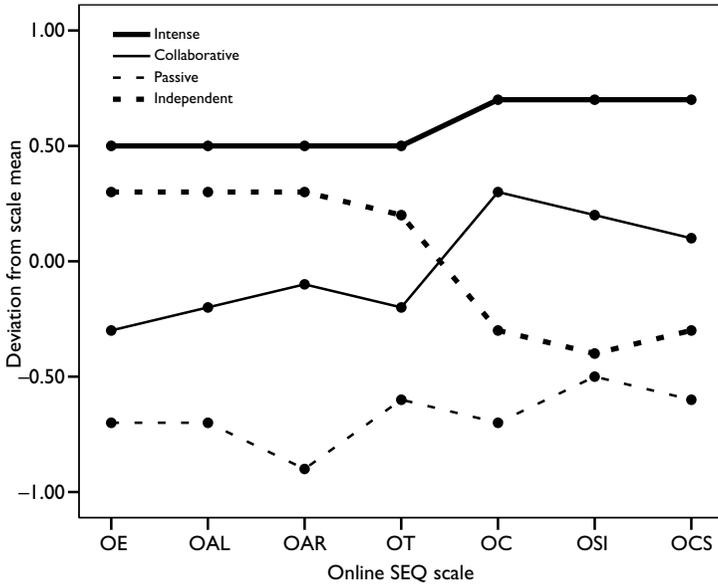


Figure 6.1 Centred online scale means for the four cluster solution.

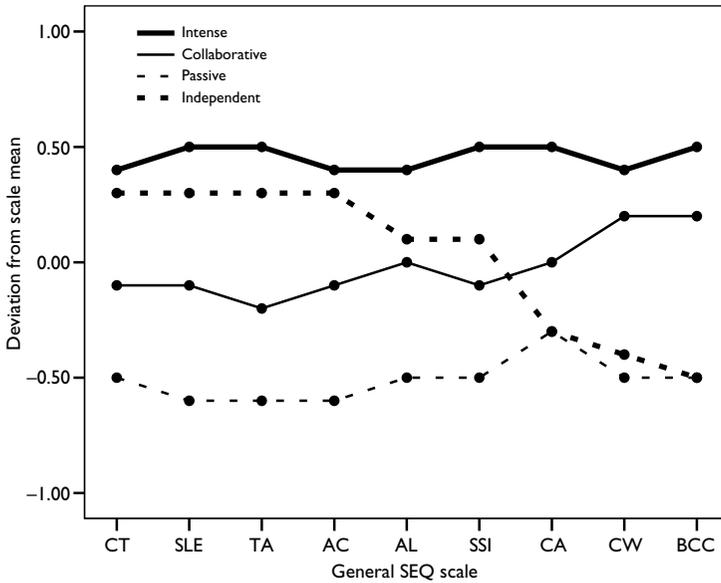


Figure 6.2 Centred general scale means for the four cluster solution.

Table 6.1 Variance ratio statistics for the four cluster solutions

	<i>F</i>		<i>F</i>
OE	319.28	CT	338.36
OAL	499.93	SLE	386.29
OAR	452.75	TA	330.56
OT	341.72	AC	388.74
OC	359.83	AL	200.32
OSI	334.03	SSI	194.22
OCS	243.11	CA	115.66
		CW	339.25
		BCC	323.99

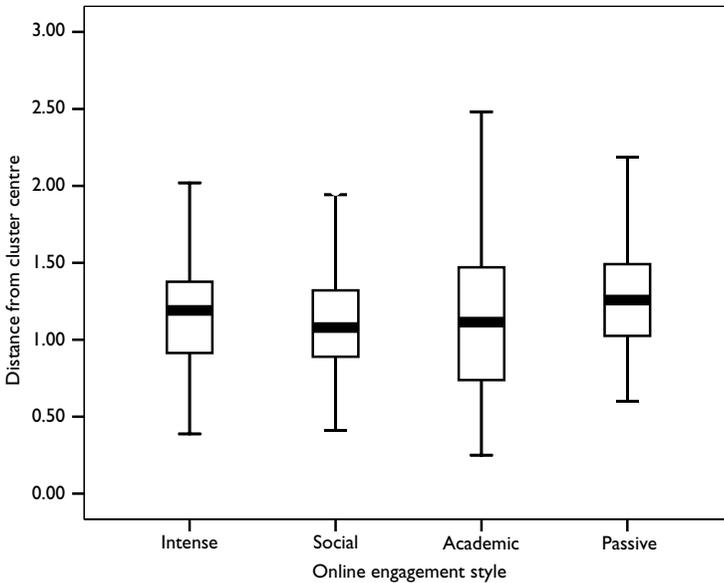


Figure 6.3 Distribution of student distances from online cluster centroids.

The number of students in each cluster provides an additional index of the stability or generalisability of the solution. Table 6.2 shows the number of students in each cluster for the online and general analyses. There is an approximately even distribution of students among the ‘intense’, ‘collaborative’, ‘independent’ and ‘passive’ online clusters, although there is more variation between the general cluster numbers. The cross-tabulation between the general and online analyses

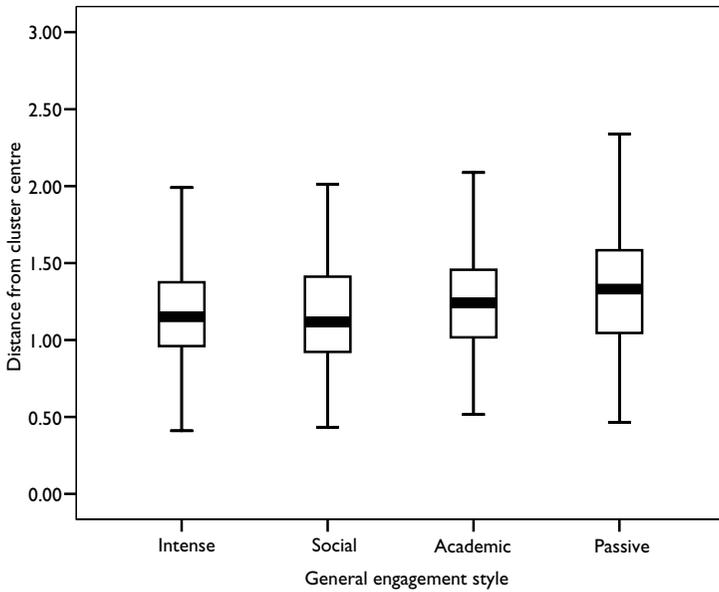


Figure 6.4 Distribution of student distances from general cluster centroids.

Table 6.2 Cluster sizes and relationships for the online and general analyses

		<i>General</i>				<i>Total</i>
		<i>Intense</i>	<i>Collaborative</i>	<i>Independent</i>	<i>Passive</i>	
Online	Intense	118	76	41	16	251
	Collaborative	44	112	46	83	285
	Independent	70	97	72	53	292
	Passive	41	60	40	82	223
Total		273	345	199	234	1,051

indicates that while students tend to be classified into similar groups, there are a significant number of students who change clusters between the online and general modalities. The patterns in Table 6.2 reinforce the independence of the general and online modalities and scales.

Patterns in the scale means for each cluster shown in Figures 6.1 and 6.2 support the interpretation that, in general, student engagement is underpinned by an academic and a social dimension. That is, each of the four identified clusters

can be explained sufficiently in terms of its performance on these two dimensions. According to this typology, students reporting a collaborative style of engagement would be expected to have below average levels of academic engagement yet above average levels of social engagement. The intense form of engagement is above average on both academic and social dimensions, independent engagement is above average on the academic dimension but below average on the social dimension, while passive engagement is below average on both dimensions. As Figures 6.1 and 6.2 show, this typology replicates across both the online and general conditions.

In social research, discriminant analysis is often used in a *post hoc* way to verify the results of cluster analysis. Broadly, multiple discriminant analysis enables examination of the extent to which continuous explanatory variables separate respondents into predefined categorical groups (Hair *et al.*, 1995; Tabachnick and Fidell, 2001). Discriminant analysis was employed to validate the cluster analysis for a number of reasons. It was used to examine the degree to which students' scale scores distinguished them into the groups identified during the cluster analysis. It was used to identify and interpret underpinning orthogonal dimensions that discriminate between the different clusters. It was used to determine the relative importance of each of the scales in terms of distinguishing students into groups. Discriminant analysis and logistic regression can generate similar outcomes. Discriminant analyses were selected for current purposes, however, given exploratory analyses which confirmed the normality of SEQ scale score distributions used as explanatory variables in the analysis.

Two multiple discriminant analyses were conducted to confirm the cogency of the groupings generated during the cluster analyses. All scales were entered simultaneously into the model after establishing the homogeneity among scale score distribution variances and covariances within each of the four engagement groups. In light of the cluster analysis results, and given no evidence to the contrary, an assumption was made prior to the analysis that there should be a roughly equal distribution of students between groups. The solutions were evaluated and interpreted by reviewing model fit statistics, the number of canonical discriminant functions required to explain the solution, and the standardised discriminant function coefficients for each of the scale scores.

Replicating the results of the cluster analysis, ANOVA statistics indicated that all variables contributed to the online and general solutions. The discriminant analyses replicated and hence validated the results of the cluster analyses. The ANOVA statistics indicated that all scales contributed to the online and general solutions. For each analysis, the pooled within-groups correlation matrix indicated low levels of multicollinearity between the SEQ scales. In each case, three separate orthogonal canonical functions were identified as discriminating students into the four identified engagement styles. In analysis of the online scales, the eigenvalues for these functions accounted for 76.58, 22.61 and 0.81 per cent of the explained variation. In the case of general engagement, the eigenvalues explained 80.39, 18.66 and 0.95 per cent of the variance. In each

Table 6.3 Standardised online and general scale discriminant function coefficients

	<i>Function 1</i>	<i>Function 2</i>		<i>Function 1</i>	<i>Function 2</i>
OE	0.28	-0.29	CT	0.16	-0.17
OAL	0.29	-0.21	SLE	0.29	-0.23
OAR	0.29	-0.38	TA	0.29	-0.13
OT	0.22	-0.30	AC	0.27	-0.20
OC	0.40	0.49	AL	0.16	-0.21
OSI	0.31	0.53	SSI	0.37	-0.06
OCS	0.37	0.36	CA	0.30	0.39
			CW	0.30	0.40
			BCC	0.23	0.49

analysis, the omnibus χ^2 model fit statistics indicated that all three functions were statistically significant. This is likely to be an artefact of sample size, however, and the eigenvalues support substantive interpretation in terms of the first two functions.

The first two standardised discriminant function coefficients for the online and general solutions are shown in Table 6.3. The pattern and size of the loadings confirm their expected utility in terms of distinguishing between the four engagement groups.

Engagement styles could be attributed to individual students in a range of ways. In addition to having appropriate diagnostic and psychometric properties, the selected method would need to be simple and effective to administer in practice.

One approach would be to use regression coefficients generated during discriminant analysis, the unstandardised correlates of those shown in Table 6.3. While statistically efficient, this approach has the limitation of being difficult to implement in practice, requiring the application of elaborate statistical techniques. It seems best, therefore, to identify an alternative method that leads to valid diagnostic outcomes yet is more parsimonious and easier to implement in practice.

One of the simplest approaches involves identifying each student's style by comparing his or her scale scores against relevant reference values such as group means. Results of the cluster and discriminant analyses suggest that the OE, OAL, OAR and OT, and the CT, SLE, TA, AC, AL and SSI scales could be used to place students along the academic dimension for the online and general modes. The results further indicate that the OC, OSI and OCS, and the CA, CW and BCC scales could be used to determine each student's location along the social dimension. With these observations in mind, a generic algorithm was tested for placing students along the social and academic dimensions for each modality. This involved totalling each student's scores on appropriate scales, and subtracting from this total the sum of the means for these scales. The results of this arithmetic can be standardised to give them an interpretable metric. Centring each student's

score around a reference mean thus enables each student to be located within one of the styles of engagement. While the means used in the current analysis are those derived from the sample, there is no reason why alternative population or other normative reference values could not be used instead.

Although classifying students into groups by comparing individual scale scores to group means is simpler than using multiple regression techniques, it is important to cross-validate the accuracy of this approach. This was done by assessing the diagnostic validity of the regression and means based approaches, using the original cluster analysis groupings as a 'gold standard' reference.

Table 6.4 shows two cross-tabulations between the cluster analysis and alternative regression and means centring approaches. The bold figures show that most students have been placed into the groups defined during the cluster analyses. The results indicate that for both methods, students reporting intense and passive styles of engagement have been classified best for both online and general engagement. For the means based approach, however, there is some divergence between the allocation of students reporting collaborative and independent styles of engagement. Using averages to distinguish students into groups, for instance, placed 155 of 285 students (54.39 per cent) reporting a collaborative style of online engagement into the collaborative cluster predicted by the cluster analysis. For general engagement, allocation based on mean scores allocated

Table 6.4 Relations between initial cluster groupings and regression and means centring groupings

			Clustering				Total
			Intense	Collaborative	Independent	Passive	
Regression	Online	Intense	243	0	1	0	244
		Collaborative	3	281	9	1	294
		Independent	5	3	281	5	294
		Passive	0	1	1	217	219
		Total	251	285	292	223	1,051
	General	Intense	269	4	5	0	278
		Collaborative	4	334	3	4	345
		Independent	0	4	188	1	193
		Passive	0	3	3	229	235
		Total	273	345	199	234	1,051
Centring	Online	Intense	250	67	41	0	358
		Collaborative	1	155	0	10	166
		Independent	0	1	215	0	216
		Passive	0	62	36	213	311
		Total	251	285	292	223	1,051
	General	Intense	264	82	5	0	351
		Collaborative	1	167	0	16	184
		Independent	8	21	150	0	179
		Passive	0	75	44	218	337
		Total	273	345	199	234	1,051

Table 6.5 Validity statistics for different classification procedures by group

		<i>Intense</i>		<i>Social</i>		<i>Academic</i>		<i>Passive</i>	
		<i>SENS</i>	<i>SPEC</i>	<i>SENS</i>	<i>SPEC</i>	<i>SENS</i>	<i>SPEC</i>	<i>SENS</i>	<i>SPEC</i>
Regression	Online	0.97	1.00	0.99	0.98	0.96	0.98	0.97	1.00
	General	0.99	0.99	0.97	0.98	0.94	0.99	0.98	0.99
Centring	Online	1.00	0.87	0.54	0.99	0.74	1.00	0.96	0.88
	General	0.97	0.89	0.48	0.98	0.75	0.97	0.93	0.85

Table 6.6 Aggregate validity statistics for different classification procedures

		<i>H</i>	<i>V</i>	<i>CC</i>	<i>SENS</i>	<i>SPEC</i>
Regression	Online	0.97	0.96	0.86	0.97	0.99
	General	0.97	0.96	0.86	0.97	0.99
Centring	Online	0.79	0.72	0.78	0.81	0.93
	General	0.74	0.76	0.79	0.78	0.92

150 of 199 students (75.38 per cent) reporting an independent style of engagement to the independent cluster.

A range of standard analyses was conducted to examine the diagnostic validity of the alternate classification procedures (Anastasi, 1976; Cohen *et al.*, 1992). These validity analyses involved exploring the sensitivity, specificity and reliability of classification. Table 6.5 shows sensitivity (*SENS*) and specificity (*SPEC*) statistics for each method, modality and group. Sensitivity refers to the proportion of true positive classifications. Specificity refers to the proportion of true negatives or correct rejections. Aggregate validity estimates are provided for each method and modality in Table 6.6. Table 6.6 shows the hit ratio or percentage of students correctly classified (*H*), Cramer's *V* (*V*) and the contingency coefficient (*CC*). Cramer's *V* and the contingency coefficient are nominal measures of association within the cross-tabulations. Although there are clear declines in diagnostic validity between the regression and means based approaches, the indices indicate a relatively high level of concordance between the classification procedures. The mean centring approach, for instance, results in three quarters of all students being allocated to the target reference groups identified during the clusters analysis.

Different dimensions and styles of engagement

Results of the statistical analyses support interpretation of student engagement in terms of an underpinning typology. The results expose a distinction between the academic and the social dimensions of engagement. These dimensions, which

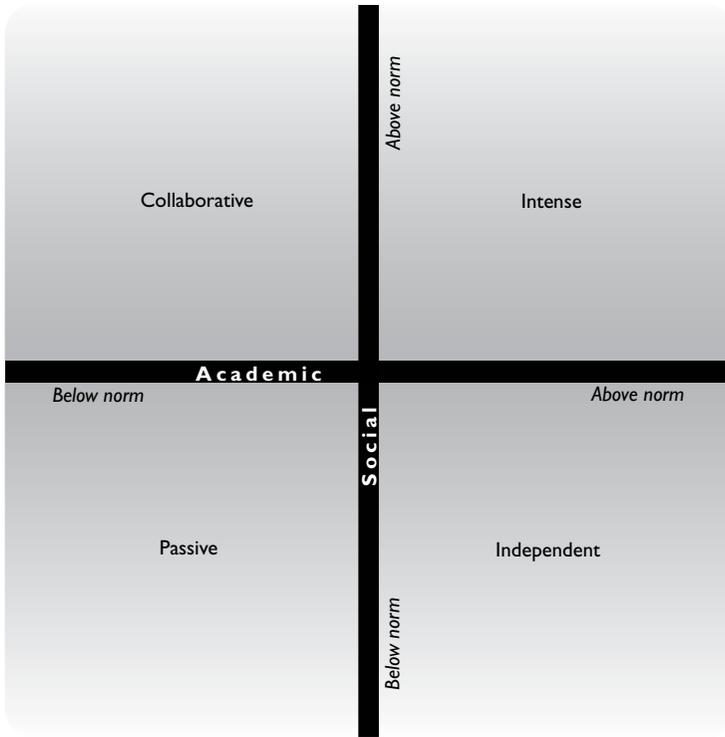


Figure 6.5 Typological model of student engagement styles.

replicate across the online and general modalities, mark out a structure that captures four identified styles of student engagement. The typology suggests, in particular, that student engagement can be characterised as either ‘intense’, ‘collaborative’, ‘independent’ or ‘passive’. The typology is depicted in Figure 6.5.

This theoretically based and empirically validated typology provides an operationalisable interpretive context for diagnosing and managing student engagement. It moves analysis beyond interpretation of the qualities of student engagement to consideration of the different ways in which campus-based students engage with their university study. This higher-level form of analysis makes students rather than engagement activities and conditions the primary unit of analysis. It provides a cogent, heuristic and efficient means of investigating the engagement of students in a particular population.

Four of the online scales measure phenomena which represent the academic dimension of online engagement. In general, students who obtain high scores on the OE, OAL, OAR and OT scales are those who report making frequent use of

online learning in their university study. These students use online learning systems to interact better with their institutions, and to improve and manage their learning. They use the systems to engage in challenging learning activities, to add value to their face-to-face learning experiences, to identify what is required to perform well and to increase their understanding of material. These students reported a kind of learning environment that is likely to stimulate their engagement and generate high-quality learning. They found that teaching staff were active participants in the online learning environment, and that the staff used the systems constructively and adaptively to help students learn. Most generally, students reporting high levels of online academic engagement were likely to find that using online learning systems helped them become part of academic life at his or her university. Their online engagement legitimated and stimulated more general involvement in university.

Together, the OC, OSI and OCS scales measure the social dimension on online learning. High scores on this dimension indicate that students have used online systems to work collaboratively, to communicate productively with staff, to explain their ideas, to extend their academic networks and to take their work beyond the classroom. While a high level of online social engagement does not directly imply that a student is using online systems to reinforce and augment his or her academic learning, it does suggest that students have found value in online forms of communication related to their study, and which are likely to promote learning. High levels of online social engagement also indicate that students have used the systems for more than simply a convenient means of accessing learning resources.

The academic dimension of general engagement is the most broad and the most substantial. The general academic dimension is composed of the CT, SLE, TA, AC and AL scales. These scales address individual and environmental concomitants of engagement which range across the student experience. Students reporting high scores on these scales see themselves as active and involved learners who are pushing themselves to learn. They are seeking out materials and reflecting on ways to construct their knowledge and improve their learning. Such students also see themselves in an environment which both stimulates and supports their learning. They appreciate the efforts made by academics to engage with and inspire individual student learning. More generally, students reporting high levels of independent engagement perceive themselves as legitimate participants in university knowledge communities. It is this kind of diffuse but profound sense of integration which much higher education research sees as essential to student learning and development.

The constituent scales of the general social dimension capture many of the broad ideas promoted by contemporary constructivist theories of learning. The SSI, CA, CW and BCC scales address the nature and frequency of students' communication with academic staff, participation in a broad range of enriching activities around the university and collaborative work with other students. The general, as with the online social dimension, taps the nature of students'

participation in those learning interactions which are explicitly interpersonal in nature. These are particularly important if students are to become further involved in conversations about academic knowledge, if they are to learn vicariously, understand the various situations surrounding their study and take up many of the broader opportunities to which university students are exposed.

Each of the styles reflects a different combination of the academic and social engagement dimensions. Students reporting an 'intense' style of engagement are engaged both academically and socially with their university study. Students reporting a 'collaborative' form of engagement have high levels of social engagement but lower levels of academic engagement. 'Independent' engagement is the converse of the collaborative style, and students characterised by a 'passive' style of engagement report low academic and social involvement with their study. The non-hierarchically related engagement styles thus take on their distinctive characteristics from the underpinning online and general academic and social dimensions and qualities.

Students with an intense style of engagement are highly involved with their university study. Those with intense online engagement use university LMS more than others to enhance and contextualise their study, to communicate and collaborate with other students, to manage and conduct their learning, and to contact staff. They also see that staff use online systems to enhance the learning experiences and supports offered to students. Students reporting intense general forms of engagement see themselves as active, motivated and imaginative learners who collaborate with others in and beyond class, participate in broadening activities around campus and initiate communication with staff. They tend to see teaching staff as approachable, and to see their learning environment as responsive, supportive and challenging.

An independent style of engagement is characterised by a more academically and less socially oriented approach to study. Such students tend to see online systems as a significant part of their campus-based education, as playing a formative role in their knowledge-construction activities, as legitimating and contextualising their learning activities, and as providing broad forms of support. They are less likely, however, to collaborate or interact with other students using university LMS, or to use the systems to initiate contact with staff. With an independent style of general engagement, students tend to seek out challenging learning experiences, to use feedback formatively to help their learning, and to initiate pedagogical conversations with academic staff. Students reporting an independent style of general engagement see themselves as participants in a supportive learning community. They see staff as being approachable, as responsive to student learning needs, and as encouraging and legitimating student reflection, and feedback. These students tend to be less likely, however, to work collaboratively with other students within or beyond class, or to be involved in enriching events and activities around campus.

In many ways, the collaborative and passive engagement styles are the converse of the independent and intense styles. Either online or in general, students reporting a collaborative style of engagement tend to favour the social aspects of

university work and life, as opposed to the more purely cognitive or individualistic forms of interaction. Collaborative online engagement tends to focus on students using the systems to work and communicate with others at university. High levels of general collaborative engagement reflect students feeling validated within their university communities, particularly by participating in broad beyond-class talent development activities and interacting with staff and other students. Although somewhat dependent on the benchmarks used for comparison, it is likely that students whose response styles indicate passive styles of engagement rarely participate in the online or general activities and conditions linked with productive learning.

It is important to clarify that the four defined styles of engagement refer to transient states rather than student traits or types. It is not supposed, for instance, that these are enduring qualities that are sustained within individuals over time or across contexts. The attribution of styles is also relative to the benchmarks or cutting scores adopted in a particular setting. Investigating the stability of engagement would require longitudinal assessment of the same students. It may also involve investigating links between manifest engagement and possible psychosocial antecedents. While there are various additional errors and risks associated with analyses based on cross-sectional assessment (Astin and Lee, 2003), and while there are certainly advantages in investigating the development of engagement tendencies over time, there remain clear advantages to having coincident information about the styles of student engagement.

Although not direct antecedents, earlier university student typologies validate the current model. This is shown in Table 6.7, which is adapted from Kuh *et al.* (2000). The very popular model proposed by Clark and Trow (1966: 24), for instance, characterises four student subcultures as combinations of two variables: 'the degree to which students are involved with ideas and the extent to which students identify with their college'. These broadly resemble the academic and

Table 6.7 Parallels among university student typologies

<i>Clark and Trow (1966)</i>	<i>Astin (1993a)</i>	<i>Kuh et al. (2000)</i>	<i>Coates (2006)</i>
▶ Academic	• Scholar	• Grind • Intellectual • Scientist	▶ Intense
▶ Collegiate	• Leader • Hedonist	• Socialiser • Recreator • Collegiate • Conventional	▶ Collaborative
▶ Vocational	• Status-striver		▶ Independent
▶ Non-conformist	• Social activist • Artist • Unconnected	• Individualist • Disengaged • Artist	▶ Passive

social dimensions which underpin the current model. Furthermore, the academic, collegiate, non-conformist and vocational types of orientations which Clark and Trow (1966) propose broadly resemble the intense, collaborative, independent and passive engagement styles of the current study. There are also correspondences with the earlier typologies of Astin (1993a) and Kuh *et al.* (2000). While neither of these earlier typologies is based on underpinning dimensions, there are broad semblances between the student types they identify and the engagement styles discussed in this book. Such broad concordance with previous studies indicates that the engagement dimensions and styles proposed above reflect general and enduring qualities of the university student experience.

This typology of engagement styles provides a research-driven structure for managing and reflecting on educational theory and practice. It provides a bridge between ‘the impossible task of knowing each student individually and the typical alternative which is to think of students only in broad academic or sociological categories’ (Little, 1975: 216). It exposes the core dimensions which underpin the student experience, and which map out a conceptual space for understanding ‘individual stylistic differences in how students approach their worlds’ (Evans *et al.*, 1998: 205). Such structures involve necessary conflation and generalisation, however they can be used to generate more nuanced interpretations of local circumstances. Such typologies provide structures for investigating, managing and teaching university students.

Framing engagement

Students’ comments on their study can be framed by the typology of engagement styles. The following brief excerpts from interviews with second-year students exemplify and provide points for reflecting on much that is discussed above, and further expose the complex interdependencies between online and general learning.

Kay, a second-year science student, reveals a collaborative style of general engagement, and hints at a more independent or perhaps even passive style of online engagement:

I did one of my subjects online, but I found it so much better being at university, because of the fact that you get the interaction of people and their ideas, which you can get if you go and look online, but it’s not the same as hearing someone and you can sort of say ‘Oh yeah, that’s right’, and you come out with things.

Charles, a history major in his third year, leverages online learning resources to enhance the intensity of his campus-based study.

I think some of my classes need to be online. My Middle East class is like, ‘Take the lecture notes of whatever he says’, and you miss so

much of what he's saying because you're trying to catch up...it's better if you had it all on the internet as well. Because usually with my Politics class, I'll print out of the notes before I have the lecture and then write down extra notes, whereas with Middle East I have no extra reading beforehand, I just go in and listen. The lecturer does put up the lecture notes, but they are just headings with no subheadings or explanation and then he just talks about it. So now you go into the class without really knowing what he's going to talk about.

Celine, studying environmental science, sees that online learning leads her to study in a passive way:

I find I get burnt out more quickly when accessing the computer, and I find I get depressed more easily through just being constantly on the computer, and you feel quite alone in your own environment, and I think that's unhealthy.

Chris, an Indonesian language major, views online learning as a means of making students more independent in their study:

I think the university at the outset was trying to get rid of certain staff and wages, however I don't really think that's now the case. It's because they want students to become more self-directed...self-directed learning. In classes where the lecturer is giving you all of the information, a lot of students just sit back and think that they can just sit back and not write anything down because they have attended class. And obviously with online you can't do that.

Li, a second-year information technology student, reports that independent use of online materials in certain subjects has reinforced a passive style of general engagement:

For the subjects that I don't really want to do, I never go to the lectures, I just get the lectures online. It's so obvious what they say, and all of the notes are on the computer, so there's no need to go. It's completely replaced the lecture. Because in some subjects, they pretty much just read the lecture notes. All the notes go online anyway. Even if they only put the headings online, if you have a good modem you can watch them by video on the internet.

Taking multilevel pictures of student engagement

As with many educational phenomena, there may often be a desire to interpret student engagement at different levels of analysis. In many instances, interest centres on assessing the engagement of individual students. This might play a role in small group teaching, academic or careers advising, or student recruitment or placement activities. Often in large organisational settings, however, there is a need to evaluate practices and activities at the group level. Faculty often reflect on the characteristics of the student cohorts they are teaching. Institutional researchers produce reports showing breakdowns for targeted demographic and contextual groups. People involved in higher education often have an even more diffuse interest in discussing aspects of universities in general. The focus of such analysis moves beyond individuals and groups, and rests on the general insights and trends which constitute the substance and activity in university life. As well as being of interest in themselves, such broad pictures of engagement often form the culmination of more specific evaluations.

This chapter draws on the ideas in previous chapters to advance the application of different approaches for generating, interpreting and applying insights into online and general engagement. After summarising key properties of the SEQ, the chapter exemplifies the use of the instrument in capturing insights into engagement at varying levels. The nature and value of such assessment is considered through analysis of individual, aggregate and more generalised reports of engagement. The value of such diagnoses is exemplified in an analysis of the nature and dynamics of contemporary campus-based student engagement. Through these activities, the chapter moves from assessment, through evaluation to interpretation. It provides a counterpoint to the somewhat normative discussion in the next two chapters, and begins discussion about the practical benefits of capturing and leveraging understandings into engagement.

Measuring university student engagement

While student engagement is a broad and complex phenomenon, the psychometric results set out in Chapter 5 demonstrate that it can be measured using the SEQ in an efficient, valid and reliable way. The SEQ contains nine scales that measure general aspects of campus-based student engagement: constructive teaching,

supportive learning environment, teacher approachability, academic challenge, active learning, student and staff interaction, complementary activities, collaborative work and beyond-class collaboration. These scales and their constituent items are shown in Table 7.1.

The SEQ includes seven scales defined to measure key aspects of campus-based students' engagement online: online engagement, online active learning, online academic relevance, online teaching, online collaboration, online social interaction and online contact with staff. These scales and items summarised in Table 7.2 tap those areas of general engagement augmented by online learning, tap distinctively online forms of engagement and tap students' use of the online systems themselves. The scales probe significant aspects of the nexus between online learning and student engagement.

Key SEQ properties are summarised in Figure 7.1. While student engagement is a broad and complex phenomenon, these properties demonstrate that it is indeed possible to obtain reliable and valid measurement of these qualities of campus-based student engagement.

Each of the sixteen defined SEQ scales provides reliable measurement of targeted constructs. The reliabilities lie around or above 0.70. These figures confirm that the SEQ measures student engagement in a way which is relatively unaffected by measurement error, and which is likely to be consistent when administered to homogeneous student populations. Such internal consistency is commensurate with the reported reliabilities of related questionnaires, such as the Course Experience Questionnaire (CEQ) (Ramsden, 1991), the USA NSSE (Kuh, 2001a), the Students' Evaluations of Educational Quality (SEEQ) (Marsh, 1982, 1987), the College Student Experiences Questionnaire (CSEQ) (Pace and Kuh, 1998) and the Cooperative Institutional Research Program (CIRP) suite of surveys (Sax *et al.*, 2000).

Reliability estimates can be used to calculate SEM for an individual student's scale scores. Such standard errors work as confidence intervals for each student's score when multiplied by an appropriate standard normal value. A conservative approach would be to determine a 95 per cent confidence interval centred around an individual's scale mean score which is about four times each of the standard errors. Considered across each of the online and general scales, this would produce an uncertainty interval of around one and a half standard deviations, or about one unit on the four-point reporting scale. The width of this margin suggests that while a student may have a mean scale score which suggests that he or she rarely engages in a particular activity, in practice, allowance would have to be made for uncertainties due to measurement. Although not their primary purpose, if the SEQ scales were to be used for measurement at the individual level, it might be advisable to augment each scale with extra items to decrease the uncertainty of measurement.

A multilevel reliability can be calculated to assess the reliability of each scale at a higher level of aggregation. In practice, scale scores are often compared across courses within institutions and also between institutions. This suggests conducting two- and three-level analyses, such as the two-level perspective

Table 7.1 SEQ general scales and items

<p><i>Constructive Teaching (CT): whether staff inspired and supported active learning</i></p> <p>Materials were presented in a way that I could understand</p> <p>Staff valued students' ideas and questions</p> <p>Staff encouraged students to question what was being taught</p> <p>Academics used teaching approaches that suited students' needs</p> <p>I felt encouraged to creatively explore ideas</p> <p>Staff talked about their research in ways that inspired me to learn</p> <p><i>Collaborative Work (CW): students' involvement in collaborative activities</i></p> <p>I have worked on group projects with other students</p> <p>I worked with other students on difficult tasks</p> <p>I thought about the best way to work collaboratively</p> <p>I used spaces around campus to study with other students</p> <p>I helped other students when they were having academic problems</p> <p><i>Teacher Approachability (TA): the broad interest of staff in students and student needs</i></p> <p>Staff seemed interested in helping students</p> <p>Staff were generally approachable</p> <p>Teaching staff were accessible</p> <p>Teaching staff made a real effort to interact with students</p> <p><i>Student and Staff Interaction (SSI): the level and nature of student-initiated contact with teaching staff</i></p> <p>I had one-to-one conversations with academic staff</p> <p>I initiated individual contact with a member of academic staff</p> <p>I sought advice from staff on how to improve my performance</p> <p>I developed a valuable rapport with a member of academic staff</p> <p>I met with academic staff outside class</p> <p><i>Active Learning (AL): students' efforts to actively construct knowledge</i></p> <p>I set high performance standards for myself</p> <p>I tried to make connections between things that I was learning</p>	<p>I pushed myself to understand things I found puzzling</p> <p>I sought out my own resources to help me understand topics</p> <p>I thought about the practical applications of material that I studied</p> <p>I thought about ethical issues related to the material that I studied</p> <p><i>Academic Challenge (AC): extent to which expectations and assessments challenge students to learn</i></p> <p>Assessment tasks challenged me to learn</p> <p>I was given enough material to keep up my interest</p> <p>I was encouraged by teachers to go beyond set materials</p> <p>Academic staff gave me comments on my work that helped me learn</p> <p>I received feedback quickly enough to improve subsequent work</p> <p><i>Beyond Class Collaboration (BCC): collaborative work with others outside formal instructional environments</i></p> <p>I talked with students outside of class about study</p> <p>Students were required to work together outside of class</p> <p>I used spaces around campus to study with other students</p> <p>I studied with other students outside of class</p> <p><i>Complementary Activities (CA): participation in broadening activities around the campus</i></p> <p>I met people with different perspectives to mine</p> <p>University resources helped me to develop my non-academic interests</p> <p>I participated in interesting events and activities around campus</p> <p>I participated in social clubs and societies with other students</p> <p><i>Supportive Learning Environment (SLE): students' feelings of legitimation within the university community</i></p> <p>Staff respected students' backgrounds, perspectives and needs</p> <p>The university campus felt like a supportive place to learn</p> <p>Staff seemed responsive to feedback from students</p> <p>I felt part of an academic community at university</p>
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Table 7.2 SEQ online scales and items

<p><i>Online Engagement (OE): the extent to which students use online learning systems to enrich their study</i></p> <p>Online learning systems are a major part of my university education</p> <p>I used online systems to improve how I learn at university</p> <p>Online systems helped me to interact better with the university</p> <p>I used online systems to manage my university study</p> <p><i>Online Active Learning (OAL): key ways in which students use online systems to enhance learning</i></p> <p>I used online materials to improve my learning</p> <p>I used online materials to make lectures more meaningful</p> <p>I identified expected work standards using online systems</p> <p>I found that online materials challenged me to learn</p> <p>I used online feedback to improve my understanding of a topic</p> <p><i>Online Social Interaction (OSI): use of online learning systems to support general forms of social interaction</i></p> <p>Teaching staff participated in online discussions</p> <p>I found it easy to explain my ideas in online discussions</p> <p>I had helpful online discussions with other students</p> <p>I met new people when using the online learning system</p> <p><i>Online Contact with Staff (OCS): the level and quality of students' online contact with staff</i></p> <p>I used online learning systems to contact academic staff</p> <p>I found it easy to communicate with staff online</p> <p>I had individual contact with academic staff online</p>	<p><i>Online Collaboration (OC): students' use of online systems to work collaboratively with peers</i></p> <p>I used online systems with other students around campus</p> <p>I used online systems to do academic work with other students</p> <p>I used online systems to work with other students outside of class</p> <p>I used university online systems to communicate with other students</p> <p><i>Online Teaching (OT): whether teachers use online learning systems to promote effective learning</i></p> <p>Staff used online systems to clarify what was required to do well</p> <p>Staff used online systems in ways that improved the overall teaching</p> <p>Academic staff made an effort to communicate with students online</p> <p>Staff used online systems to provide students with extra assistance</p> <p>Teaching staff used online systems to tailor activities for students</p> <p>Teaching staff used online learning systems to discuss interesting issues</p> <p><i>Online Academic Relevance (OAR): use of online systems to enhance the relevance and context of study</i></p> <p>Using online systems made my study seem more relevant</p> <p>Using online learning systems made me feel part of the university</p> <p>Using online materials helped me put my study in real-world contexts</p>
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Main features of the SEQ

- Measures online and general campus-based student engagement
- Efficient to administer, score and interpret
- Excellent reliability and validity
- Seventy-three items spread across seven online and nine general engagement scales
- Measures obtained using student self reports

Population and administration

- Can be administered to individuals and groups
- Administration takes around 15 minutes, including introduction, distribution, completion and collection
- Should be administered by individuals familiar with psychological testing
- The questionnaire should be introduced to students, and students should be debriefed following administration
- Students should be encouraged to respond to all items
- The questionnaire is the only material needed for administration

Instrument focus and format

- Items and scales have been designed to be modular and suit different styles of administration
- Multidimensional measurements of online and general student engagement
- Seven key qualities of online engagement: online engagement, online active learning, online academic relevance, online teaching, online collaboration, online social interaction, online contact with staff
- Nine key qualities of general engagement: constructive teaching, supportive learning environment, teacher approachability, academic challenge, active learning, student and staff interaction, complementary activities, collaborative work, beyond class collaboration
- Broad overlap, but no direct concordance between online and general scales

Psychometric properties

- Seventy-three items spread across seven online and nine general engagement scales
- Face validity established through interviews with students and discipline experts
- Content validity established through research and expert review
- Psychometrically calibrated to ensure that each scale provides valid measurement of its targeted construct
- Item performance replicates in different institutions, fields of study, and across key demographic groups
- Scale reliabilities range between 0.7 and 0.8
- Scale scores are reliable at different levels of institutional aggregation

Scoring and interpretation

- Simple scoring rubric which can be applied easily by researchers or practitioners
- Scale scores can be computed as the mean response to constituent items, and interpreted directly
- Four dimension scores can be computed as the means of the following scales: online academic (OE, OAL, OAR, OT), online social (OC, OSI, OCS), general academic (CT, SLE, TA, AC, AL, SSI), general social (CA, CW, BCC)
- Centring dimension scores using an appropriate benchmark facilitates interpretation using a theoretically-based typological model
- Missing responses can be imputed with scale means

Figure 7.1 SEQ specifications.

considered in Chapter 5. Due largely in part to the large size of the sampled lecture and seminar clusters at universities, such multilevel reliabilities tend to be very high. While there are only around four items in each SEQ scale with which to measure an individual student's engagement, there are on average many more students with whom to measure engagement at the level of each lecture. This suggests that the SEQ would provide a highly reliable source of evidence for institutional managers and leaders.

Unlike the SEQ scales, the four dimensions of engagement were designed in order to use individual responses to classify each student by his or her engagement style. As opposed to the scales, the dimensions contain around fifteen items and, correspondingly, have a higher reliability of measurement. In turn, the standard error of each individual's scale score is reduced. Analysis of the academic and social online and general dimensions suggests that, on average across the dimensions, a 95 per cent confidence interval would have a range of around one scale unit or one standard deviation, where the range of scale mean scores varies from eight to eighteen. The dimensions provide much more precise measurement at the individual level than do the scales.

Along with reliability, it is essential that survey instruments provide valid measurement of targeted constructs. Face validity is one of the more important forms of validity, although only contingently related to technical fundamentals. Face validity can play a key role in stimulating appropriate behaviour from respondents, and in supporting confidence in and even endorsement of survey results. Efforts can be made to increase face validity by building certain processes into instrument development. Development of the SEQ was guided by an iterative process of consulting with higher education discipline experts, university teachers and university students. Among other things, such consultation sought to tune item wording, validate the scale groupings and identify a readily interpretable reporting process. Although face validity is not immediately measurable, establishing consensus among a representative range of stakeholders is an important means of enhancing the perceived value of the items and scales.

Steps were also taken to account for the content validity of the SEQ. Student engagement is an emerging and complex psychosocial phenomenon which has its substance defined in terms of higher education research and practice. The review of past research marked out points of reference considered salient in the literature. Along with strengthening face validity, the student focus groups, pilot testing, and reviews by university teachers and higher education experts provided a means of consulting key individuals about the content coverage of the SEQ in terms of current practice. In combination, these activities reinforced the adequacy of the instrument. The content validity perspective suggests the importance of developing new measures of student engagement with the evolution of theory and practice.

While face and content validity rely to a large extent on the judgement of selected individuals, construct validity is established through psychometric modelling. As documented in previous chapters, an integrated series of psychometric procedures was used to analyse the primary data collected in the research

and explore the construct validity of the SEQ. The item response and congeneric measurement analyses confirmed that the items provided appropriate measurement of the targeted single latent scales and dimensions. Analysis of inter-scale correlations suggested broad divergence between the online and general scales and dimensions and, accordingly, that these measure distinct engagement phenomena. There was less support for the divergent validity between the scales and dimensions within each modality, although the correlations were not high enough to suggest any redundancy. Analyses of differential item and scale functioning provided evidence for the construct stability of the SEQ, an important quality if it is to function effectively across different institutional environments.

Individual engagement report cards

Even when collected in group settings like lectures, mail outs or tutorials, the need may sometimes present to report engagement at the individual level. Individual engagement reports may be useful in a range of settings. Individual students may find it useful to locate their academic routines in broader normative or cohort contexts. Lecturing and tutoring staff might use engagement reports for planning or adapting curricula, shaping assessments or reflecting on pedagogy. Such reports could well be useful for student affairs advisors in their discussions with students on approaches to study or course planning. Staff involved in institutional planning may benefit from examining a few distinctive reports of individual engagement. There is a possibility too that individual engagement reports may also be useful for employers who want a non-academic measure of how an individual has engaged with his or her work.

Measures of individual student engagement can be captured in a 'student engagement report card'. Given appropriate explanatory notes, institutional staff could use such reports to manage the use of online systems to enhance overall student engagement. With appropriate design, such cards could be produced for individual students, for teaching groups, or for larger institutional departments, faculties or schools. Figures 7.2(a) to (c) show an example engagement report card which reports engagement statistics for a single student ('Wendy') and her corresponding year group of seventy-four students studying in the science and engineering field of education at a large metropolitan university.

The card shows, for instance, that Wendy has reported higher levels of all forms of online engagement than the cohort in general. The differences are particularly marked for the online engagement and online social interaction scales. The same cannot be said of Wendy's general engagement scores. These suggest that while Wendy sees herself as putting greater than average effort into active and collaborative learning, she does not feel that her efforts are matched by her teaching staff and general learning environment. These results for general engagement seem to suggest a dysfunctional imbalance between Wendy's support expectations and her own initiative. Comparison of Wendy's online and general engagement scores, however, suggests that to some extent Wendy may be

substituting online for more general forms of support. While Wendy reports almost never having individual contact with staff face-to-face, she does report having contacted staff online, and receiving support through social interaction and teaching online.

These observations are captured in the distributed learning ratios shown in Figure 7.2(c). Figures for the CW/OC and BCC/OC ratios indicate that along with her fellow students she sees collaborative work as happening in more general ways than online. The AL/OAL ratio suggests that she sees active learning as a more general practice than others in her cohort. On most other measures, Wendy appears to place more emphasis on online experiences than her peers. This is particularly the case in terms of her identification of supportive learning environments (SLE/OAR), complementary activities (CA/OSI), interaction with staff (SSI/OCS) and seeking out the kinds of pedagogical structure which will help her to learn (AC/OT). In general, Wendy has reported using online learning to support a very distributed form of engagement with her study.

Wendy's responses to the SEQ indicate that she has intense online but collaborative general styles of engagement. There are seven students altogether with this pattern of engagement style, which appears to be one of the most common patterns of online and general engagement in the group. This suggests that Wendy may be using online learning to compensate for academic aspects of her campus-based study. It also suggests that she has used online communication tools to add value to her on-campus collaboration. The engagement report card shows that Wendy's online engagement is around the highest in her year group. While she has a very high level of general social engagement, she is towards the lower end of the cohort in terms of her general academic engagement. For students like Wendy, it may be useful to introduce structures into the online learning experience which will encourage or require her greater engagement in general academic activities.

Reviewing aggregate group pictures of engagement

While individual students are typically the primary units of analysis in analyses of engagement, there is often much value in aggregate reports of the engagement of demographic or contextual groups. The hierarchical structure of educational systems and institutions means that it is often natural and very useful to examine patterns and trends in student engagement at different levels. Reports of aggregated data may play an important role in shaping or enhancing practice, in programme planning or review, or in quality assurance and marketing processes. Information about the patterns, trends and levels of subgroup engagement can help educational managers and leaders design systems, institutions and learning contexts to lead and manage student learning.

Hierarchical and group reports may work in a range of ways to enhance the value of student engagement analyses. Perhaps most obviously, they can expose the influence of different demographic and contextual variables on patterns in

General scale and item scores		Student	Group	Student	Group	Student	Group	Student	Group
Constructive teaching	2.00	1.77		0.20	1.51	0.00	1.51	1.25	1.28
Academics used teaching approaches that suited students' needs	2.00	1.76	Student/staff interaction	0.00	1.53	0.00	1.53	0.00	1.01
Materials were presented in a way that I could understand	3.00	2.01	I sought advice from staff on how to improve my performance with a member of academic staff	0.00	1.73	0.00	1.73	2.00	1.11
Staff valued students' ideas and questions	1.00	1.86	I met with academic staff outside class	0.00	1.26	0.00	1.26	2.00	2.22
Staff talked about their research in ways that inspired me to learn	2.00	1.49	I had one-to-one conversations with academic staff	0.00	1.66	0.00	1.66	1.00	0.78
I felt encouraged to creatively explore ideas	3.00	1.66	I developed a valuable rapport with a member of academic staff	1.00	1.38				
Staff encouraged students to question what was being taught	1.00	1.85						3.00	2.04
			Teacher approachability			1.25	1.76	3.00	2.03
Supportive learning environment	0.50	1.90	Teaching staff made a real effort to interact with students	2.00	1.51			3.00	2.47
Staff seemed responsive to feedback from students	1.00	1.68	Teaching staff were accessible	0.00	1.74			3.00	1.00
Staff respected students backgrounds, perspectives and needs	0.00	2.18	Staff seemed interested in helping students	2.00	1.86			3.00	1.78
The university campus felt like a supportive place to learn	1.00	2.01	Staff were generally approachable	1.00	1.91			3.00	1.99
I felt part of an academic community at university	0.00	1.73							
Academic challenge	1.20	1.97	Beyond-class collaboration	2.75	1.99			3.00	2.13
Academic staff gave me comments on my work that helped me learn	2.00	1.74	Students were required to work together outside of class	2.00	1.62			3.00	2.19
I received feedback quickly enough to improve subsequent work	1.00	1.49	I studied with other students outside of class	3.00	2.04			3.00	2.22
Assessment tasks challenged me to learn	2.00	2.39	I talked with students outside of class about study	3.00	2.30			3.00	2.18
I was encouraged by teachers to go beyond set materials	0.00	2.15	I used spaces around campus to study with other students	3.00	1.99			3.00	2.18
I was given enough material to keep up my interest	1.00	2.09						3.00	2.09
								3.00	1.95

Figure 7.2(b) Student engagement report card.

Student 150 engagement styles

Ratio	Student	Group
AL/OAL	1.36	1.12
SLE/OAR	0.25	1.21
CT/OT	0.92	1.03
CW/OC	1.71	1.79
CA/OAI	0.56	1.21
SSI/OCS	0.15	1.14
BCC/IOC	1.57	1.74
TA/OCS	0.94	1.02
AC/OT	0.55	1.04

Dimension	Academic	Online	General
Style	Social	Intense	Collaborative

Group engagement styles

Online style	General style			Total
	Intense	Collaborative	Independent	
Intense	10	(7)	3	23
Collaborative	1	2	2	8
Passive	4	5	1	19
Independent	9	5	4	24
Total	24	19	12	74

Engagement style plots

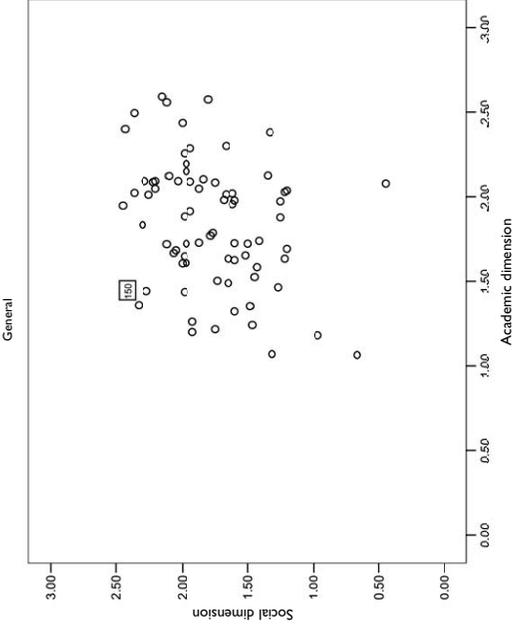
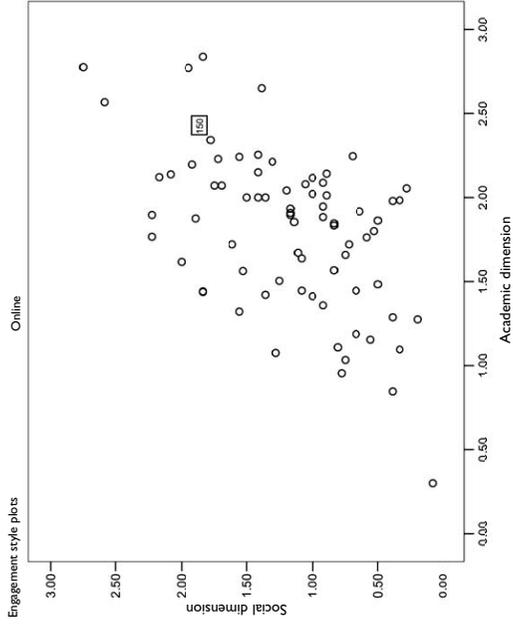


Figure 7.2(c) Student engagement report card.

engagement. They can bring out trends in different organisational groupings, and support cross-level forms of analysis. Analysing the multilevel aspects of data can adjust for and tease apart the influence and the extent of homogeneity within groups. Often, students in the same groups or cohorts provide responses which are more similar than the responses provided by students in other groups or cohorts. In exposing the presence and extent of such clustering, multilevel analysis can help identify the most effective level for making decisions, assigning responsibilities or generating changes.

One of the main reasons for multilevel analysis is to avoid the fallacies which arise from drawing inferences about individuals based on group results, and drawing inferences about groups based on individual results. Multilevel analysis clearly distinguishes the sources of variation which are due to individuals from those which are due to groups. While survey results are frequently used to draw inferences and make decisions about processes at different levels within systems and institutions, it is also important to keep in mind that the reliabilities of scales and measurement processes can vary across different levels of analysis. Psychometric instruments are conventionally calibrated at the individual level and care should be taken when they are used to report information for groups.

Three empirical examples are explored below to bring out the value of aggregate pictures of engagement. In examining these, it is useful to keep in mind that the standard deviations of SEQ scale scores hover around half a scale unit, and differences of even around a quarter of a unit reflect effect sizes which could be considered practically significant. The purpose of exploring these examples is more methodological or suggestive than descriptive, and the data are not provided as being representative of any specific population.

One of the key trends in contemporary higher education has been the rise in student mobility and particularly the international trade in education services. Although for many decades confined to research students and individually organised exchanges, the participation of international students in universities is now a major part of many higher education systems. In significant ways, Australian universities are among the most internationalised in the world. OECD figures in 2000 (OECD, 2000) indicated that foreign students accounted for around 17 per cent of all student places in Australian universities, the highest of any country and around three times the OECD average. The proportion has since grown to over 20 per cent, continuing the steady rise in numbers since the early 1990s (DEST, 2003). Remarkably for a small nation, in absolute terms Australia receives the fourth greatest number of international students, behind the USA, the UK, Germany and France (OECD, 2000). As these figures suggest, at least from the perspective of overseas student recruitment, Australian higher education is highly internationalised.

If the perspective on engagement set out in this book is treated seriously, then understanding how international students engage with university study in Australia is of critical importance to this educational system. Engagement measures can provide insight into the quality of student learning experiences engendered by institutions, provide data on the international student experience

of faculty, expose how international students feel about host-country curricula and pedagogy, give institutions a sense of this student cohort, and provide a lens for analysing international student learning approaches and outcomes. Not having valid and reliable information about international student engagement makes it difficult to make informed decisions about this increasingly important aspect of higher education.

Figure 7.3 presents mean patterns in student engagement scores across the defined qualities of engagement for Australian domestic and international students. The figures suggest broadly similar trends in engagement across the defined qualities for both international and Australian domestic students. Students report engaging most with the academic aspects of general engagement, the academic aspects of online engagement, the social aspects of general engagement, then the social aspects of online engagement. The plot does expose differences between domestic and international students, however, which alone demonstrate the value of the analysis. Specifically, international students report higher levels of engagement with online learning systems than domestic students, and slightly lower levels of engagement with the more general aspects of campus-based education. This is particularly so for the more social aspects of online learning. The trends in Figure 7.3 provide evidence that international students use university systems to enhance the relevance of their learning, to work more with other students and to interact socially with other students, both informally with other students, and with staff.

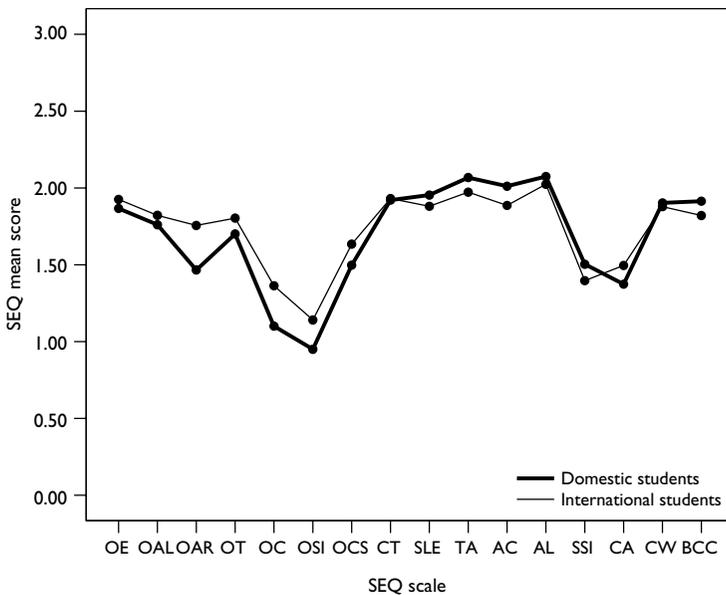


Figure 7.3 SEQ scale means by international student status.

Such patterns raise a range of possibilities and questions. Why are international students making more use of online learning systems than domestic students? Do online learning systems fit the learning style of international students? Do international students know more about how best to use such systems? Are international students using online systems to circumvent language difficulties with face-to-face learning? Should virtual learning environments be better tailored to the needs of international students, or to domestic students? Are full-fee paying international students simply more engaged across the board with their university study? Conversely, why are domestic students less engaged with the online aspects of their campus-based study? While the trends in Figure 7.3 fall far short of a sufficient response to questions such as these, they may help to triangulate other sources of evidence, or stimulate more directed forms of further inquiry.

Student engagement information can be analysed at the institutional level, and can play a role in institutional comparison activities. Ideally, such information should be read in the context of a suite of measures of institutional, pedagogical and student inputs, processes, and outcomes. In this way, information about students' engagements with educational activities and environments could complement or juxtapose figures on learning outcomes, institutional resourcing or teacher preparation. Even by itself, however, it can provide insight into the nature of students' participation in key learning activities.

The SEQ scale means are plotted in Figure 7.4 for four sample institutions. The institutions have been labelled by terms often used to identify them within the Australian higher education sector. In general, institutional results follow the same trends across the engagement scales. Besides this, there are a range of more subtle patterns which stand out as points of distinction. Most obviously, the 'sub-urban' institution has higher scores across many of the general engagement scales. Students at this institution see themselves and their teaching and support staff as more actively involved in effective educational practices, although they report what might be described as average forms of online involvement. Early year students at the 'technology' institution have reported among the lowest levels of engagement across many scales. Feedback from students at the 'research' institution suggests that they report high-level engagement experiences with online and face-to-face teaching. The same students, however, report only moderate levels of engagement on their own behalf.

In certain instances, it may be more appropriate or useful to analyse student feedback by fields of study rather than by institutional groupings. Fields of study have their own cultures, contexts or associated industries which often make it strategically valuable as well as parsimonious to analyse and report results in this way. Indeed, common differences between fields of study can threaten the validity of analyses which conflate results from different fields of study. It seems likely that, in many instances, different fields of study would evoke different opportunities for and patterns of engagement.

The value of analysing SEQ results by field of study is demonstrated in Figure 7.4, which shows SEQ scale means for two fields of study. Students taking

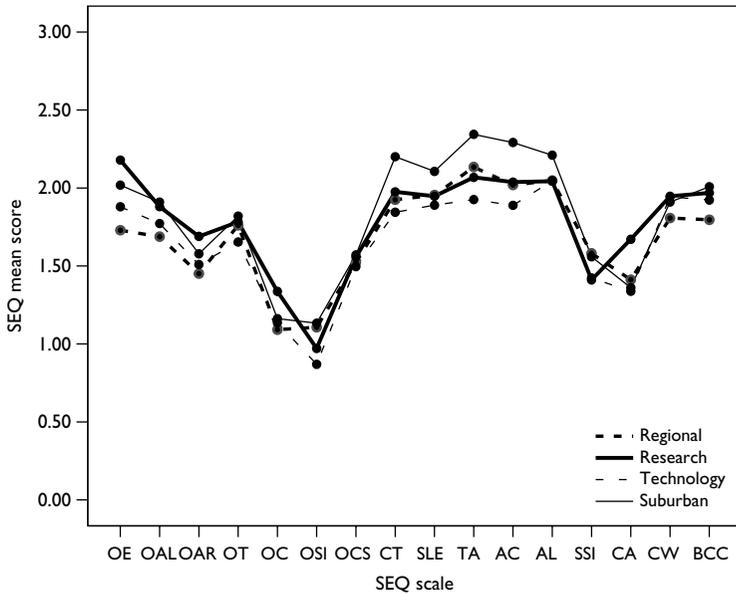


Figure 7.4 SEQ scale means by institution.

education courses report the lowest forms of online engagement in these sample figures. The student feedback suggests that they participate in online social activities only rarely, that they attach only moderate value to online teaching and contexts, and that they only sometimes engage in active forms of online learning. The same students, in contrast, report much higher forms of general engagement, particularly its more academic aspects. Like most students, they initiate fairly low levels of interaction with staff, however they do collaborate with their peers both inside and outside of class. The patterns of engagement of students taking information technology courses present an interesting counterpoint to the education student figures. As might be expected, these students report much higher levels of online learning, suggesting a more technologically distributed form of campus-based study. Indeed for these students, the line linking SEQ scale means is almost flat. They appear to invest as much energy in online learning as in in-person learning, and divide their social involvement equally between the modalities. From the trends in Figure 7.4, it might be possible that information technology students are using online systems to have a richer form of social experience than others.

Even though the sample results shown in Figure 7.5 combine data from different institutions, the patterns for each field are quite distinct. This raises a number of interesting possibilities and questions about engagement. To what extent are trends in engagement typical of or endemic to each field of study? Is it

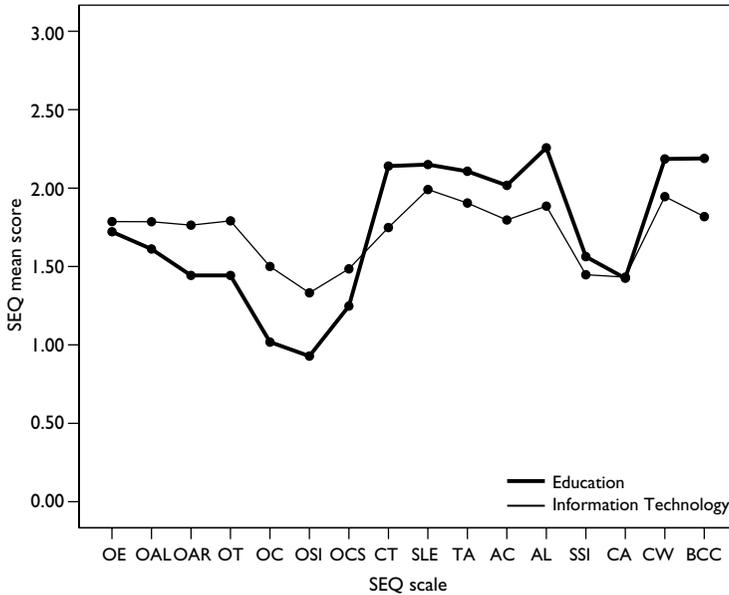


Figure 7.5 SEQ scale means by selected fields of study.

methodologically valid or substantively meaningful to conflate results from different fields of study? What are the implications of these distinctive patterns of engagement for curriculum and assessment design and pedagogy in each field of study?

A broad picture of campus-based and online study

Discussion in this book has assumed that the way in which students engage with their study is a critically important part of university education. It has also been assumed that it was likely that online learning systems could be changing such interactions, given the espoused changes they have introduced into higher education. From these assumptions, the book has sought to develop understanding of the engagement of campus-based students using online LMS. Results from the empirical analysis of engagement have been presented at various points throughout this book. As a whole, these results expose much about the online and general engagement of contemporary undergraduates who are studying on-campus. Exploring the empirical results set out in Chapters 5 and 6 helps paint a broad picture of this area of higher education, and provides points of departure for future investigation.

Analysis of student response confirmed that academic challenge, and active and collaborative learning are core qualities of students' university experience. The empirical relationships between these qualities indicated that they were largely independent to each other. Overall, students tended to report experiencing similar and fairly high levels of these engagement phenomena. While not designed to be representative of the entire student population, these findings indicate that Australian students see themselves as being encouraged to participate in the demanding tasks likely to promote learning, and as actively seeking out ways to construct their knowledge both alone, and with others. In combination with this broad trend, however, the item calibration statistics have revealed aspects of engagement which appear to be more demanding for students. Students found it most difficult to report frequent timely and helpful feedback, individual reflection on the practical and ethical contexts of study, and providing academic support to their peers, particularly around campus.

The results have also exposed encouraging information about students' beyond-class collaborations. These were identified as significant aspects of the student experience, partly because they distribute formal learning into other areas of student life, but also because they help weave students into university learning communities. While students in the surveyed population may not be engaging in many of the broader offerings of university life, they do seem to be forming collaborative relationships which extend beyond the classroom.

To a certain extent, students reported that online learning systems enhanced their sense of academic challenge. Student responses clearly indicated that the online systems were used to promote a distinctive kind of online teaching. As part of this, they saw that staff used the systems to set the expectations and demands likely to promote challenging learning. They were less inclined, however, to see staff as using the systems to offer a more individuated learning experience which perhaps extended the material discussed in the course. Although further investigation would be required, this might suggest that the systems are being used to transmit static information rather than to better tune teaching to the needs of the learner. This would be disappointing, given that even the most basic online systems available to staff at the surveyed institutions have the capacity to support formative and summative assessment, provide enriching learning materials, and support various kinds of synchronous and asynchronous discussion. From a pragmatic perspective, however, it accords with what is known about the patterns of adoption of online learning systems by many university teachers.

For their part, however, students seemed less inclined to integrate the use of online learning systems into an overall active learning approach. While most students used the online systems to contribute in basic ways to the development of their learning, only very engaged students reported using the systems to seek additional feedback and participate in challenging activities. Given the likely 'information-age mindset' of many of the surveyed students, it is surprising that students have not more readily incorporated online learning into their active learning. There may be a range of reasons for this, including that students

are unaware of how to best blend online learning into their campus-based experience, that they are resisting such integration in preference to more general forms of interaction, or that they are unaware that their use of online systems forms part of active learning. Although the interviews provided some evidence for the first two of these hypotheses, the strong relationship between the online engagement and online active learning scales tends to suggest that students are cognisant of the presence of the systems in their university study.

One of the most surprising insights from the empirical development of the SEQ scales and engagement typology was the very mild relationship between students' online and general collaboration. Although empirical validation confirmed online collaboration as an important part of the student experience, it also indicated that online collaboration was distinct from, rather than supplementary or complementary to, more general forms of collaboration. This confirms online collaboration as an important aspect of online learning, and one which seems to augment rather than substitute face-to-face forms of collaboration. The findings suggest that most students use the systems to work alongside, although not necessarily with, others around the campus. This is manifest particularly in students' reports of the extent to which they engage in the more general forms of online social interaction. Campus-based students only very rarely seem to use online systems to add value to their in-person interactions. While most students tended to find it easy to participate in online discussions, only those with greater perceived levels of engagement reported having enriching online discussions with other students. Such figures provide little evidence for the seemingly default position in the educational literature that campus-based students are using online systems to add a virtual collaborative dimension to their university experience. Only a small number of very engaged campus-based students seem to be using online systems to participate in a distributed learning environment.

The patterns in Chapters 5 and 6 mark out Australian students' contact with staff as a part of their university experience. They distinguish contacts initiated by staff from those initiated by students and show that these constructs are only mildly related. In terms of staff initiation, students reported staff as seemingly interested in students, but they found it harder to characterise teachers as putting effort into stimulating interaction with students. One of the most concerning aspects of the findings, however, was students' perceptions that they only very infrequently put effort into making contact with staff. In particular, it seems most uncommon for students to seek the kind of individualised and particularly out-of-class contact that engagement research has exposed as particularly beneficial for learning. This is particularly concerning given that the surveyed students were in the earlier years of undergraduate study. While not designed to be representative of Australian undergraduate students overall, these results do hint that such students are neglecting opportunities to engage in contacts likely to help them learn specific knowledge, feel endorsed as legitimate members of university learning communities and learn about academic inquiry. There also appears to be some ambiguity as to whether this aspect of the student experience is academic

or social in nature. While it would seem that communication with staff should form part of the broad social experience of university, the empirical results emphasised its academic quality. In part, this may be due to the apparently narrow rather than broad nature of these interactions. Thus, while the SEQ validation affirms the importance of this quality of Australian student engagement, it also reveals its somewhat limited role in the experience of campus-based undergraduate students.

Disappointingly, this also seems to be the case for students' online contact with staff. While online LMS support different kinds of communication, even students who report using the systems often in their study reported only rarely using them to interact with staff. Further, only students with particularly high levels of engagement reported having individual online contact with staff. Such findings contrast with students' perceptions that teaching staff tended to put effort into using online systems to communicate with students. Much has been said in the online learning literature about the possibilities of virtual communication between students and staff. It is surprising, therefore, to discover that, relative to their overall use of the systems, students are not using the virtual medium to enhance their interactions with staff.

Students certainly endorsed the pedagogical and more general forms of support as constituting an important part of their university education. The findings indicate that, in addition to those aspects of learning for which students are responsible, teaching and other staff play a role in enhancing the likelihood of productive learning. The surveyed students perceived that responsive and supportive learning environments as well as adaptive teaching practices contributed particularly to their academic engagement with university. However, they reported only rarely experiencing staff talking in inspiring ways about their research, staff encouraging students to creatively explore ideas, or staff responding to student feedback. Further, students required particularly high levels of engagement to see themselves as part of an academic community. While salient aspects of student engagement, there is clearly a need to enhance these aspects of the student experience. It is concerning that students might not see staff as imparting the excitement of investigation integral to academic inquiry and that, after at least a period of university study, they find it hard to see themselves as participants in knowledge creation communities which are themselves organisations learning in response to student feedback and needs.

One of the broadest and most significant results is that campus-based students are using online learning systems. Although more in academic than social respects, many of the surveyed students reported that their virtual contact with university augmented their study. In short, online learning systems are influencing the way campus-based students engage with their study. While apparently not equally as important as in-person experiences, using the systems is helping students to feel part of their university, stimulating learning and helping contextualise study. Although the situation appears to be more complex than many theorists have previously indicated, such trends seem to suggest,

importantly, that students are seeing online systems as a means of becoming more involved in their university education.

While some students do seem to be incorporating online systems into the way they engage with their study, one of the clearest trends in the findings is the generally low relationship among the online and general engagement. There were only random relationships between the items chosen to indicate key aspects of online and general engagement, and there were only very small and mostly random relationships between the calibrated scales. Given these findings, there appears to be only a very loose connection between how students use online systems and how they engage in more general ways with their university study. In particular, this connection appears to be contingent on the engagement style of each individual. Taken on face value, such results suggest that many students fail to see themselves as engaging in a technologically distributed campus-based learning environment. They suggest that despite much financial investment and theoretical speculation, online systems are not suffused into the campus learning experience. Rather, they tend to form part of a reasonably independent parallel experience. An important part of the picture of engagement being developed, however, is the replication of the academic and social dimensional structure across each modality. While only contingently related in terms of the overall experience, the online and general modalities seem to support parallel but perhaps not integrated engagement opportunities.

These ideas are fairly general, and are based on the probabilistic relationships set out in Chapters 5 and 6 between the defined SEQ items and scales. One thing the proposed model of engagement makes clear, and which is reinforced in the relationship between the online and general scales, is that in practical contexts it is difficult to generalise about the influence of online learning systems on campus-based engagement without considering the engagement style of each individual. This point is often ignored or inadequately addressed in online learning research, in which the educational significance of sophisticated contemporary online learning systems is too often taken for granted and considered unproblematic. While this analysis has defined important aspects of campus-based online learning which are certainly a part of much contemporary student experience, it has also shown that the relevance of these is not entirely a product of their provision but, in important respects, is conditional on the engagement style of the individual.

The assumption that information about individual learning should play a critical role in understanding university education is central to the idea of student engagement. The findings discussed earlier emphasise the importance of this assumption in many ways. While the empirical results are certainly not representative of the sampled institutions, they expose much about the use of university online learning resources which runs contrary to institutional statements about these valuable resources which most universities around the world have rushed to acquire. The empirical results also expose many points of divergence between students' perceptions of teaching and more generalised support, and students'

generally lower perceptions of their own engagement. Even without more detailed analysis, this divergence suggests that information about the provision of teaching and administrative resources accounts for only part of the educational equation. The findings have also confirmed the feasibility and relevance of measuring, analysing and reporting on a range of varied and often quite sophisticated educational processes. They have demonstrated a means for identifying how students are engaging with their study and, in the absence of generalisable measures of learning outcomes, whether they are using valuable university and personal resources in ways likely to maximise the productivity of their learning.

Engaging students in conversations about learning

It is important that surveys stimulate rather than suppress or supplant conversations between students and universities. While surveys help to capture, probe and clarify determined aspects of engagement, the phenomenon almost demands a degree of ongoing inquiry into its nature. The substance and dynamics of student engagement might shift with changes in contexts, cultures and people. Thus, it is important to keep having conversations with students about their engagement.

Conversing with students is important, because many characteristics of engagement are known only to students. Engagement is in many ways a socially constructed phenomenon, however much of it is also private or psychological in nature. Behaviour may provide neither necessary nor sufficient index of students' intended or felt interaction with their study. Discrete aspects of behaviour can have very loose links with or may reflect only the manifest parts of more sustained underlying intentions. Conversations with individuals help to expose the complexity and nuance of engagement dynamics.

It is difficult to imagine alternative sources of information capable of yielding better information than students themselves. Apart from very small-scale or localised instances, it is difficult to conceptualise a single or series of locations around a campus that would allow sufficiently rich opportunities for observation of individuals' overall engagement with their university study. Although audit data from LMS has been used in studies of online learning (Morgan, 2003; Postle *et al.*, 2003; Samal and Gopal, 2003; Hanson and Robson, 2004), information on software use plays only a small part in understanding how students are learning.

Interviews can provide a valuable means of getting contemporary information on how students actually think about their engagement. They provide a valuable means of gathering first-hand impressions of students' thoughts and feelings about engagement. Exploring issues in a situated way allows exploration of engagement on an ontological level. Interviews

enable theoretically derived ideas to be tested in a rich communicative context and, in particular, a context relevant to contemporary universities. Through the process of probing and exploring student responses, they provide a way of exploring nuances of student engagement, while simultaneously generating rich qualitative data.

Interviews also enable direct interaction with students. They make it possible to be active and reflective during data collection. Interacting directly with students in the field provided occasions to experience many tacit contextual qualities, and to think hermeneutically about the interview experience and the interpretation of student response. These experiences and reflections can be fed directly back in an associative way into the interview process, and provide a point of reference for later analysis and interpretation. Feelings and observations about the interview process provide an additional resource for interpreting the phenomenon of student engagement.

In addition to gathering data on engagement, interviews can provide methodological information relevant to the development of survey or other assessment instruments. Talking with students provides information useful for selecting response scales, capturing the language used by students and identifying how to target items to maximise useful variation and avoid floor and ceiling effects. Observing and interpreting how students construct understandings of their engagement suggests angles and emphases for questions, the amount of weight students attach to various issues and how students may be provided with the most useful feedback about engagement. Developing an instrument without speaking with students would require a range of assumptions to be made about the subjective relevance of phenomena being studied.

Part III

Harnessing knowledge for educational development

Distilling research into general student engagement

Student engagement is a very practical phenomenon, but also one which benefits from imaginative reflection and conceptual analysis. Without such inquiry, the phenomenon would lack substance, could stagnate and lose relevance, and would be difficult to connect with educational conversations and broader ideas. Capturing the rich substantive dynamics in the idea of engagement provides a basis for generating insight into and harnessing imaginative ideas about university education.

The breadth of the concept, as mapped out in this book, does allow it to function like a metaconstruct which can be used to gather together and integrate a diverse range of empirical and theoretical ideas about the student experience. The nine qualities of general engagement explored here provide an excellent guide for synthesising insight from research into the university learning and the student experience. This chapter takes advantage of this opportunity, and uses each of the qualities as a springboard from which to undertake a series of brief and suggestive adventures with the conceptual characteristics of these aspects of university education.

Engaging in supportive learning environments

When I first started I was really shy, but I just found it so much better coming to a class and seeing people's faces, and people actually saying 'I don't think I really get this', and I thought 'Oh great, it's not just me'.

(Hugo, first year Spanish major)

The 'supportive learning environment' quality captured aspects of students' feelings of legitimisation within the university learning community. While students are typically agents in discussions of engagement, the environment in which students learn plays an important role in affording and enhancing the kinds of learning activities which are possible. Focusing on supportive learning environments highlights the degree to which institutions engender conditions that are likely to make student engagement possible and, indeed, probable. The quality

focuses more on institutional provision than on students' own activities. Perhaps more than any other quality, it represents the accountability of the university in the educational process.

Much research has suggested the importance of the campus environment for student learning. As put by the NSSE (2002: 11), 'Students perform better and are more satisfied at colleges that are committed to their success and cultivate positive working and social relations among different groups on campus.' Similarly, Gardiner (1994: 73) writes that:

The extent to which our now-diverse students find a welcoming, intellectually stimulating, ethically principled, and emotionally supportive and caring environment when they arrive on campus can significantly affect both their decision to remain in school and their achievement of the desired developmental outcomes.

It is important to reiterate that engagement research emphasises the indirect effects of institutional resources on student performance. Rather than influence learning directly, campus characteristics are seen to generate the conditions which afford and support student learning activities.

Little's (1975) psychosocial study of the university student experience offered an early but still relevant statement of the importance of the campus environment for learning. Little used the two dimensions of support and social orientation to distinguish four types of university learning climates. The support dimension refers to the reassurance and recognition given to individuals, while social orientation refers to the kinds of demands and level of guidance they are offered. A training climate arises when high demands are made of individuals, yet they are offered a low level of support. Neglecting climates reflect low levels of both support and guidance. Indulging climates arise when individuals are given high levels of support yet demands are set low. Cultivating climates occur when the demands made of individuals are high, and they are also offered high levels of support and recognition. Little argued that each of the climates had different implications for students, and that the cultivating climate was most productive for undergraduate student learning and development. The analysis suggests that student learning is optimised when it occurs in an involving and challenging university context.

The spirit and substance of Little's ideas about cultivating climates are reflected in contemporary research on learning communities. Broadly conceived, learning communities, or communities of practice, are groups of individuals with shared knowledge creation interests. Contemporary theories of learning suggest that learning results from participation in such communities. Situated learning theory, for instance, suggests that individuals learn through interacting in a dialectical way in fields of knowledge (Brown *et al.*, 1989; Lave and Wenger, 1991). Such views have had much influence on higher education theory

and research, and are starting to impact practice. Tinto (1993: 132) writes, for example, that:

the argument about student learning moves beyond the simplistic notion that students are alone responsible for their own effort to the more complex notion that institutions also influence the quality of student effort via their capacity to involve students with other members of the institution in the learning process.

Such views have underpinned criticism of the idea that it is sufficient for student learning that institutions transmit knowledge to students in a decontextualised form (Laurillard, 2002). Accordingly, they have emphasised the idea that institutions need to provide dynamic and discursive environments with which students can interact to learn.

One expression of this has been the development of specific or tangible forms of 'learning community'. In the USA but increasingly elsewhere (Weber, 2000), the concept of community has been frequently linked with specific pedagogical or administrative devices such as small mentoring partnerships, small work-groups collaborating on particular assessments, medium-size groups collected around particular subject themes, whole year levels or multidisciplinary interest groups composed of students and academics (Gabelnick *et al.*, 1990; Dede, 1996; Matthews, 1996; Shapiro and Levine, 1999; Kezar, 2000; Land and Hannafin, 2000). Such devices manifest the idea of learning community in ways which, it is hoped, will help weave students into formative conversations about knowledge.

These perspectives are captured in the idea that student learning is likely to benefit if institutions provide a 'seamless learning environment'. As Kuh (1996: 136) writes:

In seamless learning environments, students are encouraged to take advantage of learning resources that exist both inside and outside the classroom... faculty and staff use effective instructional practices; and students are asked to make use of their life experiences to make meaning of material introduced in classes, laboratories, and studios, and to apply what they are learning in class to their lives outside the classroom (Strange, 1992).

This is very close to the idea of distributed learning, and suggests, as has been discussed, that benefits arise from blurring or synthesising what happens inside and beyond the classroom.

Higher education research has sought to identify the conditions that support and guide students' participation in university learning communities. Important work has been done by Kuh *et al.* (1994: iv), who identify a series of institutional conditions which 'seem to encourage students to use their out-of-class experiences to educational advantage'. Along with other work, themes in their analysis help

to generate a perspective on the institutional conditions which appear likely to promote students' participation in university learning communities.

Institutions promote student learning and development by embracing a holistic view of talent development. This idea stems from Astin's (1985) model of university education which, as mentioned above, sees it as a process of developing each individual's distinctive talents. In emphasising this point, Love and Goodsell-Love (1995) argue that institutional activities need to integrate the social, emotional and intellectual aspects of learning. They identify a range of ways in which staff and institutions can develop and implement policies and practices that are responsive to the needs of the learner and contribute to their overall development. These include initiatives such as focusing on students as individuals, incorporating social and emotional elements into teaching, and providing opportunities that help students reflect on and integrate diverse experiences.

Effective learning is dependent on institutions providing responsive learning environments which are congruent with students' characteristics and needs. A responsive learning environment would likely involve the provision of flexible academic and administrative resources. Even more responsive environments, however, would be dynamic rather than just reactive in nature. In key ways, their organisation would be informed by student feedback, or 'systematic assessment of institutional practices and student performance' (Kuh *et al.*, 1994: 55), and they would develop responses which students perceive as thoughtful and appropriate. As students from diverse backgrounds increasingly participate in higher education, it is important that universities continue to update their assumptions about student needs and expectations (James, 2002), and about the kinds of activities and resources students need to help their learning. Institutions which are sensitive and listen to students are likely to respond in ways that promote involvement, learning and development.

The places where people learn should be human scale settings characterised by ethics of membership and care. From studying the characteristics of involving colleges, Kuh *et al.* (1991: 110) determined that 'the properties of the physical environment shape behaviour, either encouraging or discouraging students from taking advantage of learning opportunities'. They identified a 'human scale' campus environment as being particularly important. Spaces consistent with an institution's purpose may facilitate and enhance educational activities. Such environments are more likely to engender individuals with feelings of inclusion, security, efficacy and empowerment, and promote interactions between people. Kuh *et al.* (1991: 321) write that 'The most critical issue regarding campus environments and student involvement is . . . creating a sense of belonging, a feeling on the part of students that the institution acknowledges the human needs of social and psychological comfort, and that they are full and valued members of the campus community.' The Carnegie Foundation for the Advancement of Teaching (1990: 47) writes that 'As impossible as the goal may seem to be, a modern college or university should be a place where every individual feels affirmed and where every

activity of the community is humane. Caring is the key.' These views stress human scale settings as playing a valuable educational role in making individuals feel that they belong, and are valued, respected and appreciated.

A diffuse but profound condition is that an ethos of learning should pervade all aspects of institutions through their clearly, coherently and consistently expressing their educational purposes. Learning should not be compartmentalised and restricted to formal instructional environments, or to interactions between particular people. Rather, universities should be learning organisations (Argyris and Schon, 1977; Levitt and March, 1988), which themselves are engaged in bringing practice into line with espoused intentions, as well as attempting the more substantial task of reviewing and revising the intentions themselves. They should be places where students can interact with communities 'holding conversations about knowledge' (Daniel, 1998b). This perspective accords with the broad normative conception of universities as learning communities (Little, 1975; Resnick, 1988; Brown *et al.*, 1989; Lave and Wenger, 1991; Greeno and Moore, 1993; Wenger, 1998; Wenger *et al.*, 2002) with particular kinds of social climates that bring together individuals with shared knowledge creation interests.

The above analysis has exposed important ways in which institutions might engender conditions that are likely to make student engagement possible and, indeed, probable. As such, it has highlighted an aspect of student engagement which focuses more on students' perceptions of institutional provision, rather than on their individual engagement itself. Part of this involves institutions' support for holistic talent development, the extent to which institutions provide conditions that support students' overall development, including social and other activities beyond the classroom. Institutions should also provide responsive learning environments which students perceive as appropriate for their diverse characteristics and needs. Faculty should employ pedagogical approaches which students perceive as responsive to their learning needs. Universities should provide caring and human scale settings, both socially and physically, which allow students to feel integrated into a university learning community. Institutions should convey an ethos of learning, which students perceive as an overall 'institutional ethos of learning' that is consistent with a learning organisation or community. While this is a broad range of complex ideas, it brings together many key aspects of the institutional responsibility for student engagement.

Educational interactions between students and academic staff

You kind of just want that personal level with the lecturer... you kind of expect that the lecturers will at least know your name, whereas some of the lecturers don't even want to know you and they just talk in a monotone voice and walk out when it's done.

(Tobie, second year history major)

Interaction between students and faculty is particularly significant for student learning and development. Such interaction is a joint responsibility which involves both faculty and students. While faculty need to make efforts to promote such interaction, students need to engage in activities which comprise such interaction. These two agencies are captured in two qualities of engagement exposed above. The idea of 'teacher approachability' reflects students' perceptions of whether faculty are investing energy in making contact with students. This idea is complemented by the quality of 'student and staff interaction' which reflects the level and nature of student-initiated contact with teaching staff. Together, these two qualities reveal important aspects of this area of engagement, and prompt deeper exploration of this area of engagement.

A substantial amount of higher education research has affirmed the importance of the interactions between students and academic staff. As Kuh and Hu (2001a: 309) write, 'The higher education literature almost unequivocally extols the virtues of student-faculty contact.' Interactions of many different kinds have been found to influence a wide range of student outcomes. Astin (1993b: 383), for example, writes that 'Student-faculty interaction also has positive correlations with every self-reported area of intellectual and personal growth, as well as with a variety of personality and attitudinal outcomes.' Such thought is reinforced in a large number of studies (see, for example, Wilson *et al.*, 1975; Pascarella and Terenzini, 1976, 1978, 1979, 1991, 2005; Terenzini and Pascarella, 1980; Endo and Harpel, 1982; Bean and Kuh, 1984; Astin, 1985; Bean, 1985; Pascarella, 1985; Baxter-Magolda, 1987; Chickering and Gamson, 1987; Kuh *et al.*, 1991; Chickering and Reisser, 1993; Lampton, 1993; Tinto, 1993; Kuh and Hu, 2001a). Indeed, student and staff contact has been found to be pedagogically beneficial, even after accounting for environmental and individual differences.

The contact students have with staff has been considered significant for a number of reasons. The most obvious is that interacting with staff provides students with a means of enhancing their subject-specific knowledge. In general, the more pedagogically effective contact there is between a student and an instructor, the more likely it is that the student will encounter information relevant to his or her study. Even if higher education students are able to access subject relevant information in other ways, it seems likely that, in general, contact with staff would add value to their learning experience. In addition to receiving information, students may have concepts elaborated, receive more feedback, get more individual attention, and develop their understanding about academic skills and processes. Kuh and Hu (2001a: 329) note that effective contact may indirectly value-add the student learning experience, writing that 'The most important finding from this study is that student-faculty interaction encourages students to devote greater effort to other educationally purposeful activities during college.' This reason alone seems sufficient to justify student and staff contact as an important benchmark of student engagement.

A more subtle reason for the importance of student and staff contact is that it may legitimate students' involvements in academic learning communities.

Contemporary situated learning theories describe learning as a process of 'legitimate peripheral participation in communities of practice' (Lave and Wenger, 1991: 35). Such theories hold that as students learn they move from having a valid although marginal or non-central role in the community towards playing a more significant role. It has been suggested that interactions with staff encourage this movement. This kind of socialisation is noted by Kuh and Hu (2001a: 310), who write that:

A presumed salutary effect of interactions between students and faculty members is that students will become more comfortable in the academic environment and will more willingly adopt institutional norms and values. This outcome increases their sense of belonging and 'fit' with the institution, factors that are positively related to persistence and graduation.

In addition to becoming more connected with an institutional culture or field of inquiry, having their position in a community recognised may help students validate and value their knowledge, and enhance their confidence and motivation to deal with the uncertainties associated with learning. Pascarella and Terenzini (1991: 620) write that:

A large part of the impact of college is determined by the extent and content of one's interactions with major agents of socialisation on campus, namely faculty members and student peers. The influence of interpersonal interaction with these groups is manifest in intellectual outcomes as well as in changes in attitudes, values, aspirations, and a number of psychosocial characteristics.

Overall, these ideas suggest that interaction with academic staff increases students' general integration into the life of the university.

Contacts with staff can be important inasmuch as they serve as models for student learning. Chickering and Reisser (1993: 316) write that 'Because of their influence on students, faculty should use their positions with a clear focus and intentionality. Faculty can encourage student development – as scholars and teachers, mentors, role models, and skilled listeners.' Similarly, according to the NSSE (2002: 10), 'Students learn first hand how experts think about and solve practical problems by interacting with faculty members inside and outside the classroom. As a result, their teachers become role models, and guides for continuous, life long learning.' The value of models for learning is affirmed in sociocognitive theory (Bandura, 1989). Models can reflect complex phenomena in a distilled way, and represent things that transcend the direct environment. By observing models, students can engage in powerful and efficient forms of vicarious learning.

Research has uncovered a number of facets of effective student and staff interactions. Research in this area has been dominated by positivistic 'college impact' studies (Pascarella and Terenzini, 1991, 2005) that have tended to be correlational and large scale in nature. The nature of these studies has influenced the phenomena identified as salient, as well as the specificity and certainty of the

findings. Rather than attempt to enumerate a list of the beneficial contacts students may have with academic staff, the studies have sought to uncover the generic facets of such interactions and the conditions which make them likely to occur.

First, and very basically, there need to be moments when it is possible for there to be educationally productive interactions between students and staff. The generation and provision of such moments depends on students, staff and institutions. Students need to invest time into and perhaps prepare for such interactions. Staff need to place themselves into positions where they are accessible to students, and make available time and places for meetings to occur. Institutional policies and cultures need to value, encourage and reward such interactions. As Chickering and Reisser (1993: 335) express this point, 'Accessibility means more than simply saying to students, "Feel free to come and see me". It requires an institutional climate where talking with faculty members is legitimised, where students feel free to "take up the professors' valuable time", and where such contacts are viewed as a necessary and important part of teaching and learning.' A minimum condition for such interactions, therefore, is that circumstances are created which make them possible.

Second, a recurring theme in the research is that interactions are particularly valuable when they occur beyond formal instructional environments. Pascarella and Terenzini (1991: 620) write that 'The educational impact of a college's faculty is enhanced when their contacts with students extend beyond the formal classroom to informal non-classroom settings.' The point is reinforced by Tinto (1993: 57), in his observation that 'Those encounters which go beyond the mere formalities of academic work to broader intellectual and social issues and which are seen by students as warm and rewarding appear to be strongly associated with continued persistence.' Although not clear in the literature, such locations may be important merely because they are not in the classroom, or because they may suggest a degree of extra investment in the process.

Third, research findings have shown that the theme of an interaction influences its value. Casual social and formal administrative interactions do not, in general, appear to be linked with productive learning outcomes (Kuh and Hu, 2001a). Indeed, Tinto (1993) suggests that interactions which are perceived by students to be driven by administrative necessity may be linked with voluntary forms of withdrawal. Interactions which have a more academic focus appear to be most beneficial for students. Pascarella and Terenzini (1991: 620) summarise that 'The most influential interactions appear to be those that focus on ideas or intellectual matters, thereby extending and reinforcing the intellectual goals of the academic program.' Kuh and Hu (2001a) identified out-of-class interactions as being particularly beneficial if they focus on contextualising and making relevant academic issues. It seems important, however, that academic discussions are not too narrow in their focus. Tinto (1993: 57), for instance, writes that 'Those encounters which go beyond the mere formalities of academic work to broader intellectual and social issues and which are seen by students as warm and rewarding appear to be strongly associated with continued persistence.' Such encounters appear to be particularly valuable if they help students locate themselves in a field of inquiry and establish its relevance to them.

Fourth, the way staff and students communicate influences the effectiveness of the interactions. Both staff and students need to be motivated to participate in the interaction. Although it does not seem to matter if meetings have been initiated by staff, students or institutional processes, it is important that all parties have an interest in the process (Kuh *et al.*, 1991; Tinto, 1993; Kuh and Hu, 2001a). It is important, in particular, that staff are perceived by students as caring, both about the interaction, and about the needs of the individual (Pascarella and Terenzini, 1991, 2005; Tinto, 1993). Chickering and Reisser (1993: 317) write of influential staff as ‘experienced professionally, intellectually alive and capable, pursuing problems and sharing experiences with those still testing their competence. They take students seriously. They respect students’ developing skills and life experiences, while both student and teacher work to refine them.’

Staff should have an understanding of students. This may involve understanding general cohort issues, as well as learning about individuals. Encounters are most productive when staff and students are honest. Students need to represent their understandings, confusions and anxieties to teachers. While being knowledgeable, teachers should be willing to discuss and model the uncertainties intrinsic to learning. Baxter-Magolda (1992: 294) writes that ‘Sharing with students how we as educators form our own perspectives, and that our ideas are often in disarray before we arrive at a coherent view, makes the thinking process accessible. As long as instructors do not reveal the difficulties inherent in learning, students will not perceive that their struggles to understand are part of that same process.’

This analysis has synthesised research into the educationally salient forms of interaction between students and staff. While it has stopped short of an extensive investigation of this important issue, it has travelled beyond the distilled qualities of engagement to explore many of its underlying subtleties and complexities. It has explored reasons for the significance of such interactions. It has identified a number of the educationally important characteristics of such interactions. The analysis suggested the importance of pragmatics. It needs to be possible for such interactions to occur. Ideally, research findings suggest that institutions, staff and students should endeavour to make ways for contacts to take place beyond the formal classroom environment. It is optimal for such interactions to have a broad intellectual or academic focus that is relevant to the student, brings out the wider significances of topics, and helps students locate themselves in the field of knowledge. The dynamics of the interaction also matter. Both staff and students need to be motivated to participate in and care about the interactions, and they need to understand and be honest about their learning and understanding.

Challenging academic engagements

I like it when it's the same as high school, where you've got class after class and you learn, and I prefer those learning environments where you've got everybody around. I like more contact hours than having to study at home, or on the internet and just take your things off the internet. I prefer to study in classes with tutors.

(Jeremy, journalism and mass communication major)

Being involved in academically challenging activities is something that seems central to any understanding of engagement. Unless students are engaging with tasks that they find stimulating and demanding, it would seem hard to believe that they are really studying in ways that are helpful to their learning. As put in the NSSE (2002: 10) 'Challenging intellectual and creative work is central to student learning and collegiate quality.' Despite its commonsense and intuitive appeal, however, there is a paucity of research specifically on the concept of 'academic challenge'. By drawing on various theories about learning, this section constructs a normative interpretation of the phenomenon.

Academic challenge is based on the notion that students will learn most when they engage with activities that stimulate their curiosity, intellect and involvement. While the term 'challenge' suggests a cognitive emphasis, involvement in challenging academic activities also has behavioural and affective dimensions. Being challenged requires a certain investment of energy in an activity, and the motivation to venture into and persist with a task. Environment also matters. While individual agency is critical for involvement in challenging activities, opportunities need to be afforded by staff, and by institutional contexts, policies and procedures. It needs to be possible, for instance, to identify tasks that students will find cognitively and motivationally stimulating, and to set expectations that will promote high levels of performance. Exploring these ideas in more depth makes possible the identification of conditions that promote student participation in academically challenging activities.

The very idea of a task being challenging to an individual implies a frame of reference which makes it possible to speak about task demand and individual ability. In making this framework explicit in any specific context, it is necessary to identify a directional latent variable which represents a continuum of increasing competence (Thurstone, 1959; Rasch, 1960; NRC, 2001). Although it may be difficult to achieve with large and diverse student cohorts, sufficient information needs to be obtained so that students and tasks can be represented along the continuum using estimates of ability and demand. Such information makes it possible to determine the level of a student's ability in relation to learning activities and, importantly, the point at which he or she is ready to learn.

The concept of the 'zone of proximal development' provides a mechanism for exploring the concept of learning readiness. Vygotsky (1978: 86) defines the zone of proximal development as: 'the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with capable peers.'

The zone makes explicit the idea of actual and possible performance. The idea is that students are able to perform tasks at or below their actual developmental level. The quality of their performance becomes increasingly uncertain, however, on tasks that lie above their actual level of performance on the continuum and extend into the level of potential development. These more difficult tasks lie at the upper margins of an individual's ability on the threshold at which learning will occur.

Activities are most challenging and productive when they are targeted towards the upper end of an individual's zone of proximal development. With required levels of application, such activities lie within an individual's grasp. Rather than redundant repetition of prior knowledge, they build on, use and demonstrate its value. Further, they are within a student's margin of possible performance, and are not so difficult that they may discourage or demotivate students. Gardiner (1994: 23) makes this point by writing that:

Students need to be provided with activities aimed just above their current levels of cognitive development so they can both understand and be challenged by them... These activities can set up important tensions or conflicts – cognitive dissonances – with students' current understandings of the world and thus have developmental value by stimulating them to take one step beyond their present level.

Seen from a Piagetian perspective (Piaget, 1964), this amounts to individuals employing the homeostatic equilibration processes of accommodation and assimilation to overcome cognitive dissonances that challenging tasks promote. By succeeding on such tasks, students move the threshold of their ability along the continuum of increasing competence.

Higher education researchers have identified a range of factors which promote academic challenge (Chickering and Gamson, 1987; Locke and Latham, 1990; Kuh *et al.*, 1991; Gardiner, 1994; Baird and Penna, 1996; Whittington and McCormick, 1998; Pintrich and Schunk, 2002). As challenging activities are by nature not easy, they require an active rather than passive form of involvement from individuals. Independent of their level of ability or performance, individuals need to invest a certain amount of thought, application and time into their intellectual growth. Students need to have an extrinsic or intrinsic interest or motivation in the tasks. As students learn, it is important that they encounter increasingly more demanding and higher-order kinds of tasks. It is important that appropriate standards are set which make clear that each individual is expected to work at the boundaries of his or her current levels of performance. As such work involves students venturing into uncertainty, it is important that they are given feedback to regulate and guide their performance.

With the above considerations in mind, it is possible to propose a pedagogical cycle which makes it likely that students will engage in academically challenging activities and strive perpetually to operate at and push forward the frontiers of their knowledge. First, ongoing diagnostic and prognostic assessment of students' performance and potential needs to be undertaken to determine students' current and proximal performance levels, and where to target challenging activities. Second, clear statements need to be made and understood that set high academic standards and expectations for performance, and which help students internalise these standards. Third, students need to be given opportunities and guidance to participate in challenging activities and, correspondingly, they need to devote the

energy into doing so. This may involve learning new materials, or engaging in increasingly difficult activities. After mastering challenging activities, students need to again receive prompt diagnostic and prognostic feedback on their past, current and future performance. Results of assessments should be used to adjust task contents and difficulty. Iterating this cycle suggests a means of promoting student learning by maintaining their engagement in challenging activities.

The conceptualisation of challenge just set out is highly normative and may be very difficult to achieve in practice. Given the particularities of different disciplines and the dominance of normative rather than criterion-related forms of assessment, it is rare for university teachers to have access to assessment tasks of varying levels of demand that could be used to diagnose student performance. It is perhaps even less common that staff have the psychometric skills to develop and calibrate such tasks. Without accurate and reliable standards-referenced prior assessment, it can be difficult to determine how to target activities, particularly with large numbers of diverse students. The complexities associated with managing the provision of academically challenging activities may be compounded if the notions of mastery learning hinted at above imply that each student is able to move through material at her or his own speed. Of course, regardless of incentives, many students are not interested in maximising their learning, and their learning may stall if made overly contingent on their individual inclinations or progress.

Active learning experiences

We've only got one lecturer who just tends to read off the notes. With everyone else, they are more like a prompt for them, like for what they want to say, and we have to concentrate and fill in the gaps. And I find I retain information a lot better if I've heard it. So if I go to the lecture and even if I don't have my notes in front of me, when I then go back home I go 'Oh yeah, I remember him talking about that'.

(Angela, second year English major)

As with the idea of academic challenge, 'active learning' is a very broad idea and is very popular in contemporary education. Unlike academic challenge, however, active learning has been the subject of vast amounts of educational research. As Sorcinelli (1991) writes, 'a review of the literature reveals that the terms "cooperative" and "active" are suggestive and commodious rather than precise.' The term is generally used to refer to a very broad range of phenomena, and has been described very loosely as 'anything that involves students in doing things and thinking about the things they are doing' (Bonwell and Eison, 1991: 2). In contemporary educational theory and practice, active learning is commonly linked with constructivism.

Constructivism was discussed previously while detailing the assumptions which underpin the contemporary idea of student engagement. To recap, constructivism implies that learning occurs when individuals enhance their knowledge by

synthesising new information with their prior knowledge. By this view, the passive reception and storage of information will not necessarily lead to learning. This has implications for how university students should learn. It suggests, for instance, that students are more likely to learn when they seek out materials that relate to and elaborate their current knowledge, rather than memorise the contents of materials to which they are exposed. It suggests that learning will be promoted when students question what they are being taught, and reflect on how it relates to their current knowledge. Learning should be enhanced when students think about their knowledge in different ways, and about its different theoretical and practical applications. It suggests that students can learn by forming links between their knowledge, both by themselves, and in conversation with others.

While active learning is meant to play a role in any academic learning context, its occurrence in practice will be mediated by a range of contextual factors. Although students should nominally be given opportunities to develop their understanding of ideas in conversation with others, early-year students or students in disciplines which require a certain foundation of prior knowledge may find such experiences less beneficial than others. It is likely that occurrence of active learning is determined by tradition and resources. On balance, lectures are more likely to encourage passive reception of knowledge than small group or individual tutorials unless structured in certain ways. Students are more likely to engage in active learning activities when they are not limited by physical resources or appropriate media. Irrespective of practical constraints, however, contemporary research suggests that pedagogy and learning should be informed if not directly influenced by the constructivist ideals underpinning active learning.

Constructive teaching

It always gives you more confidence when someone's there helping you know something rather than you going about it all your own way, because you're not too sure of how you're going. If you're going to learn and study, you want it to be meaningful, so you want help.

(Jessica, second year information technology student)

The idea of constructive teaching is broad and complex, however it has specific nuances when considered from an engagement perspective. This is because the idea of engagement is essentially constructivist rather than instructivist. Engagement is about learners and learning rather than teachers and teaching. This suggests an emphasis on 'constructive instructivism', rather than instructivism *per se*. Hence, when framed by discussions about engagement, therefore, the notion of 'constructive teaching' centres around the kinds of teaching which lead to constructive learning. It is useful to highlight recurring themes arising from research in this area.

Rather than programmed decontextualised classrooms, teaching environments need to be 'authentic' and selected with sensitivity to the material being taught.

This idea has different implications for different fields of study. Many courses of university study already involve contextualised learning. This may involve field-work in ecology classes, internships for medical or political science students, or teaching rounds for preservice teaching students. The idea of authenticity, however, also has epistemological in addition to physical connotations. Optimally, teaching approaches should be sympathetic to the material being taught. Faculty may need to set up specific moods to effectively teach twentieth-century fiction. Faculty need to be passionate when they are teaching materials in which they have an obvious professional investment, and are expecting students to learn. Faculty might weave their own research experiences into teaching. Even in the early years of undergraduate study, teachers should problematise materials in ways that bring seemingly abstract concepts into everyday experience, and they should infuse emotion, personality and politics into what students can often see as lifeless disciplinary fundamentals.

The idea of constructivism implies that learning is enhanced when academic staff adapt their teaching to student learning. This idea is central to contemporary pedagogical theories, which demand that instructors, as well as educational environments in general, are responsive to student learning styles, knowledge levels and abilities (Sorcinelli, 1991; Ramsden, 1992; Laurillard, 2002). While varying greatly with discipline, student factors and institutional contexts, teachers need to be sensitive and open to the different ways students can conceptualise phenomena being taught. Teachers need to untangle, value and draw together the differentiated understandings students bring to a course. Reducing this discrepancy, which Moore (1993) refers to as 'transactional distance', involves teachers developing structure and content for their course, and then seeding and managing the pedagogical conversations and feedback dynamics instrumental for learning.

Learning should be socially mediated to enhance the relevance of the learning experience. Rather than receive and interact with knowledge by themselves, distributed and situated theories of learning suggest that students should encounter, negotiate and develop knowledge through interactions with others. Almost regardless of whether these others are peers or teachers, the important point is that they can enter into structured conversations with learners about the ideas and knowledge at hand. The idea of social mediation emphasises teaching strategies such as groupwork, presentations, and discussions, rather than lectures and didactic laboratories or tutorials. While this seems to favour small group teaching, it is certainly possible to weave social mediation into the teaching of large classes and cohorts.

Contents need to be cognitively accessible to individual learners, and be selected with sensitivity to establish links with prior knowledge. This notion taps into the core of constructivism, that new knowledge is formed on a foundation of prior knowledge, and that this knowledge, once interlinked and referenced to the prior knowledge, forms a foundation of new prior knowledge. This idea, which has been considered in relation to academic challenge, suggests various kinds of pedagogy. Instructors need to diagnose individual or group ability levels in order

to ascertain the level at which to pitch their teaching. Instructors need to develop learning resources that speak to the understandings of individual students. This might involve them drawing on knowledge about student cohorts, piloting learning materials with students, developing learning materials over a sequence of semesters, or developing multiple versions of the same resources. Instructors need to develop learning resources which encourage or necessitate an interactive form of involvement from student readers, either directly with the text, or through exploration of other materials and experiences. Importantly, instructors need to project learning materials as dynamic expressions of knowledge which invite exploration and questioning from students. They should seek feedback on students' interactions with learning resources, and incorporate such feedback into the development of resources.

Assessment needs to be used to shape individual learners' understandings of content, and also their awareness of learning. Although assessment tends to be used in a very summative way, there is a wealth of ways in which it can be used as a powerful formative part of teaching and learning. Faculty might use assessment early in courses to diagnose students' ability and competence, or to shape their subsequent teaching. They might use assessment prognostically, to anticipate individual and group learning trajectories for a course. Alternatively, they might provide students with regular forms of unmarked assessment to validate their knowledge and direct their learning. Aspects of assessment could be used to enhance how individuals understand their engagement and learning. Assessments very often themselves play a role as challenging learning experiences which help students integrate and advance their learning. As key means of structuring and incentivising learning, a constructivist instructionalism suggests that assessment is used in strategic ways to enhance learning.

As these ideas suggest, constructivism does suggest various forms of pedagogy. While much has been written in this area, the quintessential characteristic of constructivist pedagogies is that they support and encourage individual learning (Land and Hannafin, 2000). Rather than present static decontextualised information, teachers should be guides who work to encourage individual questioning and 'make student learning possible' (Ramsden, 1992: 5). The drive to create constructivist higher education teaching and learning environments implies the need for adaptive and multifaceted pedagogies which support the activity and agency of the individual student. Within such a pedagogical structure, students need to be given opportunities to interact with rather than just 'receive' material they are trying to learn.

Complementary activities

I hang around everywhere, the library, café, and there's this particular mature-age room which is really quiet because not many people go there, so I just go there sometimes to take a nap. I get to the campus in the morning, and I don't leave until the sun goes down, actually, because I work here on-campus at

the bookshop. I hang out with a lot of international students. I'm quite actively involved in student associations, so I tend to meet up with them.

(Margaret, third year mathematics student)

An important aspect of people's engagement in university is participation in a broad range of activities. Research has shown that certain enriching educational experiences, particularly those which occur outside class, reinforce formal learning and promote the more generic kinds of development which add value to and complement formal learning (Astin, 1993b; Kuh *et al.*, 1994; Love and Goodsell-Love, 1995). It is seen as beneficial, therefore, that institutions encourage students' participation in such experiences and, conversely, that students take up opportunities to engage in them.

The idea of enriching educational experiences seems very general, and very profound. It seems almost implicit that student participation in the life of the academy should involve them encountering 'an atmosphere of intellectual excitement' and 'a vibrant and embracing social context' (James and Baldwin, 2002: 1). Rather than reflect a specific theoretical or practical stance, the idea seems to reflect a more general philosophical orientation towards the nature of university education. It seems to resonate with the notion that university education should have liberal qualities, rather than be narrowly focussed on academic issues, or be purely vocational in nature. In addition to work specifically on liberal education, these sentiments resonate with contemporary conversations about generic skills and lifelong learning (Candy and Crebert, 1991; Candy *et al.*, 1994; Hager *et al.*, 2002). What then, do such perspectives suggest are the kinds of experiences that would be particularly enriching for students, and therefore important for institutions to offer?

At first glance, the generality of this aspect of engagement seems to imply the inclusion of almost any experience with a vague educative purpose. Higher education researchers have, however, identified generic types of experiences as particularly beneficial for students (Astin, 1985, 1993b; Kuh *et al.*, 1991; Pascarella and Terenzini, 1991, 2005; Gardiner, 1994; Love and Goodsell-Love, 1995; Terenzini *et al.*, 1996). Indeed, these broad experiences account for much of what is commonly discussed in terms of student engagement. Analysing these broad and heterogeneous experiences suggests that they reflect several underpinning qualities such as commitment and effort, diversity and difference, energy and stimulation, culture and society, ethics and values, creativity and inquiry, and interpersonal understanding. Drawing on these characteristics, the documented material can be distinguished into a series of homogenous clusters for the purposes of analysis.

The first group involves students participating in what can be referred to as complementary social and cultural activities. This may include participation in political activities, public discussions and debates, academically relevant paid employment, or extracurricular activities such as music, debating, drama or sport. It might involve studying a foreign language, study abroad, or undertaking an

internship or community service. Such activities expose students to diverse points of view, and to people with varied perspectives, abilities and backgrounds.

A second group of experiences is focused around the academic interactions students have outside class with their peers. These might involve students living in residential communities, or participating in formal academic learning communities, particularly in leadership or organisational roles. Such experiences may manifest through casual academic interactions between students outside class, or social interactions between students from the same course. Such experiences help students locate themselves in a community of practice and make what they are learning more individually meaningful.

A third cluster of experiences includes out-of-class academic activities. The most basic kind of experience would include use of the university library and pedagogically relevant computing resources. More advanced activities may include students participating or collaborating in research projects, undertaking seminars or workshops to develop generic skills, developing social and academic networks related to their field of study, or using university support services and facilities. Such experiences may involve students undertaking activities with academic staff and other established members of the university community, who function as mentors or role models. The essence of such encounters is that they involve students extending what they are learning into a broader social environment, and elaborating it in ways that make it more contextually and personally relevant.

A final cluster of enriching experiences is that related to students' existential and ethical reflection. In speaking on this point, Shapiro (2002: 23) says that 'Given the importance I have attached to the constant reconstruction of our social narrative it is, I believe, incumbent on each of us as faculty to assist and encourage students to ask the moral and ethical questions associated with the knowledge we are imparting.' Such reflection may be promoted by environments which encourage students to be creative, and to explore and test their own interpretations of ideas. The experiences may involve students reflecting on their learning, or on the fallibility and uncertainties of academic inquiry. They may be challenged to reflect through exposure to academic values of integrity, respect, ethical conduct, and honest and open inquiry. Such experiences respect and celebrate students' individual diversity, and give them opportunities within the community to engage their ideas and beliefs.

As captured here, the term 'complementary activities' is used to capture a broad range of broadening activities around the university campus. Although such experiences almost by definition lie beyond formal curricula, they can constitute an important part of campus-based study. They relate to qualities such as diversity and difference, energy and stimulation, culture, ethics and values, and interpersonal understanding. The above analysis has distinguished four different groups of activities and experiences. Complementary social and cultural activities are those which lie beyond the formal curriculum but which add value to the formal academic experience. Beyond-class academic interactions with other students range from learning independently to organising and leading study groups.

Out-of-class academic activities include things such as library use and academically relevant paid work. Reflective experiences comprise the processes of academic inquiry, ethical reflections and students thinking about their own positions within an academic context.

Collaborative academic work

But I just find that when you're learning something and you're confused, that you 'click', and there's always that 'click', and you only really get it in tutes when you discuss it with somebody. When you don't understand then you'll be discussing it, and then it'll 'click'

(Greg, second year chemical engineering student)

In class, you get lots of people's ideas, and people have whole different ways of thinking about things, or if they bring up problems that you're experiencing but you hadn't even thought about . . . you can change your ideas to the more sort of correct ideas, because you might have been on the wrong path to begin with.

(Alexandra, second year English major)

The idea of collaborative learning manifests directly the social constructivism which underpins the idea of student engagement. Collaborative learning involves students learning by interacting and negotiating their developing knowledge with others. In practice, collaborative learning can take many different forms, such as co-operative learning, problem-based learning, writing groups, small group projects, peer teaching, discussion groups and seminars, or designed learning communities (Johnson *et al.*, 1991; Bruffee, 1993; Kadel and Keehner, 1994). While these activities and approaches may differ in practice, they are based on a common set of assumptions about knowledge and learning. These assumptions characterise the substance and purpose of collaborative learning, and account for much of its contemporary appeal.

Collaborative learning is based on certain ontological and epistemological assumptions. An assumption is made, in general, about the referential and relational nature of knowledge. Rather than exist, in its most basic form, as discrete, simple, independent, logical elements, knowledge is essentially indexed by, although not dependent upon, specific contexts. Given this, a dialogical or conversational epistemology is assumed which sees the appropriation of knowledge as involving dynamic interaction rather than static absorption. As reinforced by neural network modelling research (Hutchins, 1995, 2001), learning is not a process of passive cerebral internalisation by discrete individuals, but rather a process of continual renegotiation of meaning with the world. Rather than the introjection of invariant knowledge structures, learning involves finding a place, through dialogical interaction, in a dynamic conceptual or practical knowledge network.

These assumptions have pedagogical implications. They lead to a rejection of pedagogies based on the transmission of decontextualised symbolic information

to students (Brown *et al.*, 1989; Lave and Wenger, 1991; Clancey, 1993; Jonassen, 1995; Laurillard, 2002). Conversely, they reinforce teaching methods which require students to actively engage in discursive negotiation and construction of meaning with others. Such methods favour disaggregated rather than hierarchical social interactions, in which students can enter dialogically into the material they are learning. Bruffee (1993: 17) writes that ‘collaborative learning replaces the traditional classroom social structure with another structure: negotiated relationships among students and a negotiated relationship between those student communities and the teacher’. The idea is that collaborating with others can help students resolve uncertainty, untangle confusion, generate ideas and confidence, explore the relevance of what they are studying, and develop social skills.

Although collaborative learning is a very general idea, particular conditions distinguish it from other forms of groupwork. Johnson *et al.* (1991) in combination with Gerlach (1994) distinguish five core conditions. First, individual accountability is the idea that each individual is responsible for his or her division of labour within a group. Second, juxtaposed against this is the idea of positive interdependence, which entails that realisation of the group goal depends on the participation of each team member. Third, collaborative learning involves challenging but supportive interaction between learners as they work on certain shared activities. Individuals need opportunities to access and share knowledge, work with others to develop their understanding, and test, discuss and get feedback on their ideas. Fourth, individuals need to be given explicit opportunities to develop and practice collaborative skills in the areas of decision-making, conflict management, leadership and communication. Finally, students need to work together to manage the group. This may involve setting directions, negotiating feedback, and monitoring participation and performance. As captured in the SEQ scale and explored here, collaborative learning involves students learning through appropriately situated conversational interaction about knowledge with their peers.

Collaboration beyond class

You meet people in class and exchange numbers, and then you go and hang out in cafés. Most of the time between classes, I study with people from my course. It helps if you don’t get something from a lecture. We either work in the library or in the café, It can be hard to talk in the library if there is more than a few of you, but the café gets too noisy sometimes.

(Eric, second year science student)

Collaboration beyond the class is a particularly important form of interactive work. For a start, it entails students actually having conversations about course contents outside class. This suggests that students are, at a minimum, even investing time thinking about or reflecting on their university study outside class, that they have found people with who they can have conversations about the things they are learning, that they are managing structured learning dialogues with these people,

and that they are working with these people to develop knowledge. While such things may seem trivial, they can be quite significant personal and educational experiences for early-year university students.

On a more epistemological level, beyond-class collaboration suggests that people are distributing their learning into new contexts or knowledge communities, perhaps of their own formation. This can involve forms of re-instantiation which involve students in actively shaping their emerging ideas, explaining the ideas to other people, and placing their ideas and perspectives in contexts which offer new significances and opportunities for exploration. As such, outside-class collaboration can reinforce a dialogical or conversational epistemology at the heart of the engagement idea which is based on the assumption that the appropriation of knowledge occurs best when it involves dynamic interaction rather than static absorption. Collaboration beyond-class can involve learners in a process of continual renegotiation of meaning with the world rather than in the processes of passive cerebral internalisation. Rather than having a contingent relationship with their environment, part of their identity can be located within a field or practice of knowledge such that the 'agent, activity and the world mutually constitute each other' (Lave and Wenger, 1991: 33). In contrast to any idea that academic learning involves the accumulation of reified information about a particular domain, this perspective suggests that learning is premised on each individual finding his or her perspective and place in a field of knowledge. The form of learning which takes place in beyond-class collaboration may very well involve the construction of identities, as learners are enculturated and move towards full community participation. Insistence on the contextual coincidence of knowledge, learning and learners is a definitive aspect of the idea of situated learning central to ideas about engagement. Collaborating with peers beyond class can involve students finding a place, through dialogical interaction, in a dynamic conceptual or practical knowledge network.

Taking groupwork beyond class may also put collaborative skills and knowledge to the test. Approaches learned within contexts structured by faculty and tutors need to be recreated and re-enacted by students. Without the formal structures of 'the class', individuals need to work together to identify tangible partitions in work, and meaningfully distribute activities between group members. The idea of positive inter-dependence entails individuals showing more autonomous forms of commitment and integrity to group goals and processes. People have opportunities to explain ideas which may be difficult to their peers, and to provide and receive targeted, immediate and formative feedback about their developing knowledge. Confusion may be dispelled or highlighted in ways which prompt further clarification, and people may form more appropriate understandings of specified contents. Working collaboratively beyond class typically involves participating individuals finding suitable times and spaces in which to operate, which in itself manifests a commitment to the collaborative process, and to developing collaborative skills and managing groupwork. Observing or just

experiencing peers grasp new knowledge can provide learners with powerful insights into developing their own learning practices.

It is helpful for analysing the dynamics of beyond-class engagement, to deconstruct it into a few key ideas. While educational research has tended to incorporate analysis of beyond-class collaboration into more general discussions of collaboration, a few ideas seem particularly salient. Three of these are explored briefly here, in an analysis intended to stimulate rather than conclude normative inquiry into this aspect of engagement.

A basic yet essential component of the phenomenon is whether students actually work outside formal instructional environments. Although the research suggests that students should devote at least two hours of private study for each hour of formal class work (Kuh, 2003), recent evidence in Australia (Krause *et al.*, 2005) indicates that contemporary students fall far short of this ideal. While groupwork is often central to much work practice, therefore, it appears that it cannot be taken for granted in terms of early-year students' academic work. Students need to find places to meet, possibly around campus, and need to organise time for group members to meet. More detailed exploration of this aspect of student engagement might focus on how often students collaborate outside class, where they tend to work, and the amount of time they spend working with others.

Whether early-year students work outside class is likely to hinge to a large extent on whether they are actually required by curricula or assessments to work outside class. Courses which are designed around students internalising discrete parcels of information which are disseminated via lectures and textual resources may not explicitly encourage learning interactions with other students outside class. Similarly, courses which focus learning around the accumulation of knowledge in preparation for end of semester assessments may actually discourage collaborative work outside class. The form of assessment may matter too. On balance, multiple choice tests probably reinforce more individualistic study patterns than portfolio or performance oriented forms of assessment. Thus, while not focused directly on students, an important component of beyond-class collaboration seems likely to be whether it is afforded by courses and pedagogy.

While anticipated somewhat in the phrase 'beyond-class collaboration', an important aspect of students' work together beyond-class is that it is truly collaborative in nature. Collaborative work, it was suggested above, has particular qualities which distinguish it from other forms of groupwork. Collaborative work, for instance, should involve accountability, a planned devolution of tasks among individuals, interdependence or reliance between group members, and challenge and explicit management of group dynamics. To engage in collaborative work, therefore, involves more than students working together out of coincidence, or for convenience, competition or even collusion. Beyond-class collaboration is a distinct form of activity which may require guidance and support before it can be practiced.

Developing the online qualities of campus-based education

Less is known about the online than general qualities of student engagement, and these are important to explore. Without sophisticated understanding of these qualities, it is difficult to leverage online technologies and behaviours in ways that enhance learning. The following analysis continues on from the last chapter, and focuses on exposing, in a suggestive way, issues which may be important to consider during analysis of the online engagement of campus-based students. It sets about exploring how students may use online learning systems to support their knowledge-creation activities. In combination with previous material, this elaborated framework enhances understanding of this significant area of higher education, and provides a synthetic foundation for future empirical investigations of contemporary student engagement.

Online engagement

I think we do change our patterns of activity. It would be a lot different if you didn't have stuff online. You would have to spend a lot more time at university. If you missed a lecture, then you just missed out. But with the system then you can catch up. I think it makes it a lot more flexible. It gives you options for where and when you study.

(Margaret, third year mathematics student)

It's straight forward if you're computer literate, which, fortunately, I guess a lot of people are these days, but we found, certainly within our class, a lot of people didn't even know how to access the email or even add a new thread to a discussion.

(Chris, second year Indonesian language major)

The idea of online engagement is about students' use of online learning systems and, more specifically, their use of online systems to interact with their study. The idea of 'online engagement' is not in itself theoretically elaborate. Rather, it is intended to provide more than a time-on-task measure of how students situate online learning in their university experience. The idea is intended to capture the educational significance of online systems in students' campus-based study. This is a perspective which emphasises 'students' use of

online learning resources' rather than 'peoples' use of online learning technologies'. Rather than placing students and their education in a technological context, students and online technologies are placed within an educational context. It is necessary to go beyond the systems to understand online engagement, partly because of the undeveloped state of the diagnostic information captured by the systems (Morgan, 2003), but mostly because it is important to maintain the primacy of the educational perspective. Rather than reduce online learning experiences to time-on-task, the idea of online engagement stresses that they should be considered in terms of their perceived educational significance for students' study. Without having information on students' use of the systems, institutions are in a limited position to respond to changing circumstances in ways that enhance student engagement, learning and development.

An important component of this aspect of engagement is the extent to which institutions support students' use of online systems. As online learning systems are integrated into academic programmes, the nature in which institutions support students' use of the systems themselves might be likely to become a more salient aspect of the student experience. From a principled perspective, it would seem that the integration of online learning systems into academic programmes should be balanced by adequate opportunities to access key resources. Students would need sufficient access to on-campus computing facilities, and may also need broadband internet and other personal computing resources (Ward and Newlands, 1998). Institutions need to support students' technical understanding of online learning systems, particularly given research which indicates that students may be frequent although not necessarily sophisticated users of computing technology (Todman, 2000; Kaminski *et al.*, 2003). As Lee *et al.* (2002: 241) note, 'Students with computer anxiety or less preparation for using computers are most at risk in a virtual learning environment.' Perhaps most importantly, institutions should support students' learning, and encourage individuals to make the most efficient and effective educational use of the systems (Govindasamy, 2002; Kaminski *et al.*, 2003). Not having explicit instruction may lead students to use the technologies in utilitarian or unsophisticated ways. It may lead to unnecessary workload increases, cost burdens, unproductive learning experiences and technology difficulties (Valenta *et al.*, 2001). These, in turn, may affect student engagement.

Active learning, online

When you're marked, in nearly ever subject I've had, they don't tell you where to improve. They literally don't even tell you. They tick it and give you a standardised mark. And sometimes I wonder about the system and how it's even marked and someone can't be bothered and just gives out the same marks. But when I look at it online – fantastic. When I look at it online and see how it can let you do your own work, I think 'Bring it on, let me get on with my work'.

(Nina, first year media student)

A critical educational aspect of online learning is its capacity to support active forms of learning. It was suggested above that active learning is the idea that

learning is a process of individual knowledge construction. A basic concept in constructivism is that learning materials are cognitively accessible to individual learners and link with their prior knowledge. As mentioned in relation to academic challenge, contemporary online learning management systems have the capacity to deliver material to suit the needs of individual learners. The systems can be used to automatically provide students with learning resources, building on traditions of programmed learning and 'intelligent tutoring systems'. They also provide a context for staff to inject specific learning resources into pedagogical conversations. Without advanced strategies for managing their learning, however, presenting students with very condensed essential subject information may reinforce highly strategic forms of learning. Ward and Newlands (1998: 176) write that 'The replacement of face to face lectures by computer-based materials would perhaps remove the framework which regular dates in the weekly timetable might provide.' The idea that learning is enhanced when people receive information just as they need it, or 'just in time', has different implications if students use available materials to learn 'just in time' for assessments. Students may need support handling extra responsibilities that arise when they are given greater resources and freedoms to manage their learning.

Constructivism suggests that assessment should be used formatively to shape understanding and develop a learner's awareness of her or his own learning. LMS contain assessment tools which, as has been mentioned, can be used to provide students with an ongoing means of checking and revising their knowledge. In general, however, it seems likely that the tools which are used for formative assessments would be those which are less resource intensive, such as multiple choice and short response tests. While there is a place for such assessment methods, without very sophisticated development there may be limitations in the extent to which they can provide the kind of feedback that really helps students learn and become aware of how to develop their learning. Over-reliance on a few types of assessment may even start to influence very basic qualities of student learning. In their nature, closed-form assessments might reinforce positivist epistemological assumptions about the convergent nature of knowledge (Kolb, 1984) which run counter to the approaches to knowledge adopted in many academic disciplines.

Online learning systems may have a substantial affect on students' opportunities to be involved with active learning experiences. Pragmatically, it is likely that online learning systems have the capacity to change the basic dynamics of how students access learning materials (O'Donoghue *et al.*, 2001; Morgan, 2003). Through altering access characteristics, online learning systems may be influencing the nature of student involvement with academically challenging activities, including the time spent studying. Pedagogically, the systems may be used by teachers or students to manage access to resources and, in particular, to allow students to access materials which are challenging and stimulating for them. In supporting 'flexible learning', it seems possible, therefore, that online technologies can affect the student experience by modifying the practicalities and substance of learning.

A number of studies have suggested that enterprise-wide online learning technologies may have more subtle influences on students' engagement experiences. Researchers have argued that students respond to material in different ways when they encounter it online rather than *in situ* (Selwyn, 1999; Dringus, 2000). Critics of online learning have argued that it may lead to more passive forms of engagement with tasks (Dreyfus, 1998). In a similar vein, it has been argued that unless students are intrinsically driven to undertake a task, obtaining material online may deprive them of the environmental cues which structure or reinforce their participation (Ward and Newlands, 1998). Students may be confused by more associative and less prescriptive organisations of information, by the uncertain authority of information, and by the sheer quantity of information. It has been argued, conversely, that the virtual learning environments engendered by learning management systems provide students with the means to access additional materials, alternative communication spaces and ways of testing or applying their knowledge that embellish their experience (Pallof and Pratt, 2003). Although uncertainties in this area remain, the energy and focus of the studies implies that these are important issues to consider.

Online academic relevance

When you want to talk to the teacher, you want to get some instant feedback. When you ask them a question, you want an answer, or you might want them to elaborate something. But if it's online, you don't really read the stuff and it doesn't really encourage thinking. You just read it like you read a newspaper. But when the teacher is speaking, then you actually listen to them and you pay more attention.

(Charles, third year history major)

Online academic relevance is a multidimensional idea focused on students' use of online systems to enhance the relevance and context of their study. An important part of this idea is, of course, whether online materials are academically relevant, and whether they are perceived by students to be relevant. A related aspect is whether online resources add value and significance to campus-based educational experiences. A richer angle to the idea of online academic relevance is whether online learning enhances students' overall perceptions of their field of study. A further, more penetrating consideration is whether online learning systems reinforce students' conceptions of themselves as learners within large and complex institutions.

One of the key prospects of online learning systems is that they support access to a large and rich range of learning resources. Online learning systems for instance allow students to access enhanced curricula materials, supplementary materials, discussion fora, online learning communities, and interactive multimedia, all of which might enhance the value and relevance of campus-based education. From a pedagogical perspective, the systems provide

teachers with software which can be used to structure and focus learners' online experiences.

Learning management systems impose particular structures on the development of online resources, opening up certain possibilities while constraining others. As the systems develop, staff are offered an increasing range of features they can use to build and deliver their courses. It is important to question, however, whether such offerings are an encouragement or a limitation to the diversity and distinctiveness of discipline focuses and teaching approaches found across an institution. In incorporating online learning systems into university teaching programmes, it is important to consider whether commercially available systems are adaptable to the needs of diverse academic cultures and communities. It would be a retrograde rather than progressive step if the adoption of an online learning system resulted in the overly systematised compression of different disciplines and styles of learning.

Restrictions on the migration of content appear to be a major issue with LMS. Technical and financial factors can make it difficult for institutions to migrate between different systems. Although vendor products are starting to incorporate tools which allow standards-based distribution of content between systems, the standards themselves are only being defined, and effective and transparent tools are still some time away. However, the key questions in this area are not about delays in the development of software, but about the overall control institutions have over content. Without ultimate control over the source code that runs the programme, pedagogical content may no longer be in the hands of individual teachers, or universities, but transnational corporations.

The commercialisation of content appears to be a goal of LMS vendors. By establishing web-based delivery mechanisms, such companies have developed the foundations for selling online content. Many systems are affiliated with large publishing houses which are understandably interested in the development and distribution of copyrighted material. Gaining access to large libraries of online learning objects can be a major reason for selecting a particular system. With the development of portable learning objects still some distance in the future, however, commitment to one system can mean exclusion from others. Whether it is at all possible, let alone desirable, to standardise content across institutions, nations or cultures is a matter which institutions will need to consider carefully.

Online LMS can provide students with the capacity to access a new world of learning resources. Through making the internet a more seductive and accessible tool for teaching, however, they may also be homogenising the creation, style and ownership of pedagogical knowledge. Educational research might investigate how the parsimonies offered by LMS balance with a possible standardisation and 'shrink-wrapping' of knowledge. What are the possible effects of the commercialisation of academic content on university teaching? What are the consequences of such an intimate alignment of pedagogy with technology? How tolerable, or indeed attractive, are the risks, uncertainties and possibilities of open source LMS compared with a possible future of franchise universities?

A further dimension to the idea of online academic relevance is whether online learning enhances students' overall perceptions of the relevance of their field of study. Do people studying organic chemistry see more significance in organic chemistry or a career as an organic chemist as a result of using online learning systems? Do online LMS experiences inspire philosophy students to pursue graduate work in the area? Do online LMS help students find links which integrate their academic and non-academic lives?

A key way in which online systems enhance engagement may be by enhancing the relevance of study by distributing learning beyond the classroom. Online systems are playing an important role in developing distributed learning spaces around university campuses which blur distinctions between academic and non-academic activities. In recent years, many institutions have developed distributed learning spaces to support students' campus-based use of online learning systems, and of information technology in general. These spaces are increasingly referred to as 'learning commons' or 'information commons' (Brown and Lippincott, 2003). These are technologically enhanced collaborative spaces that provide students with a range of opportunities for interacting with online and onsite learning resources and communities. They bring together libraries, student support services and resources, and information technologies into a single purposefully designed physical and virtual space. To a certain extent, learning commons are seen as informal spaces that can complement more formal or structured instructional environments. They are linked, to some extent, with what Oldenburg (1989) has labelled as a 'third place', a public meeting space in which individuals interact as equals to create communities. The intention to generate informal interactions between students around specific educational and complementary opportunities is often included in the design of learning commons (Contreras-Castillo *et al.*, 2003). Learning spaces frequently include cafes as well as general and online recreational areas which often merge seamlessly into the more specifically academic areas. The provision of spaces that blend the virtual and the real is seen to provide central meeting places or hubs for students to congregate, collaborate and learn.

An important consideration is whether online learning systems augment students' perceptions of their own relevance within academic learning communities. The online learning literature suggests many ways in which online systems can be used to legitimate individual learners and to draw them into communities of practice. It is important to ask how online systems might contribute to the kinds of environmental supports likely to encourage campus-based student engagement. Any changes which online systems may be bringing to campuses are likely to have implications for the supports offered to students and the extent to which students feel part of university learning communities. Institutional responses may be redundant or even harmful if they are not sympathetic to the nuances of the physical campus or student learning environment. One of the most salient effects of LMS is that they may change what is required for institutions to generate the conditions that afford and support student engagement.

Learning management systems may affect students' involvement in academically relevant out-of-class activities. Online learning systems disperse rather than reinforce the in-class and out-of-class distinction. The systems distribute activities which would once only have been undertaken in formal instructional settings into wherever a student has access to the internet. A virtual chemistry practical, for instance, can be completed in a café rather than in the lab. While it may be too strong to propose that this transforms what were once formal tasks into educationally purposeful out-of-class activities, it may have an impact on students' perceptions. Students may not see particular environmental qualities as essential characteristics of particular activities. Someone may organise travel or paid employment while using the internet during a class. Conventionally in-class activities may be undertaken out-of-class, students may do out-of-class activities in-class and new kinds of activities may emerge which are distributed between a range of locations. Such changes may alter students' engagement in what are traditionally considered to be out-of-class activities.

Online learning systems may influence how universities support individual talent development. It has been argued that in an era of mass higher education sophisticated online learning technologies provide institutions with a powerful means of adapting to and supporting the needs of the individual (Johnstone, 1993; Daniel, 1998a). Many online systems contain portals, which have the capacity to draw together information about the full range of an institutions' resources and services. Portals are becoming increasingly dynamic, and able to be shaped by the user. They provide a means for institutions to respond in a virtual way to the diverse needs of individuals, and for students to shape their own virtual space within the university. Although far from one-to-one mentoring, online LMS may help individuals identify distinct aspects of their university that are of particular significance to them.

Online teaching

I think if they put subjects online, then they need to do things like have times when there is a convenor or tutor there who can give you immediate feedback, if that makes sense. Sort of like a chat room type thing. You still need someone on the other end who you feel is like there, not like someone who drops in once a week and maybe decides to give you an answer. That's incredibly frustrating. I think there are subjects where the teachers just read things that are online, and that's a waste of my time.

(Charles, third year history major)

Online teaching has been a rich topic of discussion in higher education. At the heart of such discussions is whether and how teachers use online learning systems to promote effective student learning. It seems very likely that online learning systems have major implications for teachers who try to apply constructivist pedagogics to promote active learning in students.

On paper, LMS are described as supporting an extensive range of teaching activities. Such descriptions are reinforced by many studies (Harasim *et al.*, 1995;

Postiglione, 1997; Harasim, 2000; Carmean and Haefner, 2002; Morgan, 2003; Simonson *et al.*, 2003). It appears that features which enable access to learning resources, to communication between staff and students, to conferencing, to interactive multimedia, to personal bookmarking and to note taking can well support the discursive interactions which underpin and enhance the relevance of individual students' learning (Britain and Liber, 1999; Laurillard, 2002; Postle *et al.*, 2003; Kvavik *et al.*, 2004). A recurrent message arising from the study of educational technologies, however, is that it is not the provision of features but their uptake and use that really determines their educational value.

The incorporation of online learning technology into pedagogy is not straightforward. Academics need to have specific knowledge and skills to successfully manage the online environment. They need to be comfortable in the online environment and adept at managing new forms of communication and online dynamics. Staff may need to formalise what were once tacit knowledge and practices. Without fluent understanding of the virtual environment, and how it can be used to support students, staff use of the online learning systems may result in a kind of 'accidental pedagogy' (Morgan, 2003) which is haphazard in nature and has uncertain ramifications for students. As Morgan (2003: 71) observes, while it is likely that teachers would resist aspects of LMS designed to control pedagogy, through serving an organisational function LMS do exert an implicit control over teaching:

Using course management systems as an organisational tool...seems to trigger a process of rethinking and restructuring for many faculty. Quite possibly, the extended use of any technology would do the same thing. But as it happens, most faculty members come to e-learning by using a CMS [Course Management System]. It is their starting point, and it becomes the focus of a lot of their thinking about how to teach well. A sort of accidental pedagogy happens.

In order to benefit student learning, teachers need to know not just how to use the systems, but also how to use them in a reflective and critical manner.

Academics have been given little guidance in this area by software vendors. It seems that LMS are marketed as being pedagogically neutral (Firdiyiyek, 1999; Govindasamy, 2002; Morgan, 2003), and as having the features to support an extensive and general range of teaching and learning activities. Govindasamy (2002: 288) writes that 'A recent search (December 2000) on the Internet for an LMS that incorporates pedagogy in the design of the software did not yield any fruitful results. Most LMS vendors deliberately distance themselves from pedagogical issues, often adopting an indifferent attitude or sometimes even trying to disguise it as a praiseworthy act of impartiality.' It seems likely, however, that their very design, and the types of practices they encourage, favour certain sorts of pedagogy over others.

Despite any apparent pedagogical neutrality, it seems that, to this point, online LMS have been largely based on training-type models, even though many have

emerged from universities. Used in their most utilitarian form, it could be argued that LMS are based on an overly simplistic understanding of the relationship between teachers, knowledge and student learning. In-built functions may not encourage awareness of or experimentation with sophisticated pedagogical practices. Indeed, the textual nature of the internet may reinforce conceptions of teaching as the transmission of decontextualised and discrete pieces of information. It has been argued that the flexibility and nuance essential to effective teaching can be compromised once pedagogy is coded and compiled into software (Lessig, 1999). At the extreme, under the label of self-paced learning, LMS might even be encouraging a movement towards preprogrammed forms of teaching.

One of the most obvious pedagogical limitations of LMS is their reliance on forms of assessment which can be automatically 'corrected', such as multiple choice and short response tests. While there is obviously a place for multiple choice tests, and they can be designed to test reasonably complex understandings, it would be a matter of grave concern if this form of testing and feedback became dominant in higher education. It reinforces positivist epistemological assumptions about the convergent nature of knowledge (Kolb, 1984) which run counter to the approaches to knowledge adopted in many academic disciplines. The danger is that, if this is the most prominent aspect of the assessment function in LMS, it will drive higher education pedagogy towards a simplistic, mechanical form of the vitally important assessment and feedback loop.

When managed critically and effectively, however, online learning systems have the capacity to add much value to pedagogy. It was argued earlier, for instance, that an important element of academic challenge is the assessment of individual ability. Only after ascertaining an individual's prior, current and possible level of performance is it feasible to make decisions about what he or she is ready to learn. Online LMS provide a range of assessment functions that may affect this area of pedagogy. Dringus (2000: 192) notes that the systems have the potential to provide 'Three types of feedback – immediate feedback, automated feedback, and personal feedback.' Teaching staff could use a variety of software tools to undertake the kind of formative assessment necessary to ascertain a student or groups' learning level. The systems also provide various communication tools, such as discussion boards, newsgroups, bulletin boards and individualised portals, which can be used to provide students with diagnostic and prognostic feedback.

The analysis of academic challenge also emphasised the need for assessment to be ongoing and recursive in nature. Assessment needs to be conducted repeatedly to enable upwards adjustment of task demands given increases in student ability. Online learning systems are information processing systems with an enormously powerful capacity to store and manipulate pieces of information about students. With an appropriate administrative, statistical and pedagogical approach, audit data collected automatically as students use these systems can be used to monitor and manage student growth. In principle, such information could be used to provide diagnostic and prognostic feedback or contingent access to learning

resources, or it could be used by lecturers or tutors to inform the focus and targeting of their teaching (Morgan, 2003). In the tradition of programmed learning, for instance, certain online learning systems allow access to learning resources that is contingent on certain performance or external conditions. Furthermore, the systems can often support automated, timed, individualised and contingent forms of feedback. Although the value of such processes is dependent on circumstance, their very possibility illuminates how online systems offer a means of tuning the learning experience around the needs of the learner.

Online learning systems are not pedagogically neutral technologies, but rather, through their very design, they influence and guide teaching. As the systems become more incorporated into everyday academic practices, they will work to shape and even define teachers' imaginations, expectations and behaviours. This may be particularly the case for academics with only a few years of experience. The age of such teachers may mean that they are more likely to have an 'information-age mindset' (Frاند, 2000) and consider online learning as a normal and necessary rather than optional part of teaching. Regardless of their personal characteristics, however, the incorporation of LMS into universities makes it likely that such academics will gain most of their experience in teaching contexts saturated by such systems. These are important considerations given the possibility that, increasingly, LMS will play a major role in how academics learn to teach. It is important, however, that staff know more about pedagogy than the options made available within the system itself.

Collaborative online learning

We use more email for swapping work. You don't tend to use the system for collaborating, you just talk to people and say 'Have you done that'. The system can make it easier to look at what other students are thinking.

(Diana, second year marketing student)

It is important for student engagement that online learning systems support collaborative learning. Online learning research has indicated that online learning systems can indeed support the core qualities of collaborative learning outlined by Johnson *et al.* (1991) and indeed extend communicative possibilities (Hiltz *et al.*, 2000; Macdonald, 2003; Morgan, 2003). Reflecting a frequent stance in the literature, Verbeeten (2001: 165) writes that 'On-line collaboration is easier than collaboration in a regular classroom since distance education minimises prejudices that often arise in face-to-face settings.' Researchers have also argued that collaborative learning is critical to the success of asynchronous learning environments. The provision of online learning systems, therefore, provides a means and motive to support collaborative learning activities.

Participating actively in online discussion forums provides campus-based students with an added means of asking questions, receiving diverse views, and linking with conceptual and pedagogical structures (Harasim *et al.*, 1995;

Wegerif, 1998; Palloff and Pratt, 1999; Ryan *et al.*, 2000; Driver, 2002). Although some have proposed that groups should have certain ideal structural characteristics (Palloff and Pratt, 1999), besides being monitored by staff, it seems that effective groups can take a range of forms (Driver, 2002). Irrespective of variations due to circumstance, many have observed that the virtual medium reinforces social dynamics that seem to complement in-person transactions and may even be favoured by some individuals (Harasim, 2000; Driver, 2002). Unless the individual, pedagogical and institutional conditions are right, however, there is always the chance that students may use online systems in instrumental ways, and that it may supplant rather than supplement on-campus encounters.

Thus, while online learning systems provide tools to support collaborative activities, it is important that they are used in ways that are likely to generate effective collaborative encounters. Many researchers have argued, in particular, that it is crucial that the tools are used to develop social interaction, social presence and instructor immediacy in the online environment (Short *et al.*, 1976; Lombard and Ditton, 1997; Hiltz *et al.*, 2000; Jelfs and Whitelock, 2000; Picciano, 2002; Richardson and Swan, 2003). First and foremost, individuals need to interact in a collaborative community, although research into the phenomenon of lurking (Beaudoin, 2002) suggests that even the most elementary forms of participation can have many different nuances. Recognising individuals as accountable may be one means of stimulating interaction. As Morgan (2003: 13) suggests, 'student work can be made visible to other students, which appears to make students more accountable for their performance'. More importantly, students must develop a sense of their own and others' social presence in order to develop an identity within the collaborative community (Lombard and Ditton, 1997; Richardson and Swan, 2003). On this, Dringus (2000: 192) notes that 'Learners must have an awareness of content and audience... and they must be able to participate or initiate in active peer-to-peer discussions... Learners must become comfortable with interpersonal distance and lack of face-to-face contact.' A particularly important presence is that of the instructor (Hiltz, 1994; Beaudin, 1999; Rovai, 2000; Ruderstam and Schoenholtz-Read, 2002), who should be actively seen as stimulating, providing material for and guiding students' collaborative interactions.

Online social interactions

In one subject, we've got 25 people who we interact with daily, and I can just get on the discussion board and say 'Hey students, blah, blah, blah', where in another subject, I've got no-one to relate to except other people who I've met in class, or the lecturer.

(Mark, second year information technology student)

It was suggested earlier that there is a set of broad experiences which complement and enhance formal learning and more general forms of development. Although

LMS may only be contingently linked with the experiences themselves, they may engender circumstances which impact directly on students' participation in these broader aspects of university study.

Casual observation suggests that students are increasingly using online technologies to communicate with each other. While such use may be partly instrumental, the medium may simply appeal to the inclinations and digital mindset of contemporary higher education students (Green and Gilbert, 1995; Brown, 2000; Frand, 2000). Although LMS might emphasise and support more academically nuanced conversations, providing new means of connecting with university might have ramifications for students' participation in broader social and cultural activities around university. They may, indeed, be contributing to a substantial refiguration of students' interactions with their peers.

It is possible that using university online learning systems may in itself be an enriching social experience. From this perspective, computer-mediated communication may be augmenting the interactions students already have with their institutions. The virtual dimension may provide a parallel community which complements and reinforces the campus-based experience. A possible index of this is Morgan's (2003: 66) finding that 'most faculty believe that using a CMS induces students to spend more time with the course materials than they otherwise would'. 'Flexible internet based delivery makes access to learning potentially easier for students who need to fit studies around other commitments', write O'Donoghue *et al.* (2001: 515). Students may be meeting and chatting with their peers within the online environment in addition to lectures and tutorials. In addition to engaging with events on campus, students might participate in blended online and campus-based as well as wholly online activities. Used in their most extensive way, LMS do provide students with a means of managing their university study. This view suggests that the systems enrich and extend the possibilities for student engagement.

An alternative perspective suggests, however, that online learning systems are enabling students to take a more instrumental approach to their study. This view implies that online access to services and resources is increasing students' power to predetermine and control a more streamlined form of involvement with their university. Rather than fully entering into the life of the university, people can be more selective about the experiences in which they will participate. LMS may not actively dissuade participation in sport, music, language study and general discussion and debate. Providing access to essential learning resources over the internet, however, may lead students to become more strategic about their participation in campus-based activities which are seen to yield more tacit and less immediate returns.

Reduced participation in complementary social and cultural activities may curb the extent to which students are socialised into the life of their university community. As mentioned previously, many have seen such integration as important for university student persistence and growth (Lave and Wenger, 1991; Tinto, 1993, 1997, 1998). Students may be able to manage narrow academic responsibilities

using an online system to maintain minimal contact with their university. Keeping the university at arms' length, however, may limit their understanding of concepts, development of new interests and social networks, or appreciation of academic inquiry. Such a state of affairs may be particularly problematic for students new to higher education who are less enculturated into university life.

Reduction in students' participation in a broader university milieu might affect their exposure to its ethics and values. It has been argued that exposure to the ethics and values that underpin academic inquiry is one of the most valuable qualities of a university education (Shapiro, 2002). However, the appropriation of ethical principles and conduct may be attenuated in situations where students are more focused and concentrated rather than in ongoing and dialogical types of interactions with their university communities. While the contribution of online systems to such a state of affairs may be somewhat indirect, researchers have identified other ways in which they may have a more direct impact on the students' experience of academic ethics and values. Online learning environments may contain their own more instrumentalist principles, which may interfere with or even supplant those of the academy (Govindasamy, 2002). In such ways, learning online may influence the more reflective aspects of the student experience.

Contacting teaching staff online

If you email staff, then you usually get quicker response that way. And one of my lecturers works most days at home, so email is the best way to get in contact because otherwise it's hard to get onto him.

(Kay, second year science student)

The analytical review of higher education research undertaken earlier placed much importance on interactions between students and staff. By engaging in such interactions, students contribute towards their learning, as well as other general developmental outcomes. The research reviewed has suggested that these interactions are especially significant when they have a number of specific qualities. Online learning research suggests that contemporary systems may interact with these qualities in many significant ways. It is important to consider, therefore, how online systems may be affecting this aspect of student engagement.

Learning management systems contain a number of generic communication features which may influence student and staff interaction. They have tools which can support moderated and student-led discussions, peer reviews, student presentations, free flowing discussions, debates, teamwork and group projects, individual journals, brainstorming, role playing and simulations (Morgan, 2003; Kvavik *et al.*, 2004). While software features make possible new or different kinds of interaction, it is the way these are used which has the potential to really impact communication dynamics. Used in certain ways, online systems may influence the very reasons that such interactions are seen to be significant, in addition to affecting the characteristics identified above as being of particular importance.

Used extensively, it is likely that online systems may influence the dissemination of subject-specific knowledge. At first glance, it seems likely that the systems would increase the possibilities for students to encounter information that is relevant to their study. In addition to attending lectures, seminars, laboratories or tutorials, they can access learning materials over the internet. As opposed to more conventional methods, it does not seem essential that receiving information in this way would involve interactions with teaching staff. Indeed, accessing learning resources using the internet may supplant what were previously the more routine kinds of contacts through lectures, tutorials and practicals (Ward and Newlands, 1998). Ward and Newlands (1998: 179) conclude that:

The most important perceived disadvantages of a system of computer based lectures were loss of contact with staff and with other students... These concerns again imply that lecturers and tutors would be pressed to increase their small group or individual contact with students. If contact is not increased, the quality of student learning might suffer.

It seems reasonable to assume that contemporary online systems may affect how students obtain learning resources from academic staff.

Even if obtaining materials online did involve contact with staff, it is important to consider whether these contacts are value-adding in the same way as person-to-person interactions. Used in the most utilitarian way, it is possible that LMS might reinforce exchanges based on the transmission of information rather than more dialogical forms of communication (Laurillard, 2002). In contrast to this is the possibility that the systems, particularly via their asynchronous features, give staff a powerful means of offering more ongoing and individualised forms of attention (Latchman and Latchman, 2001). It is a complex epistemological but important issue for practice as to whether accessing academic staff knowledge over the internet is the same as getting it directly from the staff themselves.

Learning management systems may affect the ways in which staff act as role models for students. To the extent that the systems enable students to diminish their in-person contacts with staff, the capacity of staff to function as models for student learning would be determined by the substance and communication dynamics of the online environment. Ward and Newlands (1998: 176) write that 'the social interaction between students at traditional lectures may provide a valued means of mutual support and encouragement which would be lost under a computer based system'. Characterisations of computer mediated communication (CMC) indicate that it may have generic qualities that limit its capacity to support such modelling. Specifically, it has been contended that CMC occurs in a context which is more depersonalised and, as a result, less hierarchical and more disaggregated, egalitarian or even democratic in nature (Holmes, 1997; Dringus, 2000; Verbeeten, 2001). Holmes (1997: 3) writes that 'the expanding use of the Internet as an imagined means of total knowledge in a globalised world empties out the identity of its participants and, therefore, the "social" context in which the pursuit

of knowledge can be thought of as a shared goal'. While this may benefit more collegial forms of inquiry, it might affect the involvement of students who have no prior appreciation of the status or eminence of academic staff. It is also possible that a greater 'transactional distance', defined by Moore (1993: 20) as 'The psychological and communications space between any one learner and that person's instructor', between staff and students may influence the extent to which staff can reflect the salient but more tacit, implicit or unstated qualities of their conduct. It is important to consider, therefore, how use of online systems might affect the way students engage in interactions with staff that link with powerful and efficient forms of vicarious learning.

In addition to affecting the underpinning value of student interactions with staff, the online learning literature suggests that online learning systems may have some bearing on the important qualities of these interactions.

Enterprise-wide online systems have an enormous capacity to change the pragmatics of student and staff interactions. They comprise many features which may expand contact possibilities. Asynchronous communication tools in most systems markedly enhance students' capacity to interact with staff (Morgan, 2003). Leaving aside pedagogical issues, online systems do, in general, appear to enhance opportunities for interaction between students and staff. While this potential underpins much of the enthusiasm of many writers, such enthusiasm needs to be tempered by the possibility that energy invested in electronic correspondence may diminish other forms of communication. At the extreme, CMC has the potential to almost replace alternative interpersonal contacts. Such changes may reflect subtle but profound shifts in the pragmatics of campus-based university education.

As just mentioned, online systems expand opportunities for student and staff interactions and, by dissolving restrictions implied by synchronicity, enhance the possibility that interactions will occur outside the classroom. From a survey of faculty use of course management systems, Morgan (2003: 13) found that '60% of respondents...reported that using a CMS [course management system] in instruction has increased their interaction with students'. Although unclear in the literature, it could be assumed that interactions which occur outside formal instructional environments are significant because they reflect an increased investment of staff and students into the meeting. Asynchronous interactions, in which students and staff are not located together, may not incorporate this quality. While communicating with teachers asynchronously outside class may not adversely affect students' learning and developmental outcomes, such contact may not be as beneficial as interpersonal meetings in which all parties are present. While exploring these consequences for learning is beyond the scope of this book, these thoughts underline how online systems add new spatiotemporal dimensions to student engagement. Rather than accentuate the inside-class and outside-class dichotomy, online learning technologies promote alternative distributed kinds of involvement.

The capacity of online systems to support broad academic and intellectual interactions between students and staff which are warm and rewarding is largely

a matter of circumstance. LMS generate virtual learning environments, however, within which instructors can structure student inquiry to illuminate the wider relevance of formal academic material. Within a hyperlinked environment, academic context can be linked associatively with broader intellectual and social issues of the day. Virtual learning environments may provide a frame of reference for students' autonomous inquiry of these broader issues (Moore, 1993), and prevent them from straying too far from the didactic narrative and becoming lost (Dreyfus, 1998; Beaudin, 1999) in the vast unstructured expanse of the internet.

Much research has been conducted into the dynamics of CMC. While this research is complex and indeterminate, it suggests that online communication may vary in significant ways from face-to-face contacts (Lally and Barrett, 1999). Variation may arise from the predominantly written and enduring qualities of online communication, which for novice students could impose a gravity and hesitance that prevents them from introducing their uncertainties into dialogue. Lally and Barrett (1999: 155) write that:

The absence of non-verbal cues within an on-line environment, in combination with the 'formality' and 'permanence' of written, as opposed to spoken, dialogue, may inhibit the participation of some students. Some commentators have referred to this syndrome as 'communication anxiety': the syndrome embraces technical anxieties (whether or not a message was successfully sent) as well as fears about the message (appropriateness of the rule, tone and content) and possible responses to the message (typically, the anxiety being that no-one will respond.)

Relatedly, online and face-to-face forms of communication may differ because students' information literacy or general study skills inhibit their relaxed and open participation in dialogues. Variation may be due to the social dynamics of online environments, which require communicators to project an explicitly constructed persona while simultaneously developing a robust conception of the presence of others. Compared with conversational types of encounters, the reduction of contextual cues may restrict the potential for developing rich interpersonal understandings.

Engaging students to enhance campus-based education

The strategic significance of student engagement lies in its capacity to enhance the quality of university education. This chapter channels ideas set forward throughout the book into three broad takes on how this might be done. First, it considers how faculty, administrators and students can maximise the educational value of online learning management systems. Second, it focuses on how institutions can work to enhance students' engagement in institutional learning processes. Third, it advances twenty-three opportunities for institutions to engage students in their learning. Many of these ideas are not radical or even new. Their significance is derived, rather, from their engagement-centred perspective on higher education.

Leveraging online systems to enhance campus-based education

The ideas discussed throughout this book can be exemplified by considering their capacity to improve understanding of university student engagement. As just suggested, the findings could contribute in a range of ways to enhance understanding of campus-based online and general engagement. One of their most direct and perhaps pressing applications, however, is in terms of understanding how online learning systems might be used to enhance overall student engagement.

Online LMS are potentially enormously powerful components of the teaching and learning process, and represent a major investment by institutions and higher education overall. It is of great contemporary research and practical importance to investigate how these systems might be used to enhance the engagement of campus-based university students (Coates, 2004a,b, 2005b). Indeed, the value-adding capacity of these systems might be the most significant part they play in the educational process. While online pedagogy is only an indirect focus of this book, information on student engagement says much by itself about how online systems might be used to enhance student engagement.

Appropriately targeted student engagement variables provide coincident measures of the extent to which students are participating in the kinds of environments and activities that are likely to enhance their learning and development.

Engagement information points directly to what students, teachers and institutions might do to improve the quality and productivity of education. The empirical analyses set out in Chapters 5, 6 and 7 provide a wealth of information about how online LMS may be used to enhance campus-based student engagement. While not designed to support a full analysis of online pedagogy, or to generate prescriptive pedagogical recommendations in the manner of Conrad and Ana-Donaldson (2004), identifying pertinent trends in this area moves analysis beyond the ‘accidental pedagogy’ observed by Morgan (2003).

It is worthwhile recapping key assumptions which have been made throughout the book, and which inform discussion below. While acknowledging the increasing integration between the online and general forms of engagement, it is assumed that onsite experiences are primary for campus-based students. Relatedly, it is broadly assumed that online learning should enhance or ‘supplement’ (Twigg, 2003) rather than replace campus-based learning. It is assumed that academic learning involves individuals constructing their knowledge by participating in communities of learners. Engagement is taken to be a malleable phenomenon (Fredricks *et al.*, 2004). Linked with this is the assumption that teaching and support staff play a vital role in generating and reinforcing the conditions likely to promote such individual learning. An assumption is made that the forms of engagement captured in the SEQ are beneficial for students. Further, although later research may find otherwise, it is assumed for current purposes that higher levels of engagement are probably a good thing for student learning. In keeping with the broad idea of student engagement, it is assumed that the student experience is integrated, and that data on the whole student experience is useful for enhancing the whole student experience.

Faculty and administrators can use indices of student engagement to assess and evaluate students’ use of online LMS. Without such information, it is difficult to determine the role and value of online learning in the campus-based student experience. Given this, it is surprising that little effort has been invested in exploring ways of capturing and interpreting such significant data. While LMS provide varying degrees of audit data, audit figures support only crude behavioural analysis of students’ movement within the systems (Morgan, 2003). Knowledge of engagement styles based on SEQ data, in contrast, can inform a much more sophisticated understanding of the significance and role of online systems in contemporary undergraduate education.

University educators can also use measures of engagement to evaluate online learning systems themselves. The engagement qualities and typology provide faculty with criteria against which to assess the performance and value of an existing system’s functionality. They provide an educational counterpoint to the technologies which can be woven easily into routine practice. The pragmatic assessment tools also provide theoretically robust foundations for stimulating insight into the limitations and possibilities for developing the software. Rather than defaulting to in-built communication tools, faculty could generate ideas about the kinds of online functionality which stimulate richer forms of interaction.

The assessment tools also provide a framework for evaluating and shaping these ideas. Such evaluation could seed the kinds of applied and reflective developmental work required to advance the sophistication of online systems.

Looking beyond the systems, staff can use the typological model to identify the distribution of engagement styles within a population. Institutions seeking to be responsive to changing circumstances and contexts should not take student engagement for granted. Demographic and contextual profiling can be used to locate students and groups reporting various styles of engagement. As illustrated earlier, the model of engagement styles can be used to map relationships between students' online and general engagement. The results presented explored a complex rather than direct relationship between the modalities. A substantial number of students report different styles of engagement across the modalities. Such complexity underlines the importance of using accurate and reliable empirical measures to diagnose patterns of student engagement.

Diagnostic information about online and general engagement can play a formative role in developing teaching programmes and approaches. The results make clear that students combine their online and general forms of engagement in different ways. This is epitomised in the comparison of the separate online and general four-cluster solutions, which show that the same students reported different engagement styles across the modalities. There appears to be a complex rather than direct relationship between the modalities, which students do not seem to see as interchangeable. Teaching staff might take a specific approach to communicate with students, for instance, where students have reported collaborative online and independent general forms of engagement. For such students, it may be counter-productive to provide independent learning experiences online, or to fail to take advantage of their use of online systems to communicate with others. With knowledge of student engagement characteristics, pedagogical approaches could be developed to enhance the involvement of those students reporting more passive styles of engagement. Lack of careful analysis of the ways in which particular groups of students are already mixing their online and general experiences may reduce the effectiveness of any pedagogical intervention.

Academic and support staff could develop a prescriptive guide for how students might use online systems to enhance their university engagement. In many instances, although online learning systems have been introduced into academic programmes, it seems that students have received little or no instruction on how to use these sophisticated learning technologies. Such a guide might increase the likelihood that students use LMS to enhance the quality rather than just the convenience of their learning. Students could be informed about how to strategically integrate online learning into campus-based study to enhance beyond-class conversations with other students, manage assessments, identify performance expectations, contextualise their experience in terms of broader debates and tailor resources to their needs. Ideally, such student guides are developed within rich educational frameworks, have solid links with documented patterns of student activity, and take account of an institution's context and resources.

Comparison of students' online and general engagement styles can help institutions use online learning systems to enhance the campus-based experience. This might involve supporting more distributed forms of learning (Saltzberg and Polyson, 1995; Dede, 1998; Oblinger *et al.*, 2001; Dutton and Loader, 2002; Lea and Nicoll, 2002). Institutions might use the systems, for instance, to create and manage environments such as 'learning commons' or 'information commons' (Brown and Lippincott, 2003; Contreras-Castillo *et al.*, 2003) which provide broad community support and stimulation for individual learners. Such environments provide opportunities for students to have extra and richer conversations with staff, to participate in a greater range of complementary activities and, in particular, to engage in more collaborative work with their peers. Ongoing analysis of patterns in student engagement would be necessary to guide and measure the extent to which online systems are being used in such ways to augment campus-based study.

The empirical patterns explored in this book, however, suggest that online systems are not yet being used in many ways most likely to enhance student learning. Two-thirds or more of the students reported that they rarely or never used online systems to do academic work with other students inside or outside of class, rarely or never used university online systems to communicate or have helpful discussions with other students, had not met new people when using the online learning system, had not had individual contact with academic staff online, and rarely used online systems with other students around campus or found it easy to explain their ideas in online discussions. Just less than half of the students reported that they never or rarely found that online learning stimulated their enthusiasm for further study, that teaching staff participated in online discussions and that using online materials helped them put their study in real-world contexts. These results suggest that even at this basic level, more could be done to get students using the online learning systems to engage in such educational practices.

At a strategic level, information about engagement styles can help teaching and support staff use online systems to manage and lead student learning. The systems provide teachers with a powerful additional tool for setting the pedagogical structures and generating the dialogues which Moore (1993) suggests are likely to reduce the 'transactional distance' between teachers and students that lead to learning. Strategic inclusion of online components into campus-based courses gives staff the means to augment their overall teaching by leveraging students' out-of-class time for learning, creating beyond-class conversations with students, managing assessments, setting frameworks and expectations for learning, contextualising learning experiences in terms of broader debates, and responding in a more adaptive way to the needs of individual learners.

The engagement typology provides a framework for institutional evaluation. As institutions and staff develop approaches to blend online learning systems into campus-based education, it is important to monitor the extent to which online experiences can substitute for more conventional forms of campus-based education. The low correlations between the online and general scales suggest that many

students do not see certain core educational experiences as interchangeable. This resonates with the view of Chin (1999: 3), who found that ‘Only a minority of the students considered that web-based teaching can substitute for classroom teaching.’ Similarly, in their recent stocktake of online learning Zemsky and Massy (2004: iii) present results which suggest that students have not taken to e-learning like ‘ducks to water’, and that students prefer in-person to online learning interactions. While efficiencies may arise from certain forms of substitution, the engagement perspective underlines the importance of considering educational as well as economic value. As a measure of the extent to which students feel that they and staff have engaged in activities and conditions likely to generate productive learning, data on student engagement styles provides an index of the extent to which online engagement might sustain productive and quality learning in the lack of comparative general experiences. Without reference to the distribution of engagement styles in a particular context, substituting online in place of general learning experiences may have implications for the quality and productivity of student learning. Many of the results suggest that rather than rely on the emergence of good practices from default, accidental or automatic forms of use, more needs to be done to get students to use online learning systems to engage in good educational practices.

Engaging students in institutional learning

Survey feedback into higher education quality

Around the world, results from student surveys are playing an increasingly critical role in many of the quality assurance and improvement activities that have become embedded within contemporary higher education. While not without their limitations, student surveys have generally come to be seen as a valid, reliable and efficient means of providing information about many key dimensions of institutional and educational leadership, management and practice. Feedback from students can, among other things, be used to monitor pedagogical quality, legitimate students as stakeholders in the educational process, inform selection procedures, analyse student expectations and experiences, determine how to leverage students’ energy for learning, and place university study in broader careers and employment contexts. As higher education institutions seek to become ever more responsive to emerging commercial, educational, international and strategic trends, it seems likely that the kind of stakeholder feedback students can provide will become ever more important to consider.

To the extent that survey information plays a role in shaping institutional and educational development, it is important to ensure that the information obtained from student surveys is as valid and reliable as possible. Although quantitative results can generate an allure of certainty, such results are typically statistical estimates which are essentially subject to varying degrees of error and uncertainty. The size and texture of this uncertainty is shaped by a range of pragmatic,

substantive and methodological factors, however a few aspects of survey design and conduct play a particularly important role.

The extent and nature of people's response to surveys play a critical role in determining the quality of survey estimates. Survey estimates deteriorate to the extent that people fail to respond, or provide careless responses to questionnaire items. It seems reasonable to suspect, conversely, that the quality of survey estimates can be improved by increasing survey response rates and respondents' sense of involvement in the survey process. This perspective suggests that achieving good levels of response from people who have a sense of investment in the survey process can enhance the representativeness of results, generate robust statistical estimates, and reduce the influence of factors which confound measurement and introduce noise into results.

Yet, despite the intrinsic significance of high levels of quality response to the survey process, there is considerable evidence that students are becoming increasingly disengaged from university surveys. Even after considerable efforts are made to generate participation, response rates for large-scale university student and graduate surveys tend to hover just under 50 per cent, at best (Guthrie and Johnson, 1997; HERI, 2000; NSS, 2004; NSSE, 2004; GCA, 2005; Krause *et al.*, 2005; Porter and Whitcomb, 2005). Clearly, short of mandating participation, quality response cannot be taken for granted. There remains a need, in turn, to better understand the dynamics of the response process so that these dynamics can be leveraged to enhance potential respondents' involvement in university surveys.

A considerable amount of research has been done into the uncertain yet important issue of survey response processes. Researchers have adopted pragmatic and relatively atheoretical approaches, economic perspectives which consider 'social exchange theories', and psychological approaches focussing on phenomena such as the 'norms of reciprocity', 'feelings of social responsibility' and 'compliance with legitimate authority'. A number of meta-analyses and reviews have also been conducted (Yammarino *et al.*, 1991; Salant and Dillman, 1994; Singer *et al.*, 1995; Porter and Whitcomb, 2003a,b; Groves *et al.*, 2004; Porter *et al.*, 2004; Trussell and Lavrakas, 2004). Although the findings from these studies are somewhat indeterminate, the research captures aspects of survey response which are important to consider.

Much previous research has concentrated on identifying correlates of increased response rates. Such research has associated increased response rates with multiple contacts, such as prenotification, repeat mailouts, telephone follow-up and reminder notes. The use of various monetary and other incentives has received much attention. While intuitively appealing, incentives have, in general, only been found to have modest links with higher response rates. Further, incentives have been found to have diminishing returns, and to be even less useful, unless they are carefully targeted at particular respondent groups. To a lesser but occasionally still significant extent, appeals for 'help', inclusion of return envelopes, assurances of confidentiality, questionnaire design, personalisation, institutional

endorsement and type of postage have been correlated with increased response rates. Perhaps surprisingly, there is only ambiguous evidence supporting the idea of 'survey fatigue', that low response rates flow from students and graduates being over-surveyed. Interestingly for current purposes, prior research does provide evidence that survey response rates are influenced by the perceived salience, purpose and legitimacy of surveys.

An approach for maximising the quality of student survey information

The idea of student engagement suggests a new approach for enhancing student participation in university surveys. This approach works from the assumption that individuals are more likely to participate in a survey if they feel that the outcomes are of personal or societal benefit, and if the survey and questionnaire themselves look appealing. It seems very likely that people's engagement with a survey is mediated by their belief that their response contributes to a meaningful process which is conducted in a consistent, valid and transparent way that will enable their voice to be heard. This 'survey engagement' approach suggests that achieved response rates are influenced by more than the number of times that an individual has been surveyed by his or her institution. It suggests, rather, that response levels are influenced by each student's perception that his or her response will enhance the success of the survey, and that the survey itself is an important process in which to be involved.

The importance of understanding how to engage students in responding to surveys derives from the growing role played by survey feedback in developing and assuring the quality of university education. As noted above, over the past decade surveys have become an increasingly significant way for students to have their voices factored into the conversations that determine the strategies, policies and practices that shape higher education. Providing feedback from such participation is also a direct means by which institutions can legitimate students' and graduates' involvement in their university learning communities.

To this end, a 'survey engagement model' is proposed here as a means of suggesting how institutions can enhance people's involvement in university student surveys. Working from prior research into survey response dynamics and the results of a large-scale national study (Coates, 2005c; Coates *et al.*, 2006), the model is advanced as an efficient, theoretically informed and relevant means of capturing best practice for maximising survey response. Rather than focus on identifying correlations between specific survey methods and achieved response rates, it takes a broader perspective to both investigate the nature of these factors and propose a model for guiding what institutions and those responsible for managing surveys within universities can do to attract and engage students' interest in the surveys. It exposes how by integrating the surveys into each student's university experience, institutional researchers can develop a context which increases awareness of the nature and significance of the surveys.

While institutional surveys themselves tend to be cross-sectional in nature, survey engagement is an ongoing process which involves planning, actioning

engagement strategies, and evaluating and improving the processes. Following the approach set by Helgeson *et al.* (2002), the survey engagement model deconstructs the survey cycle at the institutional level into four phases which might be instrumental in managing students' survey engagement: presurvey planning and evaluation, presurvey promotion, recapturing attention, and stimulating completion and return. Each of these phases locate the dynamics of survey response in multiple contexts. The model addresses psychological issues such as salience, utility and respondent disposition. It considers institutional and systemic environmental factors, social and cultural issues, and methodological issues about survey processes and instrument design.

The first phase, presurvey planning, captures the idea that to optimise response, institutions should carefully plan their strategy for engaging people in university surveys. Such planning should involve developing a strategy to manage the survey engagement process, promotional strategies and materials, an institutional policy to regulate student surveys, and a means of evaluating the survey processes and survey engagement cycle itself. Planning should commence many months before the first distribution of surveys, perhaps even up to a year before. While planning is listed here at the start of the survey engagement cycle, it is no doubt an ongoing process which influences many aspects of the conduct and receipt of the surveys. While much planning is conducted by, for and within the area in which the surveys are managed, planning may, and probably should, draw in stakeholders from across an institution. In addition to more operational considerations, it should involve notifying teaching and senior staff about the surveys, and providing a broad level of information about the surveys' promotion and conduct within the university community. In many institutions, these kinds of activities would likely occur through ongoing institutional evaluation cycles.

The second phase, presurvey promotion, focuses on raising the awareness of potential respondents about the upcoming surveys. Although it may occur many months prior to distribution of the surveys themselves, presurvey message exposure is likely to be a highly important part of securing student or future graduate involvement. This is partly because much of it could occur when students are still active participants in their university communities, attending classes, interacting with lecturers, socialising with their peers. Message exposure is more important, however, because it provides a means for institutions to situate the surveys within broader educational and experiential contexts. For instance, institutions have an opportunity to link surveys with careers services, teaching quality initiatives and broader graduate concerns. These kinds of activities could well occur post-graduation but before distribution of the survey. Such activities might play an important role in sustaining and reinforcing people's awareness of the surveys, and to raising awareness of their arrivals. Message retention supports the overall engagement process by invigorating students' awareness of the surveys at a time which, for many, is filled with substantial change. Retention activities allow institutions to remind students about the surveys, provide them with an important opportunity to update their contact details, and strengthen the link between the surveys and their wider contexts. Given these ideas, it is surprising that

many aspects of presurvey promotion appear to be underemphasised in current practice in higher education.

Recapturing the attention of potential respondents is a key part of engaging people's active involvement in a survey which takes place during distribution of the survey materials. The importance of this phase springs from the assumption that people's initial receipt of survey materials is likely to play a major role in determining their subsequent response behaviour. Any perturbation in survey engagement at this point will likely mediate the quality and levels of response. In short, response is dependent on graduates not discarding survey materials without even opening or reading them. At a very pragmatic level, it involves making contact with potential respondents, either online or by email, telephone or mail. Institutions should distribute surveys using means which are most likely to reach graduates, rather than methods which, for various administrative reasons, are simply ready-to-hand. Following this, it involves the significant step of generating interest in the survey materials as they are received, by locating them in individually salient academic, employment and lifestyle contexts.

Sustaining individuals' interest in the survey to stimulate completion and return is instrumental in effecting response. After initial receipt or exposure to the questionnaire, people need to be motivated to set aside time to complete the form. They need to be convinced that spending ten minutes completing a survey is a worthwhile investment of their time and energy. While much in this phase rests on individual volition and inclination, institutions can take steps to enhance and sustain individual engagement. These might involve providing simple, prescriptive and transparent completion instructions, providing response incentives which are meaningful to participants, or making further contact with people to endorse and assist their involvement. Even after receiving the form positively and making arrangements to complete the questionnaire, people's attention needs to be sustained while they are providing their response. Again, questionnaire design, reminder notices and follow-up practices are likely to play a role. Even after completing survey materials, people need to be motivated to return completed forms to institutions. At this point, providing reply-paid envelopes and options for alternative forms of submission might play an instrumental role in securing response. Institutions should carefully design follow-up practices to prompt response and return. As with other forms of communication, it is important to target both the methods and substance of this follow-up. Rather than resend identical materials using identical distribution methods, greater value may be derived from tuning the message of follow-ups to the apparent causes of non-response.

Twenty-three opportunities for engaging students

The ideas analysed throughout this book can be distilled into a range of prescriptive suggestions for institutional policy and practice. A powerful but indirect means of doing this is to contextualise much of the research-oriented and

normative discussion set out in earlier chapters. It is both interesting and helpful, however, to take a more direct approach, and to suggest specific strategies and activities which institutions, faculty and other staff could use to engage students and enhance campus-based education. Many of the suggestions below focus on institutions. Many changes and activities require a 'whole of institution' approach. The twenty-three ideas summarised in Table 10.1 are outlined below, as launching points for further analysis.

One of the most immediate steps that institutions can take to enhance student engagement is to produce resources to help students learn about engagement. Knowledge about engagement should not be limited to people involved in planning, administering, teaching and researching university education, or to highly reflective students or those taking part in occasional research studies. Learning how to engage in effective ways with university study should be part of every university student's educational experience. To move in this direction, institutions could develop a prescriptive guide for students, incorporate seminars and classes about engagement into orientation and transition activities, or disseminate key ideas through first-year lectures, laboratories and tutorials. Thus it may be useful to supply faculty and teaching assistants with generic instructional materials about

Table 10.1 Twenty-three things institutions can do to enhance student engagement

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| <ul style="list-style-type: none"> • Produce resources to help students learn about engagement • Find ways to generate students' reflection on their study • Expose learners to lists of engagement activities • Legitimate each student within university learning communities • Take student feedback seriously • Engineer educationally focused interactions between students and faculty into the fabric of institutional practice • Infuse ideas about student engagement into strategic plans • Weave evaluations of student engagement into cycles of institutional evaluation and research • Link engagement data with data in administrative systems • Benchmark engagement within the institution and between institutions • Have institutions take part in broader regional, sectoral, national and international conversations about engagement | <ul style="list-style-type: none"> • Conduct exploratory and investigative studies of student engagement • Highlight online learning management technologies as sophisticated systems for learning and engagement • Document, disseminate and promote ideas and discussions about engagement • Transform passive engagement into other more productive styles of interaction with learning • Infuse the idea of 'student engagement' into both formal and colloquial discussions about teaching • Weave measures of student engagement into conversations about educational quality • Generate interest groups around the idea of student engagement • Develop the capacity of teaching staff to enhance engagement • Enhance curricula and assessments • Use measures of engagement to complement measures of academic performance • Blend engagement measures into routine assessment • Develop distributed learning spaces around campus |
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engagement, and perhaps even disseminate resources and ‘useful tips’ via online learning systems.

It seems likely that having students reflect on their study would play an important role in developing engaged learners. Although there is evidence in higher education research that the deep or more relativistic approaches to study might be either enduring traits or linked with development, there is surely much that faculty and support staff can do to enhance more sophisticated styles of engagement. Institutions can provide students with advice on becoming more reflective and directed in how they manage their learning. Faculty can weave processes of reflective inquiry into open-ended assessment tasks, possibly by having students document and analyse the strengths and weaknesses of the approaches they have taken. Analyses of research-led teaching suggests that faculty can impart a spirit of creative and critical inquiry by discussing their own research experiences with students.

The process of simply using the SEQ to measure students’ perceptions of their university study may in itself be one of the most effective means of enhancing overall engagement. As Kuh (2001a) notes, simply responding to student engagement questionnaires provides students with an opportunity to reflect actively on university study. Along with their exposure to a list of good online and general educational practices, students may value the opportunity to participate in organisational feedback processes. Just as importantly, administering the SEQ to students also offers staff an opportunity and a guide to reflect on student engagement. It provides staff with descriptive information which they can use diagnostically to develop a better understanding of their teaching and learning situation, or in a prognostic way, to plan how to make their teaching more effective.

Much can also be achieved by legitimating each student within the university learning community. Situated learning theory suggests that legitimating each student’s learning can help her or him find a place in large and often daunting organisational structures, can give each student a sense of purpose, inclusiveness and clarity, and can provide insights into the approaches and outcomes required to become further integrated into academic learning communities. Such legitimating might come through formal induction procedures or ceremonies, through welcome addresses or letters from institutional leaders, through mentoring partnerships, or perhaps even through providing a personalised space within the institution’s online learning environment. In the last decade, American higher education has highlighted the value of explicitly structured curriculum-based or extracurricular learning communities. Such communities can manage and stimulate peoples’ involvement in educational activities and institutional life.

An important form of legitimating derives from taking student feedback seriously, and engaging them in the survey processes which provide a major communication channel between learners and learning organisations. This is a multidimensional activity, as suggested by the survey engagement model set out earlier. Institutions should develop a co-ordinated approach for planning their surveys. This approach, which might consist of a survey policy or strategy, should

guide how institutions plan, conduct, monitor and evaluate their survey processes. Institutions should also develop programmes to promote student and graduate feedback surveys to students as they are completing their courses. Institutions should distribute surveys using means which are most likely to reach graduates, rather than methods which, for various administrative reasons, are simply ready-to-hand. Institutions should present and market surveys in ways which capture potential respondents' attention and stimulate their desire to be involved. This may take place through simultaneous and multifaceted distribution methods, by ensuring that the materials which are distributed are easy to read and understand, and by ensuring that materials are presented as a significant opportunity to have an individual say about core aspects of the university experience. Survey forms and cover letters in particular should be designed to speak to the needs and inclinations of respondents. Institutions should carefully design follow-up practices to prompt response and return. As with other forms of communication, it is important to target both the methods and substance of this follow-up. Rather than resend identical materials using identical distribution methods, greater value may be derived from tuning the message of follow-ups to the apparent causes of non-response. Second and third distribution waves should send survey materials that address issues such as complacency, the value of the survey and the pragmatics involved with participation. That is, rather than work just as prompts, these later distributions should be seen as a means of intervening in and influencing explicit or implicit decisions which have been made not to respond.

Engineering educationally focused interactions between students and faculty into the fabric of institutional practice is an important part of engaging students in university learning communities. As discussed throughout this book, the importance of such interaction is reinforced by a significant amount of higher education research. The support for such interaction provided by theory and research, however, is typically countered by difficulties in finding the resources required to embed such interaction into everyday practice. Finding time in busy research and teaching schedules can be difficult for staff working in institutions of mass higher education which may have around twenty times more students than staff. The tensions confronting faculty in such circumstances may well require dedicated institutional resources and supports to resolve. From their perspective, students need to balance investments in forming relationships with mentors and advisors with the demands of academic work and other paid employment and family commitments. Just how such tensions are resolved most likely depends on individual institutions, faculty members and students. The role that such interactions can play in enhancing the quality of education, however, suggests that this is a particularly valuable aspect of engagement and university life to develop.

Ideas about student engagement should be infused into strategic plans. At the strategic level, models of engagement can expose explicitly structured educational fundamentals that complement considerations about research, internationalisation, community engagement, infrastructure, resources, and student

access and equity. Goals and strategies might be directly derived from aspects of engagement. That is, 'enhancing engagement' might itself be set as a goal, with a series of derivative strategies concentrated on enhancing challenging, active and collaborative learning, enhancing students' interaction with faculty, enhancing development of individual talent, developing supportive and responsive learning environments, enhancing the online experience, and developing adaptive and online pedagogies. Alternatively, the idea of engagement might be infused across a range of different areas. In this way, engagement ideas could be distributed through strategies pertaining to educational quality, internationalising learning experiences, promoting an institutional 'ethos of learning', or developing online pedagogy. Engagement is a key process by which students, faculty and other stakeholders can participate in institutional conversations about production, acquisition and dissemination of knowledge.

In a more applied way, evaluations of student engagement should be woven into cycles of institutional evaluation and research. At an operational level, the measurement of student engagement should be conducted alongside the measurement of phenomena such as teaching quality, faculty teaching qualifications, institutional resources, levels of prior academic performance and academic outcomes. The information about key learning processes which is captured in measures of engagement occupies a critical position in performance indicator systems which integrate information on student, teacher and institution inputs, processes and outcomes. Timely information about student engagement provides coincident data on the participation of a particularly significant group of stakeholders in institutional and educational processes. Without such information, institutional managers and leaders may be left to rely on assumptions or *ad hoc* anecdotal reports about how students are interacting with valuable resources and with their learning.

Linking engagement data with data in administrative systems provides a means of studying issues such as student retention and attrition. Engagement data provides rich information on key aspects of students' interactions with their institutions. Although four styles of engagement have been advanced in this text, analysing engagement data in light of information about attrition and retention may well expose additional and specific patterns of interaction which are distinctive of students who choose to discontinue their courses. Developing predictive models of persistence could flow through to strategies and practices for preventing such discontinuation, or at least managing student retention.

As an extension of such evaluation, institutions should benchmark engagement within the institution and between institutions. Benchmarking can formalise assessment and evaluation activities by placing them in more enduring and generalisable frameworks. It can provide an impetus to assure the quality of measurement activities, generate methodological discussions about the measurement, analysis and reporting of engagement, and generate collaborative interaction between organisations, consortia and networks focused on engagement.

Moving beyond evaluation and benchmarking, institutions could take part in broader regional, sectoral, national and international conversations about

engagement. Key activities here include faculty presentations at conferences about engagement, documenting and disseminating activities and resources which have a record of fostering engagement, and cataloguing and distributing novel pedagogies and resources. These are bold ideas, however, they have already been given life for some years as part of Project DEEP in the USA (Kuh *et al.*, 2005a; NSSE, 2005). Through the analysis of engagement, Project DEEP has worked to identify, document and disseminate effective educational practices linked with student learning.

Ideally, the study of engagement within universities would flow beyond institutional research into academic research activities. Stimulating research which is more scholarly in nature has the potential to generate and embed what Argyris and Schon (1977) referred to as 'double loop' learning. Double loop learning involves a sort of 'feedback loop which connects the detection of errors not only to strategies and assumptions for effective performance but to the very norms which define effective performance' (Argyris and Schon, 1977: 22). Learners are taken beyond simple forms of error correction, and involved in reflecting on systems and contexts themselves. Double loop learning can be reactive in response to problems and inconsistencies or proactive as part of a learning organisation in which managers confront and resolve conflict. Research-driven inquiry about the nature and trends in student engagement within the organisation has the potential to stimulate forms of organisational activity which enhance the quality of education.

Institutions should highlight online learning management technologies as sophisticated systems for learning and engagement, rather than as just tools for administration and teaching. A range of financial, technological, organisational, pedagogical and commercial reasons may have underpinned the introduction and support of online systems into campus-based contexts. The most pertinent issues going forward, however, centre around how to extract maximum educational value from the systems. Moving in this direction requires institutions to focus on the systems as highly sophisticated educational resources rather than as software, hardware or information technologies. While this is an easy comment to make, it is a perspective which has serious implications for human, financial and physical resources. Treating online LMS primarily as sophisticated educational resources may involve re-assigning responsibilities within institutions, forming new teams or partnerships across departments and between faculty and support staff, and focusing attention on supporting students as well as teaching staff as the end-users of the technologies.

Institutions should take steps to document, disseminate and promote ideas and discussions about engagement. While underpinned by core educational fundamentals, engagement is by its nature a fairly motile and malleable phenomenon. As such, its instantiation and value will hinge in significant ways on the life which is given to it by the conversations which are seeded and reinforced within the educational community. The ideas and practices which constitute engagement could be promoted through strategic documents, operational plans, marketing

brochures, information booklets, posters and leaflets, portals and online learning systems, announcements from institutional leaders, student newsletters, graduate and alumni newsletters, and staff and student meetings.

Institutions should work to transform passive styles of engagement into other likely more productive styles of interaction with learning. While engagement styles have not been explicitly linked with learning outcomes in this book, it seems reasonable to assume that a passive or disengaged approach to study is not the most productive or satisfying. Making this change would likely involve identifying passive engagement, and identifying the demographic and contextual factors which predispose students to assume a passive style of engagement in certain situations, and which might precipitate and perpetuate passive styles of engagement. Such insights would give faculty, advisors and counsellors valuable information for developing approaches to prevent passive engagement and stimulate each student's interest in her or his learning.

Explicit steps should be taken to infuse the idea of 'student engagement' into both formal and colloquial discussions about teaching. The induction and development of academic staff should include discussion of student engagement, and offer pedagogical strategies and practices for enhancing engagement. Discussions about teaching in departmental seminar series and colloquia should emphasise the value of stimulating engagement. Academic staff should be encouraged to record evidence of their 'capacity to engage students' into the academic or teaching portfolios which are used for appointment and promotions procedures.

Measures of student engagement should be woven into conversations about educational quality. Determinations about the quality of university education should be made with information about whether students are engaging with the kinds of practices that are likely to generate productive learning, and about whether institutions are providing the kinds of conditions that, based on many years of education research, seem likely to stimulate such engagement. This could take place through formal institutional or even state or national quality assurance procedures, or by promoting engagement experiences in institutional marketing materials as a counterpoint to often more entrenched yet less educationally sensitive measures of quality.

Institution-wide committees, partnerships or interest groups can be a powerful means of managing, taking responsibility for and promoting discussions about engagement. As explored in this book, engagement is a broad idea which brings together a range of ideas, activities and people. Engaging students in beyond-class collaboration, for instance, may require the people who design and develop spaces around campus to support such work, those who develop online tools that support specific interactions within groups, the support of teaching staff who develop courses, learning activities and assessments, and the support of student affairs staff to manage diverse non-academic aspects of the student experience. Such developments typically require coordination of ideas and work and people across an institution, and may benefit from the direction and support which institution-wide committees might provide.

Institutions should develop the capacity of teaching staff to enhance engagement. This might be done by incorporating key ideas about engagement into staff development policies, particularly those pertaining to supportive and adaptive teaching practices. Faculty development activities provide a key means of embedding perspectives on engagement into teaching processes, and helping faculty and support staff understand how to manage and lead effective forms of engagement. Teaching awards present opportunities to reward and promote teaching which has stimulated productive forms of engagement. Many mainstream books have become available in the last decade which provide advice for developing the kinds of constructivist pedagogies which form part of the engagement dynamic. Developing engagement-centred teaching is one of the most important and immediate moves that institutions can make to engage students and enhance learning.

Of course, the curricula and assessments which are the explicit and primary focus of learning conversations must engage students. This need not involve expensive development of faculty skill or learning resources. Simple steps can be taken to enhance the contextual significance of topics, ensure that materials provide points of entry for students with different abilities and learning levels, problematise resources using discontinuities and questions to stimulate reflection and debate, and apply ideas being learned beyond the classroom. Providing faculty and teaching support staff with an overview of key measurement ideas and approaches can help ensure that questions in assessments are efficient and targeted appropriately, and provide valid and reliable feedback to students. Simple changes which could be easily accommodated into existing practices include the use of panelling and focus groups, student feedback mechanisms, empirical item reviews and peer review.

A somewhat more radical idea might see measures of engagement being used to complement measures of academic performance. This perspective emphasises the intrinsic rather than instrumental role of engagement. Such measures could be used in a formative way to identify directions for learning and to encourage participation in social, cultural, recreational and political groups, internships, and international exchanges. Engagement measures could also be used summatively, as information for graduate employers about an individual's community involvement or work processes and approaches.

Blending engagement measures into routine assessment would, after a few semesters or years, provide institutions with the kind of data needed to undertake longitudinal analyses and management of the phenomenon. While this book has focused on the cross-sectional analysis of engagement, the longitudinal perspective has a great deal to offer. Capturing change in students' interactions in key learning processes over the years would surely provide one of the best possible insights into the development and nature of a graduate, and extremely telling information about how to manage university resources in ways which enhance the student experience.

Developing distributed learning spaces around campus is a direct way for institutions to enhance student engagement. Such learning or information

commons provide students with a range of opportunities for interacting with online and onsite learning resources and communities. Oblinger (2005) has captured key qualities of such spaces, noting that they should be designed around people, support different types of learning activities, be flexible, support multimodal learning, be comfortable and safe, and reflect institutional values. Distributed learning spaces provide students with supportive educational structures which hopefully encourage them to engage with learning resources and communities.

Educational leadership of online and campus-based engagement

A key argument pulsing through this book is the importance of employing online learning systems strategically as educational technologies rather than allowing the accidental generation of technological education. It is equally important that administrative factors do not wholly determine students' engagement in their campus-based education. It is important that there is educational leadership and management of students' engagement in campus-based and online education. This point comes through explicitly in the following excerpts from Masson (2005), which detail the activities of one institution.

The University...is committed to delivering an enhanced, student-centred approach to learning by applying the most effective, flexible and appropriate teaching and learning technologies. The University has embraced the potential of e-learning to improve access, widen participation and support an increasingly diverse student base.

The availability of a centrally supported and developed e-learning environment comprising highly integrated VLE [Virtual Learning Environment] and Library related tools and services has enabled course teams and academics to explore new pedagogical and androgical approaches. Novel mechanisms for engaging and communicating with students have also been developed. New assessment strategies are beginning to emerge and opportunities to explore and support diverse learning styles are now available.

The University has in place extensive expertise in the areas of e-pedagogies, content creation and the integration of e-learning systems. This team consists of Learning Technologists, Staff Developers, Librarians and Systems Engineers, supported by Graphics/Multimedia Developers, Accessibility Specialists and Programmers.

These extensive resources underline the University's commitment to the development and maintenance of a world-class e-learning

infrastructure and provide an opportunity to further develop institutional e-learning services and approaches that positively impact on the learning experience.

One feature of the University's... approach to e-learning is its focus on providing learner-centred services. This seeks to package and contextualise information from a learner's perspective to achieve maximum relevance and understanding.

The University recognised at an early stage that effective methods of user support would need to be developed to assist learners' transition to learning in an online environment, ability to participate effectively in online courses and activities and understanding of how to best use the tools and systems utilised in online courses. This has led to the development of a suite of learner support tools and resources that was informed by emerging best practice, feedback from students and the specification that any institutional support should be learner-centred and integrated with the overall student experience.

The model adopted is one of supporting student transition throughout the student application and enrolment process. Students enrolling in a fully online courses are provided with appropriate transition support as they progress through the course enrolment and registration processes. A full learner support package accessible via the VLE develops the key topics identified as critical to the success of such online programmes. These topics include 'Orientation and training in the use of VLE tools', 'Study Skills', 'Self Management', 'Online Searching and Evaluating Internet Resources' and 'Plagiarism', with the topics being explored from a student perspective.

Using the VLE to deliver the learner support package enables learners to familiarise themselves with e-learning within a realistic context. It also provides a 'just in time' level of support and guidance as they can revisit key sections during their studies. In the academic year 2003–04 this learner support package was further developed and released to all new students of the institution (over 10,000), with the service actively promoted to fully online students.

Enhancing engagement and higher education

Preparing the way

This book closes with a series of forward-looking ideas about what would be required to advance ideas about engagement into practice. Before turning to these, it is interesting to consider what might be required of people, institutions and systems to make room for engagement. In short, what is to be done for engagement to permeate key conversations and practices in higher education?

We need to raise the awareness of higher education leaders and policy-makers. While building on decades of higher education research, the principles and practices of ‘student engagement’ remain unknown to many people who run universities and systems of higher education. Conversations about engagement compete for attention with conversations about research, finances, human resources, institutional development and infrastructure. When considered, conversations about student learning and development may focus on administration or pedagogy, rather than on key learning and experiential processes. The value of student engagement as an organising principle is yet to be fully realised. As experience in the USA suggests, high-level endorsement can act as a bootstrap that allows engagement to take on a life of its own and become embedded into practice.

A more demanding task is the challenge of embedding the notion of engagement into conceptions of higher education quality. Although ‘research’ and ‘innovation’ are integral parts of the academy, higher education itself has shown a remarkable, and often respectable, reluctance for change.

To gain traction, a somewhat socialist idea like engagement must compete with sandstone, ivy and strongly reinforced reputations. While rooted in educational fundamentals, engagement is a radical rather than conservative idea. A considerable amount of development, and perhaps evolution, must take place before student engagement is considered to be a key measure of educational quality. This needs to happen within but also beyond institutions.

One of the real hurdles involves setting student learning and development on equal footing alongside research and teaching. This is a real challenge in many systems, where faculty are hired for their research experience, and where institutions are valued almost solely on their research output. Emerging international

university rankings (IHE, 2004; THES, 2004), for instance, place little emphasis on student learning and development. Against this, a teaching and learning performance fund in Australia has used feedback from graduates to filter the student voice into conversations about leading and managing university education.

As emphasised throughout this book, those responsible for online learning are an important group of stakeholders to embrace in discussions about engagement. Universities need to develop learners, not users. Doing this requires educational uses of technology, not technological uses of education. Maximising the educational use of contemporary learning management technologies involves more than filtering human factor considerations into software development. It involves educators taking responsibility for formalising educational processes in ways which are prescriptive enough for the development of value-adding software. It involves developing structures for guiding the conversations about knowledge which constitute learning.

Institutions need to develop the courage, culture and infrastructure to operationalise psychometrically calibrated coincident measures of student engagement. Engagement data may shock prevailing expectations and conceptions. Time and much effort may be required to develop a culture which values spontaneous feedback from students. The constancy and significance of key roles and responsibilities may need review. Decisions would need to be made on the importance that is assigned to hard data on learning practices.

Forward momentum for the study of engagement

The analysis set out in this book marks out frontiers for future investigation of engagement. The idea of student engagement represents the culmination of many years of inquiry into the qualities and structures of university student learning and development. The specific study of student engagement and online learning, however, is in its early stages of development. There remains much need for further research.

There is scope for much applied institutional research arising from the picture of campus-based student online and general engagement explored in this book. Future research might consider further the implications of student engagement for institutional or systemic higher education policy and practice. What are the limitations, for instance, of policies about university education that fail to account for information on student engagement? What does student engagement information have to contribute to quality assurance and improvement processes? What sort of policies might be required to reinforce particular engagement practices? What are the desirable methodological characteristics of a student engagement indicator? How could institutional managers and leaders employ such an understanding to enhance student learning outcomes? How might teachers respond to students manifesting different styles of engagement and, further, how might they work to generate or reinforce particular styles? What are the implications of the

understanding of online and general student engagement for curriculum and assessment design? What are the specific ways in which information about student engagement might influence institutional or course marketing and recruitment? Can the ideas set out in this book be distilled into more prescriptive suggestions to guide teaching practice? For the wider public, is it likely that a research-driven understanding of student engagement can counteract more entrenched ways of thinking about the quality of higher education? Investigating such questions will develop higher education.

There is much scope for ongoing analysis to enhance the defined qualities of engagement, as well as to expose new relevant aspects of the student experience. Although student engagement has certain enduring characteristics, the nature of the phenomenon renders it open to change. By its nature, the qualities which constitute any idea of student engagement need to be sensitive to the contexts of their application. Thus, while much has been done in this book to define these qualities, there remains an ongoing need for further consultation and review. Such consultation may also expose new qualities which are either additional to or finer distinctions of those which have been documented. This may be particularly the case for those qualities linked with online learning systems. As recognised in the USA (NSSE, 2004), there is much to be gained by the ongoing documentation, validation and operationalisation of effective engagement practices.

This book has proposed but not fully explored a typological model of student engagement styles. While a valid and parsimonious means of identifying different engagement styles was presented, ongoing analysis is needed to identify criterion-referenced thresholds that mark out levels of engagement along the academic and social dimensions. As with other theoretical frameworks, typologies can tend towards being reified. Research might consider the extent that this is likely to be a problem given the importance that any idea of student engagement is responsive to the nuances of particular situations. There is also a need for additional cross-validation and triangulation of diagnostic properties of the typology. This would involve determining the accuracy and implications of identifying individual students with distinct engagement styles. How accurate is such identification? How stable is such identification over time? To what extent is there a tendency by researchers and practitioners to interpret identified styles as stable traits? To what extent is engagement style related to the more general characteristics of student development? Subsequent studies might explore the interactions between the different engagement styles, both longitudinally and across the modalities. Such monitoring could work to expose the anticipated increasing absorption of sophisticated online learning technologies into campus-based university education.

Read as a whole, the book provides a foundation for working towards the development of an integrated understanding of campus-based distributed education. Despite much theorising and considerable injection of resources, this book has suggested that students do not yet see themselves as engaging in technologically distributed campus-based learning. Instead, relationships between the online and general engagement modalities of engagement indicate that students see their

learning unfolding in two possible or parallel worlds, one virtual, the other real. While this book has proposed instruments for interpreting these worlds in terms of common underpinning social and academic dimensions and engagement styles, it has not proposed a unified model of distributed campus-based student engagement. It has moved towards such a model, however, and has provided a theoretical and methodological grounding for how further work might progress.

One of the real values of online LMS is the extent to which they add value to how students' engage with their study. It seems that, regardless of its traditions or missions, almost every institution has invested in LMS as a means of leveraging the Internet to enhance some kind of competitive advantage. The challenge institutions now face is not technological or financial, but educational. Institutions need to identify how to maximise the return on their investments by using LMS to manage and improve the quality of university education.

An important move in this direction will be the integration of online learning with institutional quality assurance systems. As online learning systems develop, the audit data generated as students, faculty and support staff interact with the technology is becoming a much more extensive and powerful source of information about students' learning interactions. Such data has an enormous capacity to complement and enrich broader measures of student engagement. To realise this capacity, however, it is necessary to develop analyses, reports and tools that convert massive amounts of data on user interactions into focused education and management-relevant information. Exploration of the synergies in this area is just starting to emerge.

This book has identified a need for further discussion about how student engagement information might contribute to institutional and systemic policy and management. Student engagement exposes different possibilities for indexing the quality and efficiency of university education. While valuable, such possibilities contain uncertainties that would need to be resolved before student engagement information could be woven into cycles of policy development, implementation, assurance and improvement. One challenge, for instance, would involve reconciling the constructivist perspective underpinning the idea of student engagement with what is ultimately an institutional responsibility for managing ongoing quality improvement. There is a tension here which stems from the fact that although students are seen as making a direct contribution to the educational process, it is one which is largely beyond institutional control.

Subsequent analysis would benefit from investigating the extent to which student engagement does indeed promote student learning and development. While based on decades of research, the specific study of student engagement is in its infancy. As engagement research matures, there is a need to explore how patterns and levels of engagement relate to the short-term, medium-term and long-term outcomes of university education. Such investigation would help further position the idea of student engagement in terms of widespread perspectives on academic learning and individual development, and enhance understanding of the implications of student engagement for policy and practice.

Future investigation of students' engagement in technologically distributed campus-based university communities would almost certainly benefit from broadening the focus beyond university online learning systems. Contemporary students appear to fuse many technologies into their university experience. While beyond the focus of this book, further research might consider the extent to which students' use of technologies such as mobile phones, personal email or portable digital assistants influences collaboration, contact with staff and other salient aspects of the student experience. Without a broader understanding of this, it may be difficult for institutions to harness students' means of interaction for the purposes of learning.

The significance and nature of university student engagement is only just beginning to emerge. This book has advanced understanding of the patterns likely to constitute general forms of engagement. It has conducted an early investigation of the increasing and formative penetration of online learning into campus-based education. It has exposed theoretically informed and empirically validated structures which provide a basis for guiding future research into student engagement, and for guiding this research into practice.

Bibliography

- Admiraal, W., Wubbels, T. and Pilot, A. (1999). College teaching in legal education: Teaching method, students' time-on-task and achievement. *Research in Higher Education*, 40(6), 687–704.
- Advanced Distributed Learning (ADL). (2005). *Advanced Distributed Learning*, from www.adlnet.org
- Agre, P. E. (2002). Infrastructure and institutional change in the networked university. In W. H. Dutton and B. D. Loader (Eds), *Digital Academe: The New Media and Institutions of Higher Education and Learning*. London: Routledge.
- Anastasi, A. (1976). *Psychological Testing*. New York: Macmillan.
- Anderson, M. D. (2000). Individual characteristics and web based courses. In C. R. Wolfe (Ed.), *Learning and Teaching on the World Wide Web*. San Diego, CA: Academic Press.
- Anderson, T. and Elloumi, F. (Eds). (2004). *Theory and Practice of Online Learning*. Athabasca: Athabasca University.
- Andrews, L. (1999). *Does HECS Deter? Factors Affecting University Participation by Low SES Groups*. Canberra: Department of Education, Training and Youth Affairs.
- Anson, C. J. and Bendus, O. (2003). The pedagogical impact of course management systems on faculty students and institution. In R. Bruning, C. A. Horn and L. M. PytlikZillig (Eds), *Web Based Learning: What Do We Know? Where Do We Go?* Connecticut: Information Age Publishing.
- Argyris, C. and Schon, D. A. (1977). *Organizational Learning: A Theory of Action Perspective*. London: Addison-Wesley Publishing Company.
- Astin, A. W. (1979). *Four Critical Years: Effects of College on Beliefs, Attitudes and Knowledge*. San Francisco, CA: Jossey Bass.
- Astin, A. W. (1985). *Achieving Educational Excellence: A Critical Analysis of Priorities and Practices in Higher Education*. San Francisco, CA: Jossey Bass.
- Astin, A. W. (1990). *Assessment for Excellence: The Philosophy and Practice of Assessment and Evaluation in Higher Education*. New York: Maxwell Macmillan International.
- Astin, A. W. (1993a). An empirical typology of college students. *Journal of College Student Development*, 34(1), 36–46.
- Astin, A. W. (1993b). *What Matters in College: Four Critical Years Revisited*. San Francisco, CA: Jossey Bass.
- Astin, A. W. and Lee, J. J. (2003). How risky are one-shot cross-sectional assessments of undergraduate students? *Research in Higher Education*, 44(6), 657–672.

- Bailey, K. D. (1994). *Typologies and Taxonomies: An Introduction to Classification Techniques*. London: Sage Publications.
- Baird, J. R. and Penna, C. P. (1996). Challenge in learning and teaching science. *Research in Science Education*, 26(3), 257–269.
- Baird, J. R. and Penna, C. P. (1997). Perceptions of challenge in science teaching. *International Journal of Science Education*, 19(10), 1195–1209.
- Bandura, A. (1989). Social cognitive theory. *Annals of Child Development*, 6, 1–60.
- Barnett, R. (2003). Engaging students. In S. Bjarnason and P. Coldstream (Eds), *The Idea of Engagement: Universities in Society*. London: Association of Commonwealth Universities.
- Baron, R. M. and Kenny, D. A. (1986). The moderator-mediator variables distinction in social psychological research: conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182.
- Barraket, J., Maree-Payne, A., Scott, G. and Cameron, L. (2000). *Equity and the Use of Communications and Information Technology in Higher Education*. Canberra: Department of Education, Training and Youth Affairs.
- Bartko, W. T. (1999). *Student Engagement and Development*. Paper presented at the Conference on Student Engagement, University of Michigan, Ann Arbor.
- Bates, T. (1995). *Technology, Open Learning, and Distance Education*. London: Routledge.
- Baxter-Magolda, M. B. (1987). The affective dimension of learning: Faculty–student relationships that enhance intellectual development. *College Student Journal*, 21, 46–58.
- Baxter-Magolda, M. B. (1992). *Knowing and Reasoning in College: Gender-related Patterns in Students' Intellectual Development*. San Francisco, CA: Jossey Bass.
- Bean, J. P. (1985). Interaction effects based on class level in an explanatory model of college student dropout syndrome. *American Educational Research Journal*, 22, 35–64.
- Bean, J. P. and Kuh, G. D. (1984). The relationship between student–faculty interaction and undergraduate grade point average. *Research in Higher Education*, 21, 461–477.
- Beaudin, B. P. (1999). Keeping online asynchronous discussions on topic. *Journal of Asynchronous Learning Networks*, 3(2), 1–13.
- Beaudoin, M. F. (2002). Learning or lurking? Tracking the ‘invisible’ online student. *Internet and Higher Education*, 5, 147–155.
- Bell, M., Bush, D., Nicholson, P., O’Brien, D. and Tran, T. (2002). *Universities Online: A Survey of Online Education and Services in Australia*. Canberra: Department of Education, Science and Training.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107(2), 238–246.
- Bentler, P. M. and Bonnett, D. G. (1980). Significance test and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88, 588–606.
- Berliner, D. C. (1984). The half-full glass: a review of research on teaching. In P. L. Hosford (Ed.), *Using What We Know About Teaching*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Bernstein, R., Caplan, J. and Glover, E. (2001). America’s 100 most wired colleges: 2000. In *Yahoo! Internet Life*. Accessed 30 March 2003 from <http://www.zdnet.com/zdsubs/yahoo/content/100mostwired/index..html>
- Biggs, J. and Collis, K. (1982). *Evaluating the Quality of Learning: The SOLO Taxonomy*. New York: Academic Press.

- Blackboard. (2005). *Blackboard Learning System*, from www.blackboard.com. Accessed 12 November 2005 from www.blackboard.com
- Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H. and Krathwohl, D. R. (1956). *Taxonomy of Educational Objectives*. London: Longman Group.
- Bolton, C. D. and Kammeyer, K. C. W. (1967). *The University Student: A Study of Student Behavior and Values*. New Haven, CT: College and University Press.
- Bonk, C. J. (2004). *The Perfect E-Storm: Emerging Technology, Enormous Learner Demand, Enhanced Pedagogy and Erased Budgets*. London: Observatory on Borderless Higher Education.
- Bonk, C. J., Kirkley, J., Hara, N. and Paz Dennen, V. (2001). Finding the instructor in post-secondary online learning: pedagogical, social, managerial and technological locations. In J. Stephenson (Ed.), *Teaching and Learning Online: Pedagogies for New Technologies*. London: Kogan Page.
- Bonwell, C. C. and Eison, J. A. (1991). *Active Learning: Creating Excitement in the Classroom*. Washington, DC: ERIC Clearinghouse on Higher Education.
- Bosker, R. J. and Snijders, T. A. B. (1999). *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling*. London: Sage Publications.
- Brennan, J., Brighton, R., Moon, N., Richardson, J., Rindl, J. and Williams, R. (2003). *Collecting and Using Student Feedback on Quality and Standards of Learning and Teaching in Higher Education: A report to the Higher Education Funding Council for England*. Bristol: Higher Education Funding Council for England.
- Britian, S. and Liber, L. (1999). *A Framework for Pedagogical Evaluation of Virtual Learning Environments*. London: JISC.
- Brophy, J. (1983). Conceptualising student motivation. *Educational Psychologist*, 18, 200–215.
- Brown, J. S. (2000). Growing up digital. *Change*, 32(2), 10–20.
- Brown, J. S., Collins, A. and Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32–42.
- Brown, M. B. and Lippincott, J. K. (2003). Learning spaces: more than meets the eye. *Educause Quarterly*, 1, 14–16.
- Brown, S. (2001). Campus re-engineering. In F. Lockwood and A. Gooley (Eds), *Innovation in Open and Distance Learning: Successful Development of Online and Web Based Learning*. London: Kogan Page.
- Brown, W. and Duguid, P. (1996). Universities in the digital age. *Change*, 28(4), 11–19.
- Browne, W. B. and Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen and J. S. Long (Eds). *Testing Structural Equation Models*. London: Sage.
- Bruffee, K. A. (1993). *Collaborative Learning: Higher Education, Interdependence, and the Authority of Knowledge*. Baltimore, MD: Johns Hopkins University Press.
- Bruner, J. (1960). *The Process of Education*. Cambridge, MA: Harvard University Press.
- Campbell, D. T. and Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait multimethod matrix. *Psychological Bulletin*, 56, 81–105.
- Candy, P. C. and Crebert, R. G. (1991). Ivory tower to concrete jungle: the difficult transition from the academy to the workplace as learning environments. *Journal of Higher Education*, 62(5), 570–592.
- Candy, P. C., Crebert, R. G. and O'Leary, J. (1994). *Developing Lifelong Learners Through Undergraduate Education*. Canberra: Australian Government Publishing Service.

- Carmean, C. and Haefner, J. (2002). Mind over matter: transforming course management systems into effective learning environments. *Educause Review*, Nov/Dec, 27–34.
- Carnegie Foundation for the Advancement of Teaching. (1990). *Campus Life: In Search of Community*. Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.
- Carswell, L., Thomas, P., Petre, M., Price, B. and Richards, M. (2000). Distance education via the internet: the student experience. *British Journal of Educational Technology*, 31(1), 29–46.
- Chapman, E. (2003). Alternative approaches to assessing student engagement rates. *Practical Assessment Research and Evaluation*, 8(13). Accessed 10 August 2003 from <http://pareonline.net/getvn.asp?v=8&n=13>
- Chickering, A. W. and Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, 39(7), 3–7.
- Chickering, A. W. and Reisser, L. (1993). *Education and Identity*. San Francisco, CA: Jossey Bass.
- Chin, K. L. (1999). *A Study into Students' Perceptions of Web-based Learning Environment*. Paper presented at the HERDSA Annual International Conference, Melbourne.
- Clancey, W. J. (1993). Situated action: a neuropsychological interpretation response to Vera and Simon. *Cognitive Science*, 17(1), 87–116.
- Clark, B. R. and Trow, M. (1966). The organisational context. In T. M. Newcomb and E. K. Wilson (Eds), *College Peer Groups: Problems and Prospects for Research*. Chicago, IL: Aldine.
- Clarke, A. (2002). *Online Learning and Social Exclusion*. London: National Organisation for Adult Learning.
- Clustan. (2001). *Clustan Graphics Version 5.02*. Edinburgh: Clustan Ltd.
- Coates, H. (2004a). *The Influence of Learning Management Systems on Campus-based Student Engagement*. Paper presented at the American Association for Higher Education Annual Conference, Kansas City, Missouri.
- Coates, H. (2004b). *The Influence of Learning Management Systems on Campus-based Undergraduate Student Engagement*. Paper presented at Educause 2004: IT From a Higher Vantage Point, Denver, CO.
- Coates, H. (2005a). The value of student engagement for higher education quality assurance. *Quality in Higher Education*, 11(1), 25–36.
- Coates, H. (2005b). Leveraging online learning to enhance campus-based student engagement. *Educause Quarterly*, 1, 66–68.
- Coates, H. (2005c). *Managing Survey Engagement to Improve Quality Assurance*. Paper presented at the Australian Tertiary Education Management Conference, Perth, Australia.
- Coates, H. (2007). A model of online and general campus-based student engagement. *Assessment and Evaluation in Higher Education*, 32(2).
- Coates, H., James, R. and Baldwin, G. (2005). A critical examination of the effects of Learning Management Systems on university teaching and learning. *Tertiary Education and Management*, 11, 19–36.
- Coates, H., Tilbrook, C., Guthrie, B. and Bryant, G. (2006). *Enhancing the GCA National Surveys: An Examination of Critical Factors Leading to Enhancements in the Instrument, Methodology and Process*. Canberra: Department of Education, Science and Training.

- Cohen, R. J., Swerdlik, M. E. and Smith, D. K. (1992). *Psychological Testing and Assessment: An Introduction to Tests and Measurement*. California: Mayfield Publishing Company.
- Coleman, J. (1966). *Equality of Educational Opportunity*. Washington, DC: US Government Printing Office.
- College Student Experiences Questionnaire (CSEQ). (2004). *College Student Experiences Questionnaire (CSEQ)*. Bloomington, IN: Indiana University.
- Conrad, R. M. and Ana-Donaldson, J. (2004). *Engaging the Online Learner*. San Francisco, CA: Jossey Bass.
- Contrerars-Castillo, J., Favelo, J., Perez-Fragoso, C. and Santamaria-del-Angel, E. (2003). Informal interactions and their implications for online courses. *Computers and Education*, 42(2), 149–168.
- Coomey, M. and Stephenson, J. (2001). Online learning: it is all about dialogue, involvement, support and control – according to the research. In J. Stephenson (Ed.), *Teaching and Learning Online: Pedagogies for New Technologies*. London: Kogan Page.
- Cornford, J. (2002). The virtual university is...the university made concrete. In W. H. Dutton and B. D. Loader (Eds), *Digital Academe: The New Media and Institutions of Higher Education and Learning*. London: Routledge.
- Cornford, J. and Pollock, N. (2002). Working through the work of making work mobile. In K. Robins and F. Webster (Eds), *The Virtual University? Knowledge, Markets and Management*. Oxford: Oxford University Press.
- Costin, F., Greenough, W. T. and Menges, R. J. (1971). Student ratings of college teaching: reliability, validity and usefulness. *Review of Educational Research*, 41(5), 511–535.
- Crocker, L. and Algina, J. (1986). *An Introduction to Classical and Modern Test Theory*. New York: Harcourt Brace.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297–334.
- Cronbach, L. J. and Shavelson, R. J. (2004). My current thoughts on coefficient alpha and successor procedures. *Educational and Psychological Measurement*, 64(3), 391–418.
- Crook, C. (2002). The virtual university: the learner's perspective. In K. Robins and F. Webster (Eds), *The Virtual University? Knowledge, Markets and Management*. Oxford: Oxford University Press.
- Daniel, J. S. (1998a). *Megauniversities and Knowledge Media: Technology Strategies for Higher Education*. London: Kogan Page.
- Daniel, J. S. (1998b). *New Horizons for Distance Education*. Paper presented at the Symposium on Distance Education, Ankara, Turkey.
- Daniel, J. S. (2003). Open and distance learning: technology is the answer but what is the question? *International Institute for Educational Planning Newsletter*, 21(2), 14.
- D'Antoni, S. (Ed.). (2004). *The Virtual University Models and Messages: Lessons from Case Studies*. Paris: International Institute for Educational Planning.
- Davis, T. M. and Murrell, P. H. (1993). *Turning Teaching into Learning: The Role of Student Responsibility in the Collegiate Experience*. Washington, DC: ERIC Clearinghouse on Higher Education.
- de Wolf, H. (2001). Universities in the network society. In H. J. van der Molen (Ed.), *Virtual University? Educational Environments of the Future*. London: Portland Press.
- Dearing, R. (1997). *Higher Education in the Learning Society*. Norwich: HMSO.
- Dede, C. (1996). The transformation of distance education to distributed learning. *The American Journal of Distance Education*, 10(2), 4–36.

- Dede, C. (1998). Advanced technologies and distributed learning in higher education. In D. Hanna (Ed.), *Higher Education in an Era of Digital Competition: Choices and Challenges*. New York: Atwood.
- Department of Education, Science and Training (DEST) (2003). *The National Report on Higher Education in Australia (2001)*. Canberra: Department of Education, Science and Training.
- Dewey, J. (1974). Need for a philosophy of education. In R. D. Archambault (Ed.), *John Dewey on Education*. New York: Random House.
- Dillon, A. and Gabbard, R. (1998). Hypermedia as an educational technology: a review of the quantitative research literature on learner comprehension, control and desire. *Review of Educational Research*, 68, 322–349.
- Dreyfus, H. L. (1998). Education on the internet: anonymity vs commitment. *Internet and Higher Education*, 1(2), 113–124.
- Dringus, L. P. (1999a). The framework for directed online learning environments. *Internet and Higher Education*, 2(1), 55–67.
- Dringus, L. P. (1999b). Resources requirements for online learning environments. *Journal of Instruction Delivery Systems*, 13(4), 20–25.
- Dringus, L. P. (2000). Towards active online learning: a dramatic shift in perspective for learners. *Internet and Higher Education*, 2(4), 189–195.
- Driver, M. (2002). Exploring student perceptions of group interaction and class satisfaction in the web enhanced classroom. *Internet and Higher Education*, 5, 35–45.
- Duderstadt, J. J. (1998). Transforming the university to serve the digital age. *CAUSE/EFFECT*, 20(4), 21–32.
- Duderstadt, J. J., Atkins, D. E. and van Houweling, D. (2002). *Higher Education in the Digital Age: Technology Issues and Strategies for American Colleges and Universities*. Westport, CT: Praeger.
- Dutton, W. H. and Loader, B. D. (2002). Introduction: new media and institutions of higher education and learning. In W. H. Dutton and B. D. Loader (Eds), *Digital Academe: The New Media and Institutions of Higher Education and Learning*. London: Routledge.
- Endo, J. and Harpel, R. (1982). The effect of student–faculty interaction on students’ education outcomes. *Research in Higher Education*, 16, 115–138.
- Entwistle, N. J. (1987). A model of the teaching–learning process. In J. T. E. Richardson, M. W. Eysenck and D. W. Piper (Eds), *Student Learning: Research in Education and Cognitive Psychology*. London: Open University Press.
- Evans, N. J., Forney, D. S. and Guido-DiBrito, F. (1998). *Student Development in College: Theory, Research, and Practice*. San Francisco, CA: Jossey-Bass.
- Everitt, B., Landau, S. and Leese, M. (2001). *Cluster Analysis*. London: Arnold.
- Ewell, P. T. and Jones, D. P. (1993). Actions matter: the case for indirect measures in assessing higher education’s progress on the national education goals. *The Journal of General Education*, 42(2), 123–148.
- Ewell, P. T. and Jones, D. P. (1996). *Indicators of ‘Good Practice’ in Undergraduate Education: A Handbook for Development and Implementation*. Colorado: National Centre for Higher Education Management Systems.
- Fabri, M. and Gerhard, M. (2000). The virtual student: user embodiment in virtual learning environments. In G. Orange and D. Hobbs (Eds), *International Perspectives on Tele Education and Virtual Learning Environments*. Burlington: Ashgate.

- Farrell, G. M. (Ed.). (1999). *The Development of Virtual Education: A Global Perspective*. Vancouver, WA: Commonwealth of Learning.
- Fielden, J. (2002). *Costing e-Learning: Is it Worth Trying or Should We Ignore the Figures?* London: Observatory on Borderless Higher Education.
- Firdiyiyek, Y. (1999). Web based courseware tools: Where is the pedagogy? *Educational Technology*, 39(1), 29–34.
- Fisher, C., Berliner, D., Filby, N., Marliave, R., Cahen, L. and Dishaw, M. (1980). Teaching behaviours, academic learning time, and student achievement: an overview. In C. Denham and A. Lieberman (Eds), *Time to Learn*. Washington, DC: National Institute of Education.
- Fisher, S. and Nygren, T. I. (2000). *Experiments in the Cost-effective Uses of Technology in Teaching: Lessons from the Mellon Program so Far*. New York: Andrew W. Mellon Foundation.
- Fletcher, J. D. (2003). Does this stuff really work? A review of technology used to teach. *TechKnowLogia*, January/March, 10–14.
- Flowers, L., Pascarella, E. T. and Pierson, C. T. (2000). Information technology use and cognitive outcomes in the first year of college. *The Journal of Higher Education*, 71(6), 637–667.
- Frand, J. L. (2000). The information age mindset: changes in students and implications for higher education. *Educause Review*, 35(5), 14–24.
- Franklin, T. (2004). *Portals in Higher Education: Concepts and Models*. London: Observatory on Borderless Higher Education.
- Fredricks, J. A., Blumenfeld, P. C. and Paris, A. H. (2004). School engagement: potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59–109.
- Gabelnick, F., MacGregor, J., Matthews, R. S. and Smith, B. L. (1990). *Learning Communities: Creating Connections among Students, Faculty and Disciplines*. San Francisco, CA: Jossey Bass.
- Gamson, Z. F. (1991). A brief history of the seven principles for good practice in undergraduate education. In A. W. Chickering and Z. F. Gamson (Eds), *Applying the Seven Principles for Good Practice in Undergraduate Education*. San Francisco, CA: Jossey Bass.
- Gardiner, L. F. (1994). *Redesigning Higher Education: Producing Dramatic Gains in Student Learning*. Washington, DC: ERIC Clearinghouse on Higher Education.
- Garrison, D. R. and Anderson, T. (2003). *E-learning in the 21st Century: A Framework for Research and Practice*. London: RoutledgeFalmer.
- Gatz, L. B. and Hirt, J. B. (2000). Academic and social integration in cyberspace: students and email. *The Review of Higher Education*, 23(3), 299–318.
- Gerlach, J. M. (1994). Is this collaboration? In K. Bosworth and S. J. Hamilton (Eds), *Collaborative Learning: Underlying Processes and Effective Techniques*. San Francisco, CA: Jossey Bass.
- Gilbert, A. D. (2000). The idea of a university beyond 2000. Paper presented at the Bert Kelly Lecture. *Policy*, 16(1), 31–36.
- Gilbert, A. D. (2001). *The Idea of a University: Enterprise or Academy?* Paper presented at the Manning Clark Symposium, Canberra.
- Gilbert, S. W. (1995). The technology 'revolution': important questions about a work in progress. *Change*, 27(2), 6.
- Gilbert, S. W. (1996). Making the most of a slow revolution. *Change*, 28(2), 10–23.

- Gillani, B. B. (2000). Using the web to create student centred curriculum. In R. A. Cole (Ed.), *Issues in Web Based Pedagogy*. London: Greenwood Press.
- Goddard, J. and Cornford, J. (2001). Space, place and the virtual university: the virtual university is the university-made concrete. In H. J. van der Molen (Ed.), *Virtual University? Educational Environments of the Future*. London: Portland Press.
- Goldstein, H. (1999). *Multilevel Statistical Models*. London: Edward Arnold.
- Goldstein, H. and Healy, M. J. R. (1995). The graphical presentation of a collection of means. *Journal of the Royal Statistical Society*, 158(1), 175–177.
- Goleman, D. (1995). *Emotional Intelligence*. New York: Bantam Books.
- Gordon, A. D. (1999). *Classification*. Boca Raton: Chapman and Hall.
- Gordon-Smith, G. and Ferguson, D. (2002). Teaching over the web versus in the classroom: Differences in the instructor experience. *International Journal of Instructional Media*, 29(1), 61–67.
- Govindasamy, T. (2002). Successful implementation of e-learning: pedagogical considerations. *Internet and Higher Education*, 4, 287–299.
- Graduate Careers Australia (GCA) (2005). *2004 Graduate Destination Survey*. Carlton: GCA.
- Green, K. C. (2002a). *Campus Computing 2002: The 13th National Survey of Computing and Information Technology in American Higher Education*. Encino: Campus Computing.
- Green, K. C. (2002b). Coming of age in academe. *Converge*, October/November. Accessed 3 August 2003 from: <http://www.convergemag.com/magazine/story.phtml?id=29718>
- Green, K. C. (2003). *Campus Computing 2003: The 14th National Survey of Computing and Information Technology in American Higher Education*. Encino: Campus Computing.
- Green, K. C. (2005). *Campus Computing 2004: The 15th National Survey of Computing and Information Technology in American Higher Education*. Encino: Campus Computing.
- Green, K. C. and Gilbert, S. W. (1995). Great expectations: content, communications, productivity, and the role of information technology in higher education. *Change*, 27(2), 8–18.
- Green, K. E. (1996). Dimensional analyses of complex data. *Structural Equation Modelling*, 3(1), 50–61.
- Greeno, J. G. and Moore, J. L. (1993). Situativity and symbols: response to Vera and Simon. *Cognitive Science*, 17(1), 49–59.
- Groves, R. M., Presser, S. and Dipko, S. (2004). The role of topic interest in survey participation decisions. *Public Opinion Quarterly*, 68(1), 2–31.
- Guri-Rosenblit, S. (2005). Eight paradoxes in the implementation process of e-learning in higher education. *Higher Education Policy*, 18(1), 5–29.
- Guthrie, B. and Johnson, T. (1997). *Study of Nonresponse to the 1996 Graduate Destination Survey*. Canberra: Australian Government Publishing Service.
- Hager, P., Holland, S. and Beckett, D. (2002). *Enhancing the Learning and Employability of Graduates: The Role of Generic Skills*. Melbourne: Business and Higher Education Round Table.
- Hair, J. F., Anderson, R. E. and Tatham, R. I. (1995). *Multivariate Data Analysis with Readings*. New York: Prentice Hall.
- Hamilton, S. and Zimmerman, J. (2002). Breaking through zero-sum academics. In K. E. Ruderstam and J. Schoenholtz-Read (Eds), *Handbook of Online Learning*. London: Sage.
- Hanna, D. E. (1998). Higher education in an era of digital communication: emerging organisational models. *Journal of Asynchronous Learning Networks*, 2(1), 66–95.
- Hanna, D. E. (2000). Emerging organizational models: the extended traditional university. In D. E. Hanna (Ed.), *Higher Education in an Era of Digital Competition: Choices and Challenges*. Madison: Atwood.

- Hanson, P. and Robson, R. (2004). *Evaluating Course Management Technology: A Pilot Case Study*. Colorado: EDUCAUSE Center for Applied Research.
- Hanushek, E. A. (1979). Conceptual and empirical issues in the estimation of education production functions. *The Journal of Human Resources*, 14(3), 351–388.
- Hara, N. and Kling, R. (2002). Students' difficulties in a web-based distance education course. In W. H. Dutton and B. D. Loader (Eds), *Digital Academe: The New Media and Institutions of Higher Education and Learning*. London: Routledge.
- Harasim, L. (2000). Shift happens: online education as a new paradigm in learning. *Internet and Higher Education*, 3, 41–61.
- Harasim, L., Hiltz, S. R., Teles, L. and Turoff, M. (1995). *Learning Networks: A Field Guide to Teaching and Learning Online*. Cambridge, MA: MIT Press.
- Helgeson, J. G., Voss, K. E. and Terpening, W. D. (2002). Determinants of mail-survey response: survey design factors and respondent factors. *Psychology and Marketing*, 19(3), 303–328.
- Higher Education Research Institute (HERI). (2004). *College Student Survey*. Los Angeles, CA: Higher Education Research Institute.
- Hill, P. W. and Rowe, K. J. (1998). Modelling student progress in studies of educational effectiveness. *School Effectiveness and School Improvement*, 9(3), 310–333.
- Hiltz, S. R. (1994). *The Virtual Classroom: Learning Without Limits Via Computer Networks*. New Jersey: Ablex.
- Hiltz, S. R., Coppola, N., Rotter, N., Turoff, M. and Benbunan-Fich, R. (2000). Measuring the importance of collaborative learning for the effectiveness of ALN: a multimeasure, multimethod approach. *Journal of Asynchronous Learning Networks*, 4(2), 103–125.
- Holland, J. L. (1973). *Making Vocational Choices: A Theory of Careers*. Englewood Cliffs, NJ: Prentice-Hall.
- Holmes, D. (1997). *Virtual Politics: Identity and Community in Cyberspace*. London: Sage.
- Horowitz, H. L. (1987). *Campus Life: Undergraduate Cultures from the End of the Eighteenth Century to the Present*. New York: Knopf.
- Howard, A. (2002). *Student use of Rankings in National Magazines in the College Decision-Making Process*. University of Tennessee (unpublished dissertation).
- Hox, J. J. (1995). *Applied Multilevel Analysis*. Amsterdam: TT-Publikaties.
- Hu, S. and Kuh, G. D. (2001a). *Being (Dis)engaged in Educationally Purposeful Activities: The Influences of Student and Institutional Characteristics*. Paper presented at the American Educational Research Association Annual Conference.
- Hu, S. and Kuh, G. D. (2001b). *Computing Experience and Good Practices in Undergraduate Education: Does the degree of campus wiredness matter?* Paper presented at the Annual Meeting of the American Educational Research Association, Seattle, USA.
- Hutchins, E. (1991). The social organisation of distributed cognition. In L. B. Resnick, J. M. Levine and S. D. Teasley (Eds), *Perspective of Socially Shared Cognition*. Washington, DC: American Psychological Association.
- Hutchins, E. (1995). *Cognition in the Wild*. Cambridge, MA: MIT Press.
- Hutchins, E. (2001). Distributed cognition. In N. J. Smelser and P. B. Baltes (Eds), *International Encyclopaedia of the Social and Behavioural Sciences*. Amsterdam: Elsevier Science.
- IBM Lotus. (2005). *IBM Lotus Learning Management System*. Accessed 25 August 2005 from <http://www.lotus.com/lotus/offering6.nsf/wdocs/homepage>
- Inglis, A., Ling, P. and Joosten, V. (2002). *Delivering Digitally: Managing the Transition to the Knowledge Media*. London: Kogan Page Limited.

- Institute of Higher Education (IHE) (2004). *Academic Ranking of World Universities – 2004*. Shanghai: Institute of Higher Education, Shanghai Jiao Tong University.
- Instructional Management System (IMS). (2005). *IMS Global Learning Consortium*. Accessed 25 August 2005 from www.imsglobal.org
- Jackson, G. B. (2003). Raising achievement and lowering costs with technology in higher education. *TechKnowLogia, January/March*, 42–44.
- James, R. H. (2002). Students' changing expectations of higher education and the consequences of mismatches with the reality. In P. Coaldrake and L. Stedman (Eds), *Responding to Student Expectations*. Paris: OECD.
- James, R. H. and Baldwin, G. (2002). *Nine Principles Guiding Teaching and Learning in the University of Melbourne*. Parkville: University of Melbourne.
- James, R. H., Baldwin, G., Coates, H. B., Krause, K. and McInnis, C. (2003) *Analysis of Equity Groups in Higher Education 1991–2002: Preliminary Report*. Canberra: Department of Education, Science and Training.
- Jelfs, A. and Whitelock, D. (2000). The notion of presence in virtual learning environments: what makes the environment 'real'? *British Journal of Educational Technology*, 31(2), 145–152.
- Jensen, H. T. (1998). *From Traditional to Virtual: The New Information Technologies*. Paper presented at the World Conference on Higher Education, Paris, France.
- Johnson, D. W., Johnson, R. T. and Smith, K. A. (1991). *Cooperative Learning: Increasing College Faculty Instructional Productivity*. Washington, DC: George Washington University.
- Johnstone, D. B. (1993). Enhancing the productivity of learning. *AAHE Bulletin*, 46(4), 4–8.
- Jolliffe, A., Ritter, J. and Stevens, D. (2001). *The Online Learning Handbook: Developing and Using Web-based Learning*. London: Kogan Page.
- Jonassen, D. H. (1995). *Constructivism: Implications for Designs and Delivery of Instruction*. New York: Scholastics.
- Jonassen, D. H. and Land, S. M. (Eds). (2000). *Theoretical Foundations of Learning Environments*. New Jersey: Lawrence Earlbaum.
- Joreskog, K. G. (1971). Statistical analysis of sets of congeneric tests. *Psychometrika*, 36, 109–133.
- Joreskog, K. G. (1993). Testing structural equation models. In K. A. Bollen and J. S. Logan (Eds), *Testing Structural Equation Models*. Newbury Park: Sage Publications.
- Joreskog, K. G. and Sorbom, D. (1989). *LISREL 7: User's Reference Guide*. Chicago, IL: Scientific Software International Inc.
- Joreskog, K. G. and Sorbom, D. (1999). *LISREL 8.30*. Chicago, IL: Scientific Software International Inc.
- Kadel, S. and Keehner, J. A. (1994). *Collaborative Learning: A Sourcebook for Higher Education*. University Park: National Center on Postsecondary Teaching, Learning, and Assessment.
- Kakhar, D. (1999). A framework for open distance learning – organisation and management. In H. J. van der Molen (Ed.), *Virtual University? Educational Environments of the Future*. London: Portland Press.
- Kaminski, K., Seel, P. and Cullen, K. (2003). Technology literate students? Results from a survey. *Educause Quarterly*, 3, 34–40.
- Katchadourian, H. A. and Boli, J. (1985). *Careerism and Intellectualism Among College Students: Patterns of Academic and Career Choice in the Undergraduate Years*. San Francisco, CA: Jossey Bass.

- Katz, R. N. (2003). Balancing technology and tradition: the example of Course Management Systems. *Educause Review*, July/August, 48–59.
- Keegan, D. (2000). *Distance Training: Taking Stick at a Time of Change*. London: RoutledgeFalmer.
- Keniston, K. (1965). *The Uncommitted: Alienated Youth in American Society*. New York: Harcourt, Brace and World.
- Keniston, K. (1966). The faces in the lecture room. In R. S. Morison (Ed.), *The Contemporary University*. Boston, MA: Houghton Mifflin.
- Kezar, A. J. (2000). *ERIC Trends 1999–2000: Teaching and Learning*. Washington, DC: ERIC.
- King, B. (2001). Making a virtue of necessity – a low cost, comprehensive online teaching and learning environment. In F. Lockwood and A. Gooley (Eds), *Innovation in Open and Distance Learning: Successful Development of Online and Web Based Learning*. London: Kogan Page.
- Kolb, D. A. (1984). *Experiential Learning: Experience as a Source of Learning and Development*. New Jersey: Prentice Hall.
- Krause, K., Hartley, R., James, R. and McInnis, C. (2005). *The First Year Experience In Australian Universities: Findings from a Decade of National Studies*. Canberra: Department of Education, Science and Training.
- Kuh, G. D. (1995). The other curriculum: out-of-class experiences associated with student learning and personal development. *Journal of Higher Education*, 66(2), 123–155.
- Kuh, G. D. (1996). Guiding principles for creating seamless learning environments for undergraduates. *Journal of College Student Development*, 37(2), 135–148.
- Kuh, G. D. (2001a). *The National Survey of Student Engagement: Conceptual Framework and Overview of Psychometric Properties*. Bloomington, IN: Indiana University Center for Postsecondary Research and Planning.
- Kuh, G. D. (2001b). Assessing what really matters to student learning: inside the national survey of student engagement. *Change*, 33(3), 10–17, 66.
- Kuh, G. D. (2003). What we're learning about student engagement from NSSE. *Change*, 35(2), 24–31.
- Kuh, G. D. and Hu, S. (2001a). The effects of student faculty interaction in the 1990s. *Review of Higher Education*, 24(3), 309–332.
- Kuh, G. D. and Hu, S. (2001b). The relationship between computer and information technology use: selected learning and personal development outcomes, and other college experiences. *Journal of College Student Development*, 42(3), 217–232.
- Kuh, G. D. and Vesper, N. (1997). A comparison of student experiences with good practices in undergraduate education between 1990 and 1994. *Review of Higher Education*, 21(1), 43–61.
- Kuh, G. D. and Vesper, N. (2001). Do computers enhance or detract from student learning? *Research in Higher Education*, 42(1), 87–102.
- Kuh, G. D., Schuh, J. H. and Whitt, W. J. (1991). *Involving Colleges*. San Francisco, CA: Jossey Bass.
- Kuh, G. D., Douglas, K. B., Lund, J. P. and Ramin-Gyurnek, J. (1994). *Student Learning Outside the Classroom: Transcending Artificial Boundaries*. Washington, DC: ERIC Clearinghouse on Higher Education.
- Kuh, G. D., Pace, C. R. and Vesper, N. (1997). The development of process indicators to estimate student gains associated with good practices in undergraduate education. *Research in Higher Education*, 38(4), 435–454.

- Kuh, G. D., Hu, S. and Vesper, N. (2000). They shall be known by what they do: an activities-based typology of college students. *Journal of College Student Development*, 41(2), 228–244.
- Kuh, G. D., Hayek, J. C., Carini, R. M., Ouimet, J. A., Gonyea, R. M. and Kennedy, J. (2001). *NSSE Technical and Norms Report*. Bloomington, IN: Indiana University Center for Postsecondary Research and Planning.
- Kuh, G. D., Kinzie, J., Schuh, J. H. and Whitt, E. J. (2005a). *Student Success in College: Creating Conditions that Matter*. San Francisco, CA: Jossey-Bass.
- Kuh, G. D., Kinzie, J., Schuh, J. H. and Whitt, E. J. (2005b). *Assessing Conditions to Enhance Educational Effectiveness: The Inventory for Student Engagement and Success*. San Francisco, CA: Jossey Bass.
- Kvavik, R. B. and Caruso, J. B. (2005). *ECAR Study of Students and Information Technology, 2005: Convenience, Connection, Control, and Learning*. Boulder, CO: Educause Centre for Applied Research.
- Kvavik, R. B. Caruso, J. B. and Morgan, G. (2004). *ECAR Study of Student and Information Technology, 2004: Convenience, Connection and Control*. Boulder, CO: Educause Centre for Applied Research.
- Lally, V. and Barrett, E. (1999). Building a learning community online: towards socioacademic interaction. *Research Papers in Education: Policy and Practice*, 14(2), 147–163.
- Lampert, M. A. (1993). Student–faculty informal interaction and the effect on college student outcomes: a review of the literature. *Adolescence*, 31, 1–13.
- Land, S. M. and Hannafin, M. J. (2000). Student centred learning environments. In D. H. Jonassen and S. M. Land (Eds), *Theoretical Foundations of Learning Environments*. London: Lawrence Erlbaum Associates.
- Langlois, C. (1998). Universities and new information and communication technologies: issues and strategies. *European Journal of Engineering Education*, 3(23), 285–296.
- Latchman, H. A. and Latchman, S. M. (2001). Lectures on demand in ALN: enhancing the online learning experience. *Journal of Asynchronous Learning Networks*, 5(1), 85–98.
- Laurillard, D. (1979). The processes of student learning. *Higher Education*, 8, 395–409.
- Laurillard, D. (1993). *Rethinking University Teaching: A Framework for the Effective Use of Educational Technology*. London: Routledge.
- Laurillard, D. (2001). *Rethinking University Teaching in a Digital Age*. Paper presented at the Forum for the Future of Universities, Aspen, Colorado.
- Laurillard, D. (2002). *Rethinking University Teaching 2nd Edition: A Conversational Framework for the Effective use of Learning Technologies*. London: RoutledgeFalmer.
- Lave, J. and Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge, MA: Cambridge University Press.
- Lea, M. R. and Nicholl, K. (2002). Editor's introduction. In M. R. Lea and N. Nicholl (Eds), *Distributed Learning: Social and Cultural Approaches to Practice*. London: Routledge.
- Lee, J., Hong, N. L. and Ling, N. L. (2002). An analysis of students' preparation for the virtual learning environment. *Internet and Higher Education*, 4, 231–242.
- Lessig, L. (1999). *Code and Other Laws of Cyberspace*. New York: Basic Books.
- Levine, A. and Cureton, J. S. (1998). Collegiate life: an obituary. *Change, May/June*, 14–17, 51.

- Levitt, B. and March, J. G. (1988). Organisational learning. In M. D. Cohen and L. S. Sproull (Eds), *Organisational Learning*. Thousand Oaks, CA: Sage.
- Linke, R. D. (1991). *Report of the Research Group on Performance Indicators in Higher Education*. Canberra: DETYA.
- Little, G. (1975). *Faces on Campus: A Psychosocial Study*. Parkville: Melbourne University Press.
- Locke, E. A. and Latham, G. P. (1990). *A Theory of Goal Setting and Task Performance*. New Jersey: Prentice Hall.
- Lombard, M. and Ditton, T. (1997). At the heart of it all: the concept of presence. *Journal of Computer Mediated Communication*, 3(2). Accessed 26 November 2003 from <http://www.ascusc.org/jcmc/vol3/issue2/lombard.html>
- Love, P. G. and Goodsell-Love, A. G. (1995). *Enhancing Student Learning: Intellectual, Social and Emotional Integration*. Washington, DC: ERIC Clearinghouse on Higher Education.
- McCann, D., Christmass, J., Nicholson, P. and Stuparich, J. (1998). *Educational Technology in Higher Education*. Canberra: Department of Employment, Education, Training and Youth Affairs.
- Macdonald, J. (2003). Assessing online collaborative learning: process and product. *Computers and Education*, 40, 377–391.
- McInnis, C. (2002). Signs of disengagement? Responding to the changing work and study patterns of full time undergraduates in Australian universities. In J. Enders and O. Fulton (Eds), *Higher Education in a Globalising World: A Festschrift in Honour of Ulrich Teichler*. Dordrecht: Kluwer Academic Publishers.
- McInnis, C., James, R. H. and Hartley, R. (2000). *Trends in the First Year Experience in Australian Universities*. Canberra: Department of Education, Training and Youth Affairs.
- McInnis, C., Griffin, P., James, R. H. and Coates, H. (2001). *Development of the Course Experience Questionnaire*. Canberra: Department of Employment, Training and Youth Affairs.
- McIntyre, D. J., Copenhaver, R. W., Byrd, D. M. and Norris, W. R. (1983). A study of engaged student behaviour within classroom activities during mathematics class. *Journal of Educational Research*, 77(1), 55–59.
- McNaught, C., Kenny, J., Kennedy, P. and Lord, R. (1999). Developing and evaluating a university-wide online distributed learning system: the experience at RMIT University. *Educational Technology and Society*, 2(4). Accessed 7 August 2003 from http://ifets.massey.ac.nz/periodical/vol_4_99/mcnaught.html
- Mann, S. J. (2001). Alternative perspectives on the student experience: alienation and engagement. *Studies in Higher Education*, 26(1), 7–19.
- Marchese, T. (1998). Disengaged students. *Change*, 30(2), 4.
- Marsh, H. W. (1982). Validity of student's evaluations of college teaching: a multitrait multithreshold analysis. *Journal of Educational Psychology*, 74, 264–279.
- Marsh, H. W. (1987). Students' evaluations of university teaching: research findings, methodological issues and directions for future research. *International Journal of Educational Research*, 11(3), 253–388.
- Marsh, H. W. (1990). Multitrait-multimethod analysis. In J. P. Keeves (Ed.), *Educational Research, Methodology and Measurement: An International Handbook*. Oxford: Pergamon, pp. 4000–4007.

- Marsh, H. W. (1994). Confirmatory factor analysis models of factorial invariance: a multifaceted approach. *Structural Equation Modelling*, 1(1), 5–34.
- Marsh, H. W. and Grayson, D. (1994). Multitrait-multimethod analysis. In T. Husen and N. Postlethwaite (Eds), *The International Encyclopaedia of Education*. London: Pergamon, pp. 4000–4007.
- Marsh, H. W. and Hocevar, D. (1983). Confirmatory factor analysis of multitrait-multimethod matrices. *Journal of Educational Measurement*, 20(3), 231–248.
- Marsh, H. W. and Hocevar, D. (1984). The factorial invariance of student evaluations of college teaching. *American Educational Research Journal*, 21(2), 341–366.
- Marsh, H. W., Balla, J. R. and McDonald, R. P. (1988). Goodness of fit in confirmatory factory analysis: the effect of sample size. *Psychological Bulletin*, 103, 391–410.
- Marsh, J. (1984). Marx and Kierkegaard on alienation. In R. L. Perkins (Ed.), *A Kierkegaard Commentary: Two Ages*. Macon: Mercer University Press.
- Marton, F. and Saljo, R. (1976a). On qualitative differences in learning-I: outcome as a function of the learner's conception of the task. *British Journal of Educational Psychology*, 46, 4–11.
- Marton, F. and Saljo, R. (1976b). On qualitative differences in learning-II: outcome as a function of the learner's conception of the task. *British Journal of Educational Psychology*, 46, 115–127.
- Masson, A. (2005). *Utilising Institutional E-Learning Services to Enhance the Learning Experience: Description of Current Provision Relating to the Area of Excellence*. Newtownabbey: University of Ulster.
- Massy, W. F. and Zemsky, R. (1995). *Using Information Technology to Enhance Academic Productivity* (Vol. <http://educom.edu/program/nlii/keydocs/massy.html>). Washington, DC: EDUCOM.
- Matthews, R. (1996). Learning communities: a structure for educational coherence. *Liberal Education*, 82(3), 4–9.
- Merisotis, J. P. and Phipps, R. A. (1999). What's the difference? *Change*, 31(3), 12–17.
- Meyer, F. A. (2002). *Quality in Distance Education: Focus on On-line Learning*. Washington, DC: ASHE-ERIC Higher Education Report.
- Milliken, J. and Barnes, L. P. (2002). Teaching and technology in higher education: Student perceptions and personal reflections. *Computers and Education*, 39, 223–235.
- Moan, E. R. and Dereshiwsy, M. I. (2002). Identifying factors that predict student engagement in web-based coursework. *USDLA Journal*, 16(1). Accessed 7 July 2004 from http://usdla.org/html/journal/JAN02_Issue/article05.html
- Moe, M. T. (2002). *The Future: Anticipating 3rd Generation Learning Management Systems*. Paper presented at the U21 Global Experience, Inter-Continental Hotel, Singapore.
- Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical Principles of Distance Education*. London: Routledge.
- Morgan, G. (2003). *Faculty Use of Course Management Systems*. Boulder, CO: Educause Centre for Applied Research.
- National Research Council (NRC). (2001). *Knowing What Students Know: the Science and Design of Educational Assessment*. Washington, DC: National Academy Press.
- National Student Survey (NSS). (2004). *Interim Results of Student Feedback from the 2003 National Student Survey Pilot*. Milton Keynes: Institute of Educational Technology (IET), Open University.

- National Survey of Student Engagement (NSSE). (2001). *Improving the College Experience: National Benchmarks of Effective Educational Practice. National Survey of Student Engagement 2001*. Bloomington, IN: Indiana University.
- National Survey of Student Engagement (NSSE). (2002). *From Promise to Progress: How Colleges and Universities are Using Student Engagement Results to Improve Collegiate Quality. 2002 Annual Report*. Bloomington, IN: Indiana University.
- National Survey of Student Engagement (NSSE). (2003). *Converting Data into Action: Expanding the Boundaries of Institutional Improvement: National Survey of Student Engagement 2003 Annual Report*. Bloomington, IN: Indiana University.
- National Survey of Student Engagement (NSSE). (2004). *Promoting Student Success: Using Student Engagement Data to Improve Educational Practice*. Bloomington, IN: Indiana University.
- National Survey of Student Engagement (NSSE). (2005). *Student Engagement: Pathways to Collegiate Success, 2004 Annual Survey Results*. Bloomington, IN: Indiana University.
- NCODE. (2003). *Quality Guidelines for Resource Based Learning*, Accessed 9 August 2003 from <http://ncode.uow.edu.au>
- Nelson-Laird, T. and Kuh, G. D. (2005). Student experiences with information technology and their relationship to other aspects of student engagement. *Research in Higher Education*, 46(2), 211–233.
- Newcomb, T. M., Koenig, K. E., Flack, R. and Warwick, D. P. (1967). *Persistence and Change: Bennington College and its Students After Twenty-five Years*. New York: Wiley.
- NextEd. (2005). *NextEd*. Accessed 7 June 2005 from <http://www.nexted.com>
- Noble, D. F. (1998). *Digital Diploma Mills: The Automation of Higher Education*. New York: Monthly Review Press.
- Noll, A. M. (2002). Technology and the future of the university: a sober view. In W. H. Dutton and B. D. Loader (Eds), *Digital Academe: The New Media and Institutions of Higher Education and Learning*. London: Routledge.
- Oblinger, D. G. (2005). Leading the transition from classrooms to learning spaces. *Educause Quarterly*, 28(1), 14–18.
- Oblinger, D. G. and Kidwell, J. (2000). Distance learning: are we being realistic? *Educause Review*, May/June, 30–39.
- Oblinger, D. G. and Maruyama, M. K. (1996). *Distributed Learning*. Boulder, CO: Cause.
- Oblinger, D. G., Barone, C. A. and Hawkins, B. L. (2001). *Distributed Education and Its Challenges: An Overview*. Washington, DC: American Council on Education.
- Observatory on Borderless Higher Education (OBHE). (2002a). *Leading Learning Platforms: International Market Presence*. London: Observatory on Borderless Higher Education.
- Observatory on Borderless Higher Education (OBHE). (2002b). *Online Learning in Commonwealth Universities: Selected Data from the 2002 Observatory Report—Part 1*. London: Observatory on Borderless Higher Education.
- Observatory on Borderless Higher Education (OBHE). (2002c). *Online Learning in Commonwealth Universities: Selected Data from the 2002 Observatory Report—Part 2*. London: Observatory on Borderless Higher Education.
- Observatory on Borderless Higher Education (OBHE). (2002d). *Online Learning in Commonwealth Universities: Selected Data from the 2002 Observatory Report—Part 3*. London: Observatory on Borderless Higher Education.

- Observatory on Borderless Higher Education (OBHE). (2004a). *Online Learning in Commonwealth Universities: Selected Data from the 2004 Observatory Survey, Part 1*. London: Observatory on Borderless Higher Education.
- Observatory on Borderless Higher Education (OBHE). (2004b). *Online Learning in Commonwealth Universities: Selected Data from the 2004 Observatory Survey, Part 2*. London: Observatory on Borderless Higher Education.
- O'Donoghue, J., Singh, G. and Dorward, L. (2001). Virtual education in universities: a technological imperative. *British Journal of Educational Technology*, 32(5), 511–523.
- Organisation for Economic Co-operation and Development (OECD). (2000). *Education At A Glance: OECD Indicators*. Paris: OECD.
- Oldenburg, R. (1989). *The Great Good Place: Cafes, Coffee Shops, Community Centers, Beauty Parlors, General Stores, Bars, Hangouts, and How they Get You through D*. New York: Paragon House.
- Oliver, M. and Shaw, G. P. (2003). Asynchronous discussion in support of medical education. *Journal of Asynchronous Learning Networks*, 7(1), 56–67.
- Open Knowledge Initiative (OKI). (2005). *Open Knowledge Initiative*. Accessed 7 June 2005 from www.okiproject.org
- Oxford University Press (OUP). (2004). *Oxford English Dictionary*. Oxford: Oxford University Press.
- Pace, C. R. (1979). *Measuring Outcomes of College: Fifty Years of Findings and Recommendations for the Future*. San Francisco, CA: Jossey Bass.
- Pace, C. R. (1988). *Measuring the Quality of College Student Experiences: An Account of the Development and Use of the College Student Experiences Questionnaire*. Los Angeles, CA: Higher Education Research Institute, University of California.
- Pace, C. R. (1990a). *College Student Experiences Questionnaire: Norms for the Third Edition*. Los Angeles, CA: University of California, Center for the Study of Evaluation.
- Pace, C. R. (1990b). *The Undergraduates: A Report of Their Activities and Progress in College in the 1980's*. Los Angeles, CA: University of California, Center for the Study of Evaluation.
- Pace, C. R. (1995). *From Good Practices to Good Products: Relating Good Practices in Undergraduate Education to Student Achievement*. Paper presented at the Association for Institutional Research, Boston.
- Pace, C. R. and Kuh, G. D. (1998). *College Student Experiences Questionnaire*. Bloomington, IN: Indiana University.
- Palloff, R. M. and Pratt, K. (1999). *Building Learning Communities in Cyberspace: Effective Strategies for the Online Classroom*. California: Jossey Bass.
- Palloff, R. M. and Pratt, K. (2003). *The Virtual Student: A Profile and Guide to Working with Online Learners*. California: Jossey Bass.
- Panel on the Impact of Information Technology on the Future of the Research University (PIITFRU). (2002). *Preparing for the Revolution: Information Technology and the Future of the Research University*. Washington, DC: The National Academies Press.
- Pascarella, E. T. (1985). College environmental influences on learning and cognitive development: a critical review and synthesis. In J. C. Smart (Ed.), *Higher Education: Handbook of Theory and Research*. New York: Agathon Press.
- Pascarella, E. T. (1991). The impact of college on students: the nature of the evidence. *The Review of Higher Education*, 14(4), 453–466.
- Pascarella, E. T. (2001). Identifying excellence in undergraduate education: are we even close? *Change*, 33(3), 18–23.

- Pascarella, E. T. and Terenzini, P. T. (1976). Information interaction with faculty and freshman ratings of academic and non-academic experiences of college. *Journal of Educational Research*, 70, 35–41.
- Pascarella, E. T. and Terenzini, P. T. (1978). Student–faculty informal relationships and freshman year educational outcomes. *Journal of Educational Research*, 71, 183–189.
- Pascarella, E. T. and Terenzini, P. T. (1979). Student–faculty informal relationships contact and college persistence: a further investigation. *Journal of Educational Research*, 72, 214–218.
- Pascarella, E. T. and Terenzini, P. T. (1991). *How College Affects Students: Findings and Insights from Twenty Years of Research*. San Francisco, CA: Jossey Bass.
- Pascarella, E. T. and Terenzini, P. T. (2005). *How College Affects Students: Findings and Insights from Twenty Years of Research*. San Francisco, CA: Jossey Bass.
- Paulsen, M. F. (2003). Experiences with learning management systems in 113 European institutions. *Educational Technology and Society*, 6(4), 134–148.
- Pena-Shaff, J. B. and Nicholls, C. (2003). Analysing student interactions and meaning construction in computer bulletin board discussions. *Computers and Education*, 42(3), 243–265.
- Perry, W. G. (1970). *Forms of Intellectual and Ethical Development in the College Years: A Scheme*. New York: Holt, Rinehart and Winston, Inc.
- Perry, W. G. (1988). Different worlds in the same classroom. In P. Ramsden (Ed.), *Improving Learning: New perspectives*. London: Kogan Page Ltd.
- Petrides, L. A. (2002). Web based technologies for distributed (or distance) learning: creating learning centred educational experiences in the higher education classroom. *International Journal of Instructional Media*, 29(1), 69–77.
- Piaget, J. (1964). Development and learning. In R. Ripple and V. Rockcastle (Eds), *Piaget Rediscovered*. Ithaca, NY: Cornell University Press.
- Picciano, A. G. (2002). Beyond student perceptions: issues of interaction, presence and performance in an online course. *Journal of Asynchronous Learning Networks*, 6(1), 21–39.
- Pintrich, P. R. and Schunk, D. (2002). *Motivation in Education: Theory, Research and Applications*. New Jersey: Prentice Hall.
- Piskurich, G. M. (Ed.). (2004). *Getting the Most from Online Learning*. San Francisco, CA: Pfeiffer.
- Porter, S. R. and Whitcomb, M. E. (2003a). The impact of contact type on web survey response rates. *Public Opinion Quarterly*, 67, 579–588.
- Porter, S. R. and Whitcomb, M. E. (2003b). The impact of lottery incentives on student survey response rates. *Research in Higher Education*, 44(4), 389–407.
- Porter, S. R. and Whitcomb, M. E. (2005). Non-response in student surveys: the role of demographics, engagement and personality. *Research in Higher Education*, 46(2), 127–152.
- Porter, S. R., Whitcomb, M. E. and Weitzer, W. H. (2004). Multiple surveys of students and survey fatigue. *New Directions for Institutional Research* (121), 63–73.
- Postiglione, G. A. (1997). Asian higher education: growth, diversity and change. In M. F. Green (Ed.), *Transforming Higher Education: Views from Leaders Around the World*. Arizona: Oryx Press.
- Postle, G., Sturman, A., Mangubhai, F., Cronk, P., Carmichael, A., McDonald, J., Reushle, S., Richardson, L. and Vickery, B. (2003). *Online Teaching and Learning in Higher Education: A Case Study*. Canberra: Department of Science, Education and Training.
- Ramsden, P. (1991). A performance indicator of teaching quality in higher education: the course experience questionnaire. *Studies in Higher Education*, 16(2), 129–150.

- Ramsden, P. (1992). *Learning to Teach in Higher Education*. London: Routledge.
- Rasbash, J., Brown, W., Healy, M., Cameron, B. and Charlton, C. (2000). *MLwiN Version 1.10.0006*. London: Institute of Education.
- Rasch, G. (1960). *Probabilistic Models for Some Intelligence and Attainment Tests*. Chicago, IL: MESA Press.
- Raykov, T. (1997). Estimation of composite reliability for congeneric measures. *Applied Psychological Measurement*, 21(2), 173–184.
- Raykov, T. (1998). Cronbach's coefficient alpha and the reliability of composite scales with interrelated non-homogeneous items. *Applied Psychological Measurement*, 22, 375–385.
- Reich, R. B. (1992). *The Work of Nations: Preparing Ourselves for 21st Century Capitalism*. New York: Vintage Books.
- Relan, A. and Gillani, B. B. (1996). Web based instruction and the traditional classroom: similarities and differences. In B. H. Khan (Ed.), *Web Based Instruction*. Englewood Cliffs, NJ: Educational Technology Publications.
- Resnick, L. (1988). Learning in school and out. *Educational Researcher*, 16(9), 13–20.
- Reuterberg, S. and Gustafsson, J. (1992). Confirmatory factor analysis and reliability: testing measurement model assumption. *Educational and Psychological Measurement*, 52, 795–811.
- Richardson, J. C. and Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks*, 7(1), 68–88.
- Robins, K. and Webster, F. (2002). The virtual university? In K. Robins and F. Webster (Eds), *The Virtual University? Knowledge, Markets and Management*. Oxford: Oxford University Press.
- Robson, R. (1998). *Web-based Instruction: A Practical Workshop*. Paper presented at the World Conference on Educational Multimedia and Hypermedia, Lugano, Switzerland.
- Rovai, A. P. (2000). Building and sustaining community in asynchronous learning networks. *Internet and Higher Education*, 3, 285–297.
- Rovai, A. P. (2002a). Development of an instrument to measure classroom community. *Internet and Higher Education*, 5(3), 197–211.
- Rovai, A. P. (2002b). Sense of community, perceived cognitive learning and persistence in asynchronous learning networks. *Internet and Higher Education*, 5(4), 319–332.
- Rovai, A. P. (2002c). A preliminary look at the structural differences of higher education classroom communities in traditional and ALN courses. *Journal of Asynchronous Learning Networks*, 6(1), 41–56.
- Rowe, K. J., Holmes-Smith, P. and Hill, P. W. (1995). Methodological issues in educational performance and school effectiveness research: a discussion with worked examples. *Australian Journal of Education*, 39(3), 217–248.
- Ruderstam, K. E. and Schoenholtz-Read, J. (2002). The coming of age of adult online learning. In K. E. Ruderstam and J. Schoenholtz-Read (Eds), *Handbook of Online Learning*. London: Sage.
- Rumelhart, D. E. and McClelland, J. L. (1986). PDP models and general issues in cognitive science. In J. L. McClelland and D. E. Rumelhart (Eds), *Parallel Distributed Processing: Explorations in the Microstructure of Cognition: Foundations*. Cambridge, MA: MIT Press.
- Ryan, S., Scott, B., Freeman, H. and Patel, D. (2000). *The Virtual University: The Internet and Resource-based Learning*. London: Kogan Page.

- Sakai Project. (2005). *Sakai Project*. Accessed 7 June 2005 from <http://sakaiproject.org/>
- Salant, P. and Dillman, D. A. (1994). *How to Conduct Your Own Survey*. New York: Wiley.
- Saljo, R. (1982). *Learning and Understanding*. Gothenburg: Acta Universitatis Gothoburgensis.
- Salmon, G. (2000). *E-Moderating: The Key to Teaching and Learning Online*. London: Kogan Page.
- Saltzberg, S. and Polson, S. (1995). Distributed learning on the world wide web. *Syllabus*, 9(1), 10–12.
- Samal, A. and Gopal, B. (2003). Technological indicators of impact of course management systems. In R. Bruning, C. A. Horn and L. M. PytlakZillig (Eds), *Web Based Learning: What Do We Know? Where Do We Go?* Connecticut: Information Age Publishing.
- Sandeen, A. (2004). Educating the whole student: the growing academic importance of student affairs. *Change*, 36(3), 28–33.
- Sax, L. J., Astin, A. W., Korn, W. S. and Mahoney, K. M. (2000). *The American Freshman: National Norms for Fall 2000*. Los Angeles: Higher Education Research Institute.
- Selim, H. M. (2003). An empirical investigation of student acceptance of course websites. *Computers and Education*, 40, 343–360.
- Selwyn, N. (1999). Virtual concerns: restrictions of the internet as a learning environment. *British Journal of Educational Technology*, 30(1), 69–71.
- Shapiro, B. J. (2002). *The Research University: An Undergraduate Challenge*. Paper presented at the Sir Robert Menzies Oration on Higher Education, University of Melbourne.
- Shapiro, N. S. and Levine, J. H. (1999). *Creating Learning Communities: A Practical Guide to Winning Support, Organizing for Change, and Implementing Programs*. San Francisco, CA: Jossey Bass.
- Short, J., Williams, E. and Christie, B. (1976). *The Social Psychology of Telecommunications*. London: Wiley.
- Shulman, L. S. (2002). Making differences: a table of learning. *Change*, 34(6), 24–32.
- Simonson, M., Smaldino, S., Albright, M. and Zvacek, S. (2003). *Teaching and Learning at a Distance: Foundations of Distance Education*. New Jersey: Merrill/Prentice Hall.
- Singer, E., von Thurn, D. R. and Miller, E. R. (1995). Confidentiality assurance and response: a quantitative review of the experimental literature. *Public Opinion Quarterly*, 59(1), 66–77.
- Smissen, I. and Sims, R. (2002). *Requirements for Online Teaching and Learning at Deakin University: A Case Study*. Paper presented at the Eighth Australian World Wide Web Conference, Noosa.
- Sorcinelli, M. D. (1991). Research findings on the seven principles. In A. W. Chickering and Z. F. Gamson (Eds), *Applying the Seven Principles for Good Practice in Undergraduate Education*. San Francisco, CA: Jossey Bass.
- Stage, F. K. (1988). Student typologies and the study of college outcomes. *Review of Higher Education*, 11(3), 247–257.
- Stokes, S. P. (2000). Preparing students to take interactive online courses. *Internet and Higher Education*, 2(2–3), 161–169.
- Stokes, S. P. (2001). Satisfaction of college students with the digital learning environment: do learners' temperaments make a difference? *Internet and Higher Education*, 4(1), 31–44.
- Strange, C. C. (1992). Beyond the classroom: encouraging reflective thinking. *Liberal Education*, 78(1), 28–32.

- Tabachnick, B. G. and Fidell, L. S. (2001). *Using Multivariate Statistics*. Boston, MA: Allyn and Bacon.
- Tait, A. and Mills, R. (Eds). (1999). *The Convergence of Distance and Conventional Education: Patterns of Flexibility for the Individual Learner*. London: Routledge.
- Taylor, J. C. (2001). *Fifth Generation Distance Education*. Canberra: Department of Education, Training and Youth Affairs.
- Teh, G. P. L. (1999). Assessing student perceptions of internet-based online learning environments. *International Journal of Instructional Media*, 26(4), 397–402.
- Terenzini, P. T. (1999). Research and practice in undergraduate education: and never the twain shall meet? *Higher Education*, 38, 33–48.
- Terenzini, P. T. and Pascarella, E. T. (1980). Student–faculty relationships and freshman year educational outcomes: a further investigation. *Journal of College Student Personnel*, 21, 521–528.
- Terenzini, P. T., Pascarella, E. T. and Blimling, G. S. (1996). Students’ out-of-class experiences and their influence on learning and cognitive development: a literature review. *Journal of College Student Development*, 37(2), 149–162.
- Texas State University. (2003). *National Survey of Student Engagement at Texas State: NSSE Annotated Bibliography*. San Marcos: Texas State University.
- Thurstone, L. L. (1959). *The Measurement of Values*. Chicago, IL: University of Chicago Press.
- Times Higher Education Supplement (THES). (2004). *World University Rankings*. London: Times Higher Education Supplement.
- Tinto, V. (1993). *Leaving College: Rethinking the Causes and Cures of Student Attrition*. Chicago, IL: University of Chicago Press.
- Tinto, V. (1997). Classrooms as communities: exploring the educational character of student persistence. *Journal of Higher Education*, 68(6), 599–623.
- Tinto, V. (1998). Colleges as communities: taking research on student persistence seriously. *The Review of Higher Education*, 21(2), 167–177.
- Todman, J. (2000). Gender differences in computer anxiety among university entrants since 1992. *Computers and Education*, 34, 27–35.
- Trussell, N. and Lavrakas, P. J. (2004). The influence of incremental increases in token cash incentives on mail survey response. *Public Opinion Quarterly*, 68(3), 349–367.
- Tucker, L. R. and Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, 38(1), 1–10.
- Turoff, M. (1997). Costs for the development of a virtual university. *Journal of Asynchronous Learning Networks*, 1(1), 28–38.
- Twigg, C. A. (2003). New models for online learning. *Educause Review*, September/October, 28–38.
- University of Melbourne. (2001). *Strategic Plan*. Parkville: University of Melbourne.
- Upcraft, M. L., Terenzini, P. T. and Kruger, K. (1999). Looking beyond the horizon: trends shaping student affairs-technology. In C. Johnson and H. Cheatam (Eds), *Higher Education Trends for the Next Century: A Research Agenda for Student Success*. Washington, DC: American College Personnel Association.
- US News and World Report (US News). (2004). *America’s Best Graduate Schools*. Washington, DC: US News and World Report Inc.
- Valenta, A., Terriault, D., Dieter, M. and Mrtek, R. (2001). Identifying student attitudes and learning styles in distance education. *Journal of Asynchronous Learning Networks*, 5(2), 111–127.

- van Dusen, G. C. (1997). *The Virtual Campus: Technology and Reform in Higher Education*. Washington, DC: George Washington University.
- Verbeeten, M. J. (2001). Learner-centered? It's just a click away . . . *Journal of Educational Technology Systems*, 30(2), 159–170.
- Vrasidas, C. and Glass, G. (2002). *Distance Education and Distributed Learning*. Connecticut: Information Age Publishing.
- Vygotsky, L. S. (1962). *Thought and Language*. Cambridge, MA: Harvard University Press.
- Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.
- Ward, M. and Newlands, D. (1998). Use of the web in undergraduate teaching. *Computers and Education*, 31(2), 171–184.
- Warren, J. R. (1968). Student perceptions of college subcultures. *American Educational Research Journal*, 5, 213–232.
- WBT Systems. (2005). *TopClass/FirstClass*. Accessed 7 June 2005 from <http://www.wbt-systems.com/>
- WebCT. (2005). *WebCT Vista*. Accessed 7 June 2005 from <http://www.webct.com/>
- Weber, J. (2000). *Learning Communities in Higher Education: A Field Observation Case Study*. Philadelphia, PA: Widener University.
- Wegerif, R. (1998). The social dimension of asynchronous learning networks. *Journal of Asynchronous Learning Networks*, 2(1), 34–49.
- Wenger, E. (1998). *Communities of Practice: Learning, Memory and Identify*. Cambridge, MA: Cambridge University Press.
- Wenger, E., McDermott, R. and Snyder, W. (2002). *Cultivating Communities of Practice: A Guide to Managing Knowledge*. Boston, MA: Harvard Business School Press.
- Werts, C. E., Rock, D. R., Linn, R. L. and Joreskog, K. G. (1978). A general method of estimating the reliability of a composite. *Educational and Psychological Measurement*, 38, 933–938.
- Whittington, M. S. and McCormick, D. F. (1998). *Cognitive Level of Academic Challenges Provided to College Students*. Paper presented at the Annual Meeting of the American Vocational Education Research Association, New Orleans, LA.
- Wilkin, L. and Faccin, I. (2003). *University Students' Use of and Attitudes Towards Computers and the Internet*. Paper presented at the Annual EAIR Forum, Limerick.
- Willms, J. D. (2003). *Student Engagement at School: A Sense of Belonging and Participation Results from PISA 2000*. Paris: Organisation for Economic Co-Operation and Development.
- Wilson, R. C., Gaff, J. G., Dienst, E. R., Wood, L. and Bavry, J. L. (1975). *College Professors and Their Impact on Students*. New York: John Wiley.
- Wilson, T. and Whitelock, D. (2000). Factors affecting active participation in a CMC created for distance learners. In G. Orange and D. Hobbs (Eds), *International Perspectives on Tele education and Virtual Learning Environments*. Burlington: Ashgate.
- Winnicott, D. W. (1971). *Playing and Reality*. London: Tavistock Publications.
- Winston, I. (2005). *David B. Weigle Information Commons: Summary of Mission, Services and Facilities*. Philadelphia, PA: University of Pennsylvania.
- Wolfe, C. R. (2000). Learning and teaching on the world wide web. In C. R. Wolfe (Ed.), *Learning and Teaching on the World Wide Web*. San Diego, CA: Academic Press.
- Woodhouse, G. and Goldstein, H. (1988). Educational performance indicators and LEA league tables. *Oxford Review of Education*, 14(3), 301–320.

- World Bank (2002). *Constructing Knowledge Societies: New Challenges for Tertiary Education*. Washington, DC: World Bank.
- Wright, B. D. and Masters, G. N. (1982). *Rating Scale Analysis*. Chicago, IL: MESA Press.
- Yammarino, F. J., Skinner, S. J. and Childers, T. L. (1991). Understanding mail survey response behavior: a meta-analysis. *Public Opinion Quarterly*, 55(4), 613.
- Yu, F. and Yu, H. (2002). Incorporating e-mail into the learning process: its impact on student academic achievement and attitudes. *Computers and Education*, 38, 117–126.
- Zemsky, R. and Massy, W. F. (2004). *Thwarted Innovation: What Happened to E-learning and Why?* Pennsylvania: University of Pennsylvania.
- Zhang, J. and Norman, D. A. (1994). Representations in distributed cognitive tasks. *Cognitive Science*, 18, 87–122.

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