Tertiary construction management education: the lived experience of academic staff in Australia

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Statement or originality

The thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.

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Terminology

course	a single topic (or subject) taught as part of a degree program.
construction management	an academic discipline that aims to graduate students with knowledge and understanding of technical issues relating to constructing buildings, as well as of commercial, financial, legal and related managerial issues.
participant	those who were interviewed or who participated in a focus group as part of this study, including Heads of School, academics, students and representatives of the professional bodies that accredit construction management programs.
program	the combination of courses required for the award of a degree.
respondent	those who responded to the online survey as part of this study, including Heads of School, academics and students.

Acronyms

ACCE	Australian Council for Computers in Education
AIB	Australian Institute of Building
AIBS	Australian Institute of Building Surveyors
AIQS	Australian Institute of Quantity Surveyors
ALTC	Australian Learning and Teaching Council
API	Australian Property Institute
ARC	Australian Research Council
AUBEA	Australasian University Building Educators Association
AUQA	Australian Universities Quality Agency
BIM	Building information modelling
BQSM	Board of Quantity Surveyors Malaysia
BVAEAM	Board of Valuers, Appraisers and Estate Agents, Malaysia
CIOB	Chartered Institute of Building
DEEWR	Department of Education Employment and Workplace Relations
ESD	Ecological sustainable development
ERA	Excellence in Research for Australia
FOR	Field of research

GDP	Gross Domestic Product
GFC	Global financial crisis
HKIS	Hong Kong Institute of Surveyors
HoS	The collective term used to identify heads of school / department, heads of program, program coordinators and academics in positions of leadership of construction management disciplines and degree programs
ICT	Information and communication technology
ISM	Institute for Supply Management
IT	Information technology
LMS	Learning management system
MMR	Mixed methods research
NZIQS	New Zealand Institute of Quantity Surveyors
OHS	Occupational health and safety
PAQS	Pacific Association of Quantity Surveyors
QS	Quantity surveying
RFCD	Research Fields, Courses and Disciplines
RICS	Royal Institution of Chartered Surveyors
SIB	Singapore Institute of Building
SISV	Singapore Institute of Surveyors and Valuers
TEQSA	Tertiary Education Quality and Standards Agency
TLO	Threshold learning outcome
WIL	Work integrated learning

Abstract

This study aims to develop a rich understanding of the factors that impact on construction management academics' day-to-day and longer-term activities. Construction management academics share the same context as other university academics but are subject to several additional challenges that may be considered peculiar to their discipline. These have a profound impact on their working lives. Construction management is a relatively young discipline and this gives rise to a range of expectations and demands for those who teach into it. Respect and recognition in academic circles is predicated on research credibility, but construction management is yet to receive the research kudos of other disciplines such as engineering and architecture, to which it is frequently compared. Having academics with relevant and current industry experience is highly valued by the accrediting professional institutes but this frequently means that these academics do not possess research higher degrees, and have had little success in securing competitive research grants. In addition, the demographics of the students that construction management academics teach is markedly different to the mainstream student population in Australia. These challenges are set in the context of the numerous changes that the construction industry and the academic world have recently experienced. Many of the technologies that industry and academics currently employ did not exist a decade ago. In addition, changes in the behavioural patterns and expectations of students are markedly different to those of their teachers. Furthermore, no studies of the construction management academic workforce in Australia were found. These and other stimuli provided the motivation for this study. It explores the challenges and changes facing modern day construction management academics and how these impact on their working lives.

To set the study in context, the current state of the Australian economy and construction industry are reviewed. Despite a recent slowdown in economic growth and construction activity, the sector continues to be beset by a marked shortage of construction professionals. This shortage has fuelled the marked and continued growth in the number of students enrolling in construction management undergraduate degrees. This has seen the expansion of construction management disciplines in the universities that offer these degrees. Accommodating this growth is one of the challenges currently facing the discipline. The structure of tertiary construction education in Australia is then explored and the ways students can access university is highlighted. The origins of construction management higher

education and the ways in which teaching and research quality is audited are then reviewed. Also examined are the multiple professional institutes which construction management programs in Australia seek accreditation from and the challenges that academics face in accommodating their requirements. The demographics of construction management academics and of the students they teach are also explored. These reviews identified a number of key issues and questions which coalesced into the following objectives

- to identify the changes and challenges impacting on tertiary construction management education
- to identify interrelationships between these changes and challenges
- to explore the implications of these changes and challenges
- to postulate how these changes and challenges affect the current and future lived-experiences of construction management academics

A qualitatively-dominant mixed methods approach was designed to research these objectives. Quantitative data were obtained from universities' websites as well as from an online survey that all construction management academics in Australia were invited to complete. Qualitative data were collected from interviews and focus groups and were supplemented with responses to the open-ended questions asked in the online survey.

The qualitatively-dominant mixed methods approach used in this study revealed the multiple ways in which construction management academics' lives were impacted upon. These centred around the increasingly large cohorts of students they were teaching, the modest nature of funding that supported their efforts, the changed demographics of their students, and the generation gap between the students and themselves. In addition, the institutes that accredit these disciplines require academics to have relevant and current industry experience, whilst the universities that employ them require their academics to be in possession of research higher degrees. These changes and challenges generate tensions and pressures which are described and discussed in terms of the following domains

- the expectations the construction industry has of undergraduate construction management education
- the curricula construction management academics teach
- the approaches construction management academics use to teach and assess their students

- the student body that construction management cohorts are comprised of
- the management and support of construction academics.

Finally, recommendations drawn from the findings conclude the thesis.

1 Introduction

There is a marked shortage of construction management academics in Australia. Current recruitment practices are unlikely to be able to fill the positions needed because both academic work and the academic workforce have changed in recent years. Attracting suitable applicants is generally difficult because there are few articulate perspectives of academic life that they can refer to. Coates and Goedegebuure (2010) highlight this, saying

> "If academic life is to be an attractive future career choice for clever and dedicated people, then it is necessary to be able to show them a realistic description of what becoming an academic means, coupled with a career structure that meets the reality and expectations of an increasingly diversifying workforce." (p. 2)

The study reported in this thesis contributes such a narrative for the construction industry. It focuses on what it currently means to work as a construction management academic in Australia. It explores the multiple intersecting changes and challenges that affect the ways in which they teach, research, and engage in administrative and community-related activities.

The construction industry makes a major contribution to the Australian economy. It is the fourth largest contributor to the Australian Gross Domestic Product (GDP) and plays a significant role in determining the economic growth of this country (Australian Bureau of Statistics, 2010b). This has been achieved despite a shortage of suitably skilled personnel. A recent KPMG Econotech survey (2010a) identified building professionals and associate professionals as two of the ten occupations with the highest levels of skills shortage in Australia. However, a recent PricewaterhouseCoopers Productivity Scorecard (PricewaterhouseCoopers, 2011) highlights the fact that construction "is unambiguously good news; growth in output being driven by strong labour productivity growth (4% for the quarter) and offsetting a surprising 2% reduction in labours hours; quite simply, getting more from less" (p. 2). Skilled professionals are required to lead and manage the construction industry and the fact that such excellent results have been achieved despite the widespread shortage of people with these skills is remarkable.

Bradley, Noonan, Nugent, and Scales (2008) emphasise the importance of higher education when they say that "the reach, quality and performance of a nation's higher education system

(and, by implication, graduates)[1] will be key determinants of its economic and social progress" (p. xi). This highlights the contribution of construction management academics to the Australian construction industry and, by implication, the Australian economy. They tutor, mentor and counsel the construction students and graduates who work in the sector.

The career opportunities provided by the construction industry are well recognised. The number of students enrolling in Architecture and Building degrees has been increasing steadily during recent years. The Department of Education Employment and Workplace Relations (2010a) noted an increase of 8.3% in students enrolling in the Field of Education (FoE) of Architecture and Building between 2006 and 2007, and an increase of 15.6% between 2007 and 2008 (DEEWR, 2010b). (DEEWR classifies data using FoEs to identify higher education courses, specialisations and units of study. The FoE of Architecture and Building contains data for students enrolled in construction management (Mosely, 2010).) More recent data are unavailable but personal discussions with members of academic staff from various universities during 2010 and 2011 indicate that this trend is continuing (Sher, 2012).

In addition to these increases, the number of applicants for construction management undergraduate degrees has been spurred on by increased government funding. The Bradley Review (Bradley, et al., 2008) proposed significant changes to the higher education landscape in Australia. The proportion of 25 to 34 year olds with degree level qualifications is to be raised to 40% by 2020, and 20% of undergraduate enrolments are to be students from low socio-economic backgrounds. To fuel these changes, the Australian Government has made commitments to invest in universities and the tertiary education system to "drive comprehensive reform across the post-compulsory education and training sector." (Australian Government, 2009, p. 5). It has earmarked an "additional $5.4 billion over four years and will commit additional resourcing over the next 10 years." (p. 5). One of the ways in which these funds will be deployed is to introduce a new approach to allocating the supply of university places. From 2012, Australian public universities

> "will be funded for student places on the basis of student demand. The Government will fund a Commonwealth supported place for all undergraduate domestic students

[1] Words in italics added by author.

> accepted into an eligible, accredited higher education course at a recognised public higher education provider." (p. 17)

This changes the way student places are made available from an approach where places were rationed to one where the needs of the community are met. According to Tertiary Education Minister Chris Evans "the legislation will end bureaucratic control over university enrolments by empowering institutions to accept as many students as they choose, rather than negotiating annual enrolments with Canberra." (Matchett, 2011). This additional funding for popular degrees is likely to further augment the number of students wishing to obtain a professional construction management qualification.

The tertiary education sector has been quick to respond to this increased demand. The number of construction management degree programs offered in universities in Australia has expanded from 15 in 2008 (Williams, et al., 2009) to at least 18 in 2010 (with new programs being offered by University of Southern Queensland and Holmesglen TAFE). It is foreseeable that other universities (and TAFEs) will follow suit if the number of students applying for construction management degrees continues.

The government's strategy of allowing universities to determine their own enrolment quotas is fraught with challenges (C. King, 2010). One that is significant for construction management stems from the relative youth of the discipline, its lack of research profile, and the consequent lack of kudos it attracts from others academics. This lack of stature places the discipline at a disadvantage when negotiating the allocation of, for example, funding with others.

In addition, arrangements for the funding of university teaching are set to change. The Australian government has recently received a report it commissioned (Lomax-Smith, Watson, & Webster, 2011) detailing how this might occur. According to Hare (2011)

> "The base funding review report is a significant analysis of the complex questions about how best to support high quality education in our universities. The report is insistent that significant changes and improved funding are essential to take higher education into the future on stable footing."

Consultation with universities and other interested parties is scheduled for early 2012. It is therefore too early to say what impact this report will have but it is clear that fallout from the global financial crisis (GFC) will be factored into whatever decisions are eventually made

(Juliei Hare, 2011). Taking into account successive governments' approaches to the funding of universities, and the pressures of responding to the GFC, it is unrealistic to expect that significant additional funding will be directed to the sector. The Lomax-Smith report (2011) therefore emphasises the uncertain environment facing those making financial decisions about university programs. This is especially concerning for the construction management discipline. The steadily increasing numbers of students enrolling in these degrees, and the construction industry's willingness to employ them when they graduate, mean that academics are increasingly being expected to accomplish more with little change in the level of resources provided. This is illustrated in the following words of an academic interviewed for this study

> "I think if we could actually employ more staff it would take the pressure off so that everybody could do more research and more teaching of a higher quality so that you're not having to teach a full time teaching load and a full time research load. Of course that's related to resources and money. I think that's the single biggest issue facing our area."

In addition to these funding uncertainties, construction management disciplines are beleaguered by additional challenges. One that is key is professional accreditation. Construction management programs are amongst the most heavily accredited in Australia (Williams, et al., 2010). Whilst it is to be expected that preparing for and securing these accreditations will be resource-intensive and costly, what is surprising is the range of different requirements these programs need to comply with. The accrediting bodies are similar, with all targeting either national or international segments of either the construction management or the quantity surveying professions. Despite their common heritage, and after almost a decade of discussion and negotiation, these institutions have not been able to align their respective accreditation requirements (unlike the agreement reached between the engineering professions in the Washington Accord[2]). Complying with multiple accreditation requirements thus has obvious workload implications, and these add to those associated with the increased number of student enrolling in construction management programs.

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[2] The Washington Accord is an international agreement among bodies responsible for accrediting engineering degree programs. It recognizes the substantial equivalency of programs accredited by those bodies and recommends that graduates of programs accredited by any of the signatory bodies be recognized by the other bodies as having met the academic requirements for entry to the practice of engineering. (International Engineering Alliance, 2011)

Another challenge confronting construction management disciplines relates to the lack of information about the profile of their students. The Department of Education Employment and Workplace Relations (DEEWR) publish data collected from all universities in Australia on an annual basis and these show marked differences between the profiles of students studying different degree programs. For example, engineering programs are predominantly male (J. E. Mills, Ayre, & Gill, 2010), whilst nursing students are predominantly female (O'Lynn, 2004). Other characteristics that vary from discipline to discipline include socio-economic status, prior learning, and age. To date the profile of construction management students in Australia has not been explored. Because of the vocational nature of construction management education, it is likely that this population exhibits distinctive and yet to be determined characteristics. Generalisations based on the generic DEEWR data need to be treated with caution. If construction management academics are to develop curricula that captivate and support their students, such data are essential. Without them, the teaching and learning activities these academics develop may be ineffective, fail to engage students, and lead in turn to overworked and stressed academic staff.

A further challenge facing the discipline is that of recruiting academic staff. This is a challenge all universities face. There are several reasons for this, including the aged profile of the academic workforce, the lack of academics in their 20s and 30s replacing those retiring, a lack of job security caused by increased casualisation, increasing workloads and lower salaries compared with other sectors (Australian Government, 2009). Presenting the results of a report by Bexley, James and Arkoudis (2011), Hare (2011a) notes that 40% of academics under the age of 30 "plan to leave Australian higher education within the next five to 10 years because of high levels of dissatisfaction caused by lack of job security, poor pay and mountains of paperwork and red tape." To further compound this situation, there is a worldwide shortage of academic staff, resulting in global competition amongst universities for these staff (Australian Government, 2009). It is therefore clear that Australian universities face daunting challenges in recruiting and maintaining their academic workforce. Citing Bexley et al (2011), Hare (2011) sums this situation up saying that "while there were serious challenges in rethinking the academic workforce, it was 'probably premature to call it a crisis' ". These generic recruitment challenges are exacerbated by difficulties specific to construction management (Williams, et al., 2010; Williams, et al., 2009). The discipline is characterised by several specific requirements including the recommendations of accrediting professional institutions that academic staff have recent and relevant industry experience

(AIB, 2008). This is at odds with the recruitment practices of most universities, many of whom mandate that new academic staff possess research higher degrees. The reality is that few candidates with the required combination of experience and qualifications seek academic careers. Furthermore, the difficulties universities experience in recruiting academic staff with relevant and current industry experience is compounded by the disparity in salary between academia and industry. Salaries in the construction industry are considerably higher than those paid by universities.

There are other factors which make academic life potentially unattractive for those considering a career as a construction management academic. For example, the relative youth of the construction management discipline means that it is not as well respected as other older, better-established disciplines such as civil engineering and architecture. Those investigating construction management as an academic career are likely to become aware of the difficulties existing staff experience in trying to secure research funding compared to colleagues in other disciplines (In 2011 only nine construction management Australian Research Council (ARC) discovery projects were awarded for construction management related topics (FOR code 120000), compared to 114 in engineering (FOR code 090000) (Australian Research Council, 2011f). Comparable data for 2010 are nine projects for construction management (RFCD code 310000) and 142 for engineering (RFCD code 290000) (Australian Research Council, 2010). It is pertinent to note that the statistics for construction management include projects won by the discipline of architecture).

Taking into account the lack of financial rewards that accrue to construction management academics, the requirement for them to be in possession of a research higher degree, and the difficulties they are likely to experience progressing their research, it is small wonder that few construction practitioners find university life an appealing career choice. In this regard it is also interesting to note the experience of US construction management academics. Unlike the UK, the construction management discipline is relatively new in the US, and appears to experience many issues similar to those in Australia (Chinowsky & Diekmann, 2004).

The final challenge construction management disciplines face relates to workplace conditions. The nature of academic work has changed in recent times, largely as a result of reduced funding of public universities (Van Emmerik, 2002; Winefield, et al., 2003) and increased workload (Houston, Meyer, & Paewai, 2006). This has resulted in increased levels of workplace stress being reported in many western countries. For example, a survey of UK

academic staff conducted for the UK-based Association of University Teachers found that 93% of its members (representing almost 160,000 academic staff) suffered from work-related stress and 62% from 'excessive' strain (Tytherleigh, Webb, Cooper, & Ricketts, 2005). In Australia, a survey which attracted responses from nearly 9,000 respondents from 17 universities resulted in the authors concluding that "the financial difficulties imposed on Australian universities in recent years are having serious consequences for the psychological well-being of their staff, particularly academic staff" (Winefield, et al., 2003, p. 52). The extent to which these findings apply to construction management academics has not been established.

To summarise, the construction industry in Australia is in a relatively healthy state and indications are that this will continue in the short to medium term future. The pent-up demand for professional construction management skills, based largely on the long-standing skills shortage in the industry, looks set to assure graduates of future employment. Responding to this, universities are likely to direct some of the increased government funding from the Bradley review (Bradley, et al., 2008) to construction management disciplines. However, it is not a foregone conclusion that these disciplines will be able to grow to meet the demand. Several obstacles and bottlenecks look set to complicate and challenge the provision of the large number of additional places needed. Firstly, it is by no means assured that the funding attached to additional enrolments will be directed to construction management disciplines. The distribution of funds within and between university faculties and departments is opaque and it is not unknown for funding allocations to be based on factors other than enrolment numbers. Secondly, the recommendations of the Bradley Review (2008) were announced well before the full impact of the GFC became apparent (Forster, 2010). The influence of the GFC on the government's allocation of funding to higher education has yet to be established.

Understanding the challenges these academics experience and need to cope with is valuable because it allows researchers to appreciate details that would otherwise not be apparent. Greenhalgh and Taylor (1997) argue that "we need to listen to what people have to say, and we should explore the ideas and concerns which the subjects themselves come up with" (p. 1). It is therefore remarkable that few studies explore the lived-experiences of academic staff. Indeed, those that do were found to relate to specific topics such as the teaching of equity, diversity and global interconnectedness (Merryfield, 2000). Few investigated the experiences of construction management academics.

This study seeks to understand what it means to be a construction management academic in the current context. It seeks to establish how these academics cope with the multiple and varied challenges they face on a daily basis and over longer terms. In seeking this understanding, Van Manen (1998) emphasises that the knowledge arrived at "always refers us back to our world, to our lives, to who we are, and to what makes us write, read, and talk together as educators: it is what stands iconically behind the words, the speaking and the language". (p. 46)

This study builds on the generalised public domain data available about academic staff and brings into focus the lived experience of construction management academics elicited through their open-ended responses to an online survey, as well as workshops and interviews.

1.1 Aims and objectives

This study aims to develop a rich understanding of the factors that impact on construction management academics' day-to-day and longer-term activities. It adopts a phenomenological hermeneutic approach to understand their lived experiences.

To achieve this aim, this study explores the working lives of construction management academics with respect to: the expectations the construction industry has of undergraduate construction management education, the curricula they teach, the approaches they use to teach and assess their students, the student body that construction management cohorts are comprised of, and how construction management academics are themselves managed and supported.

The objectives of this study are to

- identify the changes and challenges impacting on tertiary construction management education
- identify interrelationships between these changes and challenges
- explore the implications of these changes and challenges
- postulate how these changes and challenges affect the current and future lived-experiences of construction management academics.

Figure 1.1 provides a framework showing the manner in which construction management academics' lived experiences have been conceptualised. Figure 1.1 depicts different factors that impact upon construction management academics. These are seen to be influenced by the

expectations that industry and the professional bodies that accredit these programs have, the curricula that are taught, the different ways in which academics teach and assess, the students that are taught, and finally, the different ways in which these academics are themselves managed and supported in their working lives.

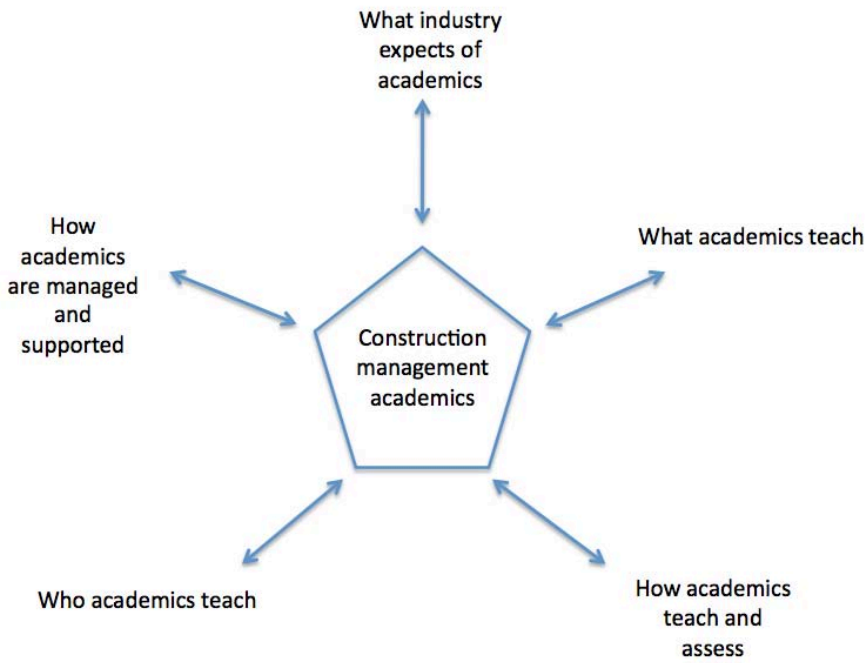

Figure 1.1: Framework of the lived experience of construction management academics

1.2 Research design

Lived experience studies have found favour as an effective approach for understanding what it means to individuals to experience certain situations (M Van Manen, 1998). They rely on interpretivism, an approach described by Nicholls (2009a) as trying to understand what it means to be human. The study reported in this thesis has explored the lived experiences of construction management academics of teaching and assessing increasingly large classes of students, of the difficulties they experience in attempting to cater for their diverse student body, of their research activities, as well as of several other aspects of their working lives.

Several sources of data were required to achieve this. Quantitative data (including the demographics of staff and students, the number of students enrolling in degree programs, rates of promotion amongst staff, and working hours) and qualitative data (relating to the personal lived-experiences of participants) needed to be combined and led to the adoption of a mixed method research design. The nature of investigations into lived-experience is primarily subjective and involves the "physical, political, and historical context of that experience"

(Ellis & Flaherty, 1992, p. 1). As such, a combination of predominantly qualitative methods was used, resulting is a qualitative dominant approach (R. B. Johnson, Onwuegbuzie, & Turner, 2007). Quantitative data were used where appropriate to provide a contextual backdrop against which the other data were analysed and reported.

1.3 Contribution and significance of this study

This study explores the lived experiences of construction management academics in Australia. It is based on primary data, collected from several sources. Whilst many lived experience studies relate to the helping professions (e.g. Benzein (2001), Hanks (2008) and Tryssenaar (1999)) and some studies explore the lived experiences of mainstream academics (e.g. Clegg (2008) and Altbach (1995)) none were found about the lived experiences of construction management academics in Australia. The study is thus timely as it presents a sector-specific perspective of academic life at a time when construction management graduates are in short supply. Moreover, the study augments the body of knowledge about lived experience studies through an investigation of a specialist academic discipline.

The outcomes of the study will be of interest to multiple audiences. It will firstly raise the awareness of academic managers to the different challenges construction management academics face and to the pressure points attention should be directed to. Secondly, it will be of interest to those in the construction industry who are concerned with the development of future generations of construction management professionals. Thirdly, it will be informative to the construction professional bodies that accredit these degrees. Fourthly, it will confirm to construction management academics that their colleagues experience similar pressures and challenges. This should provide reassurance to these academics that their concerns have been identified.

The study is important because it highlights challenges that impinge on the manner in which universities address the shortage of construction professionals in the Australian construction industry. If universities are to meet the requirements of industry, action needs to be taken to address the challenges noted in this study.

1.4 Limitations

The findings reported in this study are limited to the construction management academic discipline in Australia. The particular socio and economic conditions of this continent prohibit generalisations being made further afield.

Data for this study were collected via an on-line survey as well as via interviews and focus group discussions. All universities offering construction management degrees in Australia at the time were invited to participate. Responses to the survey were received from all universities (54% response rate) whilst representatives from 11 of the 12 universities participated in the interviews and focus groups. Whilst these response rates were good, they do not represent the entire population of construction management academics.

The data collected for this study have been interpreted through the lenses of the author's personal life experiences. The findings thus necessarily reflect his pespectives on the issues that emerged from the data.

1.5 Historical period of study

The study reported here has concentrated on trends over six years (2001 to 2006). This timeframe was chosen for several reasons. Firstly, few data are available for activities that occurred earlier than 2001. This appears to be because several universities migrated their records management software to new platforms at this time. Data prior to this time are simply not available. Secondly, several events occurred during this period that were significant for tertiary construction education, including

- major structural changes at many Australian universities which had an impact on construction management disciplines
- numerous societal and technological changes which required timely responses (including rapid developments in ICT which have necessitated changes to university policies and created financial pressures for all stakeholders)
- government-imposed budget constraints, which have prompted some universities to increase their recruitment of full-fee paying international students and have also resulted in compulsory student union membership being abolished

Universities have responded to these challenges in numerous ways including broadening their profile and expanding the range of programs they offer. The period studied is therefore brief compared to the time that these programs have been offered. However it covers events that have changed traditional notions of university education.

1.6 Structure of this thesis

This thesis consists of the following chapters:

Chapter 2 reviews the current state of the Australian economy and construction industry. It explores the contribution the industry makes to the economy, as well as forecasts of construction activity in the medium-term future. The chapter also explores the composition of the construction workforce, and highlights the acute shortage of construction management graduates currently being experienced in the industry. Prospects for the providers of construction management university education are then explored. The chapter concludes by identifying the *key issues* that emerged from the foregoing review and presents *questions* that arise from these issues.

Chapter 3 explores the provision of tertiary level construction management education in Australia. It considers the sources of funding this sector attracts, and describes the structure of tertiary construction education as well as the range of construction education qualifications currently available in Australia. It reviews the evolution of construction management university education, the curricula that are delivered and the challenges academic staff face in renewing these curricula. The methods by which the quality of teaching, learning and research are audited are then described. A brief section is then provided on the academics that teach construction management. This is followed by an exploration of the characteristics of the students that enrol in the sector, as well as an overview of their generational profiles, and the propensity they have for working whilst studying. The chapter concludes by identifying the *key issues* that emerged from the foregoing review and presents *questions* that arise from these issues.

Chapter 4 describes the research design and methodology used in this study. It explores the nature of the *questions* raised in the previous chapters and presents a case for these to be addressed through studies of the lived experience of construction management academics. The chapter provides examples of lived experience studies in other disciplines, and describes how the experiences of construction management academics have been investigated in this study. It describes how data were collected from academics, students, representatives of the main professional bodies representing the construction industry, as well as from relevant public domain sources. These were analysed in terms of the following five domains: industry's expectations of construction management education, what construction management academics teach, how they teach, who they teach, and how they are managed and supported. Each of these domains is described in the chapters that follow.

Chapter 5 explores the construction industry's expectations of the education that construction management students receive at Australian universities. It first of all investigates the manner in which industry's requirements are presented. This is followed by a description of the appropriateness of the education students currently receive. The requirements of industry for job-ready graduates are described, followed by industry's interactions with universities, and its involvement in teaching. The need for academics to have recent and relevant experience of the industry is explored next as well as the difficulties the discipline faces in recruiting such staff. A section that deals with the extent to which industry employs students then follows. The final section explores industry's views on the research that construction management academics conduct.

Chapter 6 documents the curricula that construction management academics teach. It focuses on matters that relate to establishing curricula for these programs, and the challenges associated with updating them. It is divided into the following sections: professional accreditation (the process by which professional institutions define the requirements of these curricula, and audit their delivery), existing curricula, developing, maintaining, renewing and rationalising curricula. The final section deals with the length of construction management programs (the timeframe within which these curricula need to be delivered).

Chapter 7 outlines how construction management academics teach and assess their students. This chapter is divided into the following seven sections: the impact of large class sizes on teaching and learning, existing teaching practices, the use of sessional academics in this regard, digital teaching and learning, assessment, the contribution of site visits and work integrated learning.

Chapter 8 describes the students construction management academics teach. Respondents' and participants' views about students' skills are described first, followed by those of students' attitudes and expectations of their university education. The next section deals with the extent to which students work and study, their reasons for working and the pressures this exerts on students as well as their educators. The final section deals with the timetabling of teaching and learning activities.

Chapter 9 documents the ways in which construction management academics are managed and supported in their university careers. It deals first of all with their workload, exploring the competing demands of teaching, research, administration, accreditation and other demands on their time. The consequences of this workload on construction management academics'

working lives are then explored. Aspects relating to how these academics are managed and how their discipline is resourced are considered next, followed by an exploration of their career paths and the continuing professional development activities they engage in. Finally, the topic of accreditation is revisited in the context of the support these academics and their disciplines receive from the professional institutions.

Chapter 10 brings all the issues covered in the preceding chapters to a conclusion. It draws on the discussions of the research domains reported in Chapters 5 to 9 and aligns them with the objectives of the study. This chapter then makes recommendations for future investigations.

2 The construction industry in Australia

2.1 Introduction

This chapter explores the characteristics of the industry which construction management university graduates are intended to service – the construction industry. As the main employer of construction management graduates, the industry directly influences the nature and curricula of construction management degrees, and thus has a major impact on the working lives of construction management academics. This chapter highlights the contribution the construction industry makes to the Australian economy, as well as the impact the global financial crisis is having on it. Furthermore, it explores the opportunities that are evolving for construction management graduates, the shortage of skilled construction professionals in Australia and the profile of construction qualifications held by construction industry employees in this country.

2.2 Contribution of the construction industry

The construction industry is a major contributor to the Australian economy and its fortunes are closely aligned with those of Australia. The Australian Constructors Association and Australian Industry Group (ACAAIG) report (2008) provides an authoritative overview of this sector. This report "is intended to be a stocktake of the industry – a report on current market conditions and the outlook for the industry in the medium term." (p. 5). As such it provides a succinct and overarching review of the industry, noting that it "has increased its importance as a share of the Australian economy over the past 10 years, from 5.6% of gross industry value added in 1996-97 to 7.3% in 2006-07. The construction industry comprises around 320,000 enterprises. Overall, the sector employs more than one million people. Of the workforce, 9.3% are currently employed in construction as at August 2008, a rise from 7.3% a decade ago." (p. 9).

2.3 Impact of the global financial crisis

Notwithstanding these statistics, continued growth is necessary to fuel the sector. The Australian economy is acknowledged as being robust with commentators generally agreeing that it has weathered the current global financial crisis in an exemplary manner. Furthermore, many authorities are currently forecasting growth. For example, in a statement on the 2010 – 2011 budget the Australian Government (Australian Government, 2010c) predicted that the

economy would grow by 3% in 2010-11 and 3.75% in 2011-12. Likewise Westpac (2010b) foresees strong economic growth, predicting 4% through 2010.

The implications of this overall economic growth for the construction industry are mixed. Although the construction industry grew by 6.1% p.a., compared to 2.3% for the aggregate economy between 2002 and 2007 (Australian Constructors Association & Australian Industry Group, 2008) the ACAAIG is cautious about predicting future growth in construction. Their report states that the

> "global economic and financial crisis has brought an end to a period of sustained strong expansion in the construction sector. While demand for mining and engineering projects will continue to remain strong, the remainder of the construction sector is experiencing significantly weaker conditions." (2008, p. 9).

ACAAIG note that $90 billion is planned to be spent on infrastructure by State and Territory governments in 2009 and 2010. KPMG Econtech (2010a) also forecast a positive outlook for the construction industry, based mainly on specific major infrastructure projects in Western Australia and Queensland, and dam transfer projects in New South Wales and Victoria. A complementary view is that of the reputed economic forecaster, BIS Shrapnel (2010) who predict modest economic growth and forecast the next acceleration in private engineering construction activity to occur from 2012.

Despite the attention garnered by mining and engineering, the construction industry is currently buoyant. Examples of activity in this sector include construction projects funded by the Federal Government's economic stimulus fund ($14.7 billion for school buildings and $6.6 billion for public housing) which are currently in progress (Westpac, 2010a). Furthermore, private sector building house approvals increased by 11% when seasonally adjusted from July 2009 to July 2010 (Australian Bureau of Statistics, 2010a). In addition, Westpac (Westpac, 2010a) noted that private construction work had gained momentum in the June quarter to 2010. They observed that there had been a jump in infrastructure activity, boosted by the recent commencement of the $43 billion liquid natural gas Gorgon project in Western Australia. Extremely high levels of mining and engineering activity are undeniably overshadowing activity in the construction sector but its contribution is by no means paltry.

The abovementioned observations and forecasts need to be tempered by the Government's observation that

> "the outlook is clouded by substantial downside risks. Concerns about European sovereign debt, uncertainty over the US transition to self sustaining growth, the challenge in China of managing inflationary pressures and the difficulty in managing fiscal consolidation across the advanced economies in an environment where global growth is still fragile all present risks for the global outlook." (2010c, p. 5).

In addition, there are concerns that construction activity will slow when the stimulus spending is phased out (Westpac, 2010a). However, construction management degree programs are generalist in nature and prepare graduates for a range of occupations. This flexibility allows them to capitalise on opportunities as and where they arise. Furthermore, it equips them for occupations that are evolving in the workplace as the next section illustrates.

2.4 Evolving opportunities for construction management graduates

Employment opportunities for construction managers are not restricted to building works. Construction managers have skills and abilities that are transferable to other industry sectors, including civil engineering, project management and facilities management. Furthermore, the construction industry is populated by professionals who take on a variety of roles and responsibilities (for example, as contractors, sub-contractors, suppliers, officers in local authorities and consultants, to name a few). New models of construction practice have spawned specialised professions, requiring graduates with unique skills such as "lighting, acoustic, circulation, IT specialists" (Cole, 2007, p. 100). In addition, the construction industry has steadily increased its uptake of information and communication technology (ICT). One application that is likely to have far-reaching impacts is that of Building Information Modelling (BIM) (Aranda-Mena, Chevez, Crawford, & Froese, 2008).

2.5 Shortage of construction professionals

The Australian Government monitors skills shortages and periodically publishes "Skilled Occupation Lists" which identify workplace skills in short supply. The Department of Education and Workplace Relations (2010c) currently identifies a national shortage of "Construction Project Managers" on its State and Territory Skill Shortage List.

The skills shortage currently being experienced in Australia is attracting considerable attention. For example, the recent Bradley Review (2008) notes that "Australia has suffered persistent skill shortages in a number of professional areas served by the higher education

sector" (p. 17). Carswell (2010) quotes Kym Quick who says "Of most concern is the underlying trend back to chronic skills shortages, which is moving the fastest among the building and engineering professionals and tradespeople who are so desperately needed to fulfil the nation's infrastructure agenda". In relation to the housing industry, McCarthy (2010) observes that it is facing "a skills shortage of 16,000 workers this financial year, with a national gap of up to 65,000 by 2012.". The ACAAIG (2008) states that "Despite the weaker employment outlook, a shortage of skilled labour remains a challenge" and "Skills formation and training is needed to alleviate the shortage of skilled labour and to address the long-term imperatives of changes to work organisation, technology advancements, and the needs of clients." (p. 9). Furthermore, recent surveys of investor confidence by the Australian Chamber of Commerce and Industry (2010a, 2010b) emphasise concerns about the availability of suitable qualified employees generally. These surveys list the top ten constraints on investment; the lack of personnel has been listed as one of these since March 2010 (rising from ninth position in July 2010 to fifth in October 2010).

A shortage of skills is "a source of aggravation to firms and, when acute, it is likely to hamper the quality and quantity of their output." (Richardson, 2007, p. 8). However, the term "skills shortage" is ambiguous and definitions of the term abound. For example, Arrow and Capron (1959, p.307, as cited by Richardson) state that it is "a situation in which there are unfilled vacancies in positions where salaries are the same as those currently being paid to others of the same type and quality." (2007, p. 12). Barnow, Trutko and Lerman (1998, p.7, also cited by Richardson) define a skill shortage is "a market disequilibrium between supply and demand in which the quantity of workers demanded exceeds the supply available and willing to work at a particular wage and working conditions at a particular place and point in time." (2007, p. 12). These definitions focus on the shortfall in supply relative to demand, as well as the wages and conditions prevailing at the time. However, the concepts of demand, supply and prevailing conditions are not straightforward.

Richardson quotes the United States Bureau of Labour Statistics who observe that "there are no objective measures or direct indicators of skill shortages" (2007, p. 8). Richardson (2007) goes on to identify several reasons why it is difficult to measure the supply of workers including the number of hours people are prepared to work, whether there are specialised sub-sets of skills or locations having difficulty recruiting while other areas are not, the attractiveness or otherwise of the wages and conditions on offer, the variability of skills

available, and the fact that some workers may not use their formal qualifications or may be of working age but not seeking employment.

Richardson's preferred definition of skill shortages is that of Shah and Burke (2005, p. v) who state that it is when "(t)he demand for workers for a particular occupation is greater than the supply of workers who are qualified, available and willing to work under existing market conditions." (2007, p. 15). Richardson (2007) emphasises Shah and Burke's observation that such a shortage will be signalled by the existence of hard-to-fill vacancies and goes on to observe that the "Commonwealth Department of Employment and Workplace Relations uses the idea of hard-to-fill vacancies in the construction of its list of occupations in demand." (2007, p. 15). The Australian Government's Migration Occupations in Demand List (Department of Immigration and Citizenship, 2010) currently includes several construction management-related occupations.

Richardson argues that "hard-to-fill vacancies provide an excellent means of identifying where firms are having difficulty in recruiting to meet their production requirements." (2007, p. 15). KPMG Econtech (2010a) recently commissioned a survey of such hard-to-fill vacancies. Building professionals and associate professionals are listed as two of the ten occupations with the highest levels of skills shortage in Australia. The survey uses an index (the "Clarius Skills Index" [CSI]) to compare the shortage or oversupply of skilled labour compared to demand. The CSIs for Building and Engineering Professionals and Building and Engineering Associate Professionals have been listed in the top ten occupations for at least two years as shown in Figure 2.1. There is thus clear evidence of a sustained shortage of a range of construction professionals. Graduate construction managers are well placed to fill these positions.

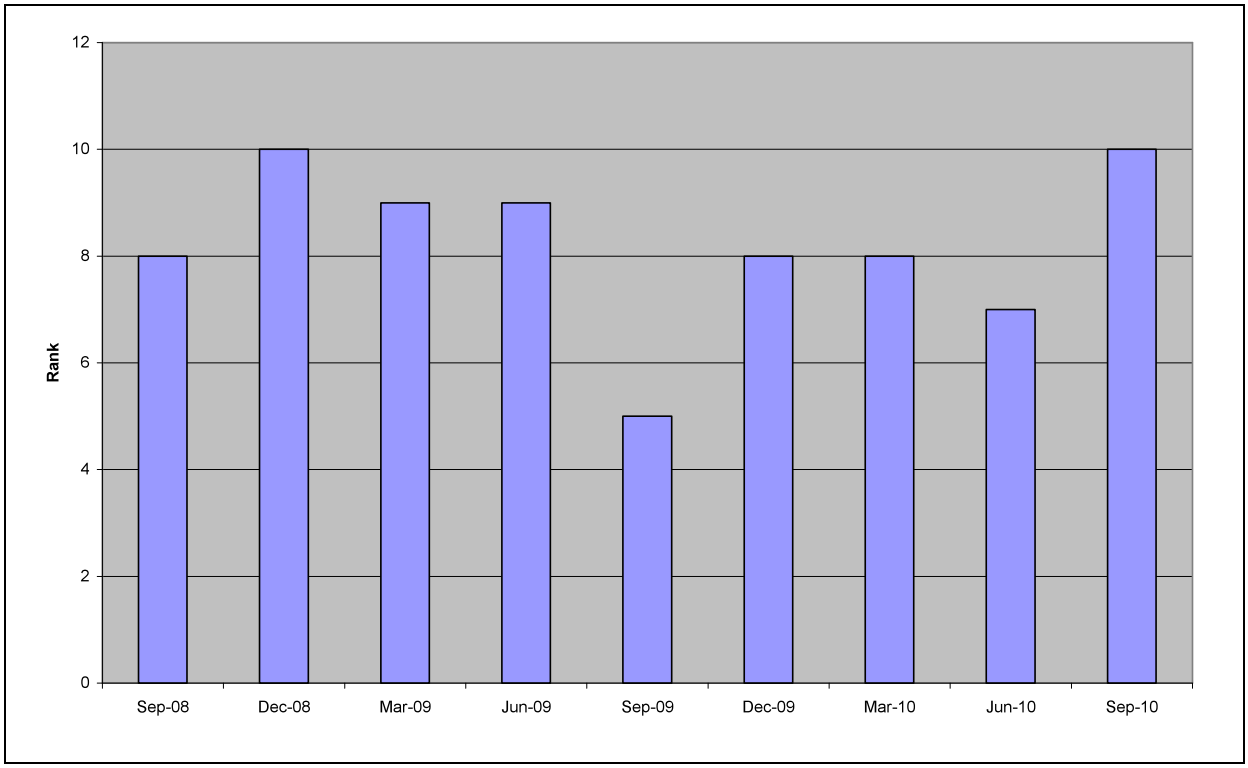

Figure 2.1: Position of Building and Engineering Professionals in top ten occupations with the highest levels of skills shortages (KPMG Econtech, 2010b)

2.6 Education profile of construction industry employees

It is interesting and relevant to compare the educational profile of employees in the Australian construction industry with those of other industries. Unfortunately such data are difficult to locate. Only one state, South Australia, has published this information (see Figure 2.2). In the absence of data from other states, these are arguably indicative of the construction workforce in Australia. The low number of university graduates employed in the industry is in stark contrast to those in other industries, and brings into sharp focus the challenges facing the industry. The Bradley Review (2008) notes that Australia "will need more well-qualified people if it is to anticipate and meet the demands of a rapidly moving global economy" (p. xi). If this is the case, Bradley et al's (2008) target of 40 per cent of 25- to 34-year-olds to have a bachelor-level qualification by 2020 appears most conservative. Based on the percentages for university graduates shown in Figure 2.2, the general population requires an increase of 17.9% (to meet the aforementioned 40% target) whilst the construction industry requires an increase of 34.1%.

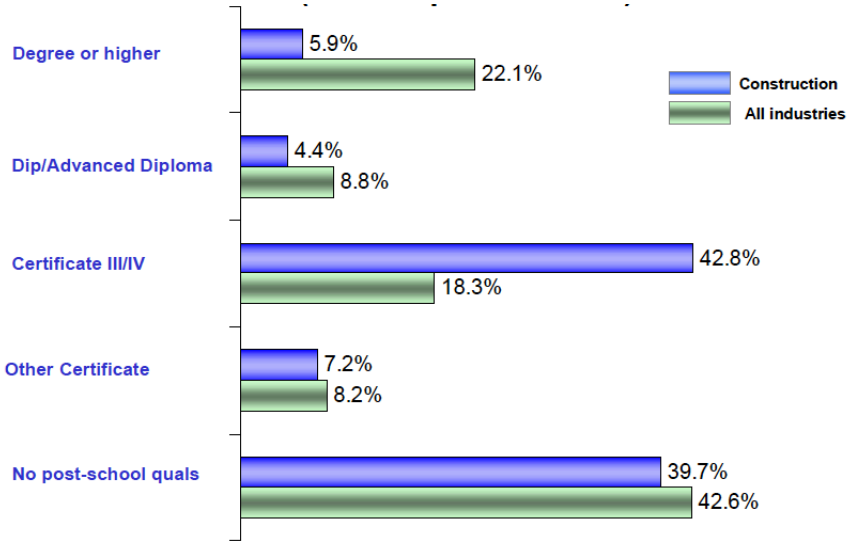

Figure 2.2: Education profile of the South Australian construction workforce (Construction Industry Training Board, 2010a)

Professionals make significant contributions, including protecting clients against incompetence, carelessness and exploitation (Eraut, 1994) and are seen as important facilitators of innovation (Drazin, 1990). It is thus apparent that a lack of a complement of professionals potentially undermines many aspects of a sector. This serves to further emphasise the shortage of construction professionals identified earlier and may also contribute to perceptions of the industry as a low-tech, bricks and mortar occupation by the general population.

The other noteworthy characteristic of Figure 2.2 is the high level of Certificate III and IV qualified individuals. This is to be expected, and reflects those with trade qualifications. This high proportion of tradespeople underscores the lack of managers and supervisors with tertiary level qualifications currently populating the construction industry. As noted in Chapter 1, the number of applications for construction management degrees has increased markedly in recent years. It is likely that those from candidates aspiring to upgrade their qualifications form a sizeable component of these applications.

2.7 Summary

This chapter has highlighted the major contribution the construction industry makes to the Australian economy. It has also indicated that the industry is not immune from the effects of the global financial crisis and that some slowing of construction activity is anticipated. Furthermore, it has highlighted the marked shortage of construction professionals in

Australia, and the diverse range of employment opportunities construction management degree programs prepare students for. Finally, it has explored the education profile of the construction industry, and has highlighted the lack of university graduates in the sector. Collectively these factors augur well for the viability and future growth of construction management programs.

This chapter has highlighted the following key issues

K2.1. The construction sector is an integral part of the Australian economy.

K2.2. Despite the aftermath of the global financial crisis, construction activity is set to continue, albeit at a reduced rate.

K2.3. The lack of construction professionals, and in particular graduates from construction management degrees, looks set to continue for the foreseeable future.

K2.4. The low number of university graduates populating the construction industry is of concern.

K2.5. The number of students enrolling in construction management degrees may be augmented by those wishing to upgrade their qualifications.

K2.6. The current and future demand for graduates should ensure a strong demand for providers of these degrees.

Construction management academics need to be cognisant of these issues and the questions that are their consequence

Q2.1. How will meeting the demand for construction management graduates affect the workload of those teaching them?

Q2.2. What challenges will the mature age profile of construction management students present?

Q2.3. How will construction management disciplines be informed of, and respond to developments in the various sectors of the industry they service?

In seeking to understand how answers to these questions might impact on the lives of construction management academics, the next chapter explores tertiary level construction management education in Australia.

3 Tertiary construction management education in Australia

3.1 Introduction

This chapter explores the work environment of construction management academic staff to provide the context of their lived experiences. It explores the provision of tertiary level construction management education in Australia (including higher education (HE) and vocational education and training (VET)). It considers the sources of funding that support these sectors, and describes the structure of tertiary construction education in Australia. It then briefly describes construction qualifications including those delivered in secondary schools. Following a description of the evolution of construction management as a discipline, recent developments in this sector, as well as the curricula that are delivered and the challenges academic staff face in sustaining the currency of these curricula are addressed. Thereafter the quality of teaching, learning and research, including the statutory requirements currently in place as well as those of voluntary professional accreditation are explored. A brief section is then provided on the academics that teach into construction management programs. The chapter ends with a review of the characteristics of the students that enrol in the sector, as well as an overview of the generational profiles they are derived from, and the propensity they have for working whilst studying.

3.2 Context

The Australian tertiary education sector is comprised of universities, technical and further education institutions (TAFEs) as well as other providers. Undergraduate and post-graduate degrees are provided by 37 public universities, two private universities and approximately 150 other providers of higher education (Australian Government, 2010d). Vocational education and training (VET), in the form of certificates, diplomas and advanced diplomas, and in certain cases associate degrees and bachelor degrees, is provided by approximately 61 TAFEs. In addition to the TAFE institutes there are many privately operated registered training organisations (RTOs) which offer VET courses. Funding for these sectors is described in Section 3.3. Further details about the nature and structure of the qualifications these institutions offer are provided in Section 3.4

3.3 Funding

Government funding for tertiary education is in a parlous state, having declined over the years. Recommendation 26 of the Bradley Review (2008) proposes that "the Australian Government increase the base funding for teaching and learning in higher education by 10 per cent from 2010" (p. 153). TAFE institutes are arguably experiencing even greater financial pressures. In a report commissioned by The Australian Education Union to highlight recent trends in public funding for VET and TAFE, Long (2010) states that "Government recurrent expenditure per hour of training declined by 11.9% between 2003 and 2008 - part of a longer term trend that has seen funding per hour decline by about 22.3% from 1997." (p. 3).

In response to the Bradley Review, the Australian Government has committed to investing in the tertiary education system. It has earmarked an "additional $5.4 billion over four years and will commit additional resourcing over the next 10 years." (Australian Government, 2009, p. 5). These funds are not solely allocated to teaching and learning ($1.5 billion is for teaching and learning, $0.7 billion for university research, $1.1 billion for the Super Science initiative and $2.1 billion from the Education Investment Fund for education and research infrastructure). Australian universities have been under financial pressure for some time, and it is not clear whether the aforementioned additional funding will be sufficient to support the extra enrolments targeted by the Bradley Review.

The historically low rate of government funding has led some Australian universities to supplement their income by enrolling full-fee paying international students. However, recent movement of the Australian dollar to parity with the US currency " is an absolute killer" according to Monash University vice-chancellor Professor Byrne, because the slight exchange rate advantage Australian universities once had over UK and US competitors has been inverted (Staff reporter, 2010). Some commentators (including Trounson (2011), Hare (2011b), Lane (2011b) and Bennett (2011)) have raised concerns that these universities have become over reliant on this income stream. In addition, various events (including cases of alleged racism and visa restrictions (Lane, 2011c; Moodie, 2011)) have jeopardised this source of funds and this has arguably exacerbated the financial pressures these universities face. It was not possible to identify the extent to which construction management disciplines rely on overseas student enrolments to supplement their income. However, it is reasonable to assume that they would not be immune to the reductions of funding experienced by their universities, and that these pressures would intensify the strained nature of their finances.

3.4 Structure of tertiary construction education in Australia

The Australian construction industry is comprised of tradespersons with different skill sets, as well as a range of supervisors, managers and leaders. Figure 3.1 illustrates different pathways to and through tertiary level construction education.

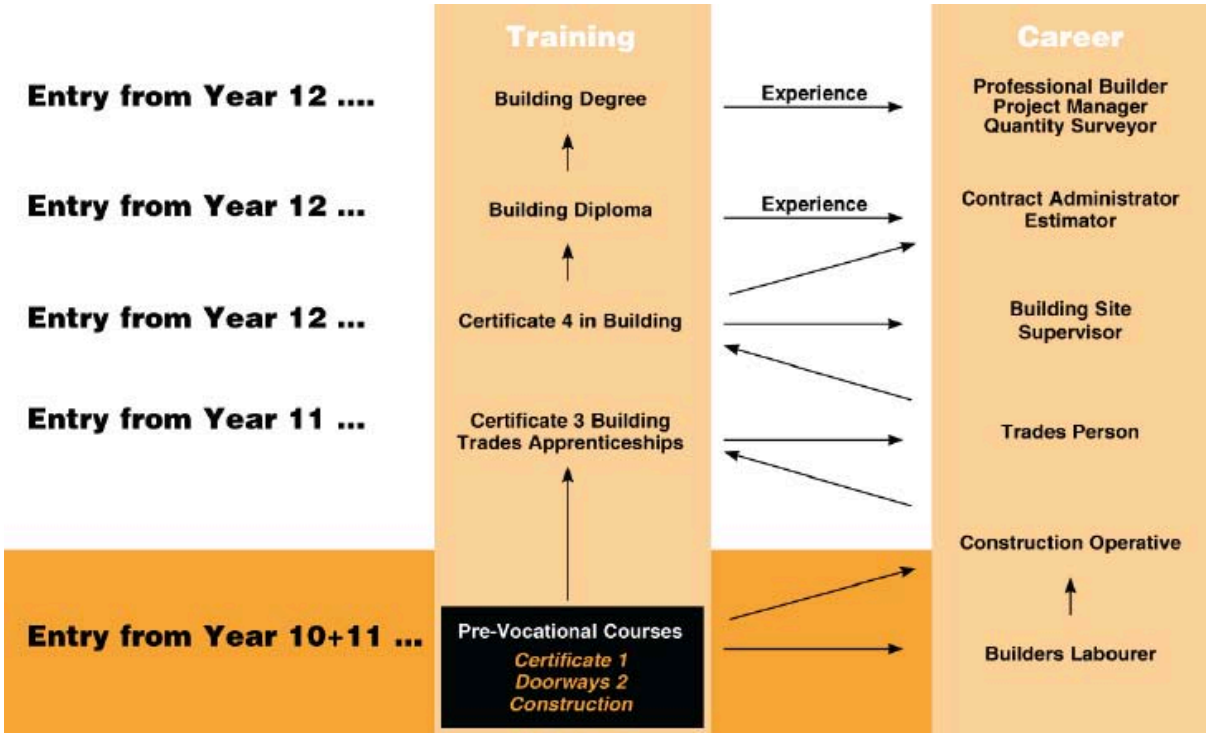

Figure 3.1: Progression from school to the construction workforce (Construction Industry Training Board, 2010b)

The education pathways for the construction workforce shown in Figure 3.1 are underpinned by the Australian Qualifications Framework (AQF) (2007). The AQF was introduced in 1995 to enable students to move easily between the higher education and VET sectors. The AQF "provides a comprehensive, nationally consistent yet flexible framework for all qualifications in post-compulsory education and training" (2007, p. 1). It recognises that schools, VET and universities each have different industry and institutional linkages and aims to connect these in a coherent single framework. The framework enables individuals to move from one qualification to another in efficient and effective learning pathways. It creates "a more open, accessible and relevant post-compulsory education system and a vehicle for implementing lifelong learning" (2007, p. 83). The AQF thus allows, for example, construction tradespeople, site foremen and managers with trade qualifications and / or relevant diplomas to access construction management degree programs.

To keep abreast of current developments, the AQF established the AQF Council in May 2008 to provide "advice on strategically strengthening the AQF to improve its national consistency, contemporary relevance and the national and international portability of qualifications" (Australia Qualifications Framework Council, 2010, p. 3). The AQF has embarked on a three phase strategy to identify areas for strengthening and developing the design requirements, develop the strengthened AQF structure and policies, and develop implementation and transition arrangements. These revisions have resulted in "10 levels of increasing complexity against which the existing qualification types in all education and training sectors have been located." (Australia Qualifications Framework Council, 2010, p. 5). Table 3.1 provides a summary of these levels, the qualifications they refer to, the purpose of the qualification and their notional duration.

Certificates I to IV prepare candidates for employment and further education and training whilst Certificates III and IV replace trade certificates (Skillsbook, 2010). Diplomas and advanced diplomas "prepare candidates for self-directed application of skills and knowledge based on fundamental principles and/or complex techniques." (Skillsbook, 2010). The AQF opens pathways for candidates from the construction workforce to progress their careers from trades-based occupations to those requiring university qualifications.

An outcome of strengthening the AQF has been the development of learning outcome-based descriptors for each qualification type. These are "based on a common taxonomy of knowledge, skills and application of the knowledge and skills with embedded generic skills for each qualification type." (Australia Qualifications Framework Council, 2010, p. 5). Those that apply to bachelor degrees are shown in Table 3.2.

3.5 Non-university construction education

The main focus of this study is on university education. This section provides a brief overview of the offerings of key non-university providers to present an overall perspective of tertiary construction management education. These include pre-vocational courses that are offered at secondary school level, VET qualifications that are offered to secondary school students, opportunities for secondary school students to study construction at university, stand-alone VET education, and apprenticeships.

Table 3.1: Summary of qualification details (Adapted from: Australia Qualifications Framework Council, 2010)

Qualification type	**Level**	**Purpose** *This qualification is designed to qualify individuals...*	**Notional duration**
Certificate I	1	with basic functional knowledge and skills for work, further learning and community involvement	0.5 to 1 year
Certificate II	2	for mainly routine work and as a pathway to further learning	0.5 to 1 year
Certificate III	3	who apply a broad range of knowledge and skills in varied contexts to enter skilled work and/or as a pathway for further learning	1 – 3 years
Certificate IV	4	who apply a broad range of specialised knowledge and skills in varied contexts to enter skilled work and/or as a pathway for further learning	0.5 to 2 years
Diploma	5	who apply integrated technical and theoretical concepts in a broad range of contexts to enter advanced skilled or paraprofessional work and/or as a pathway for further learning	1 to 2 years
Advanced Diploma	6	who apply specialised knowledge in a range of contexts to enter advanced skilled or paraprofessional work and/or as a pathway for further learning	1.5 to 2 years
Associate Degree	6	who apply underpinning technical and theoretical knowledge in a range of contexts to enter paraprofessional work and/or as a pathway for further learning	2 years
Bachelor Degree	7	who apply a broad and coherent body of knowledge in a range of contexts to enter professional work and/or as a pathway for further learning	3 to 4 years
Bachelor Honours Degree	8	who apply a body of knowledge in a specific context to enter professional work and as a pathway for research and further learning	4 years
Masters Degree (Research)	9	who apply an advanced body of knowledge in a range of contexts for research and/or as a pathway for further learning	1 to 2 years
Masters Degree (Coursework)	9	who apply an advanced body of knowledge in a range of contexts for professional practice or scholarship and/or as a pathway for further learning	1 to 2 years
Doctoral Degree (Research)	10	who apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation	3 to 4 years
Doctoral Degree (Professional)	10	who apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of professional practice	3 to 4 years

Table 3.2: Attributes of Bachelor degrees (Australia Qualifications Framework Council, 2010)

Summary	To qualify individuals who apply a broad and coherent body of knowledge in a range of contexts to enter professional work and/or as a pathway for further learning
Knowledge	Graduates of a Bachelor Degree will have a broad and coherent body of knowledge, with depth in the underlying principles and concepts in one or more disciplines as a basis for independent lifelong learning
Skills	Graduates of a Bachelor Degree will have: • cognitive skills to critically review, analyse, consolidate and synthesise knowledge • cognitive and technical skills to demonstrate a broad understanding of knowledge with depth in some areas • cognitive and creative skills to exercise critical thinking and judgement in identifying and solving problems with intellectual independence • communication skills to present a clear and coherent exposition of knowledge and ideas
Application of knowledge and skills	Graduates of a Bachelor Degree will demonstrate the application of knowledge and skills: • using judgement and initiative in professional practice and/or scholarship • to adapt knowledge and skills in diverse contexts • to take responsibility and accountability for own learning and professional practice and collaboration with others within broad parameters coherent and independent exposition of knowledge and ideas

3.5.1 Pre-vocational courses

As highlighted in Figure 3.1, some secondary school students in Australia have opportunities to enrol in a range of pre-vocational courses that allow them to gain skills and knowledge that will be immediately of use to employers. These "are generally aimed at helping (students) get an apprenticeship or traineeship, because the skills and knowledge associated with holding a Certificate make (students) more attractive to employers." (Queensland Government, 2010).

3.5.2 VET qualifications for secondary school students

In many states it is possible for secondary students to embed VET qualifications from industry-endorsed National Training Packages in their studies. For example, in Queensland, students can study a number of Category A and Category B subjects which "provide students with the opportunity to attain either a full or partial qualification at Australian Qualifications Framework (AQF) External Link Certificate I, II or III levels." (Queensland Government

Department of Education and Training, 2010). Furthermore, in New South Wales there are currently eight industry framework VET courses (including construction) that students can incorporate into their Universities Admissions Index (UAI) (NSW Board of Vocational Education and Training, 2010).

These opportunities are similar to those offered in the UK where school students can enrol in a "Construction and Built Environment" Diploma at three levels: Foundation and Higher (these two levels relate to14-16 year olds) and Advanced (for post 16 year olds) (Knutt, 2010)

3.5.3 School students studying construction at university

Further opportunities exist in some regions for secondary school students to complete construction-related university courses whilst still at school. These aim to attract gifted and talented students to construction disciplines and to raise awareness of careers in construction (Dosen, Sher, Hingston, & Williams, 2011; Hingston, Sher, Williams, & Dosen, 2010) whilst others seek to increase participation from population groups that are under-represented in university intakes (A. Mills, McLaughlin, & Davis, 2011).

3.5.4 VET as stand-alone education

School students may enrol in VET courses that are not assessed as part of their secondary school studies. In such cases a VET Certificate or Statement of Attainment is awarded for the competencies achieved (Queensland Government Department of Education and Training, 2010).

Flexible entry pathways also make it possible for those without formal qualifications to enrol in VET courses. TAFEs offer numerous qualifications that target a wide range of construction careers, including architectural drafting, bricklaying, carpentry, concreting, electrician, floor finishing and covering, joinery, painting and decorating, operating plant, plastering, plumbing, rigging, roof tiling, scaffolding, steel fixing, stonemasonry, and wall and floor tiling.

3.5.5 Apprenticeships

Apprenticeships provide a well-recognised pathway for workers to be trained as construction tradespeople. Apprenticeships involve paid work and structured training that can be on-the-job, off-the-job or a combination of both and lead to nationally recognised qualifications.

They may be full-time or part-time. Australian Apprenticeships are available at a variety of certificate levels (Australian Government, 2010a).

There is, however, widespread concern that insufficient numbers of tradespeople are qualifying via these routes. The Construction Industries Training Board in South Australia summaries the key issues surrounding apprenticeships as follows

> "The most perplexing issue for the construction industry is that skilling a fully qualified tradesperson takes time and commitment on the part of the trainee and the employer. It also requires a level of confidence about the industry to supply sufficient work to justify the productivity costs. The structure of the construction industry is just not geared to embrace the volume of training required to keep pace with activity. Until we change the way apprentices are employed and trained any improvement in the situation is likely to be marginal, at best." (Construction Industry Training Board, 2010c, p. 2)

Responding to these challenges, the Council of Australian Governments (COAG) arranged for a taskforce to recommend actions to support the engagement and retention of apprentices during the economic downturn experienced in the mid 2000's. The taskforce prepared a report and action plan which was considered by COAG on 7 December 2009. The proposals outlined how governments can intervene to meet the short-term challenge of maximising the number of apprentices who commence and who complete, and also about how Governments in partnership with industry parties can quickly strengthen the system and its quality over the next few years (Australian Government, 2010b). The outcomes of these recommendations are yet to be reported.

This section has highlighted the main pathways high school and VET students can follow to obtain construction trade qualifications. These approaches allow and encourage students to consider and engage in construction-related careers from an early age. Furthermore, TAFE graduates are able to continue their studies at university. They are generally able to obtain credit for relevant TAFE qualifications in partial fulfilment of some of the requirements of the construction management programs described in the next section. These routes constitute the supply-chain that feeds the degree programs that construction management academics teach into.

3.6 Construction management higher education

A relatively recent academic discipline of construction management (or building) has emerged, which aims to graduate students with knowledge and understanding of both technical issues relating to constructing buildings, as well as commercial, financial, legal and related managerial aspects. Construction managers require skills that complement elementary design and engineering attributes (Woudhuysen & Abley, 2004). In this regard, construction managers have legal obligations which vary from state to state. In NSW, they must comply with and be aware of all changes in legislation. If an engineer or architect designs work that does not comply with, for example, the Building Code of Australia (Australian Building Codes Board, 2010) or any law or instrument, the liability rests with the person constructing the structure (not with engineers or architects). This liability places very real responsibilities on those that provide education to construction management students.

3.6.1 The evolution of construction management as a discipline

Buildings have been constructed since time immemorial. As they grew in size, it became necessary to employ more and more people to assist. Similarly, as buildings became more complex, the expertise of specialists needed to be enlisted. For example, the New York World Trade Centre transportation hub (due for completion in 2014) involves 19 public agencies, two private property developers, 101 different construction contractors and sub-contractors, and 33 different designers, architects and consulting firms (ICON, 2008). Contemporary construction has extensively and now requires construction professionals with an extensive and diverse range of knowledge, skills and attitudes.

Architects have historically been responsible for interpreting clients' requirements and translating them into design drawings. According to Seeley (1979), in the seventeenth century architects were responsible for the design and construction of buildings. They employed master craftsmen who completed the necessary work. Over the centuries design has become a multi-disciplinary activity incorporating architects, engineers, specialist designers as well as construction contractors, project managers and other construction professionals. According to Cole, from the mid 1700s until the 1950s "the largest of projects normally required input from few professions, viz., the architect, a civil (and later) a mechanical engineer, a quantity surveyor and a (master) builder" (2007, p. 100). It was not until the 1970s that these professions became more specialised and clearly defined. The range of expertise now required on major projects has risen exponentially (as the example of the

New York World Trade Centre transportation hub mentioned above illustrates). Large projects require input from many specialists. For example, Cole (2007) observes that these projects "now use input from dozens of specialists, the 'emerging professions', (e.g. 'Lighting, acoustic, circulation, IT specialists')" (p. 100).

Responsibility for managing the human capital, money, mechanical equipment, materials and time required to construct buildings has evolved. The history of the management of construction projects in Australia has not been documented extensively. According to Gimesy (1992), practices here have been largely influenced by trends in Europe, America and the Asia Pacific. He notes that the first builders in Australia were builder-architects and drew their knowledge (and, to begin with, bricks as well) from the UK. It was not until 1865 that the first building courses started at the Sydney Mechanics School of Arts, New South Wales as a drawing class (Gimesy, 1992, p. 35). The first formal quantity surveying course in Australia was a diploma offered at Sydney Technical College in 1928. It delivered "fourteen subjects over four years, though classes in quantities were being held regularly as early as 1888 at the Sydney Technical Institute" (Lenard, 2008, p. 215). Queensland had a quantities course which started in 1935, Victoria had one which started in 1949, and South Australia Technical Institute started one in 1948 (Lenard, 2008). During this period, construction education was delivered largely by technical institutes. Students worked during the day and attended part-time evening courses (a practice similar to the UK) (ATN, 2004; Lenard, 2008). Five of the universities in this study (Curtin, QUT, RMIT, UNISA and UTS) were formerly institutes of technology.

The first building degree was accredited by the Australian Institute of Building (AIB) in Adelaide in 1958, with another following in Melbourne that year and in Sydney in 1960 (AIB, 2004, p. Course Accreditation).

The term 'building' has fallen out of favour in some quarters as it implies that graduates are restricted to managing the construction of buildings. As their skills are relevant to civil engineering projects as well, the all-encompassing term 'construction' has become more popular.

3.6.2 Recent developments in construction higher education

Whilst universities have had to respond to commercial pressures, their main operations are closely regulated by government policy. Universities have undergone major changes both

internationally and in Australia during the last two decades (Naylor, 2007). Decreasing resources have placed increased pressures on teaching. In addition, there has been marked pressure on academics to conduct research and to monitor the impact of their investigations (Kogan & Hanney, 1999). Furthermore, the boom/bust nature of the construction industry has compounded the challenges facing those delivering Australian construction degree programs. The educational landscape for these programs has altered significantly for a number of reasons, including changes in government funding, information technology initiatives and work-integrated learning initiatives (Ashford & Mills, 2006; Pick, 2006; Star & Hammer, 2008). Thirteen universities and one TAFE currently award construction management degrees. Construction management graduates are in demand and at present universities are experiencing buoyant enrolments.

The way construction disciplines have been managed and structured within university hierarchies has influenced the way they are perceived in Australia today. Many co-exist with other disciplines including property, industrial design, architecture and engineering. As such, construction arguably lacks a unique identity and this may, in part, be due to it being overshadowed by higher profile disciplines such as architecture and engineering. In addition, perceptions of academic disciplines are largely influenced by the research they conduct. Research in building/construction management is mostly applied (and usually multi-disciplinary) and does not attract the same recognition as the fundamental research conducted in other disciplines (e.g. science and engineering) (CNBR, 2008). Construction management academics in the USA experience similar challenges. Rosenbaum, Rubin and Powers (2001) observe that "construction education still copes with painful realities—that the discipline is an academic stepchild to larger programs on campus, that it lacks financial strength and its graduates technical depth, and that its welter of titles can leave students, recruiters and guidance counsellors (sic) confused and uninterested" (p. 26).

The construction industry has a vested interest in ensuring it has an adequate supply of appropriately trained graduates (A. Mills & Ashford, 2004). The curricula taught at universities need to respond to commercial imperatives as well as to industry requirements. Growing industry demands for environmental, ICT and management skills often far exceed the capacity of construction curricula to accommodate them. Furthermore, industry has strong perceptions and demands about what university education should involve and this is frequently more practical than theoretical (Warren & Wilkinson, 2008). The landscape of the construction industry, perceptions of practitioners and future demands for a diverse range of

knowledge and skills has the potential to influence construction curricula and, thereby, influence the lives of the construction management academics that develop and deliver them.

3.6.3 Construction management curricula

Construction management curricula differ from university to university. A snapshot of the content of these curricula was gleaned from the websites of all universities offering construction management programs (Figure 3.2). The nature and extent of the information obtained varied from university to university. Some websites provided detailed descriptions of courses whilst others included only brief statements of their syllabi. Furthermore, some universities included large amounts of content in case studies (some of which was delivered using innovative teaching and learning methods) and this further complicated the analysis of this information. Supplementary details were obtained from the Tertiary Course Guides published by the Australian Institute of Quantity Surveying (AIQS) (2010).

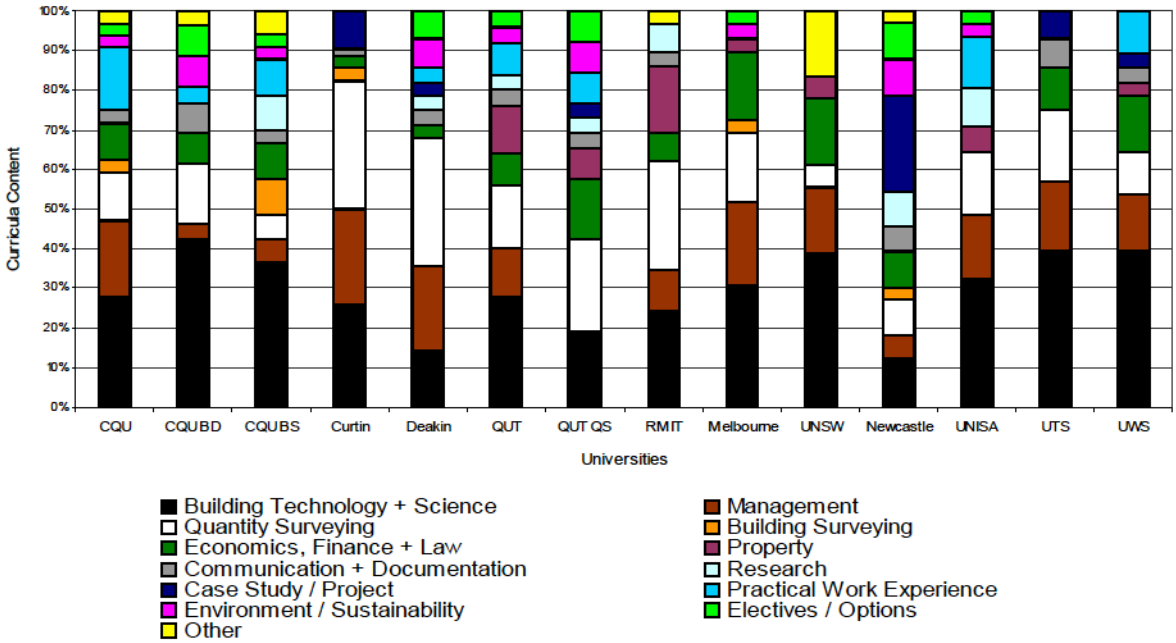

Figure 3.2: Construction curricula content - 2007 (University web pages and AIQS handbooks)

Figure 3.2 shows that the core content areas of construction management degrees are building technology and science, management and quantity surveying. These areas account for approximately 60% (on average) of curricula with the residual 40% being made up of mix of topics that vary in nature and extent from degree to degree.

3.6.4 Curriculum renewal

In addition to accommodating the requirements of multiple professional institutions (see Section 3.8.2), construction management curricula need to maintain their currency and respond to future trends. Topics that received scant attention a decade ago are now viewed by most construction academics as mainstream. For example, ecological sustainable development (ESD) has attracted considerable attention in recent years (Cotgrave & Alkhaddar, 2006; Desha, Hargroves, & Smith, 2009; Hales & Holdsworth, 2006; Sherren, Robin, Kanowski, & Dovers, 2010; Zillante, 2007), as has BIM (BIM Education Co-op, 2011; MacDonald & Mills, 2010), new forms of procurement (Love, Skitmore, & Earl, 1998; Rowlinson & McDermott, 1999; Walker & Rowlinson, 2008) and new construction technologies such as prefabrication and modular construction (Blismas, Pendlebury, Gibb, & Pasquire, 2005; Gibb, 1999). Indeed, some of these new topics have become mainstream in many construction management programs. Pertinent examples of the introduction of new topics include occupational health and safety (Cotgrave, Nunnington, & Eilander, 2005) and alternative forms of dispute resolution.

In addition to these new topics, some of the more traditional ones have evolved markedly. For example, building services have become increasingly sophisticated and complicated with the advent of computer-aided design and control applications. Furthermore, the distinctions between some types of buildings have changed. Buildings that were considered high-rise a decade ago are now considered to be of a modest elevation, and revisions (and additions) to curriculum are required to address the challenges associated with working in these conditions.

Keeping abreast of current developments and trends thus necessitates the inclusion of new curriculum content. Noting the difficulties associated with this, Ashworth (2008), when reporting on a survey of heads of Built Environment Departments in the UK, stated

> "A problem with every academic discipline is the growth in access to knowledge. It has been suggested that this doubles every two months! Programme designers therefore need to be selective on what is included in the curriculum and in what proportion to other knowledge, not forgetting the importance of developing key and subject specific skills." (p. 14)

Evidence of the extent to which construction management curricula have evolved in recent years is illustrated in Figure 3.3. In Figure 3.3 the courses in construction management programs in 2003 are compared with those delivered in 2007. The figure highlights the extent

of changes in content during this period. Economics, finance and law, property, case studies, environment and sustainability, and electives have all increased, whilst building technology and science, quantity surveying, communication and documentation, research and practical work experience and other have decreased. The manner in which these new materials were introduced appeared to be ad hoc. Clearly curricula need to be effectively managed if they are to maintain their integrity.

The next section describes the processes by which the quality of teaching, learning and research are audited at universities in Australia.

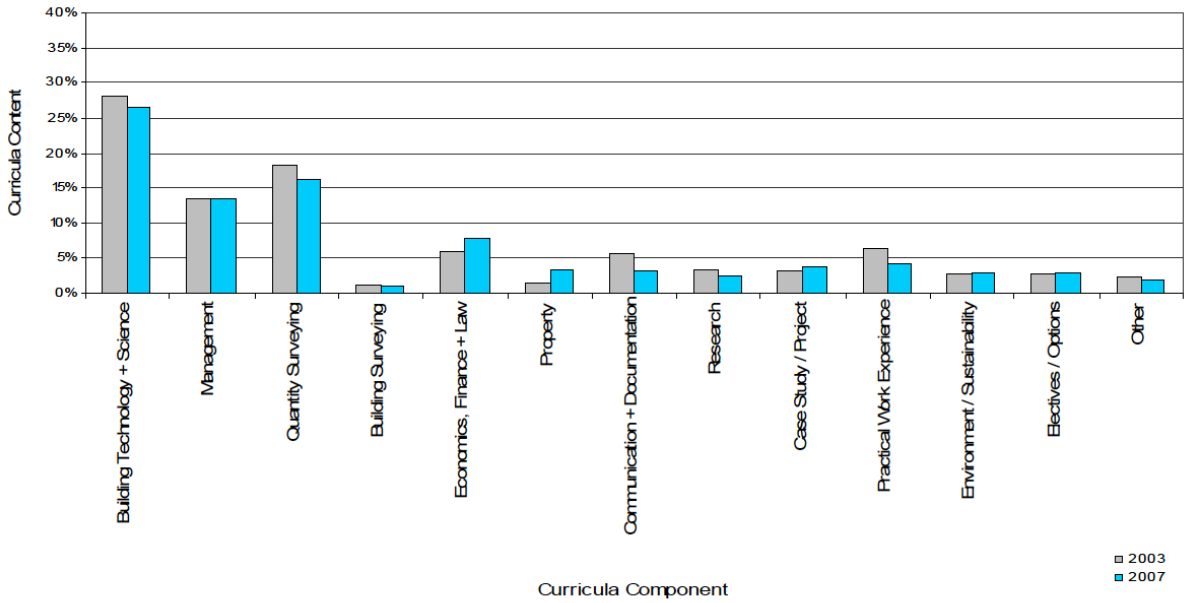

Figure 3.3: Changes in content of curricula 2003 compared to 2007 (University websites and AIQS tertiary course guides)

3.7 Teaching and research quality

The Australian Federal Government oversees the assessment of quality of teaching and research in Australian universities. Under the Australian Universities Quality Agency (AUQA) these universities were audited on a regular basis to "determine whether activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve" (Australian Universities Quality Agency, 2010b). The Tertiary Education Quality and Standards Agency (TEQSA) have recently replaced AUQA. The sections below describe the processes for auditing the quality of teaching and research.

3.7.1 Teaching quality

AUQA) was the principal national quality assurance agency in higher education with responsibility for assuring the quality of teaching and learning in Australia's universities (Australian Universities Quality Agency, 2010a). AUQA was established to be

> "the principal national quality assurance agency in higher education, with responsibility for quality audits of higher education institutions and accreditation authorities, reporting on performance and outcomes, assisting in quality enhancement, advising on quality assurance; and liaising internationally with quality agencies in other jurisdictions, for the benefit of Australian higher education."

AUQA was trialled between September 2001 and February 2002 and first implemented in 2002 (AUQA, 2002). Currently the Australian Government is establishing a new national regulatory and quality agency for higher education called the Tertiary Education Quality and Standards Agency (TEQSA). TEQSA will

> "be established as an independent body with powers to regulate university and non-university higher education providers, monitor quality and set standards. TEQSA will register providers, carry out evaluations of standards and performance, protect and assure the quality of international education and streamline current regulatory arrangements. It will join together the regulatory activity currently undertaken in the states and territories with the quality assurance activities currently undertaken by the Australian Universities Quality Agency." (Australian Universities Quality Agency, 2010c)

TEQSA legislation was introduced into the Parliament of Australia in March 2011 and provides for a Higher Education Standards Panel that will be responsible for developing the Higher Education Standards Framework, including teaching and learning standards. Feedback on a discussion paper is currently being sought from higher education providers, professional associations, industry bodies and government agencies, and the outcomes from this discussion process will be provided to the Higher Education Standards Panel for further consideration (DEEWR, 2011).

One of the inputs to this process is the outcomes of the ALTC funded Learning and Teaching Academic Standards (LTAS) project in Building and Construction (Newton, 2011a). This project developed threshold learning outcomes (TLOs) that all graduates of an Australian

Bachelors award in Building and Construction will be expected to meet or exceed. A summary of these statements is shown in Table 3.3. These statements are the result of consultations with the Australian Deans of Built Environment and Design and a specially constituted Building Discipline Reference Group (Newton & Goldsmith, 2011).

Table 3.3: Proposed threshold learning outcomes for construction management (Newton, 2011)

TLO_1:	integrate and evaluate the fundamental principles and technical knowledge of building and construction technology, management, economics and law
TLO_2:	identify and resolve typical building challenges with limited guidance, employing appropriate evidence-based problem-solving and decision-making methodologies
TLO_3:	critically and creatively reflect on personal behaviours and capabilities in the context of entry to professional practice
TLO_4:	interpret and negotiate building and construction information, instructions and ideas with various project stakeholders
TLO_5:	research and develop methods and strategies for the procurement and delivery of contemporary construction work
TLO_6:	experience and demonstrate an integrated understanding of both the theory and practice of building and construction

Pilot evaluations of how these learning outcomes map against the existing requirements of some of the professional institutions accrediting Australian construction management degrees have been conducted. In addition, they have been mapped against the learning outcomes of some of the courses offered in existing construction management degrees. However, their future is uncertain. According to Lane (2011a), it is unclear whether or not they will be adopted by the new TEQSA. He notes that

> "Richard Henry, who chairs the deputy vice-chancellors (academic) group for Universities Australia, said he believed TEQSA would not adopt the ALTC learning outcomes. He also doubted the ALTC project would be rolled out across all disciplines."

In addition to TEQSA, construction management programs are subject to the internal quality assurance processes and procedures in place at their host universities. These typically involve periodic reviews of all matters relating to the delivery of a program including an evaluation of the curriculum, assessment items, feedback from students and interviews with academic staff. An example of the terms of reference used for the review of one program is provided in Appendix 1.

3.7.2 Research quality

A separate body has been established to assess research quality within the higher education institutions in Australia. The Excellence in Research for Australia (ERA) initiative uses a combination of indicators and expert review by committees comprised of experienced, internationally-recognised experts. ERA provides information about "areas within institutions and disciplines that are internationally competitive, (and points) to emerging areas where there are opportunities for development and further investment". (Australian Government, 2010e). ERA was trialled in 2009 (Australian Government, 2008) and implemented in 2010.

It is appropriate to explore ERA results for construction management in the light of the contribution research capability makes to the reputation of disciplines (as noted in Chapter 1). Universities' research performance was recently assessed in the categories shown in Table 3.4

Rating	Descriptor
5	The Unit of Evaluation profile is characterised by evidence of **outstanding performance** presented by the suite of indicators used for evaluation. The research outputs demonstrate the highest standards of quality and scholarly impact.
4	The Unit of Evaluation profile is characterised by evidence of **excellent performance** presented by the suite of indicators used for evaluation.
3	The Unit of Evaluation profile is characterised by evidence of **above average performance** presented by the suite of indicators used for evaluation.
2	The Unit of Evaluation profile is characterised by evidence of **average performance** presented by the suite of indicators used for evaluation.
1	The Unit of Evaluation profile is characterised by evidence of **below average performance** presented by the suite of indicators used for evaluation.

Table 3.4: ERA rating scale (Australian Research Council, 2009)

The results of ERA 2010 for Fields of Research (FoR) relevant to construction management are shown in Table 3.5, Table 3.6 and Table 3.7.

Table 3.5: ERA ratings for FoR 12(EE) - Built Environment and Design (Australian Research Council, 2011b)

ERA rating	Number of Unis	Percentage of Unis ranked in this category
1	1	8
2	6	50
3	3	25
4	2	17

Table 3.6: ERA ratings for FoR 12(HCA) - Built Environment and Design (Australian Research Council, 2011c)

ERA rating	Number of Unis	Percentage of Unis ranked in this category
1	2	9
2	9	41
3	8	36
4	3	14

Table 3.7: ERA ratings for FoR 1202(EE) – Building (Australian Research Council, 2011e)

ERA rating	Number of Unis	Percentage of Unis ranked in this category
2	6	55
3	3	27
4	2	18

As shown in Tables 3.5 , 3.6 and 3.7 no construction management discipline was rated in the top (5) category. Furthermore, at least half of these disciplines were rated in the two lowest categories (1 and 2). This confirms observations recorded in Section 1.6 that the research conducted by Australian construction management disciplines is not highly ranked.

Moreover, as this discipline is frequently compared with that of engineering, relevant engineering ratings for the same period are considered. Table 3.8 presents data for all engineering disciplines, whereas Table 3.9 presents data for the civil engineering discipline. Both of these Tables show that at least 10% of universities were rated in the top (5) category, and 28% and less were rated in the lowest two categorise (1 and 2). Thus engineering outperforms construction management from a research perspective.

Table 3.8: ERA ratings for FoR 09(EE) – Engineering (Australian Research Council, 2011a)

ERA rating	Number of Unis	Percentage of Unis ranked in this category
1	2	7
2	6	21
3	12	41
4	6	21
5	3	10

Table 3.9: ERA ratings for FoR 0905(EE) - Civil Engineering (Australian Research Council, 2011d)

ERA rating	Number of Unis	Percentage of Unis ranked in this category
2	2	13
3	3	20
4	8	53
5	2	13

The requirements of AUQA, TEQSA and the ERA are mandatory for Australian universities. In addition, several professional institutions accredit construction management degrees. In the next section the purposes of accreditation and the extent to which these programs are accredited in Australia are described. Details of the institutions that most frequently accredit construction management programs are also provided.

3.8 Accreditation

Professional qualifications require external ratification, and Australian construction management degrees are no different in this regard. Professional bodies provide this ratification by accrediting degrees nationally and internationally, providing support for them and creating links with industry (Harvey, 2004). The benefits of accreditation have been identified as providing "certification that a program meets or exceeds minimum standards of excellence" (MacKenzie, 1964; Pastore, 1989), "ensur(ing) a uniformity of educational standards" (Stettler, 1965), and "help(ing) high quality students identify high quality programs" (Pearson, 1979; Posey & Parker, 1989; as cited in 2003, p. 197). Furthermore, members of the Council of Heads of Department of the Built Environment in the UK "recognised the importance of all programmes that were accredited meeting specified minimum standards. This gives accreditation some credibility" (Ashworth, 2008, p. 20). It is therefore apparent that securing and maintaining accreditation has the potential to impact on construction management academics.

3.8.1 Purpose of accreditation

Harvey (2004) defines the purpose of accreditation as "the establishment or restatement of the status, legitimacy or appropriateness of an institution, programme (i.e. composite of modules) or module of study". (p. 208). Accreditation may thus be of degree programs or of universities. The process of accreditation of a program by a professional (or regulatory) body is separate from quality assurance processes and procedures adopted by national agencies

(Shearman & Seddon, 2010). In Australia, the Australian Universities Quality Agency (AUQA) operates at institutional rather than at program level, checking how universities maintain their academic standards and quality. Australian universities offering construction programs seek professional accreditation from professional bodies for their degree programs as this attracts recognition and marketing opportunities. Having a recognised qualification assists construction professionals gain acceptance in overseas markets, though local construction contractors appear to attach little value to membership of professional bodies.

Accreditation by international professional institutions is attractive to universities. By securing overseas accreditation, construction programs are able to project an international profile and encourage offshore employment and study opportunities for their students. According to West and Krevatin, "the need for students to work internationally (is) recognised by most, if not all educational institutions" (2008, p. 103). These international openings anecdotally attract additional students, enhance industry's perceptions of these programs and attract additional funding. Those construction degree programs seeking international accreditation do so from numerous professional institutions. This is repetitive, onerous and costly, and in stark contrast to the engineering disciplines; engineering participates in several major international accords, within and outside Europe, which establish the "tradeability" of engineering degrees. Three of the agreements covering mutual recognition of higher education level qualifications in engineering are the Washington, Sydney and Dublin Accords. These ensure that engineering degrees accredited in the UK are recognised in other parts of the world participating in these accords (Shearman & Seddon, 2010). Such a system of mutual recognition presents obvious advantages to the higher education engineering disciplines servicing these areas and provides an informative example for construction management professional institutions.

Harvey (2004) also distinguishes between graduating from an accredited program and having a licence to practice and that, in some cases, these activities are aligned. He goes on to note that "(i)n many professional areas, graduation from an appropriately accredited academic programme is a preliminary step and full professional certification, and thus a licence to practise, follows only after some period of work experience" (p. 209). In Australia there is currently no legislative requirement for construction practitioners to be members of their professional institutions (in contrast to other professions such as engineering and architecture). In Australia, industry, community and student perceptions of professional institutions appear to be ambivalent. According to Davies (2010),

> "Australia has a relatively youthful professional culture in the built environment. It appears to have a cultural preference for experience in building rather than education and professional membership. A search through jobs advertised for built environment vacancies evidences few requiring tertiary education let alone membership of a profession. Indeed, research results indicate that only 10% of students on built environment courses believe that Australian employers would expect them to become professionally qualified (Wilkinson & Warren, 2007)". (p. A006 – 6)

This is in marked contrast to other parts of the world (e.g. Singapore, Malaysia, UK and Africa) where membership of a professional institution is aspired to and, in some cases, required as a licence to practice. Indeed, in this regard Davies (2010) goes on to note that

> "(o)ther countries have a very different culture. Hong Kong and Singapore, for example, have such a high regard for professional and educational qualifications, that professional courses such as Facilities Management attract 100's of students and students happily enrol in several professional bodies after graduation – their business cards exhibit long lists of letters for professional memberships and educational attainment. Professional membership is seen to give higher social status and increased earning potential". (p. A006 – 6)

Professional institutions operating in Australia thus need to contend with a lack of appreciation of the value of membership of a professional body. Echoing these challenges, Warren and Wilkinson (2008) observe that

> "as the professional bodies seek to become global organisations the need to attract new members is a quintessential element of the growth strategy. This rapid growth expectation, while being realised among established practitioners, is not being so readily translated into student and early career professionals" (p. 2)

The key motivating factors for obtaining multiple accreditations are provided in the next section, as well as the extent to which construction management programs are accredited in Australia.

3.8.2 Multiple accreditations

The main Australian professional bodies that accredit construction management degrees are the Australian Institute of Building (AIB) and the Australian Institute of Quantity Surveying

(AIQS). In addition, some construction management programs seek accreditation from other professional institutions. As mentioned in Section 3.8.1, whilst the benefits are contended, international accreditations are seen to enhance opportunities to recruit overseas students and to improve the employability of graduates seeking to work overseas. Some construction management disciplines therefore also seek accreditation from various international professional institutions (including the Chartered Institute of Building (CIOB) and the Royal Institute of Chartered Surveyors (RICS) as well as others predominately from the Asia Pacific region). It is therefore not surprising that these disciplines are amongst the most heavily accredited in Australia, with some being endorsed by more than nine professional institutions (as shown in Table 3.10).

Table 3.10: Accreditation of Australian construction degrees in 2008 (Universities' websites)

Institution	AIB	AIQS	AIBS	RICS	SISV	Other
University of Technology Sydney	●	●		●	●	CIOB, ISM, NZIQS, SIB, PAQS
University of New South Wales	●	●		●		API
University of Western Sydney	●	●				
University Newcastle	●	●			●	CIOB
University of Melbourne	●	●		●	●	API, BQSM,CIOB, HKIS, PAQS, BVAEAM
Royal Melbourne Institute of Technology	●	●		●		API
Deakin University	●	●		●		
Queensland University of Technology	●	●		●		BQSM
Central Queensland University	●		●			
Bond University				●		API
Curtin University	●	●		●		BQSM
University of South Australia	●	●	●	●	●	ACCE, HKIS, BQSM, CIOB

Legend:

ACCE	Australian Council for Computers in Education
AIB	Australian Institute of Building
AIBS	Australian Institute of Building Surveyors
AIQS	Australian Institute of Quantity Surveyors
API	Australian Property Institute
BQSM	Board of Quantity Surveyors Malaysia
BVAEAM	Board of Valuers, Appraisers and Estate Agents, Malaysia
CIOB	Chartered Institute of Building
HKIS	Hong Kong Institute of Surveyors
ISM	Institute for Supply Management
NZIQS	New Zealand Institute of Quantity Surveyors
PAQS	Pacific Association of Quantity Surveyors
RICS	Royal Institution of Chartered Surveyors
SIB	Singapore Institute of Building
SISV	Singapore Institute of Surveyors and Valuers

Satisfying the requirements of these institutions inevitably results in a proliferation of course content, with each institution insisting that material specific to their discipline be included in curricula. Compromises need to be made because each degree program can only contain a finite amount. This often means that all the requirements of one accrediting body cannot be

met in tandem with all those of the other professional institutions. According to Ottewill, McKenzie and Leah (2005), attempting to meet multiple accreditation requirements may result in a "zero-sum game" (p. 92), where one subject area is included at the expense of another.

If universities are to meet and maintain the requirements of their accrediting professional institutions, the requirements of these bodies need to be well-articulated, flexible and the accreditation processes consultative. In this regard, the skills and competency requirements of AIB and CIOB are compared. The AIB's requirements are set out in a document entitled "Information Publication Number 1 – Procedures for the assessment of courses and accreditation of qualifications" (AIB, 2006), whilst the CIOB's accreditation requirements are set out in their education framework document (CIOB, 2007). The skills specified by the AIB are presented on a single page (as shown in Table 3.11) whereas those of the CIOB are presented over ten pages. This crude comparison highlights the difficulties of accommodating two sets of accreditation requirements, let alone those of the multiple other professional institutions that many programs seek accreditation from.

Table 3.11: Skills requirements of the AIB

1.	Apply building principles and methods
2.	Prepare documentation for a building project
3.	Interpret building documentation
4.	Apply the properties and use of materials and systems in the building process
5.	Discuss with appropriate specialists, design considerations association with the installation and operation of building services
6.	Describe the principles for designing a building
7.	Describe the building certification process
8.	Apply relevant legislation, regulations, standards and codes relevant to building work
9.	Apply contract principles and law to building work
10.	Apply the principles of managing finances for a building project
11.	Apply the principles of managing human relations and resources to a building project
12.	Apply the principles of managing time for a building project
13.	Apply the principles of managing the building construction process
14.	Apply quality management principles to building projects
15.	Apply environmental protection principles to building work
16.	Apply the principles of OH&S on building sites
17.	Apply business management principles

Construction management disciplines thus need to address the requirements of multiple accrediting bodies, the teaching and research requirements of the Australian government

(described in Section 3.7) as well as the internal quality assurance processes and procedures of their university. Preparing for and organising these audits involves a considerable amount of work and expense. In addition, each of these audits calls for information to be presented in a particular manner, exacerbating the time and effort required in preparing them. The workload involved in these activities is far in excess of that experienced by staff in related degree programs (including architecture and engineering).

3.9 Construction management academics

Much has been written about the challenges facing academic staff teaching in universities. Examples of the extensive international body of literature relating to this topic include studies about stress in the workplace (Abouserie, 1996; Gmelch, Wilke, & Lovrich, 1986; Olsen, 1993; Tytherleigh, et al., 2005; Van Emmerik, 2002), and how work-life balance is challenged by the work habits of academics (Berglund, 2006; Houston, et al., 2006; A. Hunt, 2005; Kinman & Jones, 2004). Numerous other studies have investigated these as well as a combination of other topics including job satisfaction, workload and anxiety (Lacy & Sheehan, 1997; Linn, Yager, Cope, & Leake, 1985; Oshagbemi, 1997).

Similar studies have been conducted in the Australian context. For example, Winefield et al (2003) conducted a national survey of occupational stress in Australian Universities, concluding that "the financial difficulties imposed on Australian universities in recent years are having serious consequences for the psychological well-being of their staff, particularly academic staff" (p. 52). These views are echoed in the studies of Winter, Taylor and Sarros (2000) who recorded academics feelings of being over-worked, stressed out and demoralised. They attributed these feelings to universities trying to maintain educational excellence whilst relying on external sources of income.

No studies of the construction management academic workforce in Australia were found. However, some studies in disciplines related to construction management were located. For example, Bellamy, Morley and Watty's (2003) study of business academics has relevance for construction management because this discipline shares some similar course content and staff profile. These authors investigated the factors motivating business academics to remain in academia, observing that recent reforms of the Australian government appeared to have resulted in a homogeneous workforce, rather than a diverse one. They also noted that the factors that attracted staff to academic careers (including the autonomy and flexibility they

experienced) were those that kept them there, but questioned whether these factors would be sufficient to attract new academic staff.

The looming challenges of recruiting academic staff were further emphasised by Hugo (2005) who provides a detailed analysis of the demographic trends in Australia's academic workforce. Noting that academia has one of the oldest workforces, he argues that "Australian universities face a massive recruitment task over the next decade due to the retirement of the large numbers of academics who began work in the 1960s and 1970s" (p. 327). Furthermore, he foresees recruitment difficulties being compounded by the most competitive international labour market that has ever existed. In this regard, Ashworth's (2008) observations about the shortage of construction management academics in the UK are pertinent. This shortage was one of the major issues affecting construction, property and surveying education identified by heads of department in UK universities.

The findings of these authors are endorsed in the Australian Government's (2009) report on transforming the Australia's higher education system, which states that

> "Australia's academic workforce is ageing, and this has been exacerbated by the under representation of academics in their 20s and 30s to replace those retiring. Over time, the attractiveness of an academic career has diminished through factors such as a lack of job security caused by increased casualisation, increasing workloads and lower salaries compared with other sectors. There is also a severe shortage in the international academic labour market, resulting in intense global competition." (p. 23)

Coates and Goedegebuure's (2010) authoritative report on the state of higher education in Australia explores the ramifications of the aforementioned challenges in depth. They observe that a key characteristic of academic work in Australia is that the rate at which it is growing is similar to the rate at which the resources that fuel it are diminishing. A small number of academic staff is being expected to cope with a growing amount of work. Moreover, Coates and Goedegebuure argue that current recruitment practices are unlikely to be able to fill the positions needed because both academic work and the academic workforce have changed. They see the articulation of a vision for the future as a precursor to meaningful change, saying that

> "(a) significant foundation task for any workforce development initiative is to understand the major changes taking place with the workforce, learners and education

itself, and to translate these into new conceptualisations of roles and expectations, and to implement them If academic life is to be an attractive future career choice for clever and dedicated people, then it is necessary to be able to show them a realistic description of what becoming an academic means, coupled with a career structure that meets the reality and expectations of an increasingly diversifying workforce." (p. 2)

The aims and objectives of this study align closely with this quotation, focussing on what it currently means to work as a construction management academic. A thorough understanding of the current situation will contribute to the definition of a discipline-specific vision.

The aforementioned texts refer to generalisations about the entire academic workforce. Little is documented about the members of academic staff who teach into construction management disciplines. Preliminary web searches to ascertain their age, qualifications, areas of expertise and other characteristics proved unreliable. This lack of discipline specific data undermines the credibility of observations made about the discipline, and is something that this study seeks to redress.

3.10 Construction management students

The behaviours and attitudes of construction management students impact on the academics that teach them. This section explores the demographics and generational characteristics of construction management students. Their attitudes, as well as the extent to which they work whilst studying, are also examined.

3.10.1 Age of students

The Department of Education Employment and Workplace Relations (DEEWR) publish data collected from all universities in Australia on an annual basis. The data are available in the form of aggregated datasets for all higher education institutions that provide data in the Higher Education Student Collection. Some of these relate to the age students commenced their studies. To date the age profile of construction management students in Australia has not been explored. Age data for five years of the most recent cohorts of Australian students were sourced from DEEWR through the University of Newcastle's Planning, Quality and Reporting Division. Data for all commencing students were compared with those of students starting their construction management studies (based on "field of education code 040303", the classification used to describe higher education courses, specialisations and units of study in building construction management (Mosely, 2010)).

Figure 3.4 shows that the percentage of students under 19 years of age enrolling for the first time in Bachelor degrees in Australia has remained constant during the five-year period from 2004 to 2008, varying from 51.7% in 2005 to 53.7% in 2007. In contrast, the percentage of students in this age group studying Bachelor degrees in building construction management has declined steadily, reducing from 50% in 2004 to 40.7% in 2008 (a reduction of 9.3%). This 10% reduction currently shows no sign of abating and clearly has major implications for providers of construction management degrees.

Whilst concerns about engaging the Net generation of students (see Section 3.10.2 for definitions of nomenclature relating to generations) clearly need to be addressed, there is also a danger that other groups of students may be neglected and disadvantaged. These groups are categorized by DEEWR as follows: 19 to 24 years old, 25 to 29 years old, and 30 years and over. Percentages for these groups are shown in Figure 3.5, Figure 3.6 and Figure 3.7.

Figure 3.5 shows that the percentage of students in the 20 to 24 year old age group enrolling in all Bachelor degrees has stayed constant at 27% (with 27.9% being the highest percentage recorded in 2008 and 27.4% being the lowest in 2007). In contrast, the percentage of building construction management students in this age category has increased considerably, rising to a high of 34.5% in 2005 and dropping off slightly to 32.8% in 2008.

Figure 3.6 shows the most marked rise in construction management students is in the age group 25 to 29 years old. After dipping to 8.5% in 2005, the percentage of these students rose to 15% in 2008. In contrast, the percentage of students enrolled in all other Bachelor degrees remained constant at just under 8% (with a peak of 8.1% in 2004 and a low of 7.6% in 2006).

For students aged 30 years and over, percentage data are shown in Figure 3.7. The percentage of students taking construction management degrees was lower than that that of students enrolled in all other degrees, except for the most recent data (for 2008). The 2008 data shows that students in this age group have converged to represent approximately 11% of the student population.

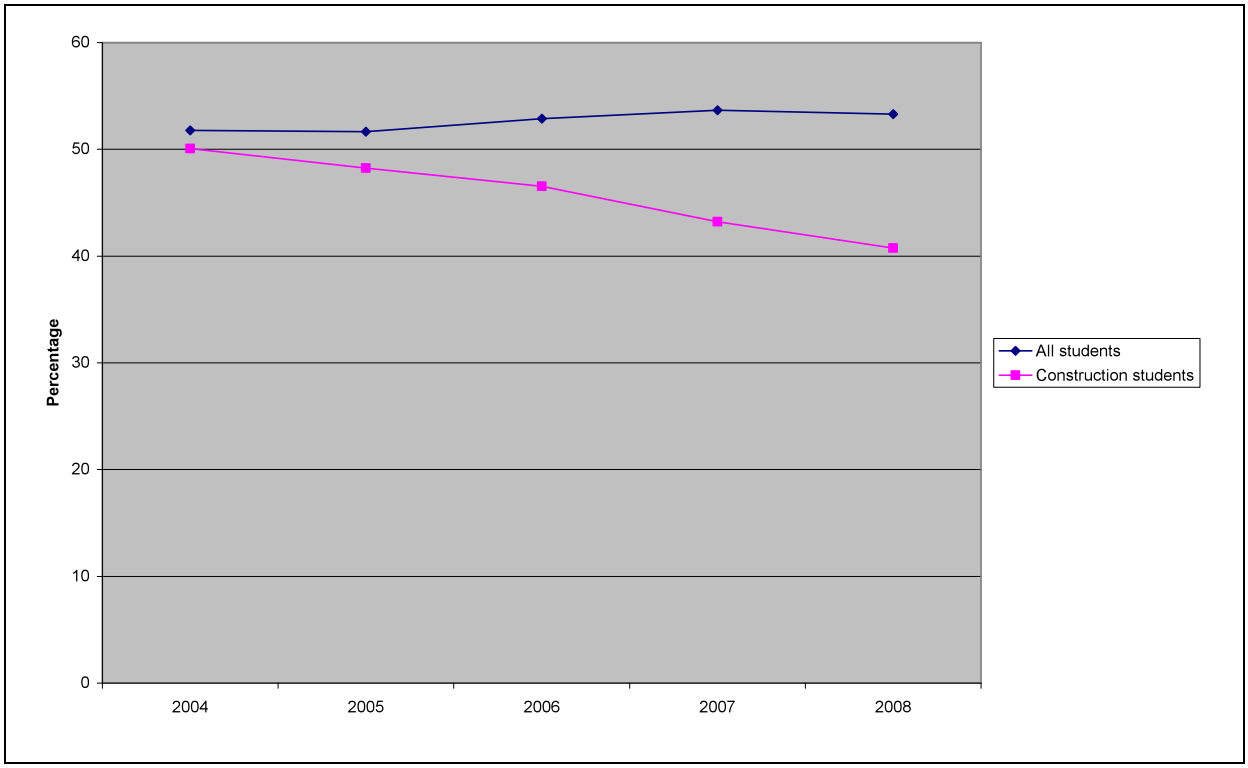

Figure 3.4: Percentage of under 19 students commencing Bachelor degrees in Australia compared to students commencing building construction management (Mosely, 2010)

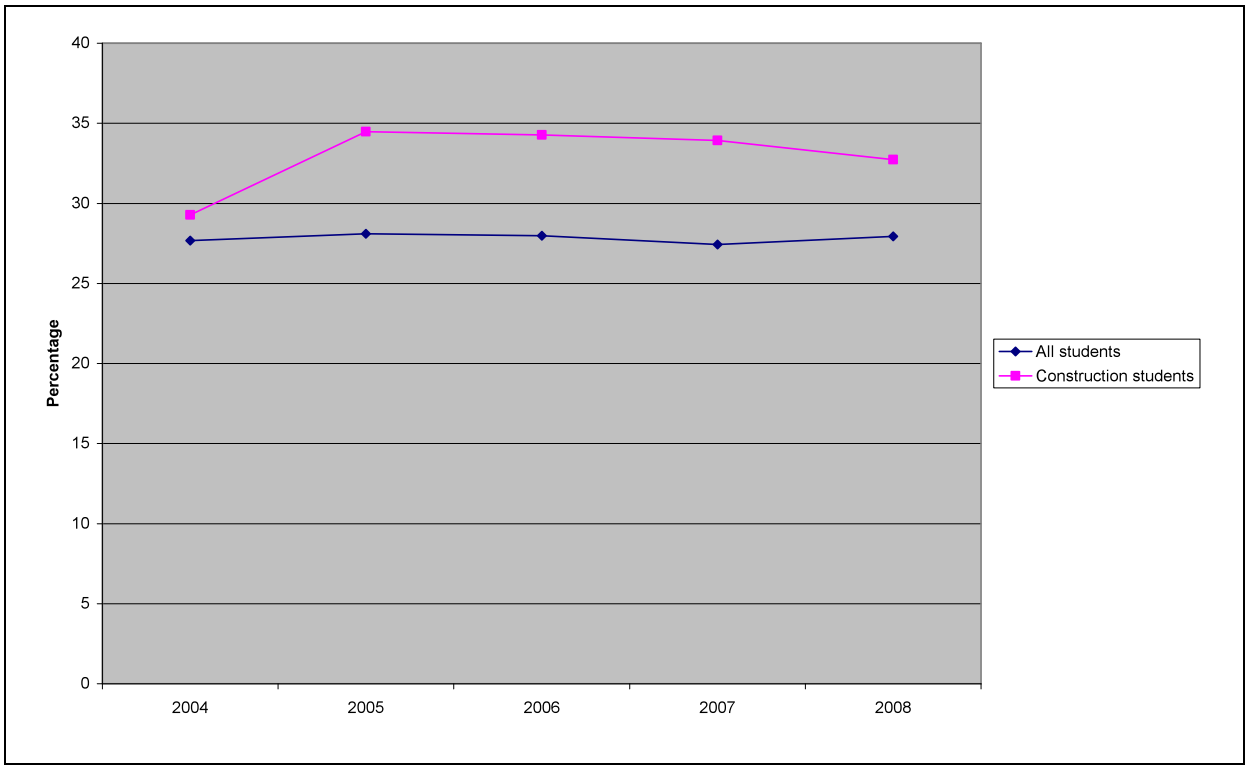

Figure 3.5: Percentage of 20 to 24 year old students commencing Bachelor degrees in Australia compared to students commencing building construction management (Mosely, 2010)

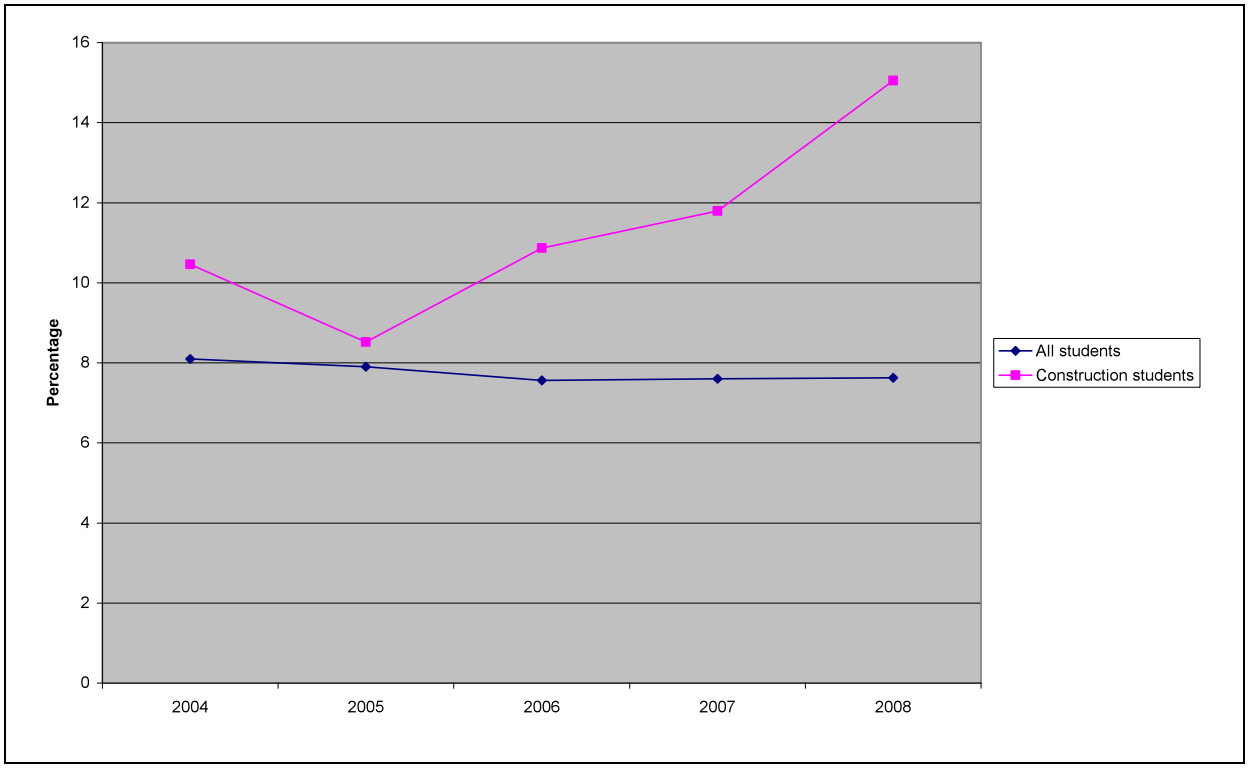

Figure 3.6: Percentage of 25 to 29 year old students commencing Bachelor degrees in Australia compared to students commencing building construction management (Mosely, 2010)

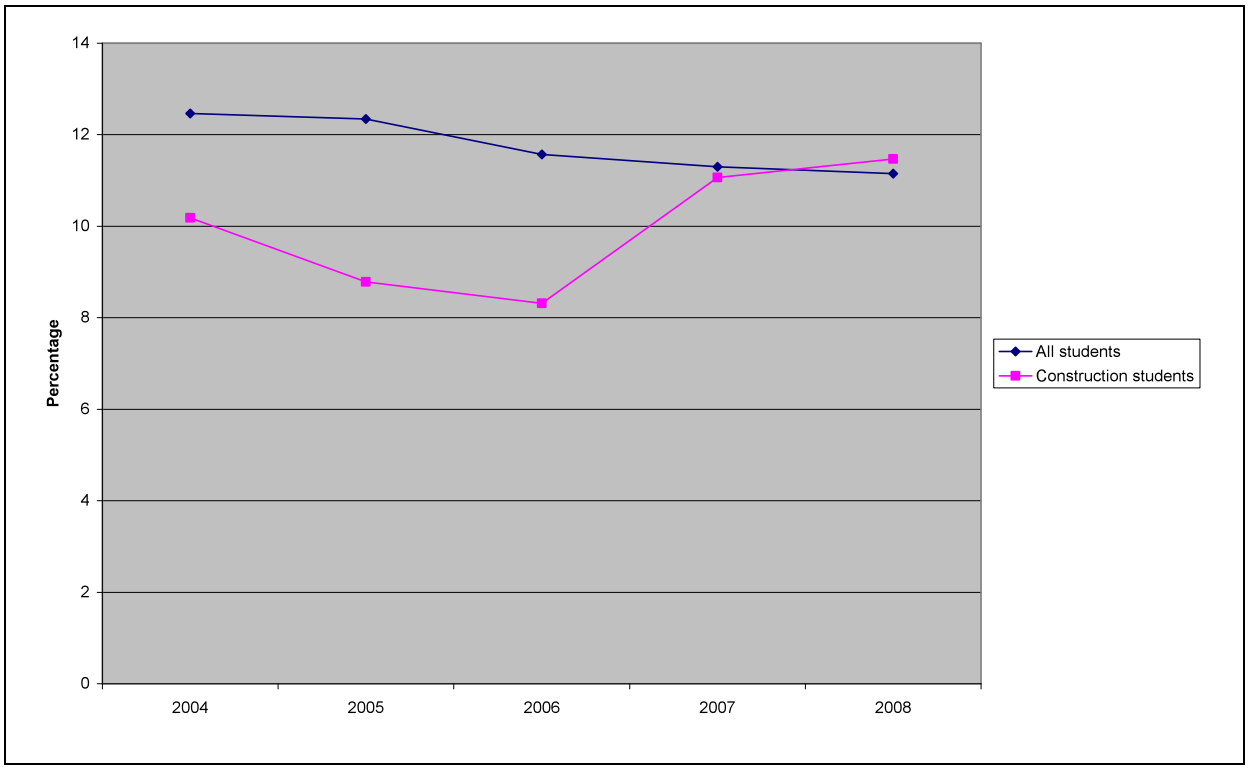

Figure 3.7: Percentage of 30 year old and over students commencing Bachelor degrees in Australia compared to students commencing building construction management (Mosely, 2010)

The generational profile (as defined in Section 3.10.2) of the construction management students shown in Figure 3.4, Figure 3.5, Figure 3.6 and Figure 3.7 is considered next. These are based on the data shown in Table 3.12 which also provides an approximation of the generational groups (e.g. Net generation) populating each age group (e.g. 19 and under). It has not been possible to identify exact boundaries between generations as these specify an age range and more detailed age data are not available. However, Table 3.12 emphasises that most construction management students are of Generation X. Clearly the Net generation will eventually dominate construction management cohorts, but at this stage they are in the minority. It has not been possible to identify the number of Baby Boomers (Section 3.10.2) studying construction management.

Table 3.12: Number of commencing construction management students in age groups (DEEWR data extracted by Mosely, 2010)

Age Group	2004	2005	2006	2007	2008
19 and under	359	368	364	418	341
20 to 24	210	263	268	328	274
25 to 29	75	65	85	114	126
30 and over	73	67	65	107	96
Total	**717**	**763**	**782**	**967**	**837**

Legend

Net generation	
Generation X	

3.10.2 Generational profile

Much has been written about the preferences, attitudes and behaviours of the different generations of students currently in higher education. How these attributes apply to the academic staff responsible for teaching them is also pertinent because they highlight where misunderstandings and tensions may occur. Understanding and accommodating generational differences should provide insights into ways to motivate, direct and reward students from different cohorts (Lancaster & Stillman, 2003) (Zemke, Raines, & Fillipczak, 2000) (Borges, Manuel, Elam, & Jones, 2006).

Table 3.13 defines the terms used in this thesis to describe the different generations as well as their birth dates. Different sources provide different data in this regard, and those presented here are based on the work of Oblinger and Oblinger (2005).

Table 3.13: Summary of age profiles of current generations (D. G. Oblinger & J. L. Oblinger, 2005)

Generation	Born between	Age of youngest as at 31 Dec 2009
Matures	1900 - 1946	63
Baby Boomers	1946 - 1964	45
Generation X	1965 - 1982	27
Net generation	1982 - 1991	18

Each generation is influenced by the events that occur in that lifetime. Generations are influenced by common icons (people, places or things) as well as events and conditions that become reference points to them (Lancaster and Stillman, 2003, cited by Borges, et al., 2006). Those who experience similar influences are likely to exhibit similar behaviours and have similar values. In this connection it is accepted that few generalizations are entirely representative. However, generalizations do highlight trends (D. G. Oblinger & J. L. Oblinger, 2005).

Work has been conducted in other disciplines (e.g. nursing (S. A. Johnson & Romanello, 2005), law (McGaugh, 2003) and medicine (Borges, et al., 2006)) investigating the impact of students from different generations. Gen Y students are currently attracting some attention from construction management academics in Australia (Best, 2010), but the majority of these students are not of this generation, as noted in Section 3.10.1. This study of the particular characteristics of construction management students is thus timely. The observations noted above have been used to provide a foundation for the sections that follow. In the next section some of the key influences that have shaped the generations and their main preferences, attitudes and behaviours are presented and discussed.

3.10.2.1 Matures

Sometimes called the "Silent" generation (McGaugh, 2003), the youngest individuals in this generation were 63 years old in 2010. They are likely to include senior staff in positions of influence. They would have been born into the aftermath of the Great Depression of the

1930's and would have experienced the Second World War and the rebuilding that subsequently occurred. As a result of these and other experiences, this generation wish for consistency and uniformity, according to McGaugh (2003). They value conformity, logic and discipline and are conservative in dress, spending and politics. McGaugh goes on to observe that, in the context of legal education, this generation perhaps understands better than any other the value of "putting your nose to the grindstone" (p. 121) so that sacrifice today provides benefit in the long run.

3.10.2.2 Baby Boomers

Baby Boomers are younger than Matures, with the youngest being 45 year old in 2010. As result of their parents' sacrifices, the childhood of Baby Boomers would have been marked by optimism, growth and opportunity (Zemke et al, 2000, as cited by McGaugh, 2003). They would have have experienced turbulence in their lifetime but their experiences would have generally involved improvements. The key traits of this generation include optimism and a belief in growth. Boomers "can easily see themselves at the center of everything, both because the Silents sacrificed so much for them and because the sheer size of the generation commands the attention of government and business alike" (Zemke et al, 2000, as cited by McGaugh, 2003, p. 121). The differences between generations are particularly marked for Baby Boomers and the next generation, Generation X, according to McGaugh (2003). The reason for this is attributed to the information technology revolution.

3.10.2.3 Generation X

The youngest of Generation X would have been 27 years old in 2010. This generation has witnessed events such as the energy crisis, the introduction of the personal computer, the stock market crash of 1987, and the fall of the Berlin Wall. They are thought to be mainly latchkey children who have possibly been raised by a single parent (Murray, 1997). They are likely to have spent more time watching television alone than in the company of their parents. They are thought to be cynical and pessimistic, believing that they live in troubled times marked by problems they have no control over. Additionally, they have little confidence in their nation's social institutions. They prefer individualised programs to generalised approaches, and regard variety and quick responses as important. They are private, may fear intimacy and are largely independent. Furthermore, they "look for and value hard facts, expertly delivered" (Murray, 1997, p. 39).

Generation X students are described as culturally independent and sceptical, but also resourceful. They engage readily with technology and consider using it as an indicator of being up-to-date. They are likely to want hard facts, expertly delivered. They value variety and speed (Murray, 1997 as cited in Borges, et al., 2006, p. 572).

3.10.2.4 Net generation

Various names have been attached to this generation, including Gen Y, NetGen, Millennials and Net generation. The youngest of the Net generation would have been 18 in 2010. As children they are likely to have been doted on by parents concerned about their safety, security, schooling, as well as their present and future success (Borges, et al., 2006). They are likely to be team-oriented, value being connected with others, and have the ability to organise and mobilise. They are accustomed to having their time structured and to following rules. They are likely to be hard working and to have been raised to aim for success in all they do by their supportive parents. They are accustomed to being tested, to receiving feedback and to achieving set goals. However, given their extensive participation in planned activities and lack of experience with unplanned time, they may not be spontaneous or introspective.

Having always had access to computers, pagers and cell phones, they are likely to appreciate how technology enables them to do many things at one time and have a high expectation of technology's usefulness and availability in all settings. NetGen students have been described as optimistic, generous and practical. They are education oriented, saying it is "cool to be smart" to be educated (Bonamici, Hutto, Smith, & Ward, 2005, p. 9). Furthermore, many observe that the current Net generation is unique in that it is the first to have grown up with digital and cyber technologies. They observe that not only are the Net generation acculturated to the use of technology, they are saturated with it (Barnes, Marateo, & Pixy Ferris, 2007; Bonamici, et al., 2005; D. Oblinger & J. Oblinger, 2005).

3.10.2.5 Summary

Oblinger and Oblinger (2005) provide a summary of the attributes, likes and dislikes of the different generations. This is outlined in Table 3.14.

Table 3.14: Attributes, likes and dislikes on different generations of students (D. Oblinger & J. Oblinger, 2005)

	Matures	Baby Boomers	Generation X	Net Generation
Birth Dates	**1900–1946**	**1946–1964**	**1965–1982**	**1982–1991**
Description	Greatest generation	Me generation	Latchkey generation	Millennials
Attributes	Command and control Self-sacrifice	Optimistic Workaholic	Independent Skeptical	Hopeful Determined
Likes	Respect for authority Family Community involvement	Responsibility Work ethic Can-do attitude	Freedom Multitasking Work-life balance	Public activism Latest technology Parents
Dislikes	Waste Technology	Laziness Turning 50	Red tape Hype	Anything slow Negativity

Many of the Generation X and Net generation attributes challenge university academic staff, many of whom are of mature age. For example McGaugh (2003) identified the preconceptions of some law academics about their students, including students' short attention spans, uninformed and apathetic attitudes, arrogance and slackness. In exploring these preconceptions, McGeogh suggested a range of responses that academics could harness but noted the difficulties some academics experienced when these involved the use of information technology. Furthermore, in the context of teaching construction management students how to measure buildings, Hodgson, Sher and Mak (2007) reacted to students' reluctance to engage with two-dimensional hardcopy drawings by providing digital three-dimensional construction drawings

Contemporary students appear to be motivated to obtain a qualification but not necessarily an education (Sheahan, 2005). Current construction management students may have different priorities to those of the past; for example, family, friends, leisure and employment may take precedence over education. Furthermore, students may be increasingly aware of their education rights. Many may consider the demands previously placed on students to be unreasonable (Ashford & Francis, 2007b).

The manner in which the various generations of students and academics interact with one another is thus filled with challenges. For example, different life values, responsibilities and familiarity with IT intersect to make the development of curricula as well as the delivery of courses challenging for all concerned.

3.10.3 Numbers of students

The number of students enrolling in construction management degrees has increased at a steady rate since 2001. By 2006 this number had grown from 3702 to 4016 (as shown in Figure 3.8). As shown in Figure 3.8, the rate of increase has been modest but steady. Furthermore, this growth has been consistent across each of the universities (Williams, et al., 2009). Since then the Department of Education Employment and Workplace Relations (2010a) has reported an increase of 8.3% in students enrolling in the Field of Education (FoE) of Architecture and Building between 2006 and 2007, and an increase of 15.6% between 2007 and 2008 (DEEWR, 2010b). More recent data are, as yet, unavailable but anecdotal indications are that this trend is continuing (Sher, 2012). It is likely that these increased enrolments are in response to the skills shortage noted in Section 2.5 as well as to applicants' increased awareness of construction career pathways (Warren, Birch, & Westcott, 2005).

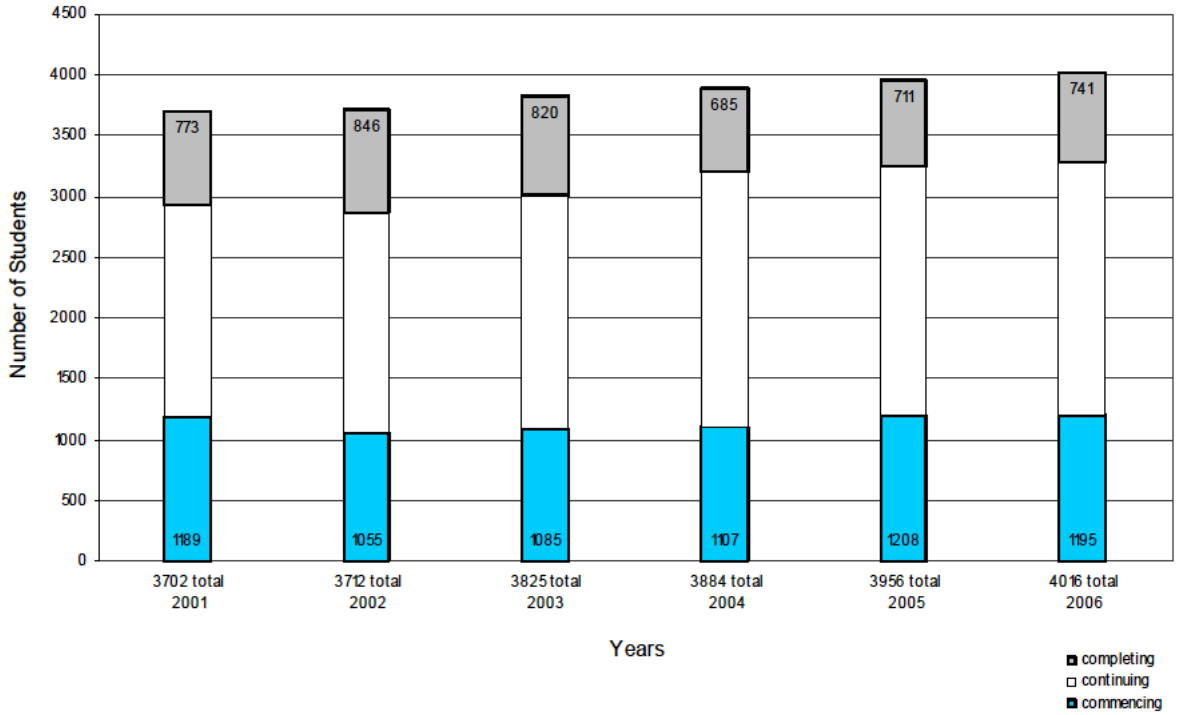

Figure 3.8: Construction students completing, continuing and graduating (2001 – 2006) (Williams, et al., 2009)

Less than 10% of the students shown in Figure 3.8 are female, and no growth in their number is discernible during this period. This situation is indicative of the pattern of employment in the construction industry. Ongoing attempts are being made to encourage females to consider construction management as a career. For example, the National Association of Women in Construction (NAWIC, 2011) seeks to "raise the profile of women working in the

construction industry", and the efforts of Engineers Australia (2008) to encourage female engineers may benefit the discipline by association. Attempting to redress this imbalance is one of the numerous challenges facing construction management academics.

3.10.4 Students working and studying

There is currently a worldwide trend of students studying and working (Darmody & Smyth, 2008; Lingard, Yip, Rowlinson, & Kvan, 2007; Moreau & Leathwood, 2006). A useful framework for viewing the circumstances surrounding the reasons for the levels of student employment is provided by Darmody and Smyth (2008) who propose four perspectives: 1) the level and nature of employment growth in the economy; 2) the socio-demographic profile of students;
3) financial support structures for students and the costs associated with participation; and
4) the amount of class contact time. These are explored briefly below.

Firstly, students seek and obtain employment in many different sectors of the economy. In many countries employment growth has occurred in particular employment sectors, mainly marginal, less skilled and low-paid service jobs. There is some evidence that some construction management students in Australia work in sectors that are not related to construction (Robins & Ashford, 2010).

Secondly, the skills shortage currently being experienced in Australia means that some students are able to secure responsible positions in industry well before they graduate.

Thirdly, Darmody and Smyth (2008) reinforce that the profile of students enrolling in university degrees has changed dramatically in recent years. They note that many students now return to education later in life and that the increased presence of both mature students and those from working-class backgrounds means that a growing number of students may need to combine study with work. This is shown to be the case in construction management in Australia as shown in Table 3.12.

Fourthly, global trends show that the increased numbers of students engaging in paid work reflects the increasing cost of higher education and the changes in higher education funding (Moreau & Leathwood, 2006). These observations are applicable to Australia. The Bradley Review (2008) has acknowledged that "current levels of income support are inadequate to support the participation and success of students from low socio-economic backgrounds" (p.

xv). In addition, Bradley et al (2008) recommended that the Australian Government introduce reforms to the student income support system to redress the imbalance.

Fifthly, Darmody & Smyth (2008) highlight the impact that different approaches to structuring program and course curricula may have. They note, inter alia, the financial pressures experienced by many students, and the tensions these students experience when trying to accommodate the sometimes-conflicting requirements of their academic class timetables and the work rosters of their employers.

In terms of students' work and study patterns overall, as already mentioned, many mature age students need to support their families and have other financial commitments. In addition, many school leavers also find themselves in positions of financial need or wish to complement their studies with periods of practical experience. Consequently, many students work whilst they are studying. However, what distinguishes construction management students from others is the impact of the skills shortage noted earlier. Construction employers often employ students in positions of considerable responsibility. Tensions between work and study overshadow students' lives in many cases and have been noted to cause students to "burnout" (Lingard, et al., 2007).

3.11 Summary

This chapter has explored the background and context of construction management tertiary education in Australia, and has identified the main factors that have the potential to impact on the working lives of construction management academics. It has described funding for the sector, the way in which it is structured and the various routes through which students obtain construction-related qualifications. It has explored the provision of construction management degrees, and the challenges associated with developing and renewing the curricula that these programs deliver. In addition, it has considered the various ways in which the quality of teaching, learning and research are quality assured. Finally, it has explored the profile of the academic staff that deliver these programs, as well as those of the students that enrol in them.

This chapter has highlighted the following key issues

K3.1. Whilst there are indications of bipartisan government support for the recommendations of the Bradley Review, it appears unlikely that the sector will receive significant additional government funding.

K3.2. Both nationally and at a discipline level, the structure of education is continually evolving in an attempt to respond effectively to, amongst other things, the skills shortage.

K3.3. Pressures to embed new topics into construction management curricula are besieging those delivering these programs.

K3.4. Construction management programs are the most heavily accredited in Australia.

K3.5. The construction management discipline has not achieved widespread recognition, from academic peers and industry, for the research its academics conduct.

K3.6. The demographics of construction management students are markedly different from those of other mainstream university students.

Collectively, these issues raise the following questions relevant to the lived experiences of practising construction management academics

Q3.1. What are the implications for academics of a financially constrained construction education sector?

Q3.2. Are changes in the structure of the tertiary education system likely to impact on the working lives of construction management academics?

Q3.3. How can those responsible for the fluid nature of construction management education keep abreast of current developments in industry and research?

Q3.4. How can construction management academics respond to the challenges presented by the multiple quality audits of their discipline?

Q3.5. How are construction management academics to increase recognition for the research they conduct?

Q3.6. How do the generational profiles of construction management students intersect with those who are responsible for teaching them? What are the implications of this?

The next chapter describes the research design and methodology used to investigate the questions raised posed above.

4 Research design and methodology

4.1 Introduction

This chapter describes the research design and methodology used to answer the questions raised in Chapters 2 and 3. The answers to these questions will provide an understanding of the lived experience of construction management academics, and expand upon related studies about the challenges academics face generally in their working lives. The tertiary education sector is currently facing several challenges, including constrained funding, legislative changes, high student to staff ratios, as well as changes in students' expectations and working patterns. However, little research has been conducted into how these challenges and changes affect the discipline of construction management, and how they are manifested in the working lives of construction management academics.

The discipline of construction management is relatively young, and is subject to additional and different pressures to those of other more well-established disciplines. How do these discipline-specific challenges intersect with those experienced by other disciplines? Are there unique challenges that construction management academics need to address? Importantly, are any specific actions needed to address these challenges? The following 9 questions, raised in Chapters 2 and 3, provide the setting for this study

Q2.1. How will meeting the demand for construction management graduates affect the workload of those teaching them?

Q2.2. What challenges will the mature age profile of construction management students present?

Q2.3. How will construction management disciplines be informed of, and respond to developments in the various sectors of the industry they service?

Q3.1. What are the implications for academics of a financially constrained construction education sector?

Q3.2. Are changes in the structure of the tertiary education system likely to impact on the working lives of construction management academics?

Q3.3. How can those responsible for the fluid nature of construction management education keep abreast of current developments in industry and research?

Q3.4. How can construction management academics respond to the challenges presented by the multiple quality audits their discipline?

Q3.5. How are construction management academics to increase recognition for the research they conduct?

Q3.6. How do the generational profiles of construction management students intersect with those who are responsible for teaching them? What are the implications of this?

To answer these questions, the study reported here focused on the working lives of construction management academics. Lived experience studies have found favour as an effective means of understanding what it means to individuals to experience certain situations. They rely on interpretivism, an approach explained by Nicholls (2009a) in the following terms

> "Interpretivism tries to understand what it is to be human. It is associated with a phenomenological tradition that seeks to understand experience through the eyes of the person experiencing it (Van Manen, 1990). It is the oldest and most well-established of the qualitative traditions, and the one that has gained the most traction in health care, particularly in nursing and occupational therapy. Interpretivists view the objectivity of the world as a subjectively lived phenomenon. Time is lived, the space we occupy is lived, our relationships are lived, our bodies are lived, and are not abstract phenomena amenable to the objective gaze of detached observers (Benner, 1994). The questions 'what does it mean to be human; to be someone with Parkinson's disease; to be alive' are at the heart of the interpretivist's approach to research. Interpretivists come to understand what health and illness mean to people by talking to them, generating texts from interview, and analysing their data phenomenologically (Holloway and Wheeler, 1996)." (p. 530)

This study explored the lived experiences of construction management academics. It sought to identify the impact of the social and economic landscape, as well as of stakeholders, on the lives of these academics. Collectively, these experiences provided a focussed account of what it means to be a construction management academic in present day Australia.

4.2 Research aim and objectives

The questions listed in Section 4.1 are encapsulated in the aim of this study (Section 1.1), which is to develop a rich understanding of the factors that impact on construction management academics' day-to-day and longer-term activities. In so doing the study harnessed the phenomenological hermeneutic approach that has become popularised in some domains as "lived experience" studies. This aim is underpinned by the following objectives

Obj 1. To identify the changes and challenges impacting on tertiary construction management education

Others have investigated the generic changes and challenges that have affected university education in Australia (Australian Government, 2009; Bexley, et al., 2011; Bradley, et al., 2008; Brown, Goodman, & Yasukawa, 2010; Coates & Goedegebuure, 2010; Cowley, 2010; Gottschalk & McEachern, 2010; Hugo, 2005; R. James, Bexley, Devlin, & Marginson, 2007; Kimber, 2003; Percy, et al., 2008), but those that apply specifically to the discipline of construction management have yet to be identified and explored. Some of the generalisations about academic staff may not apply to those in the construction management discipline in Australia. Such approximations may lead to ill-conceived decisions and actions. The challenges that face the discipline warrant detailed investigation so that future actions can be targeted and well informed.

Obj 2. To identify interrelationships between these changes and challenges

The pace and volume of the changes and challenges experienced in university construction management education in Australia is rapid. Changes do not occur in isolation. For example, the Australia-wide shortage of construction professionals (Section 2.5) makes it difficult for universities to attract graduates to academic careers, and in some cases, for universities to retain their existing academic staff. The result is that an industry skills shortage has expanded to become a shortage of academic staff. These difficulties are further compounded by the requirements of the professional bodies that accredit construction management degrees for academic staff to have recent and relevant construction experience. The relationships between these sometimes conflicting requirements are complex, and require detailed analysis if their ramifications are to be understood and catered for.

Obj 3. To explore the implications of these changes and challenges

The ways in which different changes are likely to intersect with each other warrants investigation if a thorough understanding of academics' lived experiences is to be obtained. Not all academics will experience the changes and challenges in the same way. Indeed, in their criticism of experimental quantitative research, Lincoln and Cannella (2004) argue that the "subtle social difference(s) produced by gender, race, ethnicity, linguistic status, or class" need to be considered if outcomes are to be "sensitive to social needs" (p. 7). Educating university students involves complex social interactions, and resolving these into formulaic outcomes is of limited value. Some changes and challenges are likely to work in a compound manner, whilst others may intersect in positive ways. Exploring different scenarios will enable informed views to be developed which should, in turn, improve the merits of subsequent decisions.

Obj 4. To postulate how these changes and challenges affect the current and future lived-experiences of construction management academics

Nuances between the lived experiences of construction management academics will develop a robust and informed understanding of the multi-facetted way in which the changes and challenges affect them. This, in turn, will facilitate a better understanding of the ways in which emerging trends are likely to impact on these academics. This will inform strategic planning in the discipline and allow better-informed decisions to be made.

This chapter reports on the research methodologies and methods by which these objectives have been addressed. It begins with a description of the main research philosophies that underpin investigations of this nature. It then highlights a number of relevant lived experience studies and argues that these provide an appropriate approach for this study. It then provides a description of the origins of these studies, as well as some examples of where they have been applied.

4.3 Research philosophies

This study investigates the lived experiences of construction management academics. To achieve this, it is necessary to explore the environment in which these academics practice (the construction management landscape), as well as the characteristics and opinions of the academics themselves. Data about the tertiary education sector and the environment it

operates in (including demographic data about academic staff and students, curricula, university structures and resourcing) are distinct from the views of those working in the sector (including those of students, academics and industry practitioners). According to Nicholls (2009a), investigations of different paradigms are served by different views of reality. Positivism is one paradigm and stems from a belief that things have essential, positive properties, and that it is the task of investigators

> "to locate these positive (i.e. not imagined) properties and explore the natural laws that govern the universe and everything within it Positivists try to discover the machinery that makes our world work. Their tools of the trade are experiments, and their goal is objectivity (strictly speaking, the ability to see the essence of the thing they are studying)." (p. 528)

Data about the environmental factors that influence construction management tertiary education are therefore appropriate to a positivist interpretation and analysis using quantitative methods. However, this approach has severe limitations where investigations seek to explore factors which motivate academic staff to teach or students to learn. The limitations of quantitative approaches are succinctly summarised by Nicholls (2009a) who states

> "the key tenets of quantitative research – objectivity, value-neutrality, detachment, rationalism, and logical reasoning – work well when we exclude people's subjectivity from the equation, but, when a person's experiences, interconnections with others, or social and cultural systems in which they live, breathe, work, love and play demand attention, quantitative research has some profound limitations" (p. 528).

Similarly, Saks and Allsop (2007) note that quantitative methods are generally concerned with data that is not experientially or socially constructed. They go on to argue that qualitative studies are appropriate where investigations seek to "establish an understanding of people's lives, experiences and the subjective meanings that could explain the process of decision-making and action" (p. 24).

Epistemological approaches other than positivism are appropriate in circumstances where all-encompassing world-views are sought, such as those of academic staff and students. In such a context interpretivism is useful because, as Nicholls (2009a) states that

> "(i)nterpretivism tries to understand what it is to be human. It is associated with a phenomenological tradition that seeks to understand experience through the eyes of the person experiencing it (M Van Manen, 1990) Interpretivists view the objectivity of the world as a subjectively lived phenomenon. Time is lived, the space we occupy is lived, our relationships are lived, our bodies are lived, and are not abstract phenomena amenable to the objective gaze of detached observers (Benner, 1994) Interpretivists come to understand what (a topic means) to people by talking to them, generating texts from interview, and analysing their data phenomenologically (Holloway & Wheeler, 1996)." (p. 530)

4.4 Research methodologies

In his commentary about the evolution of the use of different research approaches by construction management researchers, Dainty (2008) notes that research in this discipline is characterised by "widespread confusion over terms such as 'method', 'methodology'" (p. 2). In the interests of clarity, Nicholls' (2009c) explanation of these terms, which is succinct and illustrative, has been adopted for this study. He likens peoples' individual beliefs in God to personal philosophies, thereby acknowledging the existence of different religions (or, in a research context, the personal preferences researchers may have for positivist, interpretivist or other research philosophies). Thereafter he draws parallels between the day-to-day rituals and ceremonies of these religions and the "methods" (for example, surveys and focus groups) by which these religions (philosophies) are practiced. Finally he observes that an array of guiding principles, rules, prescriptions and imperatives exists between the philosophy and the every-day practices, and that these may be likened to research "methodologies" (such as quantitative and qualitative approaches).

The multi-faceted nature of this study, involving public domain data, as well as the views of different stakeholders, led the author to consider a mixed method research approach (MMR) as an appropriate and effective way to address the aim and objectives of this study. The limitations of quantitative approaches for obtaining rich data about people's opinions are well documented (Dainty, 2008; Greenhalgh & Taylor, 1997; R. B. Johnson & Onwuegbuzie, 2004; Nicholls, 2009a). Similarly, qualitative approaches do not lend themselves to highlighting nuances between sets of numeric data (which represent much of the landscape of construction management tertiary education). This led the author to explore MMR as a way

of combining different research approaches. In the oft-cited review of different researchers' interpretations of MMR, R. B. Johnson, Onwuegbuzie and Turner (2007) state that

> "(t)oday, the primary philosophy of mixed research is that of pragmatism. Mixed methods research is, generally speaking, an approach to knowledge (theory and practice) that attempts to consider multiple viewpoints, perspectives, positions, and standpoints (always including the standpoints of qualitative and quantitative research)." (p. 113)

Naoum (1999) also supports pragmatic approaches, stating that the approach which researchers adopt depends on the purpose of the study, as well as the nature and availability of the information that is required. MMR presented an attractive methodology as it provided opportunities to work with the datasets pertinent to this study.

Lived experience studies as popularised by Van Manen (1990) in his seminal and oft-cited book "Researching lived experience", have gained recognition for studies of this nature. Lived experience descriptions (or "narrative stories") are currently seen as an alternative to theory development, the outcome traditionally expected of qualitative studies. Corbin and Strauss (2008) note that theory development "seems to have fallen out of fashion" (p. 55) and have been replaced by those of lived experiences. Corbin and Strauss go on to acknowledge that not all studies "can or should be reduced to one clever theoretical explanatory scheme" (p. 55). This is the position taken in this study – that its outcomes are best demonstrated by descriptions of the lived experiences of construction management academics. The following section describes the origins of these studies, and provides some examples of where they have been used.

4.4.1 Origins of lived experience studies

As studies that investigate the lived experiences of people are inherently about their personal feelings, opinions and perspectives, it is not surprising that many adopt a phenomenological approach. Phenomenology is derived from the Greek word to 'interpret' and in this context is concerned "with what it means to 'be' human" (Nicholls, 2009c, p. 587). Nicholls goes on to note that phenomenology

> "tells us that we should view each person as unique, and that if we are to understand the unique experiences each person has, we should concern ourselves with their particular world-view. Phenomenologists believe humans are self-determining. This

> means that each of us interprets our world in our own unique way, and what comes to be considered 'real' is entirely idiosyncratic. To study the meaning of reality 'phenomenologically', demands, therefore, that one goes through an exhaustive journey of exploration into the meaning the participant in the study gives to particular facets of reality." (p. 588)

Many researchers of lived experience draw on Van Maanen's (1998) influential work on phenomenology and hermeneutics. Hermeneutics relates to the theory of understanding and interpreting linguistic and non-linguistic expressions (Abulad, 2007; Ramberg & Gjesdal, 2009). The hermeneutic tradition of interpreting texts stretches back to ancient Greek philosophy and emerged as a branch of Biblical studies. An in-depth review of the origins and evolution of hermeneutics is outside the scope of this study, but selected milestones in the development of hermeneutic philosophy are relevant here. In his review of hermeneutics, Abulad (2007) makes three pertinent observations about the pioneering work of Friedrich Schleiermacher (recorded in Bowie, 1998) who argues that understanding has two dimensions: language and thinking. Firstly, he notes that

> "no understanding can take place if one does not think (that implies the thinker) and if one does not have words by which to think (that makes for the language). It is not only that we cannot think without words; it is also that what we try to understand is normally couched in words, whether oral or written" (p. 16).

Abulad (2007) goes on to say that interpretation requires an understanding of language as well as of what was in the mind of the person whose utterances are being studied. The second observation of Abulad (2007) highlights circularity in the act of interpreting texts. He notes that to understand what was said, texts need to be understood in their entirety, which implies that the component parts of it are understood, and vice versa. Thirdly, Abulad (2007) notes Schleiermacher's observation that those interpreting texts need to have a better understanding of the topic in question than the originator. The utterances of those being studied incorporate messages triggered by their subconscious. Schleiermacher's (1998) point is that those interpreting texts need to be able to expose and highlight these subliminal messages.

These points are pertinent to the research design and methodology adopted in this study. It seeks to interpret texts transcribed from the interviews and focus groups conducted with construction management academics, as well as recorded in their responses to open-ended survey questions. The thematic coding and analysis of these texts (described in Section 4.6.3,

Section 4.6.4 and Appendix 6) involved several readings to obtain a comprehensive appreciation of what was said. The interconnected nature of these texts and responses necessitated the circular approach described by Abulad (2007). With respect to surfacing the subconscious thoughts of respondents and participants, it is relevant to note the author's background as a construction management academic since 1988. Whilst this is not a claim that such experience automatically assures the "better" understanding mentioned above, it does attest to the opportunities the author has had to assimilate the different views of his peers. These have enabled the author to explore the sub-text underlying some of the statements made by respondents and participants. In doing so, the author acknowledges that his personal background has necessarily influenced his interpretation of these texts.

An approach frequently adopted by lived experience researchers is one that combines phenomenology and hermeneutics. Many of the lived experience researchers discussed in the next section subscribe to Paul Ricoeur's tradition of phenomenological hermeneutics, the appeal of which is aptly argued by Lindseth and Norberg (2004) who argue

> "it has become obvious that essential meaning is something with which humans are familiar in the practices of life, and this familiarity has to be expressed through the way of living, through actions, through narratives and through reflection. For research purposes lived experience has to be fixed in texts, which then always needs interpretation. We do not believe in 'pure' phenomenology in which essences are seen intuitively, 'uncontaminated' by interpretation. Nor are we interested in 'pure' hermeneutics, i.e. in text interpretation that does not transcend the text meaning to reveal essential traits of our life world." (p. 147)

Lindseth and Norberg (2004) further highlight the potential of phenomenological hermeneutical lived experience studies to affect change. They argue that as researchers interpret texts, the texts influence researchers in the sense that results help to construct new meanings, not only about the research topic but also about the worldview of the researchers. They term this process of applying phenomenological hermeneutical interpretations "appropriation" (p. 151) and argue further that it is incumbent on researchers to communicate these new insights to others. This is what this study endeavours to do.

4.4.2 Application of lived experience studies

Positivist, quantitative research approaches have limitations when applied to personal data. For example, in seeking to alert the medical community to the limitations of positivism, Holloway and Wheeler (1996) argue that "the danger of this approach is that researchers treat perceptions of the social world as objective and absolute and neglect everyday social interpretations and the context of the research" (p. 11). Lived experience studies address these shortcomings and have found application in investigations that seek to expose people's innermost thoughts and feelings. For example, Van der Molen (1996) wrote that "dyspnoea (shortness of breath) is one of the most frightening and distressing symptoms that a patient can experience and, like pain, can only be interpreted and reported by the person experiencing it" (as cited in Nicholls, 2009a, p. 528). Lived experience studies have therefore understandably been used in investigations by the caring professions (such as nursing and occupational therapy). However, they have also found wider application in other domains as highlighted by Corbin and Strauss (2008) who note that "lived experience" (and "narrative stories") (p. 55) have become more popular in recent times.

The following examples illustrate the use of lived experience studies. They show the approaches researchers have used to prompt participants to contribute their thoughts and feelings, and thereby to enable a rich understanding of their experiences to be gained. The approaches described below informed the ways in which the personal perspectives of construction management academics were studied.

> **Ethical studies:** Lindseth and Norberg (2004) investigated ethically difficult situations in the care work of nurses and physicians. They found that these professionals were able to talk about their experiences, but were not usually able to explain their ethical thinking. They went on to argue that this inability is related to peoples' morals, and the internalised manner in which these are played out in their day-to-day actions. They note that
>
> > "you cannot just ask people what morals they have. Often they will not be able to answer. So if you want to investigate the morals of physicians and nurses, the object of investigation is not just openly there, ready to be observed. To gain access to this 'object', you may ask the nurses and physicians to tell stories about situations involving regrettable conduct, something they have done themselves, actions they have participated in or witnessed." (p.145)

This study illustrates the application of lived experience methodologies in surfacing issues that research participants are not objectively aware of. Lindseth and Norberg argue that their phenomenological hermeneutical method of interpretation "can be used for research with the aim to affect people's perception of reality and help them become aware of possibilities, i.e. alternative ways of being in the world" (p. 152).

Patient care: Lived experience studies have found widespread application in the caring professions. Many of these studies seek to understand patients' feelings and experiences. For example, Benzein, Norberg and Saveman (2001) investigated what it meant to hope to recover from terminal cancer. These researchers found that hope was important to terminally ill patients both in terms of providing meaning for the remainder of their lives, as well as for their hope of a dignified death.

Lived experience studies have also been used to explore the relationships between care-providers and their patients. For example, Sundin, Norberg and Jansson (2001) used a phenomenological hermeneutic analysis of the narrative interviews they conducted with care-providers particularly successful in communicating with stroke survivors. In the conclusion to their study, the authors highlight the understanding they gained of the meaning of their lived experiences of the caring relationship that developed between patients with stroke and aphasia and their care providers. They also argue that their study may constitute a basis for further reflections.

Education: Lived experience studies have also been used to inform curriculum development. Kohn and Truglio-Londrigan (2007) used this approach to develop an understanding of the meaning of the lived experience of being a second-career baccalaureate nursing student. They anticipate that their findings will be used in "curriculum development, revision, and implementation" (p. 399).

In a similar vein, Mercado's (1996) lived experience study involved bilingual education, english as a second language (ESL), special education and mainstream english monolingual teachers of varying levels of experience, and prospective teachers entering teaching as a second/third career. Mercado chronicled her participants' experiences learning about and through an integrated literacy/bi-literacy approach. By critically reflecting on everyone's experiences, participants were able to confront their assumptions and beliefs and, although this did not always result in consensual

agreements, Mercado argues that it "may yield understandings about the interrelationship of literacy assessment, instruction, and educational equity" (p. 567).

These examples illustrate the range of uses of lived experience studies. They have revealed issues that participants were not objectively aware of as well as their feelings about deeply personal issues. They have been used to trigger reflective practices, to inform curriculum development and to confront participants' assumptions and beliefs. They show that lived experience studies elicit rich, personal data that researchers interpret in their own way. Lived experience studies are thus most appropriate for an investigation that seeks to understand what it means to be a construction management academic as this study has aimed to do.

According to Sundin et al (2001), the results of lived experience studies should not be generalised. They may, however, be applied to similar situations if the results are decontextualised and recontextualised to the current context (Ricoeur, 1976). Lived experience literature emphasises the individual nature of researchers' interpretations – it is simply one of several that are possible. Sundin et al (2001) note that a researcher's interpretation "is never a mechanical reproduction of an objectively given meaning; on the contrary, it always includes a creative, constructive component. This determines different interpretations of the same text" (p. 319).

Both Sundin et al (2001) and Abulad (2007) refer to the seminal work of Gadamer (1975) who observes that understanding the deep meaning of experiences presupposes a "fusion of horizons" (with one horizon being that of the author of a text, and the other horizon being that of the person interpreting the text). The horizon of different interpreters naturally varies depending on many factors including backgrounds and cultures. The meanings that different interpreters attach to texts combine the past and the present and those judging the results of these interpretations should be judged taking into account the authors' pre-understandings. In this connection the author has worked as a full-time construction management academic at different universities in different continents and in developing and developed economies. His life experiences have influenced the manner in which the data in this study have been interpreted, and reflective passages have been included in this thesis to acknowledge his personal perspective.

4.5 Research methods

4.5.1 Qualitative methods

Qualitative data is data about human behaviour and thought. The methods of collecting qualitative data are relatively straightforward (Nicholls, 2009b, 2009c). Figure 4.1 provides a graphical taxonomy of these methods, showing three main qualitative techniques: indirect observations, direct observations and elicitation.

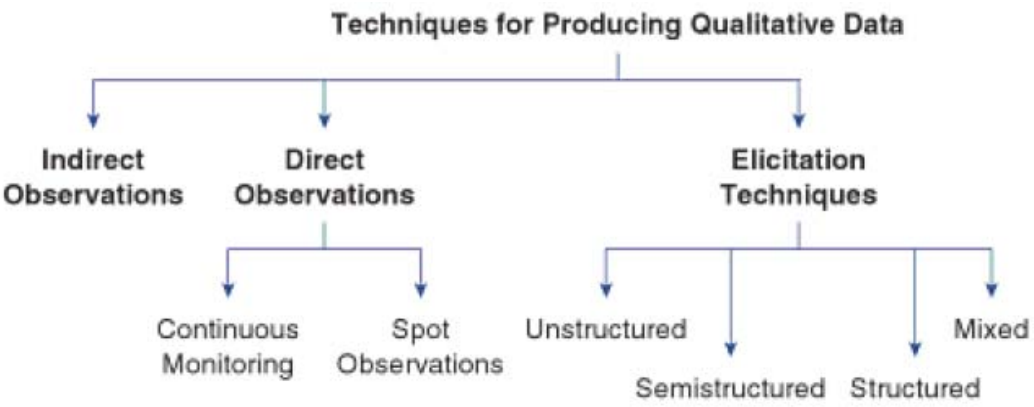

Figure 4.1: Taxonomy of qualitative data collection techniques (Bernard & Ryan, 2010)

Indirect observations involve studying evidence of human behaviour, feelings and thoughts, analysing archival data, and reanalysing data collected for other projects (Bernard & Ryan, 2010). Nicholls (2009b) refers to this technique as "document analysis" (p. 642) and notes that a document may be any form of text that conveys meaning. In the context of this study, the documents considered included universities' websites, websites of the professional institutions that accredit construction management programs, as well as various publications these institutions allow the general public to access.

Direct observations may be either **continuous** or **spot** observations. Continuous observations involve researchers watching what people or groups of people do, and recording their behaviour as accurately as possible. Spot observations are similar except that they involve researchers noting what occurs at specific intervals in time (Bernard & Ryan, 2010). Nicholls (2009b) extends the aforementioned definitions by distinguishing "non-participant" observation from "participant" (p. 641) observation. Non-participant observation is where researchers attempt to remain detached from the

participants they are observing. Nicholls highlights the futility of such endeavours stating that

> "observations depend on one's own perspective (literally and metaphorically), and the act of observing someone can have a profound effect on the people being observed. Consequently, there is no way that anyone can ever undertake observations with quantitative objectivity" (p. 641).

The aforementioned quote emphasises the impact researchers have on the qualitative data they collect. How a researcher behaves affects the way participants respond. According to Finlay (2002),

> "(m)eanings are seen to be negotiated between researcher and researched within a particular social context so that another researcher in a different relationship will unfold a different story. Research is thus regarded as a joint product of the participants, the researcher, and their relationship: It is co-constituted." (p. 531)

Examples of observation in a study of this nature include reviewing the manner in which lectures are conducted, and evaluating the approaches used by academic staff when facilitating online tutorial activities. However, these approaches present practical as well as professional difficulties and were not used in this study.

Elicitation (or interviewing) is a technique widely used to collect qualitative data (Bernard & Ryan, 2010; Naoum, 1999; Nicholls, 2009b). Various forms of interviewing are highlighted in Figure 4.1 including unstructured, semi-structured and structured interviews, as well as interviews which mix these approaches. Interviews are widely used in studies that seek to understand the lived experiences (Nicholls, 2009b, p. 640) of those being studied. They are thus suitable and appropriate for a study which seeks to understand the views of academic staff about the issues that affect their working lives.

4.5.2 Quantitative methods

Some data are not readily analysed in textual format. Examples of such quantitative data in the context of this study include the demographics of respondents, the number of times they

were promoted, and the number of courses they taught. These data were used as a backdrop for the qualitative investigations that followed.

The analyses that are conducted on quantitative data seek to prove or disprove hypotheses and generally conclude with highly specific outcomes that, on first inspection, are only applicable to a very discrete population (Carpenter & Suto, 2008). However, this study has drawn from an inductive research paradigm where predominantly qualitative data have been collected with no hypothesis in mind. As such, there are no hypotheses which these data are intended to address. These quantitative data are intended to provide a frame of reference against which the qualitative data can be evaluated and analysed.

Descriptive statistics (School of Psychology University of New England, 2000) are appropriate methods for working with such data and allow them to be interpreted in conjunction with qualitative data. Descriptive statistics measure and describe the "characteristics of groups without drawing inferences about the population in general. They summarize or profile a data set" (Decision Analyst, 2011). Examples of the descriptive statistics used in this study include arithmetic averages and rankings of scores.

4.5.3 Mixed methods research

The qualitative and quantitative methods used in this study included an online survey, a review of resources in the public domain, as well as interviews and focus groups (Figure 4.2). These data were collected for an Australian Learning and Teaching Council (ALTC) funded discipline-based initiative (DBI) (Williams & Sher, 2007).

Methodologies	On-line survey	Public domain	Interviews	Focus groups
Qualitative	Academic staff		Heads of Schools	• Academic staff • Professional institutions • Students
Quantitative	Academic staff	• DEEWR data • Websites • Publications		

Figure 4.2: A matrix of the nature and sources of the data

This combination of data predisposed this study to MMR, as defined by R. B. Johnson, et al (2007)

> "Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration." (p. 124)

The data shown in Figure 4.2 are predominantly qualitative and have thus shaped the nature of the MMR approach used. Drawing again on R. B. Johnson et al's (2007) work, and referring to Figure 4.3, this research is categorised as "qualitative dominant" according to the following definition

> "Qualitative dominant mixed methods research is the type of mixed research in which one relies on a qualitative, constructivist-poststructuralist-critical view of the research process, while concurrently recognizing that the addition of quantitative data and approaches are likely to benefit most research projects." (p. 125)

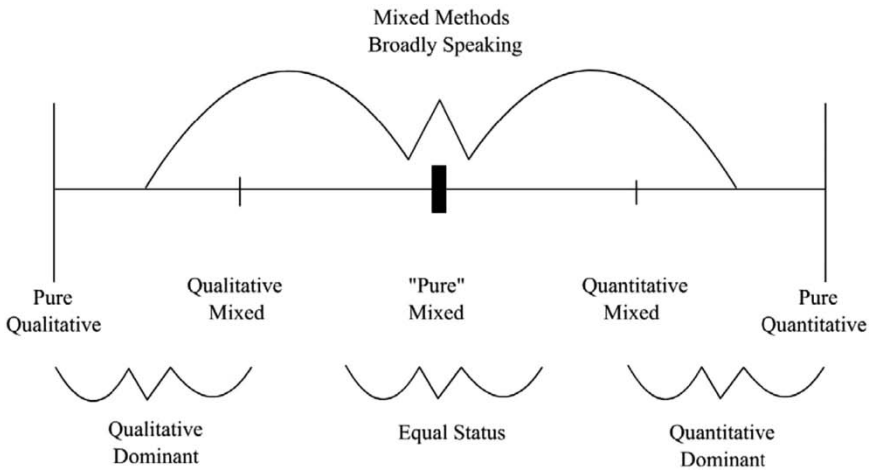

Figure 4.3: The three major research paradigms, including subtypes of MMR (R. B. Johnson, et al., 2007)

MMR allowed the author to analyse these data (Figure 4.2) in a more insightful and robust manner to that used in the ALTC DBI. None of the qualitative data elicited from the online survey were used in the ALTC DBI reports and book (Williams, et al., 2010; Williams, et al., 2009). Time and resource constraints confined the use of these data to that of providing

stimuli for the supplementary prompts that were used in the semi-structured interviews and focus groups.

In contrast, this study harvested the similarities and differences apparent in these two datasets. Responses to the open-ended questions posed in the online survey were compared and contrasted to those elicited from the interviews and focus groups. The quantitative data obtained from public domain sources, as well as from the online survey provided a context in which expressions of participants' views were analysed. This melding of qualitative and quantitative sources is in line with the recommendations of Green, Kao and Larsen (2010) who state that they "advocate the use of quantitative analysis techniques where appropriate and would contest the common assumption that interpretive research is solely dependent upon qualitative methods" (p. 120).

MMR may be used for different applications. Onwuegbuzie and Leech (2004) refer to the work of Greene, Caracelli, and Graham (1989) who identified five general purposes of such studies as follows

> "(a) triangulation (i.e., seeking convergence and corroboration of findings from different methods that study the same phenomenon); (b) complementarity (i.e., seeking elaboration, illustration, enhancement, and clarification of the findings from one method with results from the other method); (c) development (i.e., using the findings from one method to help inform the other method); (d) initiation (i.e., discovering paradoxes and contradictions that lead to a re-framing of the research question); and (e) expansion (i.e., seeking to expand the breadth and range of inquiry by using different methods for different inquiry components). As observed by Greene et al. (1989), every mixed methodological study can be classified as having one or more of these five purposes." (p. 770).

In this study, qualitative data from the online survey were used to confirm some of the findings of the interviews and focus groups. Using Greene et al's (1989) aforementioned categorisations, this study used MMR to triangulate as well as to complement the qualitative results of the online survey with those of the interviews and focus groups. According to R. B. Johnson et al (2007), the origins of triangulation are attributed in the social science methodological literature to Campbell and Fiske (1959). Campbell and Fiske "introduced the idea of triangulation in which more than one method is used as part of a validation process

that ensures that the explained variance is the result of the underlying phenomenon or trait and not of the method (e.g., quantitative or qualitative)" (p. 113).

To locate the approach used here within that of the methodological literature, the work of Morse (1991) is useful as it offers informative categorisations of methodological triangulation. She uses the term "simultaneous triangulation" where qualitative and quantitative methods are used simultaneously, but there is limited interaction between the two sources of data during the data collection stage. She extends this categorization by adding that the findings from each source are found to complement each other at the data interpretation stage. Similarly, Curtin and Fossey (2007) note that different research strategies offer additional unique perspectives on the phenomenon being studied. This aptly describes the processes that were adopted in this study. As illustrated in Figure 4.4 qualitative data were initially obtained through the online survey of academic staff. The subsequent interviews and focus groups provided further qualitative data elicited from similar and different populations (including heads of schools (HoSs), academic staff, undergraduate students and representatives from the accrediting professional institutions). The juxtaposition of these datasets allowed instances of agreement and complementarity to be identified that aligned with the approach proposed by Greene, et al (1989).

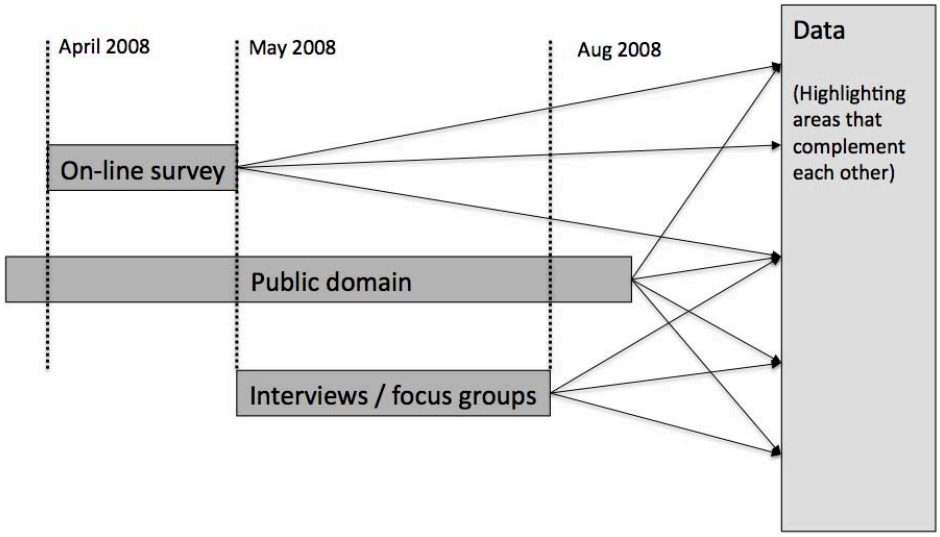

Figure 4.4: Sources and timing of data collection activities

Data collection occurred in accordance with international standards of ethical human research (National Health and Medical Research Council, 2009). Confirmation of ethics approval by The University of Newcastle (approval number H-2008-0042) is included in Appendix 2.

4.5.4 Online survey

An online survey of academic staff teaching construction management at Australian universities was conducted during April and May 2008. The aim of the survey was to identify issues affecting the provision of construction management education in Australia. The survey was piloted with a small number of academic and research staff in the School of Architecture and Built Environment at The University of Newcastle.

The survey targeted construction management academics. Only full-time employees were invited to participate as they were responsible for developing, structuring and delivering the courses they taught as well as for the nature, content and structure of their program.

Sessional (casual and/or part-time) staff also teach into construction management programs, but are generally only engaged to provide guest lectures, deliver tutorials and/or assist in marking assignments. This ad hoc involvement potentially compromises their ability to offer well-informed responses to questions about aspects of the construction management education they are involved in delivering, and they were therefore not invited to participate in the survey. Non-academic, administrative staff were similarly not invited. Whilst these staff make significant contributions to these programs, they are not responsible for developing, structuring and delivering courses to students, and may not have the background knowledge and experience to respond to some of the questions asked in the survey.

Respondents were sought through university web-pages. However, it proved difficult to identify academic staff teaching construction management as it was not clear from these web-pages whether the staff listed as members of construction management disciplines actually taught these courses. A list of the names of academics working at each university was therefore sent to the respective heads of construction management disciplines / departments, requesting that they confirm that those listed were full-time, long-term or contract academics primarily responsible for teaching undergraduate construction management students. Following this confirmation, 116 construction management academics were invited to complete the online survey. This population of full-time construction management academic staff teaching in Australia was surveyed. In this regard, Cook, Heath and Thompson (2000) observe that "if we capture all or almost all of the population, our samples must be representative" (p. 821). The responses obtained are thus representative of the population.

An initial invitation to staff to participate was followed by four subsequent reminder emails, and some additional anomalies in participant eligibility became apparent at that time. Sixty-

three responses were received (corresponding to a response rate of 54%). With regard to response rate, Kerlinger (1986) (cited by Cook et al (2000)) suggested that mail surveys with "returns of less than 40 or 50 percent are common" (p. 826). A response rate of 54% for an internet based survey may thus be considered as substantial as Cook et al (2000) also note that "response rates for e-mail and Web-based surveys may not yet match those of other methods" (p. 824). This view is endorsed by paper surveys yielding higher response rates than online surveys (Sax, Gilmartin, Lee, & Hagedorn, 2008). This echoes the more recent observations that postal surveys achieved higher rates than email surveys (Shih & Fan, 2009).

The survey was delivered using in-house online survey software by the Corporate Information division of The University of Newcastle. Data were analysed in Microsoft Excel and QSR NVivo (QSR, 2008). The survey comprised approximately 40 questions and is included in Appendix 3.

4.5.5 Public domain data

Historical data pertaining to the enrolment patterns of construction management students were sourced, on request, from DEEWR for the period 2001 to 2006. In addition, historical data relating to the evolution of the courses taught in construction management curricula were sought from several sources. University handbooks and websites were reviewed but, in the main, these only provided details about the programs being offered at the time. Furthermore, each university presented their data in their own format, compounding the difficulty of interpreting the data. Past editions of the tertiary course guides published by the AIQS (similar to AIQS (2010)) were subsequently reviewed but some of the data they contained were found to be ambiguous. Attempts were made to access the annual reports construction management programs submit to AIB, but these were deemed not to be in the public domain by AIB[3]. Nevertheless, collectively the data obtained were deemed to provide an overview of the trends, changes and developments that occurred over the past six years, including the size of student intakes for each year, the number of students that graduated, and the changes that

[3] In this connection it is interesting to note observations made in publications of the ALTC DBI in architecture (Ostwald & Williams, 2008). These highlight the availability of data from the Royal Australian Institute of Architects and the Association of Architecture Schools in Australasia about the architecture programs available in Australia going back at least 15 years.

were made to curricula. These data sets were managed in a Microsoft Access database and presented using Microsoft Excel.

4.5.6 Interviews and focus groups

The views of HoSs, academic staff, representatives of the professional institutions that accredit construction management programs (AIB, AIQS ans AIBS) and students were obtained through semi-structured interviews and focus groups. A total of 136 individuals were consulted. A total of 39 events (shown in Table 4.1) were conducted between May and August 2008. Staff and students at eleven of the 12 universities offering construction management degrees at the time agreed to participate in the study (see Table 4.2).

Table 4.1: Number and category of participants in data collection events

Data collection event	Participants	Number of events	Participants		
			Male	Female	Total
Interviews	HoS	20	19	1	20
Focus groups	Academic staff	10	28	2	30
	Students	8	79	7	86
	Professional bodies	1	2	1	3

Table 4.2: Interviews and focus groups conducted

Activity	Location
1 Interview / focus group *	University of South Australia
2 Interview / focus group *	Curtin University of Technology
3 Interview / focus group *	The University of Newcastle
4 Interview / focus group	Queensland University of Technology
5 Interview / focus group	Bond University
6 Tele-conference	Central Queensland University
7 Interview / focus group *	RMIT University
8 Interview / focus group *	Deakin University
9 Interview / focus group	University of Technology, Sydney
10 Interview / focus group	University of Western Sydney
11 Interview / focus group *	The University of Melbourne
* conducted by other researchers	

Undergraduate programs recruit students from school and some are under 18 years of age during the first year of their studies. The National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council, 2009) has stringent requirements that govern the administration of interviews and focus groups with minors, and it was therefore decided to exclude these students from the study.

4.5.6.1 Semi-structured interviews

Research interviews can be structured, semi-structured or unstructured. Structured interviews tend to be "didactic, one-sided and positivistic" (Nicholls, 2009b, p. 640), whilst unstructured interviews provide "the most data dense interviews" (Corbin & Strauss, 2008, p. 27) but may result in interviews that "proceed aimlessly; meandering through whatever topic the interviewee cares to bring up" (Nicholls, 2009b, p. 640). Semi-structured interviews are the most common in qualitative research. With this approach, investigators conduct interviews based around sets of pre-defined broad questions. They keep to a recognisable plan, but allow themselves the flexibility to deviate according to the responses provided by the interviewees (Bernard & Ryan, 2010; Nicholls, 2009b). Barriball and While (1994) argue that semi-structured interviews are appropriate when exploring the perceptions and opinions of respondents about complex and sometimes sensitive issues as the approach permits investigators to probe for more information and clarification as and when this is needed. Semi-structured interviews were used in this study. The questions and prompts shown in Table 4.3 were used in semi-structured interviews with the various HoSs.

4.5.6.2 Focus groups

Powell and Single (1996) define a focus group as "a group of individuals selected and assembled by researchers to discuss and comment on, from personal experience, the topic that is the subject of the research" (p. 499). They go on to explain that it is a technique that allows researchers to guide discussions to generate "the rich details of complex experiences and the reasoning behind [an individual's] actions, beliefs, perceptions and attitudes" (Carey, 1995). Similarly, Nicholls (2009b) observes that focus groups seek to bring together the different opinions of participants and "to explore a plethora of viewpoints they look for richness, diversity and breadth" (p. 642).

The prompts that were used to guide the focus groups with academic staff are shown in Table 4.4, whilst those that were used for students are shown in Table 4.5. No specific prompts

were developed for the focus group with representatives of the accrediting professional institutions, with the topics shown in Table 4.4 being used to guide these discussions.

Table 4.3: Semi-structured interview guide for HoSs

1) Construction Management Education Can you tell me about your experience of construction management education now compared to five years ago? Prompts: Possible Changes - higher education reform, technology, students, time management, patterns of students' employment, student attitudes. **2) Teaching and Learning** What is your role as an academic in the construction management discipline? What do you feel are the biggest issues facing construction education today? Prompts: Values, attitudes, resources, economics, culture, bias, cost, roles of others, workload, information technology, class sizes, course structure, academia versus the profession, teaching versus research, the curriculum and course structure. **3) Research** How important is research in academia to construction management disciplines? Prompts: Past, present, future, publications, teaching and research. **4) Future Change** What do you believe is the future of education in schools of construction? Prompts: Technological and social change, improvements need to be made. **5) Questions** Is there anything else you would like to add? Do you have any questions for the researcher?

Table 4.4: Semi-structured focus group guide for academic staff

1) Construction Management Education
Recount your experiences of construction management education now compared to five years ago
Prompts: Possible changes - higher education reform, technology, students, time management, patterns of students' employment, student attitudes.

2) Teaching and Learning
What is your role as an academic in the construction discipline?
What do you feel are the biggest issues facing construction education today?
Prompts: Values, attitudes, resources, economics, culture, bias, cost, roles of others, workload, information technology, class sizes, course structure, academia versus the profession, teaching versus research, the curriculum and course structure.

3) Research
How important is research in academia to construction management disciplines?
Prompts: Past, present, future, publications, teaching and research.

4) Future Change
What do you believe is the future of tertiary education in schools of construction?
Prompts: Technological and social change, improvements need to be made.

5) Questions
Is there anything else you would like to add?
Do you have any questions for the researcher?

Table 4.5: Semi-structured focus group guide for students

1) Construction Management Education
Can you tell me about your educational experiences of construction management education comparing present teaching processes to the past?
Prompts: Technology, teachers' time, space, curriculum, importance, time, part time study/working, e-learning.

2) Teaching and Learning
What is your experience of both the teaching and learning of construction management methods?
In what modules have you encountered difficulties?
What do you like/dislike about construction management education?
What do you feel are the issues confronting construction management disciplines?
What are your views on your compulsory industry experience which is required in the final year of your studies? (How are they progressing with their employment? How difficult was it for them to organise industry experience? Are you being paid? Does University support you in anyway whilst they are completing industry experience? Is industry experience valuable or a waste of time?)
Prompts: Values, attitudes, resources, economics, culture, bias, cost, roles of others, workload, information technology, online subjects, class sizes, work experiences versus virtual work experience, academia versus the profession, teaching versus research projects, the curriculum and course structures, group work.

3) Future Change
What do you believe is the future of education in schools of CMQSBS education?
Prompts: Technological and social change, improvements, 3 year degrees, trimesters.

4) Questions
Is there anything else you would like to add to the discussion?
Do you have any questions for the researcher?

4.6 Data collection, management and analysis

This section describes how data were captured, managed, coded, reviewed and analysed. Bernard and Ryan (2010) observe that this stage involves applying methods for finding and laying out patterns of data, and presupposes that these data are in digital form.

4.6.1 Data capture

The recording of qualitative data is a well-entrenched practice (Barriball & While, 1994; Bernard & Ryan, 2010; Nicholls, 2009b; Silverman, 2010) and all interviews and focus groups were audio recorded. Several members of the ALTC DBI team conducted these events (Table 4.2), but no individual researcher attended all of them. All team members used the prompts in Table 4.3, Table 4.4 and Table 4.5 to guide their interview and focus groups. This ensured that all researchers conducted these activities in a similar manner.

Bernard and Ryan (2010) emphasise the importance of listening to recordings as a means of gaining an appreciation of the "context and nuances they contain" (p. 48). These recordings afforded the researchers, who were not present at an event, opportunities to gain a rich understanding of what was said and to discuss these with their colleagues.

The recordings were subsequently transcribed. Transcription is onerous and error-prone (Kowal & O'Connell, 2004) and the "opportunities for error are 'various and infinite.' " Dey (2005) quoting Gibbon (1960) (p. 77). According to Easton, McComish and Greenberg (2000), in an ideal situation "the researcher should also be the interviewer and the transcriber" (p. 707). This was not possible in this study due to time constraints and other responsibilities of some of the researchers. All recordings were transcribed using an external professional transcription service provider. Easton, McComish and Greenberg (2000) are supportive of such an approach, observing that transcription errors may be avoided if the services of professional transcribers are employed. They argue that these professionals "have a high degree of accuracy in the transcription process" (p. 707).

4.6.2 Data management

The transcribed interviews and focus group discussions were uploaded to NVivo (QSR, 2008), qualitative data analysis software. The advantages of this computer application was identified by Silverman (2010) as the speed with which large volumes of data may be handled, the improved rigour with which these studies may be conducted, and the facilitation of investigations by teams of researchers. However, Silverman questioned the advantages of

such applications compared to modern word processing software, whether they influence the nature of analysis that researchers conduct, and the usefulness of the software with small volumes of data. Hutchison, Johnston and Breckon (2010) argue that the efficiency of data analysis can be greatly enhanced if computer systems are used to record, sort, match and link data. NVivo was used as a reservoir for all the qualitative data obtained for this study, and as a means of facilitating coding and manipulating data, as described in the following sections.

4.6.3 Data coding

Using the procedures described by Bernard and Ryan (2010), themes were identified in the qualitative data. Bazeley (2009) notes that the terms *theme, category* and *concept* are used by different authors in different ways. Indeed, Morse (2008) offers different definitions of categories and themes and draws attention to the differences she sees between these terms. In this study, the word theme has been used to describe elements which have been identified from the transcribed text.

Codes were used to identify (or tag) data that corresponded to a theme (Bernard & Ryan, 2010). The themes that were identified thus evolved from inspection of the data. This is accepted practice, as Bernard and Ryan (2010) state "there's no way to anticipate all the themes that will come up before you analyze a set of texts" (p. 56). Collaizzi (1978) (as cited by Nicholls (2009b)) refers to this step as an "initial reading where the raw text is read, listened to, or viewed a number of times. A form of 'naïve' coding is applied. This coding represents the first, un-reflexive ideas of the reader (hence the word 'naïve' – which is not meant to imply ignorance)" (p. 643 – 644).

Subsequently, and in accordance with the protocols suggested by Nicholls (2009b), the transcribed text was scrutinised more closely. The codes were revised to "ensure the researcher's ideas are reasonably based on the data" (Nicholls, 2009b, p. 644).

Some approaches to the coding of qualitative data advocate the development of lists of codes (or codebooks) (Bernard & Ryan, 2010)) before coding is embarked upon. In these instances, researchers develop codes based on the concepts documented in relevant literature. However, no a priori codes (Bazeley, 2009) were developed in this study so as not to constrain the nature of the themes that were identified. Notwithstanding this, the author acknowledges that the questions and prompts (Table 4.3, Table 4.4 and Table 4.5) used during

the data capture events guided participants' responses, and that these questions and prompts will have influenced the responses which participants provided.

4.6.4 Data analysis

Data analysis involves exploring data to locate patterns and then identifying ideas that assist in explaining the occurrence of these patterns (Bernard & Ryan, 2010). Bernard and Ryan (2010) argue that analysis continues throughout all qualitative research efforts as researchers develop ideas, test them against their observations, and then modify their ideas, re-test them and so on. This was the process followed by the author. The results of the online questionnaire were reviewed first. The quantitative data (including the age of participants, their qualifications, teaching responsibilities and number of promotions) were then used as a backdrop against which the responses to open-ended questions were considered. These results were used to inform the interviews and focus groups which were administered shortly thereafter. Subsequent analysis involved iterative reviews of all data (Greenhalgh & Taylor, 1997; Hutchison, et al., 2010).

The procedures align with those advocated by Ricoeur (1976) and adopted by many lived experience researchers (including Benzein, et al., 2001; Kohn & Truglio-Londrigan, 2007; Lindseth & Norberg, 2004; Rasmussen, Sandman, & Norberg, 1997; Sundin, et al., 2001). They involve a "naïve reading, the structural analysis, and the comprehensive understanding" (Sundin, et al., 2001, p. 311). Furthermore, this combination of qualitative and quantitative research methods is recognised by Green et al (2010) as appropriate for a contextualist investigation of this nature.

Participant codes were used to identify HoSs, representatives of the accrediting professional institutions, academic staff and students. ***Theme codes*** were used to describe elements identified from the transcribed text. The data manipulation facilities provided in NVivo are comprehensive and flexible, and allowed data to be presented in two-dimensional matrices (an example of which is shown in Table 4.6. Appendix 4 provides matrices for all the codes used to analyse the interview and focus group transcripts), thereby highlighting the frequencies of participants' responses relevant to a particular theme code. NVivo uses specific terminology to identify themes and participants, and this has been used from this point onwards. The term 'free node' refers to a single theme code, whilst 'tree node' is used when referring to a collection of free nodes. For example, in Table 4.6, nine free nodes relating to accreditation were collected within the tree node of 'accreditation'.

Table 4.6: Frequency of *accreditation* codes within the *accreditation* tree node

	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Accreditation - general	15	4	1	9	0	*29*
Accreditation - resrictions imposed by	5	1	0	2	0	*8*
Accreditation - multiple	5	0	0	2	0	*7*
Accreditation - work preparing for	3	0	0	3	0	*6*
Accreditation - measurement	3	0	0	2	0	*5*
Accreditation - institutes specifiying industry needs	3	1	0	0	0	*4*
Accreditation - definition of rqumnts	1	0	0	1	0	*2*
Accreditation - ind experienced staff	0	0	0	1	0	*1*
Accreditation - unis aren't producing rqd product	1	0	0	0	0	*1*

Bernard and Ryan (2010) further argue that the more themes that are identified the better. The rationale for their assertion is that researchers evaluate the importance of themes at a later stage. Inadequate theme identification at an early stage will therefore undermine subsequent analysis. The 13 themes (or tree nodes) that were identified are shown in Table 4.7.

Table 4.7: Tree codes used to classify qualitative data

1.	Accreditation
2.	Assessment
3.	Class size
4.	Curriculum
5.	Discipline-related matters
6.	Funding
7.	Image of construction
8.	Industry
9.	Online delivery
10.	Staff
11.	Students
12.	Teaching
13.	Work integrated learning

According to Dey (2005) "there is no single set of (themes) waiting to be discovered. There are as many ways of 'seeing' the data as one can invent" (p. 117). This was apparent in this study as the themes identified in the ALTC DBI project (Table 4.8) differ in number and, in some cases, in nature from those derived by the author for the same data (See Table 4.7 and Appendix 4). Other researchers have also derived different themes from the same data. For example, Jehn and Doucet (1996) used three different techniques with the same data and produced a different set of themes with each technique. It is thus not unusual for the same data to generate different themes. Indeed, it would be surprising for different researchers to

produce identical themes, as this would contradict the interpretivist approach on which qualitative studies of this nature are based.

The sequence and method of coding that was adopted is illustrated in Figure 4.5. This shows that the transcripts of the 39 interviews and focus group discussions were reviewed and that (169) free nodes were identified. These were subsequently allocated into the 13 tree nodes (or themes) (also shown in Table 4.7). The next stage of analysis involved reviewing all of the data within each tree node and annotating sections of text with notes that related to relevant concepts. These activities paved the way for the final stage of analysis, that of an exposition of the lived experience of construction academics. This is provided in Section 4.7.

Table 4.8: Themes and sub-themes used in the ALTC DBI project (Williams, et al., 2010, p. 50)

Primary Nodes	Secondary Nodes
Accreditation	Benchmarking Cumbersome
Curriculum	Discipline status Curriculum fragmented New program
Gender	
Industry	Industry experience
Staff Issues	Workload Promotion Recruitment issues Large classes
Students	Attributes of Generation Y (members of the population born between 1978 and 1994) Students working whilst studying
Teaching and Learning	Teaching versus research Practical experience On-line learning Group work Face to face Assessment
University	Lack of resources Research Future change Playing the game

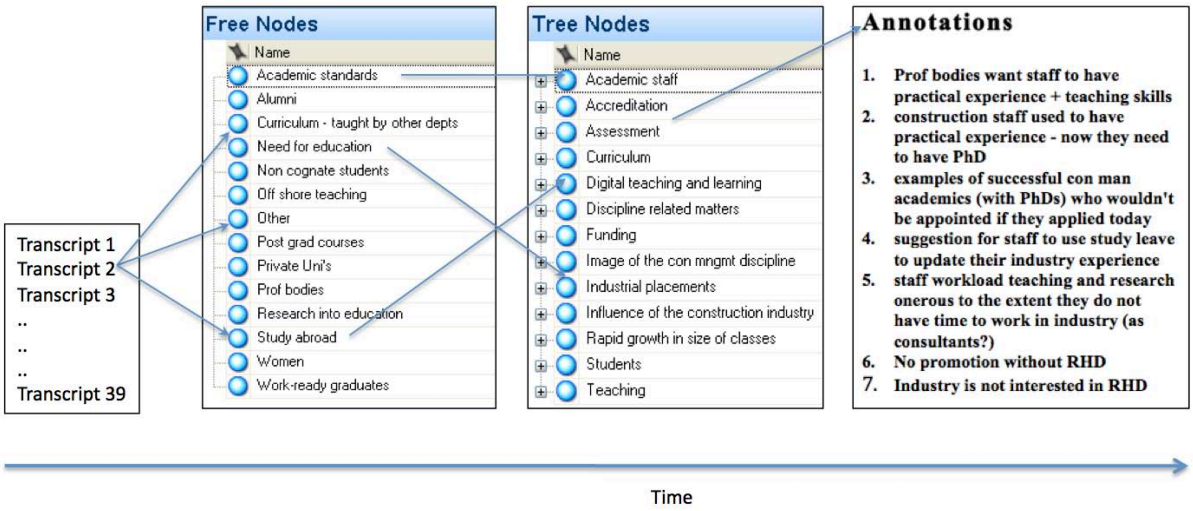

Figure 4.5: Method of coding qualitative data

4.7 Lived experience of construction management academics

Qualitative research is of little value unless it generates theory. Nicholls (2009b) argues that without this "qualitative research is little more than descriptive wordplay" (p. 644). The term "theory" is ambiguous to researchers not grounded in the social sciences and Corbin and Strauss' (2008) definition is helpful in this regard. Citing Hage (1972), they say that a theory

> "denotes a set of well-developed categories (themes, concepts) that are systematically interrelated through statements of relationship to form a theoretical framework that explains some phenomenon The cohesiveness of the theory occurs through the use of an overarching explanatory concept, one that stands above the rest. And that, taken together with the other concepts, explains the what, how, when, where, and why of something." (p. 55).

However, descriptions of lived experiences are viewed by some researchers as alternatives to theory-building. Corbin and Strauss (2008) note that theory-building "seems to have fallen out of fashion, being replaced by descriptions of 'lived experience' and 'narrative stories' " (p. 55). Notwithstanding the esoteric discrepancies between these terms, this study sought to develop a rich understanding of how construction management academics cope with the challenges they face in their day-to-day and longer-term activities. To achieve this, the tree nodes (and related free nodes) shown in Table 4.7 were reconstructed in the framework shown in Figure 4.6. This framework represents the lived experiences of construction management academics as being comprised of the following five domains

- the expectations the construction industry has of undergraduate construction management education,
- the curricula construction management academics teach,
- the approaches they use to teach and assess their students,
- the student body that construction management cohorts are comprised of, and
- how construction management academics are themselves managed and supported.

To facilitate discussion relevant to each of these domains, data previously allocated to the tree nodes (Table 4.7) were assigned to each domain. The manner in which this was achieved is shown in Table 4.9. This shows the frequently occurring tree nodes that were assigned to each domain, which are explored in subsequent chapters.

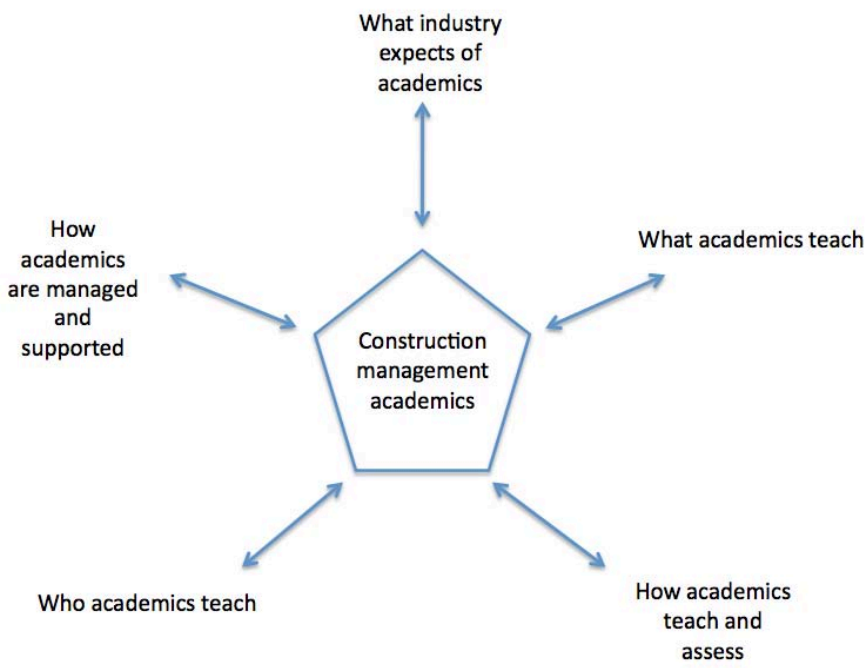

Figure 4.6: Framework of the domains of the lived experience of construction management academics

4.8 Summary

This chapter has described the research philosophy, methodology and methods used to explore the lived experience of construction management academics in Australia. Interpretivist research recognises the existence of multiple realties and is serviced by different research methods to those used in positivist paradigms. However, the nature of this study required approaches that straddled positivist and interpretivist world-views. Obtaining the views of academic staff, students and industry practitioners is best served by different data collection techniques to those required to source, for example, the number of students enrolled

in construction management programs, the age of members of academic staff and similar quantitative data. The varied nature of the data required to address the aims and objectives of this study led the author to adopt a mixed methods research (MMR) approach.

Throughout this study, the terms **participant** and **respondent** have been used deliberately to distinguish between those who contributed to the focus group discussions and interviews (participants) and those who responded to the online survey (respondents).

The following chapters present and discuss the data collected for this study in each of the aforementioned domains (Figure 4.6 and Table 4.9). These include

- the expectations the construction industry has of undergraduate construction management education (Chapter 5)
- the curricula construction management academics teach (Chapter 6)
- the approaches they use to teach and assess their students (Chapter 7)
- the student body that construction management cohorts are comprised of (Chapter 8), and
- how construction management academics are themselves managed and supported (Chapter 9).

Table 4.9: Assignment of themes to lived experience domains

Tree nodes and related free nodes	What industry expects	What academics teach	How academics teach	Who academics teach	How academics are managed
Academic staff					
Academic staff workload					✓
Promotion of con mngmt academics	✓				
Staff industry experience	✓				
Shortage of staff					✓
Accreditation					
Benefits of accreditation		✓			
The challenges presented by accreditation		✓			
Assessment					
Assessment strategies			✓		
Feedback			✓		
Curriculum					
Compartmentalised delivery of courses		✓			
Addressing compartmentalisation of courses		✓			
Multiple accreditations		✓			
New and revised industry practices		✓			
Academic staffing		✓			✓
Integrity of curricula		✓			
Length of construction management degrees		✓			
Digital teaching and learning					
On-campus vs. distance delivery			✓		
Distance-learning / blended-delivery			✓		
Challenges of digital teaching & learning			✓		
Convenience of digital teaching & learning			✓		
Shortcomings of digital teaching & learning			✓		
Digital teaching & learning benefits			✓		
Discipline-related matters					
Vocational nature of con mngmt education					✓
Discipline leadership					✓
Position of disciplines in universities					✓
Funding					
Funding of staff					✓
Quality of facilities					✓
Image of the con mngmt discipline					
Perceptions of the status of construction	✓				✓
General public's perception of con mngmt					✓
Industrial placements					
Problems organising industrial placements			✓		
Assessment of industrial placements			✓		
Influence of the construction industry					
Appropriateness of university education	✓				
Job ready graduates	✓				
Tensions due to multiple accreditations		✓			
Industry / university interaction	✓				
Industry's views on research	✓				
Industry involvement in teaching	✓				
Industry employing students	✓				
Rapid growth in size of classes					
Appropriate facilities					✓
New teaching and learning strategies			✓		
Staff development	✓				
Recruiting & retaining sessional academics			✓		
Students					
Students working and studying				✓	
Extent of workplace involvement				✓	
Impact of employment on class attendance				✓	
Timetabling teaching & learning activities				✓	
Students' motivations				✓	
Teaching					
Balancing workload					✓
Site visits			✓		

5 Industry's expectations of construction management education

5.1 Introduction

The construction industry has a vested interest in promoting and nurturing the development of future generations that will staff its workforce. This chapter considers the implications of this interest for the academics that teach these students. A topic that pervaded many of the observations of participants as well as respondents was that of the vocational nature of the industry. This was manifested by expectations that students be job-ready when they graduate, and that they be taught by academics with relevant first-hand construction experience.

This chapter first of all describes perceptions of the appropriateness of the education students currently receive. Industry's need for job-ready graduates is described next, followed by its interactions with universities, and its involvement in teaching. The requirement for academics to have recent and relevant experience of the industry is explored as well as the difficulties the discipline faces in recruiting such academics. A section that deals with the extent to which industry employs students then follows. The final section explores industry's views of the research that construction management academics conduct. This chapter thus provides key perspectives of the nature and content of the education that students are expected to graduate with, as well as the demands likely to be made of those that teach them.

In the study documented here, the views of the accrediting bodies have been taken to represent those of the construction industry. However, it is important to note the concerns expressed by some academics in Section 6.2.2.2. These record their reservations about the extent to which the professional bodies actually represent the views of the construction industry. Rather than undermine the observations noted in this section, their concerns reinforce the need for constructive communication between industry, professional bodies and universities. As one head of school (HoS) noted "industries' active participation in setting standards and teaching is very limited because they don't fund or they don't actively engage with education bodies." This view was endorsed by an academic who said "I think the main problem is the connection between industry and academia because of the lack of connection between the two."

Notwithstanding these reservations, and in the absence of any other authoritative construction industry voice, the views about and by the professional institutions have been taken to be those of the construction industry.

The data presented and discussed in this chapter are drawn predominantly from the interviews and focus groups that were conducted for this study. The term 'participants' has been used to indicate those who took part in these activities. Supplementary data from the on-line survey has also been used, with the term 'respondents' indicating replies from people who responded to this survey.

5.2 Appropriateness of current university education

Participants expressed a range of views about whether or not universities were graduating students with appropriate knowledge, skills and attitudes. For example, one HoS noted that industry was satisfied with graduates' technical skills but not with their soft skills. He said

> "When I talk to industry and say 'What (should we be) doing more of?' or 'What (are our) students are lacking?', it's not the technical stuff, no one ever tells us they haven't done enough building services or building materials or whatever it might be. It's more the people skills… To be able to stand up and speak, to be able to write letters and communicate with people, talk on the phone and write memos and all those kinds of things."

Another HoS supported the abovementioned comments, saying that the concerns of industry were longstanding ones. He said

> "They were there years ago and I think that they're much the same. It's all the things you would have heard for the last ten or fifteen years; students can't write, apparently. I had one guy tell me that if you put a student in a room for half an hour to write a letter they would just walk out at the end with a blank piece of paper. They certainly can't measure; QS students can't measure. The university doesn't teach them anything. To a certain extent I can understand that when there are 200 (students) in a measurement class, but anyway. You can never get enough practice. What else can't they do? There are lots of other things."

Another HoS was aware that some employers were not satisfied with the university graduates produced by some universities, as the following quote illustrates

> "Speaking with the industry groups, one of the biggest complaints – and they say it's getting worse – is that they're finding people who are coming out, that they have to spend so much time retraining and – they're unhappy with what's coming out of the programs."

Similarly, another participant highlighted responses from an unspecified survey of employers' views about construction management graduates' preparedness for measurement-related tasks. These responses indicated that industry representatives felt that graduates did not meet their expectations, and that they were concerned about the costs of upgrading the skills of these individuals. He said "(o)ne response was if the universities are not producing the goods, then it's not up to the profession to spend money doing their job for them." Another academic, recounting a meeting with a past AIQS president, observed that AIQS was also dissatisfied with graduates, as the following extract shows

> "and I was the only one academic in… there to face the music 'But you know you're just not teaching what we want!' in front of a whole room of people. …(E)ver since I've been on AIQS's Chapter Council it's always been 'You're not doing what we want'."

By way of contrast, other academics argued that industry employed their graduates in a range of occupations and that their adaptability indicated the value industry placed on them. Furthermore, it was observed that most of the graduates from that university were productive from the time they started employment as the following extract shows

> "our students are certainly valued by industry because they're actually getting other industry areas which are not directly mainstream construction and that's becoming known of our students. Because we do turn them out with a fairly well-grounded and broad-based sort of knowledge, so that they can, most of them can hit the ground running, which is what industry wants. They want them to walk out the door and start operating straight away. Most of ours can."

Another academic was also sceptical about the abovementioned concerns of industry. As shown below, he argued that criticism of graduates' skills and abilities came from a vocal minority, and did not reflect more generally held views

> "It's always the case of a squeaking wheel. The employees that yell out, or run to join a committee, are often those who have opinions. They certainly are the tip of the

> iceberg, the rest of the iceberg we never hear from and so they're quite satisfied if you scratch beneath the surface and they rarely come to tell us they're satisfied. They will tell you if they aren't satisfied."

The views highlighted in this section illustrate different opinions about the appropriateness of construction management university education in Australia. This variety of opinion is unsurprising and as one HoS observed, "it's hard to say there's an industry view. Different people in the industry have got different views". However, it is important for construction management academics to feel that their efforts are recognised and respected. The reservations of some industry representatives noted in this section are therefore of concern because these have the potential to de-motivate academics. Shortcomings in manner in which some of professional institutes specify their requirements (Section 6.2) augment these concerns as academics.

5.3 Job ready graduates

Several participants commented on the expectations of industry for job-ready graduates. They noted that many in the quantity surveying profession expected university graduates to be productive from the time they left university and to be able to measure quantities from drawings. For example, one HoS said "(o)n the quantity surveying side there are certainly the quantity surveying people who think we should be turning out people who can measure first and foremost." Other participants provided additional examples of these concerns, as the following quotations show

> "I think sometimes in the industry people there forget what they were like at this level. They expect (students) to be able to come out and measure multi-story buildings on their own."

> "Measurement in QS is probably the biggest one. They want measurement-ready people coming out and we say well we can give the basics but really there is a lot of on-job training here which you are responsible for. There is always tension between those two."

Another HoS reinforced the aforementioned observations, stating "I think there's one professional body (AIQS) that seems to be more than the others interested in us producing graduates who are really work-ready, that they should be able to be productive from day one once they go out and join the industry."

Some participants challenged the view that students should be job-ready by the time they graduate. One HoS observed "I think other professional bodies don't take that (being able to be productive immediately on graduation) as seriously". Similarly, another HoS said

> "Actually the quantity surveying part of the industry is grasping, and has grasped to some extent now, the fact that the university courses have changed. They are university courses, they're not TAFE training and they realise that they actually needed to take some more responsibility for themselves"

Another HoS observed that industry fully expected graduates to have to develop their skills on leaving university. He said

> "industry know(s) what the universities produce in the building line of things and in the quantity surveying line of things. They know that they're going to have to put a bit of time into a student particularly in the year out and perhaps shortly after they graduate."

The willingness of industry to train graduates was illustrated in the results of an unrelated survey conducted by one of the participants and a colleague. This survey investigated graduates' measurement skills and abilities and elicited the following response: "(t)hen the other end of the spectrum was one who said 'just send me smart people, I'll soon teach them to do what I need them to do' ".

Several participants expressed concern at what they saw were the short-sighted views about university education, as expressed by some professional institutions and employers. For example, one academic said

> "But they (employers) come in with a very short term view of skills, knowledge and true education. They want (students) to go ready and equipped into their offices whereas we are trying to broaden their skills and make sure that they are adaptable to any future changes."

Another participant recounted a visit to an AIQS meeting where the vast majority of attendees appeared to value graduates' job-readiness on graduation over their long-term potential. This is illustrated in the following extract

> "A few years ago I went to a strategic planning meeting in Canberra for the AIQS. These are mainly senior people in the profession, directors of firms and that sort of

> people. And I asked the question 'If faced with a choice to employ a highly technical competent person who was not very smart or employing someone who had a lot of vision and motivation and lots of capacity but did not know anything about measurement or construction, which one would you employ?' What do you think they said? 90 per cent of them said one thing. They want the technical person who can do their job and leave the thinking to (the employers). And I was astounded by that."

Several academics argued that university education should be geared to preparing students for more than their employment immediately after graduation. In this connection, a HoS stated

> "I would hate it, and I think the university would too, if we were sending people out who were going to be the perfect practitioner this year but they've been so busy measuring bills of quantities at the university that they'd never look around to see well where is quantity surveying going."

Another HoS noted that employers had a responsibility to continue their graduate employee's education, as the following quote shows

> "a university education is part of the bigger picture of the students' development into the industry. They (the professional bodies) can't expect them to earn lots and lots of money from day one for the company… The companies do have a responsibility to continue educating the students."

In summary, it is apparent that there are tensions between academics' perceptions of the expectations of some employers for job-ready graduates, and the aspirations of some academics who wish to prepare graduates for the longer-term challenges they will encounter in their profession. In particular, several participants highlighted graduates' poor communication skills and the expectation of the quantity surveying profession for graduates with more highly developed measurement skills. Furthermore, tensions were also apparent in the extent to which academics believed that employers were willing to train graduates when they employ them. This section reinforces the concerns noted in Section 5.2 that not being able to meet industry's requirements is potentially demoralising for construction management academics, especially in light of the multiple and sometimes poorly defined requirements of the accrediting professional institutes.

5.4 Industry / university interaction

Accreditation by professional institutions is not the sole approach whereby universities learn of the construction industry's requirements. Most construction management disciplines organise industry advisory committees that meet periodically to discuss issues relating to the degree offered at that university. The frequency and remit of these meetings varies from university to university. Generally they were seen to be constructive events. In this regard, a HoS said

> "(t)wice a year we meet with an external advisory committee. We've got a very strong advisory committee panel, comprising a number of AIB members, an AIQS member, and also industry practitioners. They go through all the recommendation(s), especially accreditation. They look at that. They also look at any curriculum changes, if we have any changes. So we get feedback from them about whether it is appropriate to do some changes"

Similarly, another academic noted

> "At this university we have got advisory boards to a level and degree that I have not seen anywhere else construction management, QS, could be facilities management, property, all those. And the extent of the size of those advisory boards is bigger than I have seen. So we engage probably more (successfully) and more regularly than any other institution. Some pay lip service to it and I have seen that."

Yet another academic said

> "They (the industry advisory committee at this university) get involved in anything relating to the program. We get them to look at curriculum issues. We'll get an annual review done of our programs. The committee will get a copy of that to look through, they'll comment on that. They're helping us set up our relationship for employers, they're helping us with our other accreditations."

In contrast, in some universities the liaison between industry and the university was infrequent and ad hoc. An academic from this university stated that

> "We have no ongoing program of regular meetings or engagement with industry in any form or shape whatsoever. And I think it creates problems for industry as well because all of a sudden we'll run an accreditation review or something and something

> will come up. They want more emphasis on problem-solving or team work or finance stuff, emerging issues in the industry – and it sort of hits us out of nowhere. And often we're not really prepared for this sort of stuff."

Some participants saw industry advisory committees as a source of advice and as potentially powerful lobbying bodies. One HoS stated

> "I think they (industry advisory committees) are a sounding board. I think that they're effectively a group that is supportive of the course when support is needed, like a review of the school or the closing of a programme or something. I think they can bring things to the table about new ideas. If there's some merit in it then we would pick up on it, but they wouldn't advise us that we have to do it. They could advise us. They could go up to the Vice Chancellor and pound the table if something was wrong, I guess. I think that's probably much the same as anywhere else."

Similarly, an academic said

> "It's a good thing to have people who can help, but now I'm tasking (sic) them with putting pressure on the university to provide appropriate resources. We're targeting people who can actually put pressure on the VC and council. I learnt a lot in the US about how to do that, but we haven't been very successful so far, so maybe my techniques from the US won't work here. I don't know, but it's worth a try."

In summary, participants noted that contact between construction management academics and construction industry representatives occurred mainly during industry advisory committee meetings. However, these committees did not operate with the same efficacy at all universities. They were seen to be constructive and helpful in promoting and facilitating discipline-related matters when they occurred on a regular basis and were well organised. The limited extent to which industry representatives and construction management academics reported communicating is likely to have an impact on their understanding of each other's priorities and preferences. It is conceivable that improved communication would affect educational outcomes positively and may also improve industry's understanding of the challenges and pressures of academic life.

5.5 Industry involvement in teaching

Professional bodies and academics recognised the contributions that experienced construction practitioners could bring to teaching. For example, one academic acknowledged the input of industry experts. His preferred ways of harnessing such input was to video these professionals and present these recordings during lectures. He said "(i)n each of your courses, you've got some industry experts that you wouldn't mind having a two minute video clip of. And with research, that's what I'd like. Two minute video clips".

Similarly, a HoS acknowledged the difficulties he was experiencing in delivering the content of certain courses. In these cases he had attempted to obtain industry input, saying

> "I find it hard (in) other units. I get some assistance from the (line manager), but yes it becomes a problem for me. So I must say, I really rely on in-kind contribution from industry, and because it's been so busy in recent years, it's been hard to get"

Furthermore, in response to an open-ended question asking respondents to identify changes to their present circumstances that they wished for, several respondents indicated that they would welcome closer involvement of industry in university teaching. They suggested various approaches that could be used to facilitate this, including part-time teaching by industry practitioners, "holistic and integrated approach(es)" and "Corporate education partnerships".

The professional bodies' representatives were also supportive of industry representatives being engaged in teaching. In the quote below, a representative of the professional institutes reflected on the challenges of engaging experienced construction practitioners in academic careers. He said

> "but what we've seen is a squeeze on funding for PhDs, a loss of career path for academia or income for academia, a raising of the bar for entry points. And industries like ours basically looking at that and saying 'We ain't going to have the bodies to come in because our people aren't like that, our good teachers, our people who can contribute to the industry at this stage in their life, in this way, aren't like that.' "

A wide range of existing industry involvement in teaching was apparent from the data. At one end of the spectrum, when students at one university were asked if there was any industry input into their courses, their response was that this was not the case. At the other end of the

spectrum, a HoS presented a markedly different picture, saying "(w)e actually offer whole subjects that are taught by sessional academics from industry. They take the whole thing, do the lectures, organise the tut's, the assignments, the marking, and set the exam the whole works".

Whilst most participants were supportive of industry personnel being engaged in teaching, one academic highlighted the need for these individuals to be supported in their teaching. He said

> "but let's not discount the fact that, just because you work in industry, you may be able to come in and you might be able to relate to students and you might have current sort of tales and anecdotal stuff, but there does need to be some rigour in there."

Participants were aware that engaging industry personnel in university teaching presented challenges. A representative of the professional institutions felt that the employment practices in place at most Australian universities did not encourage industry practitioners to teach. As the following quotation shows, it was suggested that flexible pathways for teaching-only academics needed to be considered by universities

> "We've also got to look at our focus on tenure and career path for academics. I think maybe if we want to be able to draw readily from that wealth of industry experience that we've got, maybe we need to say some of our teachers may not in fact be career academics, they may be successful practitioners who teach for a proportion of the time and we should be utilising them when we can. And that's not saying that I think for a minute there shouldn't be proper academic career paths and jobs for those that are the core of the university system."

In exploring opportunities for academic staff to update themselves with current industry practices, a suggestion was made for staff to be able to spend periods in industry as part of an exchange. This arrangement was seen to be of benefit to academia as well as to industry. The academic said

> "If a system could evolve where academics interchange with industry people and industry people came into the universities every five years as a mandatory thing, that'd be – you know. I (don't) know how the mechanics could be worked out. But that would be a wonderful partnering arrangement… I mean you'll get some enlightened organisations that may provide a position for the one person perhaps. But how you're

going to do it would be extremely difficult. But private enterprise would learn something about how universities operate".

In summary, there was general agreement that experienced construction practitioners could make valuable contributions to university teaching. Where this occurred, these practitioners needed to be effectively resourced, supported and managed. Such engagements should ensure that professionals familiar with the modern construction techniques exposed students to these practices. This would alleviate some of the concerns about the relevance of what is being taught noted in Section 5.2 and provide valuable assistance to academics not familiar with the practical aspects of some construction techniques. However, engaging industry practitioners in this way requires the involvement of academic staff if it is to be successful. The timing of such industry input needs to be carefully considered for best effect. In addition the topics presented by industry practitioners need to be aligned with course learning outcomes. These activities are time consuming and require well-developed negotiation skills on the part of the academic.

5.6 Industry experience of construction management academics

Engaging construction practitioners as sessional teaching staff (as described above) was seen as a way of addressing the perceived lack of industry experience of some academic staff. This practice was highlighted by a representative of the professional bodies who observed that "(existing academic staff) can bring them in a sessional or casual teacher(s) and a lot of universities do, not through desire at the moment, *but through necessity* [4] "

This emphasises the perceptions of the professional bodies' representatives that some of construction management academics may lack relevant industry experience. Data relating to the extent and currency of participants' industry experience is provided in Section 5.6.2. This section notes the extensive real-world experience of many participants but highlights that, in many cases, this had occurred prior to joining the university sector. It is this likely that such industry experience could be dated due to the time that has elapsed. The following sections explore the recognition such experience attracts, as well as the impact of current recruitment practices and the ways in which staff keep up-to-date with recent developments.

[4] Italics added by author

5.6.1 Recognition of the need for industry experience

There was general recognition and agreement that construction management academics should have relevant and current industry experience. For example, a representative of the professional institutes argued that they wanted academics who were "people who have got practitioner experience as well as people who have the teaching skills."

Several HoSs shared these views. For example, they said

> "I like the utilisation of practitioners into the teaching programs, as opposed to shall we say researchers and people who shall we say have had limited industry experience, because I think that there's a lot of theory that we teach in the various components that make up the programs."
>
> "But it is vital that academics teaching in construction management programs have industry experience. We hold that in high regard. Academics should have industry experience, otherwise there are a number of units they won't be able to teach, or relate to the students the way they want."

Construction management academics were also of the same opinion. Speaking about contract administration (a course in most construction management programs), one academic observed "there are some things that the students can be taught at university to be able to do, so that they are of some financial benefit to the employer quickly. But those staff (who) can do that are actually retiring and people replaced by PhD people".

Another construction lecturer noted the synergies that occurred when academic staff and students have industry experience. He said

> "(I)industry experience is both for students and academic staff. I believe that anyone teaching, academic staff shouldn't be just pure academics. Neither should students be just pure students, yeah. If they have both they can connect – they can find a link or connection between the industry and the – what they learn here. Because not everything can be learned in practice; neither can everything be learned in school. So there's got to be a good mix of both."

There was thus general agreement that industrial experience benefitted academics in their teaching. In this context it is relevant to consider their actual experience that academics have gained in the workplace. This is explored in the next section.

5.6.2 Industry experience of construction management academics

Academics were asked how many years' industry experience they had in the area in which they taught. Figure 5.1 shows that more than half (52.4%) had considerable industry experience (between 6 and 20 years).

In addition, academics were asked how long it was since they worked in industry. Almost two thirds (65.1%) answered that it was more than five years. 11.1% had more recent experience (between 1 and 4 years) whilst 23.8% of respondents did not answer this question.

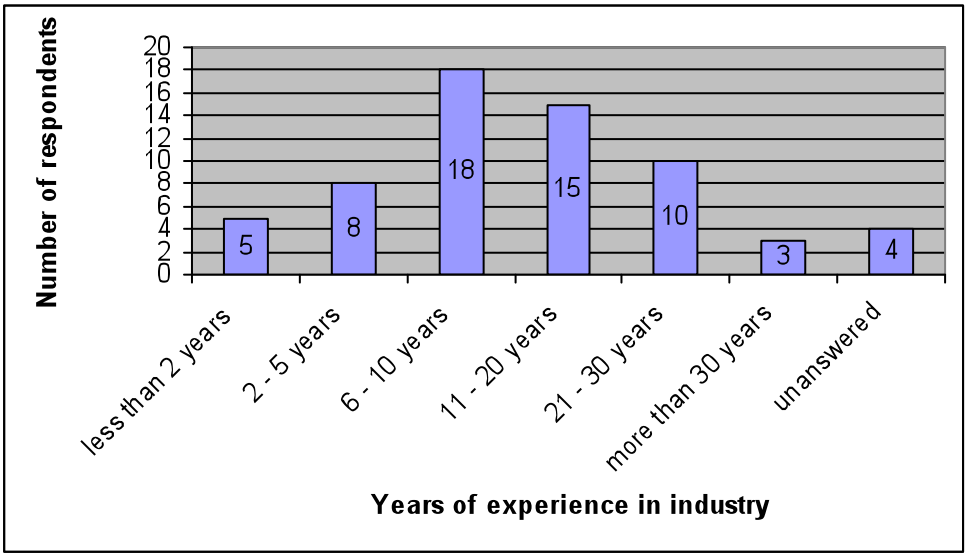

Figure 5.1: Extent of construction academics' industry experience (Williams, et al., 2009)

Academics were also asked whether they were currently working part-time in a section of the construction industry related to the discipline they mainly taught in. Most (77%) replied that they were not working, whilst 17% replied that they were employed in a related field. Six percent did not answer this question.

Many academics identified their industry experience as one of their strengths. They reported that this enabled them to present and discuss current construction-related issues with their students. For example, one respondent wrote that having industry experience allowed him/her "….to illustrate teaching and learning with current and future industry issues". Another commented that "a strong industry background of relevance is recognised and respected by students".

These data show that, whilst many construction management academics had worked in the construction industry, for most of them this was a long time ago. In addition, very few of them were currently employed on a part-time basis in construction-related activities. Notwithstanding the above, some academics were of the view that their experiences of industry were still relevant to their teaching. The tensions between these academics desire to keep up-to-date with industry practices and the demands such activities placed on their time are obvious and reflect the dilemma facing them. They value being exposed to current industry practices but, as will be shown in Section 9.2, prioritise the time they spend on activities to those they consider will benefit their academic careers. This frequently means that they devote time to research rather than to updating their knowledge and understanding of contemporary construction.

5.6.3 Impact of current staff recruitment practices

Notwithstanding the general agreement that academics should have relevant and recent industry experience (Section 5.6.1), participants observed that many universities currently required new staff to have already obtained a doctorate. One HoS stated that "(i)n terms of recruitment of new people, it is an issue because (this university) only wants people with PhDs and just don't see industry experience as terribly important." In a similar vein, an academic said

> "(f)or new staff coming in the expectation, certainly at senior lecturer, is for PhD and so as a result if people had taken that research route and gone and got their PhD, particularly if they're under say 35 the chances of them having spent very much time in industry are slim."

However, not having industry experience was seen to potentially compromise staff's ability to teach. For example, some academics said

> "(s)o we're hiring people with research skills but very little – often they're not very good at teaching or they haven't had much experience with teaching, haven't had much industry experience. So they really struggle with the credibility issue with the students and often they don't have the skill set or the technologies, they're not based in the technologies we're looking for either. It's really tricky."

> "Because if you're trying to teach somebody in construction and you've got a PhD but you've never gone onto a building site, is that what we want the industry to have?"

A representative of the professional bodies aptly summarized this situation as follows

> "I think that it's areas like ours where we used to have hands-on people who may have been able to teach more likely to be on staff. Because they weren't getting recruited because of their research background necessarily now in our area, a 28 year old who has a PhD will pick up a lecturing tenureship over someone who has got 30 years industry experience, has decided to change career paths and go into academia, who has a wealth of experience to offer their students. Because that one's got the PhD. They've got a few articles published in respectable journals, versus a wealth of experience and that's a real structural problem."

Expressing frustration with these recruitment processes, a representative of the accrediting professional institutions said "they are imposing such rigid provisos on employing people that they have to have a PhD. It's just absolutely impossible for the people that we need to have that requirement." Furthermore, another professional institution representative went on to say

> "I see the imbalance that's occurring, especially in vocational training, between research priorities versus teaching as being the focus. In that, with research, more and more funding is linked to how many articles you publish, having staff of a certain calibre for example. (A university) has recently told us that they're going to advertise for academic positions. They desperately need tenured staff but the minimum requirements for the positions will be PhDs. The sort of academics we require (are) people who have got practitioner experience as well as people who have the teaching skills… So that whole tension between the role of research and the universities I see as a problem."

In summary, the recruitment practices currently in place at many Australian universities to only hire academics with research higher degrees were seen by industry as well as some academics to compromise the quality of some of the teaching provided in some construction management courses. This has clear implications not only for the existing complement of construction management academics who have to cope high staff / student ratios but also for future construction management academics who will need to find ways of accommodating the requirements of academia as well as the expectations of industry.

5.6.4 Recruiting staff with industry experience

Despite consensus about the desirability and merits of appointing staff with industry experience, participants reported a dearth of suitable applicants. The following observations of some HoSs illustrate this situation

> "I think the inability to attract good quality academic staff with solid industry experience as well as academic experience is the biggest challenge."

> "There's a lack of staff with industry experience, particularly in discipline-based programs. There's a lack of staff with industry experience who are local to the Australian construction industry or a similar construction industry."

> "Where we struggle is getting new staff over the past three or four years that have got more than just a couple of years of industry experience."

Survey respondents also noted that it was difficult to recruit suitably qualified and experienced construction academics. A related challenge that was identified was the difficulty of making it financially attractive for highly-paid industry practitioners to engage in university teaching.

The following quotation from an interview with another HoS attests to the ubiquity of the problem

> "I'm sure that the issue of staffing has been brought up by everyone I think that the problem is that university is not a very attractive place for people with industry experience we seem to be employing people with very limited experience, virtually no experience on site."

This section underscores the challenges of recruiting academics with experience of industry noted in Section 5.6.3. How effectively this challenge is addressed has potential to significantly impact on future graduates' education.

5.7 Industry employing students

The construction industry expects students to gain first hand experience of the construction industry as part of their education. This is a mandated requirement of several of the accrediting professional institutions. For example, the AIB requires students to complete 80 days of industrial experience prior to the final year of their studies (AIB, 2006). Furthermore,

the widespread shortage of professional construction management skills noted in Section 2.5 attracts many construction management students to work part or full-time whilst they are at university. Notwithstanding the positive and formative aspects of students gaining real-world experience whilst studying, some academics expressed reservations about the manner in which this occurs. For example, one HoS was critical of the extent to which some construction employers expected students to be involved in their businesses. He saw this as having the potential to pressurise students into neglecting their studies, as the following quote shows

> "(Staff are) forever being bombarded by students who couldn't get to their class, who couldn't do the assignment on time because they're working and it's just a fact of life. I think here again, I'd blame industry for this. Industry, it seems to me it has no compunction to – employing a student full-time knowing they're full-time students and putting loads on them. So industry gets what it deserves."

A representative of the professional bodies acknowledged that students were subject to enormous pressures, and that these were due to the extent to which students worked whilst they studied. He said

> "(s)o you've got that huge squeeze on their time which mustn't be good for them as a human being, trying to do what is effectively a full-time university course, working full-time, and perhaps having a little bit of social life packed in there somewhere as well. So there are huge pressures on them but I think they need both to be able to get most out of their university degree."

It appeared that academics were resigned to students attaching more importance to their work commitments than to their studies. A HoS observed that "(i)t is a major issue for them because university is the last thing they focus on. It is work first, then the social life, then the university."

Students may commit to additional hours of work because of the difficulties presented by intermittent periods of working. This is illustrated in the following quote from a student focus group

> "I only work two days a week. It is very hard for them to give me very meaningful stuff to do because if I come on a Monday they can give me that and then I come in on

> Friday, well it's due, we need it on a Friday. You need to really come in Monday, Wednesday because Friday is too late."

Academics saw this situation in a similar light and, as one academic said, "industry is saying 'We don't want the kid for two days a week, we want them for five days' ".

Another reservation expressed by academic staff was about the quality of the experience some students were afforded. The quote below records a student's concern about being engaged to complete mundane tasks that were of little benefit. He said

> "(i)t's the industry kind of going, 'Oh this is a construction management (student) let's let (him/her) do contract administration'. Such a nice title, it's basically photocopying and filing and people don't realise that and then they're caught in – locked into a contract".

In summary, there was general agreement about the benefits of students working in the industry whilst they studied. However, several participants were concerned that some students prioritised their work activities over their studies, and that this was to the detriment of their studies. Devising ways of harnessing students' work experiences to complement and enrich their studies is a challenge that effectively construction management academics have yet to address effectively. The benefits and opportunities of work integrated learning (WIL) are explored in Section 7.8.

5.8 Industry's views on research

Industry's expectations of the research conducted by construction management academics are important because they potentially affect the relationships that develop between these parties. In this regard, several participants highlighted the vocational nature of the construction management discipline. They argued that the research activities academics engaged in were esoteric and difficult to relate to the practical requirements of the construction industry. One academic observed that

> "construction is very practical a discipline. But universities (are) very sort of academically driven. So there's always a gap between academia and industry. So I guess for these disciplines, basically – I mean it's sort of training for a profession, professionals. But at the same time, within an environment of academia, (sic) very research (intensive) university. So I'm not surprised to see the gap."

Another academic highlighted the construction industry's focus on financial rewards. He highlighted industry's reluctance to engage and / or acknowledge research activities that would benefit others in the years to come. He said:

> "The other pressure that is on staff very much at the moment is to push out on the research area, and industry isn't always totally comfortable with that. The whole issue of relevance and focus comes into play. And what is good for industry is stuff that can help them earn extra dollars, not stuff that can necessarily develop the knowledge base and understanding which may feed back through the teaching in years to come."

Similarly, respondents saw the industry culture as a potential impediment. The experience of some of them was that industry was not keen to share their experiences or ideas. A few respondents perceived this hesitancy to result from the competitive nature of the industry as well as to the "building boom" and "fragmentation of the industry".

Academics were thus generally of the view that the construction industry was not supportive of the research activities their discipline engaged in. This is problematic for academics seeking to initiate construction-related research. Such attitudes on the part of industry may result in academics identifying research topics that are unrelated to industry's concerns, and it is understandable that such topics might be considered by industry to be abstract and irrelevant to real world issues. This reinforces the need for academics and construction practitioners to communicate with each other (Section 5.4).

5.9 Discussion

This chapter has explored the expectations that the construction industry has of the education construction management students are receiving in their university studies. Participants highlighted the contributions that industry advisory committees make in communicating industry's expectations to academics. These committees are comprised of industry representatives and academics who meet periodically to discuss matters related to the degree in question. However, participants' responses highlighted the ad hoc nature of these activities. Whilst some disciplines appeared to have secured the support of senior construction practitioners on these committees, and to meet on a regular basis, others had experienced difficulty enlisting practitioners and in arranging regular meetings. It is thus likely that a lack of opportunities to communicate may have led to some of polarised views noted in this chapter.

Construction management programs are designed to prepare students for a range of occupations, as described in Section 2.4. It was therefore not surprising that some industry sectors indicated that graduates were not adequately equipped to complete some of the tasks expected of them. These reservations related to students' communication and measurement skills. The lack of direction provided by some of the professional institutes accrediting these degrees may contribute to this state of affairs. The frustrations experienced by academics in this regard have been noted earlier in this section.

In addition, participants indicated that some employers expected new graduates to be productive from the time they started full-time employment. Several academics countered these expectations by arguing that a university education should prepare students for broader horizons than those experienced immediately on graduation. These necessitated periods of familiarisation with industry practices – an aspect recognised by some employers who supported newly graduated construction managers through graduate training programs. Finding ways to capitalise on students' work experiences and incorporate them into university teaching and learning are challenges that confront construction management academics.

Notwithstanding the lack of measurement skills identified by some participants, and the expectation on the part of some employers that graduates should be productive from the time they started work, there was general agreement that those teaching construction subjects would benefit from having worked in the construction industry themselves. Whilst over half of those surveyed indicated that they had considerable industry experience, little of this was current (with almost two thirds or participants indicating that it was more than five years since they had worked in their field). Furthermore, almost 80% indicated they were not currently working part-time in the industry. The extent to which academics are familiar with current industry practices is thus questionable, and arguments can be made for academics to engage in continuing professional development exercises that update their knowledge and skills.

Many participants commented on the recruitment practices currently in place at most Australian universities that required new members of academic staff to be in possession of a research higher degree. Several participants were critical of this requirement, arguing that it discouraged experienced practitioners from considering academic careers. They argued that this, in addition to other factors, compounded the difficulties the discipline experienced in attracting experienced applicants to academic positions. Some participants noted that, where newly appointed academics with post graduate degrees were employed, these individuals had

difficulties in delivering materials they had no first-hand experience of. The quality of the teaching and learning activities delivered by these academics is thus questionable.

Several academics indicated that they engaged industry practitioners to assist them with various teaching related activities. Whilst employing such individuals was generally seen to be an effective supplement to the efforts of full-time academics, they needed to be effectively managed, resourced and supported. In some cases this meant that academics replaced their teaching responsibilities with management ones and experienced little additional opportunity to engage in other activities (e.g. research).

The shortage of professional construction management skills currently being encountered in the industry, as well as the requirement for students to complete periods of industrial experience means that many students work whilst they study. Participants from all of the population groups investigated (i.e. academics, HoSs, students, professional institutions) commented on the extent to which this occurred. This was generally seen to be of benefit to students but some concern was voiced about the priorities students attached to their studies compared to their work. Furthermore, some participants were concerned about the pressures students experienced in the workplace. In this regard at least one university has developed a code of conduct which employers of students are required to sign up to. This code sets out the conditions under which construction management students should be employed (RMIT School of Property Construction and Project Management).

Finally, industry's views on the research that construction management academics conduct. It was apparent that some participants felt that the construction industry was generally not supportive of the research activities their discipline engaged in. This was of concern because it could undermine relationships between these parties. This mismatch been industry's expectations (and / or their lack of awareness) of construction management academic research, and the research efforts of construction academics may lead to a lack of mutual respect between these parties and may hamper academics' efforts in identifying research topics that are valued by industry.

6 What construction management academics teach

6.1 Introduction

The previous chapter has identified a number of factors that impact on the lives of academics. This chapter focuses on factors that are most personal to academics, namely the roles they have as teachers. It deals with a fundamental aspect that impacts on the lives of construction management academics – the curriculum they teach. It focuses on matters that relate to establishing curricula for these programs, and the challenges associated with designing, updating and teaching them. It is divided into the following sections: professional accreditation (the process by which professional institutions define the requirements of these curricula, and audit their delivery), existing curricula, developing, maintaining, renewing and rationalising curricula. The final section deals with the length of construction management programs (the timeframe within which curricula need to be delivered).

The data presented and discussed in this chapter are drawn predominantly from the interviews and focus groups that were conducted for this study. The term 'participants' has been used to indicate those who took part in these activities. Supplementary data from the on-line survey has also been used, with the term 'respondents' indicating replies from people who responded to this survey.

6.2 Professional accreditation

Professional accreditation (Section 3.8) is a process that provides evidence that the standards expected by a professional accrediting bodies have been met. It is logical to expect that the requirements of these institutions reflect their expectations. In this regard, the requirements of the main construction management professional institutions are specified in, inter alia, the following documents

- Australian Institute of Building Information Publication Number 1 - Procedures for the assessment of courses and accreditation of qualifications (AIB, 2006)
- The CIOB Education Framework 2007 (CIOB, 2007)
- RICS Accreditation (RICS, 2011)

In essence, these documents set out the construction industry's requirements for construction management professionals. They require graduates who are conversant with relevant theory, and who are able to apply such theory in real-world construction-related situations. However,

reservations were expressed by some respondents about the manner in which some professional bodies specify the skills and competencies they require. The following are some examples of such reservations

> "(T)he biggest issue I see that impacts upon Construction Management education is the lack of a clearly recognisable profession of Construction Management There is a lack of a recognised body of knowledge for construction managers."

> "That there will be a more clearly recognised body of knowledge for the profession of Construction Management so that curriculum may be more focussed."

> "(Lack of) clearly defined and consistent accreditation parameters"

Accreditation requirements provide the foundations upon which curricula are built. The lack of clarity noted above is thus particularly concerning. If these requirements are poorly specified, they are likely to be interpreted in different ways by different construction academics.

6.2.1 Need for accreditation

There was general agreement amongst participants that accreditation was a necessary and valuable exercise. The following quotes from HoSs confirm that accreditation was important and helped academics to reflect on their work and to maintain standards.

> "(W)e've always taken it as being a reasonably important thing to do. I think it's a useful exercise in that you are having somebody with other eyes looking at what you're doing which can be helpful."

> "I'm just making an observation that the importance of accreditation maintains the standards."

Respondents were asked how important they considered the accreditation process was for maintaining standards. Twenty eight point six percent saw this as important, 27% as very important and 17.5% as extremely important. Respondents were then asked for their views on the importance of the accreditation process as a means of setting an agenda for future directions. 22.2% saw this as important and 27% as very important.

Although the needs for accreditation and its benefits were understood and appreciated, participants also noted shortcomings in the accreditation process. For example, a member of academic staff said

> "(m)y comment was just that I think accreditation is good as a quality check but I think the process is more complex than it needs to be."

In a similar vein, HoSs stated

> "I'm a general critic of accreditation but the first one is that it's worth doing… I think it's worth doing but it needs to be more streamlined, more focused."

> "Fundamentally I agree with the accreditation process… I find that the relationship and the concept of accreditation is worthwhile. It's just that sometimes I think the way the accreditation process is conducted leaves room for improvement."

Several respondents made mention of the time consuming and onerous nature of preparing for accreditation audits. Academics' workload is discussed in detail in Section 9.2. However, accreditation makes a considerable contribution to this workload. Whilst respondents generally viewed accreditation as worthwhile, several respondents were critical of some accreditation processes. These are described in the following section.

6.2.2 Challenges of accreditation

Respondents were asked to indicate their level of agreement with a set of statements about accreditation. Their views are summarised in Table 6.1. Almost three quarters (74.5%) agreed / strongly agreed that accreditation increased academics' workload, whilst 41.2% disagreed / strongly disagreed that accreditation encouraged diversity in their discipline. There was less agreement about whether the feedback provided by accrediting panels improved curricula, and whether the academic community valued accreditation.

Table 6.1: Respondents' views about accreditation

Accreditation	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/a
Preparation for accreditation increases my workload	3.2%	3.2%	3.2%	31.7%	42.9%	15.9%
Feedback from the accreditation process has improved the school's curriculum	11.1%	11.1%	28.6%	30.2%	3.2%	15.9%
The accreditation process encourages diversity in my discipline	20.6%	20.6%	31.7%	9.5%	1.6%	15.9%
The accreditation process is valued by the academic community	4.8%	15.9%	25.4%	34.9%	3.2%	15.9%

Legend:

Area of dominant response	

In addition, respondents were concerned about the restrictive manner in which some professional bodies specified their requirements, and also questioned whether these reflected the needs of industry. These aspects are described below.

6.2.2.1 Encouraging compartmentalisation and stifling of innovation

Some participants observed that the way in which some professional institutions specified their accreditation requirements meant that some course content needed to be delivered in discrete packages. An academic said

> "they still quite clearly indicate separate competencies so if you had to try and comply and said 'Yeah we've got a unit that does all of this', it would be difficult to drill into that unit and say that bit was about the bit you want and this bit is about this competency"

Furthermore, some academics believed that the accrediting bodies were impeding their efforts to innovate. In the view of a HoS

> "(o)ne of the things though that came through from the previous accreditation was that they, very definitely, the professional bodies want to discourage innovation. They want us to stand still and not to change our programs."

The requirements of some accrediting institutions were thus seen to be restrictive and to discourage academics from developing innovative approaches to curriculum development and

renewal. In addition, when viewed in conjunction with the poorly defined requirements of some professional institutes (Section 6.2), it is likely that, in terms of the lived experience of academics, these shortcomings contribute to the levels of stress they experience, as well as to their workload.

6.2.2.2 Not representing industry requirements

Some HoSs and academics expressed concern that the requirements of the professional institutions did not reflect those of industry. This has obvious implications for the quality of graduates that universities produce, as well as for their employment prospects. The following quotes indicate the mismatch as perceived by HoSs

> "I think the biggest one is probably the industry expectations not being very clear and articulated in many ways. Although we think professional bodies do articulate what the industry expects, it seems to fluctuate quite with the times of boom and recession. So it's been a bit of a tough thing for us to actually produce graduates without knowing what the standard the industry actually requires. It is particularly very relevant to quantity surveying discipline and particularly when you are delivering a degree that is combined with a number of professional avenues. It becomes quite hard to pitch the curriculum in the right level and pitch the skills in the right level properly."

> "We try and address the requirements of the AIB and the AIQS and fortunately there is enough latitude there that we can move things around a little bit if we need to. They are not always aligned with the requirements of the industry at the time. I think they have a bit of an issue to sort out there."

Some academics were thus perturbed about the lack of specificity with which some professional institutions communicated their requirements to universities (Section 6.2) and questioned whether the requirements of these institutions did indeed reflect the needs of industry. The impact of the relationship between academics and some accrediting institutes may impact on these academics' lived experiences because it has the potential to frustrate them and cause them to devote time and resources to activities that prove to be superfluous.

6.2.2.3 Increasing focus on course content

As noted in Section 3.8, construction management degrees are amongst the most heavily accredited degrees in Australia. Satisfying the requirements of several accrediting bodies

inevitably results in a proliferation of course content, as each institution requires discipline-specific content to be included in curricula. The following observations of academics illustrate tensions that result from trying to accommodate these multiple requirements

> "(T)he amount of content we're supposed to cover keeps increasing And the reality is that it becomes a lot of series of compromises. Everyone's got their own ideas about where the compromises are made and the effects they have. But the reality is that the courses are very much a compromised course."

> "(W)e are accredited by two very different bodies, the AIB and the AIQS. On the one hand, one of these institutions insists there isn't enough measurement. On the other hand (students) are training to be managers and so on, there is more management… Some students in the course say 'I'm not really interested in becoming a Quantity Surveyor. I'm not really interested to learn all of these measurements.' But they've got no choice. This is the only university in this state that is offering this degree. So they have to do all of the other units which they think are irrelevant. Someone who wants to be just a manager, he ends up having to learn all this measurement and things. At the end of the day, when he comes out to work, in his career he's not going to do any measurement, so how do you resolve this?"

> "So the university is being pulled in many different ways and we have to navigate through the dichotomy of the multiple aspirations and expectations to make sure we turn out a product that is well regarded and can at least cover some of the bases."

In addition, a HoS noted that different accrediting bodies' requirements were generally similar but included peculiarities that needed to be met. He said

> "we've got ten or 12 of them (accreditations) at the moment and they're all basically saying the same thing. This includes national and international outfits and they all want a little bit of this and a little bit of quantity surveying and a little bit of that and all the rest of it"

These quotations illustrate the challenges of developing and maintaining construction management curricula that respond to multiple similar or different accreditation requirements. Addressing these requirements makes it difficult for academics to position construction management degrees relative to local industries' requirements as the following quotation from a HoS shows

> "(W)e've had to reduce Measurement by one unit, in the last review. I think here in (a State), even though you've got (another university) coming on, we have to be all things to all employers. I'm trying to produce students that are dynamic and diverse."

In summary, being accredited by multiple professional institutions was seen to pressurise academic staff to include ever-increasing amounts of content in their curricula. This inevitably resulted in compromises being made, with some topics being accentuated at the expense of others. Whilst these approaches may secure multiple accreditations, it is unclear whether they address the requirements of local industries. Furthermore, the workload involved in preparing for multiple accreditations is exacerbated by the unique requirements of each institute. Despite attempts to rationalise the requirements, each institute currently requires disciplines to prepare accreditation documentation in accordance with their own particular requirements. Construction management academics find this duplication of effort unsatisfactory.

6.2.2.4 Lack of formative feedback

Academics were generally concerned about the lack of constructive feedback and advice provided by some of the professional institutions as part of the accreditation process. Several academics observed that they felt the process was one of policing rather than of constructive development. The following quotes by HoSs indicate the impact on academics of their general sense of frustration with the process

> "(A)t the moment my view is that all these professional bodies see themselves as police rather than assist (sic) and help us. It's all very well accrediting everybody left, right and centre, but all you're doing is getting people to gather data and you're not actually helping them generally to overcome their problems."

> "That was another thing I said to the AIB, that rather than policing us you should be working together and giving feedback."

> "So that's where I see the role of accrediting bodies, is to actually help the schools out. At the moment, from my perspective, it doesn't seem to be happening."

Similarly, an academic said

> "I don't recall them putting forward ideas and we think '(W)ow, what a fantastic suggestions to put in the curriculum', and we haven't thought about it already. I

> would have thought they might pick up small things like we don't teach big building management, okay we had, that we'll put it back in."

On at least one occasion this lack of constructive criticism was seen as a consequence of a lack of expertise on the part of those conducting the accreditation, as the following quote from a HoS indicates

> "I think the accreditation is good, to make sure that you keep on track, but having said that, the AIB ones don't actually add value to our programs. (They provided) very little ideas to help us. The reason for that is the people who are doing the accreditations really don't have a clue anyway."

Academics perceived that accreditation processes generally did not improve their curricula. The quotations above indicate that academics expected the process to generate constructive criticism and feedback but felt that this rarely occurred. Accreditation was seen to be an exercise in policing rules rather than an activity that supported and improved courses and programs. It was seen as compromising the development, maintenance and renewal of construction management curricula. Furthermore, it served to create barriers between the professional institutes and academics, with both parties taking up entrenched positions. Clearly improved communication between the professional institutes and academics would benefit all concerned.

6.2.3 Benefits of accreditation

On the other hand, participants noted that accreditation presented opportunities for improvements to be made. For example, a HoS stated that academics can become complacent if they are not exposed to and challenged by others. He saw accreditation as providing opportunities for making changes. He said

> "Yeah I've been involved in accreditation for a long time now. I've been part of accreditation panels and things like that. I think it's important. My experiences generally have been that it helps you to prove the quality of what you do. I really like the outside objective assessment of what you're doing, even though you mightn't necessarily agree with certain comments or whatever might be written. But I think it's refreshing to get that objective outside view because you can become insular in what you're doing and think you're doing a fantastic job. But also what I find in these accreditation visits and so on and discussions, you can often learn a lot about what

> other courses are doing. You can learn a lot from the accreditation panel. They can see what you're doing, they can make suggestions."

These views were echoed by another HoS who said

> "(W)e've always taken it (accreditation) as being a reasonably important thing to do. I think it's a useful exercise in that you are having somebody with other eyes looking at what you're doing which can be helpful."

Furthermore, an academic commented that preparing accreditation documentation was a valuable experience for him (Appendix 5 provides an indication of the contents of accreditation documentation prepared by the author). He noted that

> "I think it's good to have accreditation because I'm the one who's done the documentation last time and you learn a lot. You learn, so I think it is good doing it. I just think that the level it's done at it is over the top."

A HoS commented on the way in which accreditation had changed, from an onerous process to something that was (depending of the professional body concerned) more supportive of improvements. This is illustrated below

> "Ten years ago it was more of a big stick - 'Are you compliant with all the rigorous content?' I find now they're changing their philosophy, it's more of a coming in as a partnership to help where you're going wrong. I find generally it's okay; I think they just need to reduce the amount of work required."

In summary, some professional institutes were proactive and provided useful guidance and feedback to universities on accreditation. The potential for such exercises to be of value is generally appreciated by academics. However, the relationship between some of the accrediting professional institutes continues to be strained, and the likelihood of their accreditation requirements being harmonised in the near future is remote.

6.3 Existing curricula

An overview of the construction management curricula offered at Australian universities has been provided in Section 3.6.3. A graphical representation of the content areas included in these curricula in 2007 is provided in Figure 3.2. These curricula are those referred to by respondents and participants in the remainder of this section.

Academics were asked to identify the undergraduate study content areas they taught. Their responses are shown in Table 6.2, ranked in order of the number of respondents who indicated that they had taught each particular topic. They were also asked to indicate the undergraduate study content areas they had previously taught in. Their responses are shown in Table 6.3, ranked according to the number of respondents who indicated that they had previously taught each topic.

6.4 Developing curricula

The accreditation requirements of the professional institutions (Section 6.2) and the accreditation processes (Section 3.8.1) determine what construction management students should be taught – i.e. their curriculum. Professional curricula are challenging to develop, maintain and renew and construction management curricula are no exception. This section describes participants' views about curriculum-related issues. It deals first of all with the development of curricula (this section), and subsequently with their maintenance and renewal.

Table 6.2: Undergraduate study areas taught by construction staff

Undergraduate study content area	No. of respondents indicating they had taught this topic
Project Management	24
Research	18
Construction Technology	17
Economics	17
Sustainable Development	16
Procurement	11
Business Management	10
Cost Control	10
Environment	10
Estimating and Tendering	9
Facilities Management	9
Measurement or Quantity Surveying	8
Building Materials	7
Law	6
Risk Management	6
Structures	6
Building Services	5
Computer Skills	4
Drawing and Surveying	4
Health and Safety	4
Building Science	3
Quality Management	3
Communication and Documentation	2

Table 6.3: Undergraduate study areas previously taught by construction staff

Undergraduate study content areas	Number of times previously taught
Project Management	25
Research	24
Construction Technology	23
Procurement	15
Building Materials	13
Estimating and Tendering	13
Business Management	12
Communication and Documentation	12
Cost Control	12
Drawing and Surveying	12
Measurement or Quantity Surveying	12
Computer Skills	11
Facilities Management	10
Building Science	9
Building Services	9
Risk Management	9
Economics	8
Health and Safety	8
Law	8
Quality Management	7
Structures	7
Sustainable Development	6
Environment	5

6.4.1 Compartmentalised delivery of courses

Academics were concerned about the lack of connection they believed that students saw between the courses they enrolled in. For example, in discussions with his colleagues, an academic noted that, whilst lecturers may appreciate the connections between courses, students may not. He said

> "It may not be to us I guess, but my point is maybe the students see that it is a diverse group of topics. And we do in fact integrate those and we do try to integrate that. But maybe it's because they still have a mindset where they see this is 'Structures', this is 'Measurement', this is 'Technology' and even though you talk and link the two or three, they're really not seeing them as a composite. They're still seeing them as (separate)".

Similarly, a HoS felt that the manner in which courses were delivered led students to view them as discrete entities. He said "I worry, I fret at how many, almost always, that the way in which we shape our courses contributes to that compartmentalisation, the way of thinking."

Participants noted the benefits of students being able to identify and appreciate how the courses in a degree program related to one another. For example, an academic observed that

students who were able to link the content of discrete courses together "(got) much more pleasure and seemingly (got) more understanding out of doing it that way"

Participants were generally aware of the shortcomings of the compartmentalised manner in which courses were delivered. Reasons for the continued use of these approaches included the flexible manner in which students were allowed to enrol in courses and the time interval between courses. These are explored below.

6.4.1.1 Flexible enrolments in courses

Recognising that students do not all study full-time, and that some have completed credit-bearing courses elsewhere, most universities provide students with flexible enrolment options. Such students are thus able to enrol in courses that progress differently to those recommended for full-time students who enrol year after year without failing a course. These non-traditional sequences were seen to aggravate the compartmentalised manner in which students saw their courses.

Furthermore, some participants observed that students enrolled in courses that appealed to them, rather than in a recommended sequence. For example, according to a HoS, "students seem to progress by units, by subjects, almost just like ticking them off, like cafeteria style. 'I'll have one of those. Finish that, right, have the next one'"

6.4.1.2 Time interval between courses

Participants noted that the time interval between courses exacerbated the difficulties some students experienced in identifying linkages between courses. In this connection, a HoS said

> "it's not just what we might call that horizontal across a year level of different subjects and thinking, but it's also vertical as well. You know, the linkage of first year to second year to third year and to fourth year of, you know, it's the old classic, isn't it, the lecturer's there in the third year 'You remember in first year when you talked about so-and-so?' - and the blank look. 'That was first year. I've forgotten all about that, mate. I've ditched all those notes', kind of thing."

6.4.1.3 Addressing compartmentalisation of courses

Participants identified several approaches that would help students appreciate how the courses they took prepared them as professionals in their own discipline. For example, a HoS described a mapping exercise he and his staff were planning to conduct. He foresaw that this

would help students to appreciate relationships between the courses they took. He said "it's going to give a cohesive picture of how everything links together. So when they are doing other courses they can relate it back to that bigger one. All of the staff members have a view of what it is but the students may not have that view".

Other HoSs highlighted the use of specific teaching and learning activities which provided students with opportunities to integrate the content of discrete courses. They said

> "(w)e actually have in our program in the fourth year a unit called integrated studies… (H)aving a subject at each year level called integrated studies (is) quite critical."

> "What we've tried to do in this program is we teach the traditional way… But finally we tried to pull it all together and we run something we call the Integrated Project"

In summary, some participants were aware of the compartmentalised manner in which some students viewed the courses in their curricula and the problems such an unstructured vision presented to them. These academics were pursuing different strategies to alleviate this situation, frequently in addition to their other teaching responsibilities.

6.5 Maintaining curricula

Construction management curricula are continually subjected to calls for change. Figure 3.3 (p. 59) illustrates changes in the content of these curricula that occurred between 2003 and 2007. Highlighting these changes, a HoS said "(a) curriculum is always a live document. You're always looking for changes and there will always be changes. If you don't make changes then you shouldn't be in the business."

Curricula need to be carefully and rigorously maintained. If this does not occur, the logical structure of a curriculum may be compromised, and some course content may either be duplicated and / or omitted. This is likely to adversely affect quality assurance and accreditation outcomes. Maintaining curricula was seen as a challenging task. HoSs provided the following examples of the difficulties they had experienced

> "(E)veryone tries to keep up to date with the latest in their field that they're teaching, and in some subject areas it's changing much more rapidly than others. Like if you're teaching building energy and things like that, that's very topical and there's a lot of things happening with how we measure energy efficiency and so on. On the other hand, I teach first year structures which is static, it hasn't changed for 100 years, and

> thank goodness for that. So it varies from course to course. I think particularly in the more applied subjects, in the final year subjects that we really are up to date."

> "We do continually develop new courses, subject areas, that type of thing. Again the curriculum idea is a live document. I think we've just got to get it bedded down the way we want to teach, and then look at the facilities."

Furthermore, several participants mentioned that course content tended to evolve in line with the personal experiences and preferences of individual lecturers. One HoS noted that "(a)s all courses develop you tend to get bits and pieces in that reflect the personal desires of academics rather than what is desired curriculum". Similarly, another HoS stated

> "as far as curriculum development, I know here probably four or five years ago I thought we had it right, but then of course with a lot of new staff, older staff leaving, and whatever, the new staff coming in are teaching the stuff they've taught elsewhere. So the curriculum actually changes. Now we're in a situation where perhaps we're duplicating some materials."

Concurring with these views, an academic said

> "because we've had a quite substantial staff numbers change over time, and the curriculum isn't very well bedded down in terms of describing what each course has got each week, people tend to go and present what they want to present in the class. And then there (aren't) good linkages between (courses). You might see a lot of repetition and a lot of gaps, and we've certainly become aware of those issues over the last couple of years. I presume if we've got those problems we're not the only course with them."

Some academics noted that the personal profile of new staff did not always align with what was required in their discipline. For example, one said

> "A lot of our staff… don't have a breadth of experience in construction management. They might have a specialised expertise, which then also means that they may not understand the other discipline areas or how those areas contribute to the professional's knowledge"

Construction management curricula are thus subject to considerable pressures to include increasing amounts of content. However, there is little evidence that out-of-date materials are excised from curricula. This is indicated in the words of the following HoSs

> "You could keep broadening it, but it's really how much are you going to pack into each course? How are you going to allow students sufficient time for reflection and to go over the work?"

> "There's probably a fairly sizeable proportion of stuff that we should probably chuck out of our course that's always been there and continues to be there because of the staff involved"

This section has highlighted some of the difficulties of maintaining curricula. A key challenge for academics was that of maintaining the overall integrity of curricula. This was because it was difficult to keep track of the all the changes individual academics made, and to manage their tendency to tailor the course content they deliver to their personal preferences. Participants also noted that it was difficult to match academics' background and expertise to the courses they taught. In addition, it appeared that, whilst additions were continually being made to curricula, little was omitted.

6.6 Renewing curricula

Curricula need to be renewed to reflect new and / or revised industry practices. New specialist areas of endeavour have accompanied the rapid pace of global economic growth. Topics, which received scant attention a decade ago, are now viewed by most construction academics as mainstream. Furthermore, some of the more traditional ones have evolved markedly. The distinctions between some types of buildings have also changed. Buildings that were considered "high-rise" a decade ago are now considered to be of a modest elevation, and revisions (and additions) to curriculum are required to address the challenges associated with working in these conditions. This was aptly described by one HoS, who stated that

> "I think it's a little bit like way back when engineering programmes used to have steam and so forth. Then, after a while, steam sort of fell out because other technologies and energies took over. I think maybe we've got to perhaps revisit some of the curriculum to work out whether we're trying to cover too many cases. Maybe we should just more or less go down with, shall we say, some bare bones stuff. For example, Construction 1 is always domestic construction; Construction 2 is your

> simple commercial portal frames type stuff; and then Construction 3 has been high-rise. But, even in the area of high-rise, now we're getting high-rises which might be eight to ten stories; then you're getting high-rises up to 50 stories; and now the ultra high-rises of 60 plus stories. That's a totally different type of scenario."

Furthermore, the importance of various changes in content over time as well as keeping abreast of these changes were reported by participants as being difficult. They were concerned about the miss-match between what their program delivered, and what the needs of industry were, as the following observation of an academic illustrates

> "(U)p until that time no construction management student that I know of has ever been taught marketing skills and yet we get the managing director of (a national construction contractor) standing up and saying that's what our students desperately need to know, they need to know how to deal with clients Again, both marketing and negotiations could be single subjects in a construction management course. We teach our students how to design structures (which is of minimal value to them) but we don't teach them skills that they need every single day of their working life. So I think the course, our course is skewed and I assume that every other construction management course that you've seen is pretty much the same."

Construction management academics were reported to be continually beset with new topics and encouraged to incorporate these in the courses they teach. Decisions needed to be made about whether or not to include such new materials and, if they are to be included, in which part of a course and of the program they should be located. These decisions are frequently made in isolation, with individual academics deciding what to include or omit. In this connection, an academic indicated that

> "the amount of content we're supposed to cover keeps increasing. We're forever squaring the circle in all of this. And the reality is that it becomes a lot of series of compromises. Everyone's got their own ideas about where the compromises are made and the effects they have"

In addition to these challenges, several respondents were concerned that they would experience difficulties devoting the time and resources necessary to maintain and renew the curricula they taught.

In summary, the pressure to include new content in construction management courses and programs is ongoing. However, the manner in which such additions are evaluated and incorporated into curricula appears to be ad hoc. In this regard, the challenges of maintaining and renewing curricula were seen to be consistent across the sector and contributed to academics' expanding workload (Section 9.2) as they try to respond to the pressures brought to bear by professional institutes and industry.

6.7 Rationalising curricula

Over the years, reduced Federal funding for tertiary education has meant that universities have needed to explore opportunities to economise. Many have sought to do this by rationalising the curricula of degree programs. In this connection, a HoS observed that one of his functions "has been to rationalise." Similarly, another HoS stated that

> "we've rationalised courses out of sight. I started off in my school with 365 (courses) I think we're down to about 330 at the moment and still going. So many of the specialisations have gone. Many of the options have gone, which in a way is a great shame. Then you've got these large student (cohorts). You could easily have a stream of 30 in each – we're up to 80-90 students in third year or even fourth year. You could have the streams but we don't have the funding. We don't have the motivation from senior management to allow that. Rationalisation / reduction of the number of options has been what we've sort of striven for"

Participants commented on the challenges of rationalising curricula. Rationalisation was seen to result in courses with generic content rather than those that focussed on the specific requirements of a discipline. In the context of construction management, some courses were seen to be relevant to students in other disciplines (e.g. architecture). Furthermore, participants observed that some generic courses (e.g. economics) could be delivered to students from several disciplines including those from construction management. Whilst this arrangement is not confined to the construction management discipline, the extent to which it occurs is marked and presents challenges to academics endeavouring to maintain the structure and integrity of their curriculum. For example, in the following quotation, a HoS noted that the delivery of courses to his construction management and architecture students has necessitated some compromises

> "because it's a difficult thing, because when we were developing our curriculum we all were consulted in a way and they were put together, assuming that certain subjects should be there, I mean that's through the experience of our senior academics and their consultations and exposure to the other universities would have influenced what subjects should be there. But then again, we are a course that's merged with architecture so sometimes both of us don't get the exact accurate curriculum. They have to compromise and we have to compromise for that synergy. And there could be a few subjects which may be on the borderline for both of them. I mean for us certain subjects (don't) mean much. On the other hand for them certain subjects they do may not mean much."

In addition to the challenges associated with teaching large cohorts of students, a diverse range of students inevitably enrol in generic courses. For example, the following HoS quote indicates that students from five or six different disciplines were enrolled in one of the courses he taught

> "(Another lecturer has) got 70 students enrolled this year and he picks up quite a lot of people from property. The one that I run of design management I only have about 60% of the class or less that are construction students. This year I've got people from fashion and textiles, visual communications, architecture, property and interiors or industrial design"

Generic courses presented different challenges at different universities, as disciplines were not all affected to the same extent. One academic noted that his discipline was subject to these pressures, but had managed to avoid them to date. He observed that

> "There certainly is pressure on us to have joint courses with other schools and we're not averse to that, provided they can teach. But to date that hasn't been the case because we've been able to teach them pretty well"

The comments of a HoS indicate that he saw advantages and disadvantages of generic courses. He said

> "some universities have too many courses from the other faculties as a core requirement But if you do an economics course or… an IT course, the text books are set… So construction management is fairly loose in that sense. It's a strength in a way and it could be a weakness also."

The impacts that generic courses have on curricula and academics are explored below.

6.7.1 Advantages of generic courses

The motivation to deliver generic courses was noted to be primarily financial. Savings were seen to result from generic courses being delivered to large classes as the following observations of HoSs show

> "A lot of our course is taught in other faculties and in other departments, or other sections of our own faculty, because we're a one department faculty. So we share some of the early years in construction (technology) with the architects for example."

> "Yeah well, we actually had a core unit Business Accounting, which was taught by an accountant to our cohorts for years." (HoS)
>
> "That's all gone by the by then?" (Facilitator)
>
> "Well no, it's not that it's gone by the by, it's just that the classes are a lot larger now. They're now, those sorts of units are now teaching 500 to 600 students, as opposed to one or two." (HoS)

Similarly, another HoS felt that some construction management courses could be delivered to students outside of his discipline. Financial savings were implied in these circumstances, as indicated in following quote

> "Then we also have some law and some economics and some management, and at the very basic level those subjects, they can be… for any course, not just construction management… We have a course called 'Building economics'. It's an early stage course. (It) could just be called 'Economics'. Okay, it's called 'Building economics' and the person who teaches it puts a bit of a construction spin on it. But you could argue that you could just put all the students together from the School of Management and the School of Commerce and they all do 'Economics 1'"

In addition, these courses were seen to offer opportunities for students to appreciate that they were part of a team. Another HoS observed that being able to view challenges from different professional perspectives would benefit students. He said

> "there's landscaping and planning and architecture and engineering. Engineering's got about five different (disciplines) - mechanical, electrical, civil structural, etc. Then you've got all the consultants, industry consultants, all the sub-contractors. So it's a team thing. So the students need to be aware that there's – if you're given a particular topic, an architect will perceive it in a different way to what a contractor will to what an engineer will. So their perception of what has to be resolved and how it should be resolved is quite different."

In summary, motivation for the development and delivery of generic courses appeared to be primarily financial. Generic courses were seen to be beneficial where they allowed students to obtain a multi-disciplinary appreciation of course content but could be challenging to deliver where students from different disciplines exhibited markedly different characteristics.

6.7.2 Disadvantages of generic courses

Notwithstanding the abovementioned advantages, participants identified some disadvantages of generic courses. For example, some expressed concern that students would not be able to relate generic content to their discipline. The following quotes show that a lack of discipline specific focus discourages students and may compromise accreditation requirements. A HoS said

> "So there are some real challenges that we've dealt with in the past, where we've had teaching residential construction to large classes of 300 students, where there are 200 architects in there and 100 property and construction. Now you cannot satisfy both of those fields. That's reflected in the quality of teaching surveys that are done. You just can't do it."

Similarly, some academics said

> "(o)f course our students are very focused on their discipline. And you mention something that to them appears a little bit diverse and they don't want to have a bar of it. But the University is pushing towards generic units in the first year or two years. I think that would represent a problem for the students. It would also present a problem for us in ensuring that the course retained its accreditation perhaps."

> "We're still having a little bit of difficulty with some students not wanting to do particular tasks because they're not interested in that. It's not what they signed up to do."

A student's perspective on generic courses is provided in the following quote. This confirms that they appear to value a discipline-specific focus. The student said

> "I think some of the subjects overlap each other. Like in construction project management 1 we do project management 1, 2 and 3. Construction project management 1 and 3 are just exactly the same, they're just theoretical management… My opinion was that it was boring. It was just so boring. I just couldn't wait to finish these subjects. Whereas project management 2 is all subcontractor management, occupational health and safety. But 1 and 3 are the exact same… from my point of view I'd like to see other QS subjects involved in this degree because I don't think there's enough."

Furthermore, an additional complication was seen to occur when students move from one university to another. In these circumstances they apply for credit for the courses they have already completed. However, as the HoS quote below indicates, the generic content of some degrees make it difficult for those responsible to decide whether or not to award credit.

> "(T)here should be uniformity, but if you look at the curriculum of (a university) and the curriculum of (another university) and (another university), when (we need to) articulate credits (we) really struggle. The reason is some universities have too many courses from the other faculties as a core requirement and it's very difficult to match."

In summary, delivery of generic courses to students from several disciplines was seen to contribute to students' compartmentalised perspectives of course content. In addition it was seen to potentially lead to student dissatisfaction and to complicate the demonstration of discipline specific content to accrediting bodies, as well as to other universities. Whilst generic courses may ease the challenges facing those responsible for developing, maintaining and renewing program curricula, they present different challenges to the individual academics charged with responsibility for delivering them. Meeting such challenges requires academics to devote time to structuring and delivering these courses in ways that recognise and accommodate the characteristics of the different cohorts of students being taught. This has potential to increase academic workload.

6.8 Length of construction management degrees

This section addresses views about the duration of construction management degrees. This is important because the length of a degree constrains what can be taught. Notwithstanding the challenges posed by adding new content to curricula (Section 6.6), some students expressed positive views about shorter degrees, as the following quote shows

> "Sometimes you feel like it would be easier if you did it five days a week and finish the course a year earlier or a year and a half earlier instead of being here three days a week and having two days off."

Other students argued that the duration of a degree was an indicator of its depth and the respect with which the wider community viewed it. They were in favour of retaining four-year degrees, as the following quote illustrates

> "Like a doctor's degree takes six years and people think 'I'm not going to do that. It takes a long time. It's a long time to commit to.' Same with a law degree - some of them are four and five (years)… So by having a three year degree I think you can do a lot of things like simple accounting There are lots of degrees that are three year degrees and I think by it being a four year degree it means you've got to apply (yourself) a little bit better and you'll learn that little bit more."

To date, only one construction management degree has adopted the Bologna model (European Commission - Education & Training, 2010). In this regard, one HoS commented

> "I think the industry will see long-term that the quality of the graduates coming out (with a Bologna Masters construction management) is certainly better, in terms of a slightly broader background that the students will be coming from, having education in a different background, with breadth subjects that they can choose."

The online survey asked whether respondents thought their university intended to change the length of the degree program in the future. Fourteen point three per cent said that this was the case, whilst 42.9% said that the length of their degree would remain the same. Thirty one point seven per cent did not know the answer to this question, and 11.1% did not provide an answer. Those who indicated that the length of their degree was likely to change were then asked what the revised duration would be. For the majority (77.8%), the proposed change was for a decrease from 4 to 3 years. Eleven point one per cent indicated an increase from 4

to 5 years, and 11.1% selected 'other' stating that their change could be to 3 + 1 + 1. This indicates that some universities may be considering adopting the Bologna model as is currently being implemented at the University of Melbourne (Ashford & Francis, 2007a). Furthermore, recent developments of the AQF (Section 3.4) are also likely to influence decisions that are made in this regard.

In summary, some students and academics support reducing the duration of construction management programs. However, industry and the accrediting professional institutions have not yet considered the impact of such a reduction. Any reduction in the length of these degrees will increase the difficulties academics face when deciding what to include in curricula. In addition, it is too early to evaluate the impact of the Bologna model on the structure of construction management degrees. Whether or not construction management programs follow the example of the University of Melbourne in this regard is unclear. It is thus not possible to predict whether the duration of construction management degrees will decrease or increase. Should a decision be made to change the duration of these programs, construction management academics will need to evaluate the merits of alternatives including those described in this section. Such activities are likely to be stressful as they will influence the future viability of programs. In addition, these activities will add to academic's already considerable workload (Section 9.2).

6.9 Discussion

Construction management curricula need to address not only the requirements of multiple professional bodies (identified in Section 3.8.2) but they also need to respond to those of the Australian government as well as their university. The professional bodies' expectations (Sections 3.8 and 6.2) are contained in their accreditation requirements, which were seen to be ill-defined, contribute to courses being delivered in a compartmentalised manner, and to stifle innovation. According to Gann (2001), compartmentalization is ingrained in the ethos of the professional institutions that accredit construction management degrees. He noted that professional bodies "constrain development when they adhere to outmoded notions of narrowly defined discipline-based activities" (p 321).

The requirements of the Australian government (Section 3.7.1) are, as yet, unspecified, and neither respondents nor participants made any observations in this regard. With respect to the requirements of individual universities, all programs generally need to address over-arching attributes with which all students from that university are expected to graduate. Those

developing, maintaining and renewing construction management curricula thus need to satisfy the requirements of several different bodies. The extent to which these requirements align with one another was not explored as this was deemed to be outside of the scope of this study. What is clear is the complexity and extent of these multiple requirements.

In addition, some respondents and participants reported that the requirements of some construction professional institutions did not reflect those of the construction industry. These reservations may relate to the relative indifference of the Australian construction industry and personnel to the professional institutions mentioned in Section 3.8.1.

Whilst other professional degrees also need to be accredited, the number of professional institutions that construction management programs seek accreditation from distinguishes them from other programs. In addition, respondents' and participants' aforementioned concerns about the unhelpful aspects of accreditation exacerbate the difficulties they face in this regard.

With respect to the processes involved in developing curricula, respondents and participants observed that students' perceptions were that the programs they enrolled in lacked an obvious and coherent structure. These views were seen to stem from a combination of factors including the poorly articulated requirements of the accrediting professional bodies, the compromises that need to be made to accommodate the requirements of multiple professional bodies, the flexible enrolment practices in place at most universities, and the time students take to progress through the courses that make up their program. The reasons for the perceived lack of connection are thus diverse and not easy to address. In this regard it is relevant to consider the similarities that some HoSs and academic staff drew with engineering disciplines. Engineering is no longer a single discipline, having evolved into streams (including civil, mechanical, electrical and chemical engineering). Furthermore, civil engineering has developed its own specialisations (including structural and geo-mechanical engineering). It is interesting to note that some construction management programs have been structured in a similar manner, allowing students to choose between specified sets of courses which relate to the requirements of different disciplines. For example, the Bachelor of Construction Management and Property offered at the University of New South Wales (Faculty of the Built Environment, 2011) is structured with majors that allow students to specialise in building, property development, quantity surveying, or facilities management. This allows construction management academics to focus on the requirement of particular

professional bodies, thus reducing the number of requirements these curricula need to address. Such an approach has the potential to reduce construction management academics' workload.

With respect to maintaining and renewing curricula, respondents and participants in this study identified several challenges. These include deciding what new content should be incorporated, identifying what was obsolete and should be omitted, and structuring curricula in a coherent manner. It is clear that new topics cannot continue to be added to curricula ad infinitum without consequences. In this regard, Ashworth (2008) notes that "(o)ver-load is of concern, if content is to be nothing but superficial" (p. 15). Furthermore, staff's propensity to orient course content according to their personal background and expertise needs to be managed, as does the allocation of academics to the courses they teach. Collectively these aspects challenge the integrity of a curriculum. In this regard, it is interesting to note the recommendations of Heinrich, Karner, Gaglione and Lambert (2002) who advocate the use of "a structural grid, or matrix" (p. 136) to test the integrity of curricula. However, no evidence of this or similar approaches was mentioned in the data collected. It is also significant to note the lack of formative input that professional accreditation were seen to provide in this regard. Participants expected professional bodies to provide constructive criticism and feedback but felt that this rarely occurred.

It is pertinent to reflect on graduates' poor communication and measurement skills (Section 5.3). In this regard, Table 6.2 is informative, showing that "Communication and Documentation" is the lowest ranked area of study (with only two respondents indicating they taught this topic). The reasons for this were not explored with participants, but a lack of academics with the knowledge and experience to teach this topic can be ruled out as Table 6.3 shows that 12 respondents had taught it in the past. It therefore is plausible that industry's concerns about graduates' abilities to communicate effectively are at least partly due to the fact that little priority is attached to teaching these abilities. This observation is supported by the trend shown in Figure 3.3 (p. 59). This shows a marked decrease in the extent to which this topic was taught between 2003 and 2007. Reasons for industry's criticism of graduates' measurement skills are not as readily apparent from these tables. Figure 3.2 (p. 57) shows that "Quantity Surveying" is taught at all universities, and that it comprises a markedly different proportion of each curriculum. Furthermore (and similar to "Communication and Documentation"), Figure 3.3 shows this topic has shown a marked decrease in the extent to which it was taught between 2003 and 2007. Collectively it may be inferred that academics have not responded to industry's concerns about this topic. A partial explanation for this is

provided in respondents' evaluations of overcrowding of curricula which indicated that more than three quarters of them felt that curricula should not be over-crowded.

Academics did not express strong views about changing the duration of their programs. Whilst some students saw shorter degrees as attractive, academics were more circumspect. Many of them acknowledged the requirements of the accrediting bodies as being paramount in this regard. The AIB states that "an equivalent of eight full-time academic semesters is required" (AIB, 2006, p. 7) and this has hitherto been interpreted as requiring construction management degrees to be of four years duration.

On the international front, the Bologna Declaration (European Commission - Education & Training, 2010) calls for a Bachelors as well as a Masters degree. To date, the University of Melbourne is the only Australian university to offer degrees structured in this way. It is therefore too early to tell whether this approach will prove attractive to industry, students and universities in Australia.

There are clear tensions between increasing the duration of degrees to accommodate new content areas, the requirements of some students for shorter degrees, and those of the construction industry for skilled professionals. In this regard it is interesting to note the observations of Ashworth (2008) with respect to a similar debate in the UK. He states

> "(t)here clearly wasn't much enthusiasm for extending the teaching and learning programmes, either by increasing weekly delivery times, extending the academic year or even by extending the length of the programme that has already occurred in some disciplines such as engineering (who have adopted the Bologna model)" (p. 15).

The debate about the duration of construction management programs has only commenced. The decisions that are reached will have far-reaching consequences for the curricula of these programs as well as for the working lives of construction management academics. The requirements of the AQF for graduates from professional disciplines to have an Honours qualification (i.e. to be of four years duration) mean that the debate still has some considerable way to progress. Should Masters qualifications become the norm for admission to professional disciplines (as is currently the case for Bologna qualifications) the duration of degrees will increase. Such a change will require construction management disciplines to re-evaluate their entire offerings, and the working lives of those responsible to teaching into and administering the discipline are likely to change in marked ways.

7 How construction management academics teach and assess

7.1 Introduction

This chapter builds on the exploration of what construction management academics teach by focusing on how these academics teach and assess their students. This aspect is central to the lives of academics because it constitutes the major part of their workload and has the potential to constrain their capacity to engage in other activities (e.g. research). It is subject to numerous influences that, in turn, affect academics in different ways.

The data presented and discussed in this chapter are drawn predominantly from the interviews and focus groups that were conducted for this study. The term 'participants' has been used to indicate those who took part in these activities. Supplementary data from the on-line survey has also been used, with the term 'respondents' indicating replies from people who responded to this survey. A topic that underpinned many of the observations offered by respondents and participants was that of the increasingly large size of the classes they were expected to teach and assess. The extent to which this has occurred in recent years is described in Section 3.10.3. Finding ways to accommodate and manage the pressures related to large class sizes motivates many of the observations recorded in this chapter.

This chapter is divided into seven sections: the impact of large class sizes on teaching and learning, existing teaching practices, the use of sessional academics in this regard, digital teaching and learning, assessment, the contribution of site visits and work integrated learning. The manner in which these affect the lives of construction management academics is described and discussed in these sections.

7.2 Teaching large class sizes

Classes of construction management students have been increasing in size for almost a decade (Section 3.10.3). The number of students enrolling in these programs has placed significant demands on those responsible for their delivery. When asked in the online survey to identify significant issues they were facing, respondents overwhelmingly highlighted class size as a major concern. This response was also evident during the interviews and focus group discussions and is summarised in the words of the following HoSs

> "The threat at the moment is that the numbers just overwhelm us. We've had increases in numbers for the last three years and they've been big increases so that we're now sort of nearly three times what we were four years ago. I mean in student intake and at the same time staff have left. So that's the biggest threat."

> "I think the pressure - certainly in our situation our numbers have increased significantly. Our first year classes are in excess of 100 so we're having to do with a lot less staff and a lot more students. The lecture is not a problem; it's the backup, the follow up, the support, the tutorial aspects, the (marking) and if you take teaching seriously the feedback that has got to go with that. That is a real challenge."

Academics were also concerned about class sizes and the impact this would have on the way they engaged with their students. This is indicated in the following quote: "What I find difficult sometimes is dealing with increasing the size of our classes - it's going to be more and more difficult to engage with students on a one to one basis…".

Academics noted that class sizes of in excess of 500 students were possible for some core courses[5] and that the resulting student-staff ratios were of concern. In one case this ratio was noted to approach 70:1. In this connection a HoS said "I think the student-staff ratio has always been a concern. I have identified it over the years, it has been. I think that's a problem anywhere". Another HoS stated "Yes, student to staff ratio has been the biggest problem at the moment, and that increases the workload. And we just had a schools forum and that was the highlight (of it)".

Larger classes were thus of concern to construction management academics. Not only did the number of students affect their workload, it presented them with challenges of having to learn and acquire new teaching skills and techniques. Participants noted that the number of students being taught and assessed necessitated the use of appropriate methods. The following quote illustrates a HoS's observations about several of his academics

> "There's a lot of issues around that our staff are struggling with because some of them are still teaching and assessing as if they've got 60 students in the class when they've

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[5] Some courses enrol students from other disciplines (e.g. architecture, property) and may also be available as general electives to a wider student population.

> got 200. And you need to think about redesigning the systems and being a little bit more efficient."

It was not possible to identify how prevalent the use of inappropriate teaching and assessment approaches was. During interviews it became evident that these were changing in some instances. Some academics had adopted new teaching approaches as the following quote illustrates.

> "I think that also the numbers that we have now have impacted on the way that we teach. We used to teach, even three years ago, very much differently to the way we teach now. We don't have the small groups that we had, so we're tending to – well at least me from a personal perspective – its more lecture based, than a sort of tutorial that we used to be involved with."

Similarly, a HoS observed that

> "it means a shift in your teaching technique. You have to increase your number of tutorials, because the assessment load can really burden you. You've got to approach it in the right way. It's harder to teach a class of 200 in something like measurement for example. I have to engage in different ways, different techniques, online quizzes which we're experimenting with. It's all time, all of these things."

Respondents were asked to indicate if they used any of the innovative teaching and learning approaches identified in a list of options provided in the survey. Their responses are shown in Table 7.1.

Table 7.1: Respondents' usage of innovative teaching and learning methods

	Do not use /do not intend to use	Currently use	Intend to use	N/A to my teaching practices	No answer
Learning contracts	36.5%	11.1%	7.9%	15.9%	28.6%
Simulation projects	6.4%	58.7%	7.9%	7.9%	19.1%
Peer assessment	19.1%	42.9%	12.6%	3.2%	22.2%
Self assessment	38%	27%	6.3%	4.8%	23.8%
Group work	4.8%	77.8%	1.6%	1.6%	14.2%

Some respondents indicated that they used other approaches, including reflective writing and reflective journals, as well as role-play, whereas other academics identified a need to consider teaching approaches that did not involve ICT applications. For example, these individuals

saw "team teaching" and "(p)ressure to move to a more tutorial/workshop style of teaching" as challenges they would need to cope with. If construction management lecturers are to cope effectively with the increased number of students in their classes, they need to adopt new teaching and learning strategies. The extent to which these academics have availed themselves of opportunities to develop new teaching and learning skills is described in Section 9.6.1.

Academics also expressed concern that teaching standards would be compromised as a result of large class sizes. For example, one respondent was worried that s/he would have "(l)imited/no time to think about improving my teaching" whilst another was worried about "finding time to teach at the standard that I would like to teach at". Some respondents expressed concern that large classes were motivating academics to adopt pragmatic teaching practices. For example, one wrote

> "Large classes, for example 110 students, make it too easy and attractive for me as a teacher to just deliver lectures which are probably the most ineffective form of teaching. Small group tutorials or other small group activities are essential but consume my time, effort and money."

Teaching, assessing and providing feedback to large classes was thus a major concern to construction management academics. Many respondents saw their current high workload remaining at least at its current level or increasing, and foresaw their teaching responsibilities competing with those of their research and administration commitments. Whilst there was evidence of a range of teaching, learning and assessment strategies being used by some academics, it was not clear how widespread their use was.

To reiterate and emphasise the importance of this aspect, respondents and participants referred to the issues identified in this section in many of the observations and comments they made about other topics. It is clear that coping with large class sizes was a major concern to them.

7.3 Existing teaching practices

This section reviews the perceptions academics have about their own teaching strengths, as well of the main factors that either impede or support these strengths. A realistic appreciation of their own strengths is important if academics are to develop their skills and abilities as teaching professionals.

7.3.1 Perceptions of teaching strengths

Some respondents saw their ability to actively engage students as one of their strengths. They identified this in a variety of contexts as the following examples show.

> "Presenting lectures that keep students awake and make them come back next week"

> "I recognise that every student is an individual and for each student their learning is important. The same student may learn differently in different situations, and different students may learn differently in the same situation, so, in designing assessment tasks and class activities I provide a variety of approaches that try to allow each student to engage into the learning process."

Respondents saw themselves as being able to effectively manage their teaching responsibilities. For example, one mentioned "being able to plan out lessons reasonably well…" and another noted that s/he was good at "delivery of courses and marking". Other descriptors used in this context included: systematic, well organised, well prepared, good preparation and planning.

Several respondents also saw themselves as excellent teachers. One noted that s/he had "Excellent teaching skills and (I) am able to provide excellent, up-to-date resources as appropriate for student learning". Various different approaches were noted in this regard, including being able to blend theory and practice, and simplifying complex concepts. One observed that

> "I try to remember and operate from the belief that the focus of my teaching is not on what I do, but instead on what the students do, and how they engage in learning activities that will assist them to see the world differently or whatever is required to achieve the l desired earning outcomes."

An aspect identified by many respondents was their knowledge of their subject. Respondents' comments are summed up in the following statement made by one who noted that s/he had "deep and current knowledge of subject matter".

Respondents were thus able to identify a range of strengths they believed related to their teaching, including being able to engage their students, and manage their teaching responsibilities. The passion and commitment of many academics for this aspect of their

working lives were thus clearly evident. However, they also identified certain issues that impacted on their teaching strengths and these are described in the next section.

7.3.2 Significant issues impacting on academics' teaching strengths

Many respondents saw their heavy workload as an important issue and one that impinged on their abilities to exploit their teaching strengths to the full. This was described in many ways, from all-encompassing statements about workload to specific statements relating to a lack of time to accomplish various tasks. The activities that respondents felt were compromised included teaching, developing / updating / improving courses, providing students with feedback, and keeping up-to-date. Inherent in all these comments was concern about the increasingly large number of students that they were required to teach. Not only did these large classes result in increased workload, respondents noted that it was difficult to engage students and to get to know them.

One of the ways universities were attempting to cater for large classes was through the introduction of ICT enabled learning management systems. Some respondents were of the view that engaging with these systems was challenging. A few identified a need to develop their skills in using these technologies; the main concerns raised related to lack of suitably qualified support staff and a lack of funding for ICT-related initiatives.

Another impediment to academics exploiting their teaching-related strengths was seen by some respondents to be the competing pressures of having to secure and conduct research, teach and complete administrative duties. These activities were seen to be mutually exclusive. As participants noted

> "Expectations to do more research reduces my ability to teach well"

> "More time required for teaching administration rather than facilitating student learning".

This section has highlighted the significant issues that academics saw impacting on their teaching strengths. These largely centred on the workload involved in teaching large classes and encompassed all aspects of their teaching. Academics' other responsibilities, including research and administration, were also seen to limit the time they could spend on teaching. As a consequence of this workload, academics neglected activities that would have helped them to teach and assess large classes effectively and efficiently. This highlights the impact of heavy workloads on construction management academics' working lives. In many cases

simply keeping abreast of their teaching responsibilities was all they could accommodate. Other activities, such as engaging in research, and developing their skills as and where needed, were relegated to second place.

7.3.3 Greatest areas of teaching need

Respondents were asked to rank a list of teaching needs for their discipline. Their responses are summarized in Table 7.2. In addition respondents identified a number of requirements, including Australian-based learning resources, salary increases, extended contact time with students, improvements to online courses, recognition of good teaching as being just as important as good research, space for students to work in, reduced class sizes, more tutorials and more site visits.

Table 7.2: Respondents' ranking of teaching needs

Rank	Teaching need
1	Increase in staff numbers
2	Curriculum reforms
3	Lecture rooms/Theatres
4	Online teaching and learning resources
5	Professional development
6	Tutorial spaces
7	Computer labs
8	Up-to-date academic books/journals
9	Staff offices
10	Student meeting rooms
11	Up-to-date visual equipment
12	Staff and student internet access

A wide range of teaching-related requirements were identified. Underlying several of these is a need of academics to find ways of coping with their workload. Specifically, the need most highly ranked in Table 7.2 was for more academic staff (which would reduce individual academics teaching workload), as well as other teaching and learning related resources. Academics are thus aware of interventions that could assist them with their teaching but, as will be shown in Section 9.6.1, few reported having the time to exploit such opportunities.

7.4 Sessional academics

The teaching, learning and assessment activities associated with large classes need to be adequately resourced and respondents identified a lack of suitably experienced academic staff as a concern in this regard. An approach several universities used was to engage sessional (or

casual) academic staff to assist full-time academics with tutorial and / or other teaching-related activities. However, recruiting, retaining and managing sessional academics was seen to present several challenges. These related to the remuneration of staff, their motivation and goodwill, the number of senior students and researchers willing to work as sessional academics, as well as encouraging these staff to offer their services year after year. Each of these is outlined below.

7.4.1 Remuneration of sessional academics

Some participants noted that despite the assistance sessional academics could provide, the financial pressures prevailing in their discipline prohibited them from being appointed and renumerated. One academic observed that "funds are limited. There's nothing much to spend (on) say a tutor or anything like that. You've got to do everything yourself."

It is reasonable to assume that there are differences between universities, and that some disciplines were experiencing financial pressures at the time this study was conducted.

7.4.2 Motivation of sessional academics

Notwithstanding the problems some construction management disciplines may experience in funding the efforts of sessional academics, some participants noted that these staff were not motivated by payment alone. This is illustrated in the following exchange between two academics

> "(A university) pay(s) about probably $120 now an hour which equates to about $4000 for a semester and it is hard to get people to do it." (Interviewee 2)
>
> "People are not doing it, particularly if they are well paid. Why come into a university and get paid (relatively little)?" (Interviewee 1)
>
> "Because they love it is the only reason I have ever heard, because the students are getting something. Sometimes it is a recruiting thing as well, if you can find a few good people and take them back to work with them but it is not the money." (Interviewee 2)

Similarly, in answering a question about whether money attracted sessional academics, a HoS said "No. Well it depends on who the staff member is. But somebody who's very experienced with a lot to offer, when you look at what's involved, the money's not that good."

Success in locating sessional academics with the motivation and time to assist at university appeared to be serendipitous. It is likely that regional universities experience more difficulties in locating and engaging these individuals as they have a smaller population of suitably qualified personnel to recruit from. Notwithstanding these difficulties, experienced and motivated sessional academics are a boon to the discipline, and many academics sought to engage their assistance.

7.4.3 Goodwill of sessional academics

At one university, academics indicated that their sessional academics were motivated by a sense of goodwill. It was not clear how staff at this university had cultivated and harnessed their pool of willing tutors. A number of factors appeared to have contributed, including long-standing and positive personal relationships between academics, students and graduates, the reputation of the university, the geographic proximity of graduates' workplaces relative to the university, the timing of lectures, and support from the graduates' employers. It is relevant to note that the university concerned is located in a large metropolitan area and is relatively easily accessible to graduates working on a range of construction projects and offices. Furthermore many construction management lectures at this university are delivered in the evenings. This makes it possible for sessional academics to offer their services after they have finished their full-time work commitments.

The following focus group discussion records the way in which participants spoke about this

> "There are lots of casuals required, we have a long history, like a long-term relationship, I don't think they're here for the money." (Interviewee 1)
>
> "They are here for the money?" (Facilitator)
>
> "They aren't." (Interviewee 1)
>
> "I don't think they're here for the money. The money is not, I mean, it's…" (Interviewee 2)
>
> "It's trivial compared to what they can earn?" (Facilitator)
>
> "Yes" (Interviewee 1)
>
> "Why do you think they're here? Do they tend to be ex-alumni or…?" (Facilitator 2)
>
> "I think the reputation is a big one" (Interviewee 1)

Although an isolated example, the situation described above illustrates the benefits that accrue from effective interactions with alumni and industry. Construction management academics are arguably aware of this, but may find the demands their other working commitments prevent them from spending time to develop such relationships.

7.4.4 Availability of sessional academics

Some universities experienced difficulties recruiting senior students and researchers to work as sessional academics. As will be discussed in Section 8.5, many construction management students engage in paid employment whilst they are studying. The opportunities and experiences gained in industry appear to outweigh those offered by tutoring, and compound the difficulties construction management academics experience in staffing their classes. In this regard, a HoS said

> "it's hard to find tutors because all our final year students are working out in the industry so they're (not) looking for extra money because they're already making more money than we are (In addition) we have very few full-time research students so you don't have that fund of potential tutors around the place".

Construction management disciplines thus find it difficult to locate senior and graduate students to work as tutors. This means that academics need to take on many of the roles that would otherwise have been are staffed by sessionals. Indeed, it was apparent from participants that not all universities were able to ease academics' workload in this manner.

7.4.5 Retention of sessional academics

Continuity of sessional academics from one year to the next is desirable. Where this is possible, these staff members benefit from their previous experiences, and do not need to be supervised to the same extent as new sessional academics. However, retaining these staff over successive semesters and years can be problematic and costly. In this regard a HoS said

> "(t)he consistency, continuity is lost when casual staff come on board you have to train them, they're not professional teachers, their experience is limited. You have to train them get them familiarised with the university system. One or two terms they're gone, you have to replace them and train them again. That's a lot of work"

Another HoS commented in the same vein about the difficulties of retaining sessional academics

> "in the last few years I haven't been able to get staff. I haven't been able to consistently keep sessional academics on, in my area." (HoS)
>
> "Okay." (Facilitator)
>
> "What's happening is I'm getting younger and younger tutors, and I think that can put some pressures on teaching quality. Not everywhere, but just in the last few years." (HoS)

Whether or not sessional staff are reemployed year after year is generally dependent on factors which construction academics cannot influence. Recruiting and training new sessional staff makes demands on the academics they will be assisting. The employment and retention of sessional academics thus has workload implication for full-time academic staff.

7.4.6 Managing sessional academics

Sessional academic staff assist with tutorials, marking of assignments and related activities. Once they have been appointed, their activities need to be coordinated and managed, and these activities add to the workload of full-time academics. As one HoS noted, "there's (sic) coordination roles and tutor roles and all that sort of thing have to be reasonably methodical and well planned in advance."

This is not a trivial task, as illustrated in the following exchange between academics.

> "For instance course coordination I would classify as administration, but other people might say it's all part of the teaching process. But that's building up because you know particularly if you've got sessional lecturers to write contracts (for)". (Interviewee 1)
>
> "We spent a half a day writing applications for three sessional academics contracts because it's so fiddly and complicated. You've been there and done the same thing. Yeah. A half a day out of you know 10 half days in a week is a lot of time and then it never goes through smoothly and there's always something that comes back...". (Interviewee 2)

An example of the extent to which large classes require resourcing is provided in the following words from a HoS. He describes how a full-time academic has been employed specifically to manage the activities of sessional academics.

> "Then for each of these big subjects, there's a level A lecturer permanently appointed to coordinate the subject. So when you've got 480 running in one semester, that's a full-time job just for a coordinator, to make sure everything runs properly they're not doing any lectures. It's done by somebody else. So they help with the development of the lectures. They help develop the tutorials. But then they organise all the tutors, have mediation sessions, feedback sessions, all that. So you know, you're running 30 (tutorial) groups."

Furthermore, sessional academics need to be familiar with the activities they are assisting with. Those without the requisite skills and knowledge should not be employed, but recruitment of these individuals is subject to the pressures of availability noted in Section 7.4.4. In the following quote, a HoS highlights instances where sessional academics were not familiar with the subject matter they were required to tutor on.

> "The problem with tutorials, however, is that you need to know your material backwards… So the people doing the tutorials need to know it. We had problems last year and this year where the people are not comfortable doing those (tutorials) for one of my subjects. And the students are seeing through that. They quiz them on particular areas and get, 'Oh I don't know'. That's not good."

Where several sessional academics assist in marking submissions, the ways in which they assess and provide feedback to students needs to be consistent. Full-time academics need to brief sessional staff and monitor their efforts. The following quotes provide examples of the difficulties academics have experienced in this regard.

> "Yeah I think that's quite an issue because we are divided into something like 20 different tutorials and obviously the assessment (differs with) different tutors I think it's quite difficult because two diverse groups of tutor assess in a very different manner."

> "I think also we use a lot of sessional academics and it's been difficult to get them to understand the need to give feedback they tend to just want to put a grade on it and not give feedback. So they're not really into that understanding that students want feedback and need feedback."

Similarly, a HoS stated

> "(o)ur head of (faculty) has given us reasonable funds so I get support for some of those areas in terms of marking assistance and so on. But there is always a danger that that is not consistent with the lecturing input."

An additional challenge identified by participants was that of creating a positive environment for sessional academics. The following quote highlights the fact that some sessional academics were not managed and supported effectively.

> "A lot of emphasis is placed on casual staff, sessional academics. And I think one of the challenges is getting a team of sessional academics that fill part of the program, that don't feel isolated, that feel part of let's say the team where they can input their practical knowledge. But what often happens is it tends to be in a more isolated fashion. They're just coming in, give their lecture and leave."

Sessional staff need to be effectively managed. It is necessary for full-time academics to plan the activities they are responsible for, to train, monitor and support them where necessary, to co-ordinate the activities of fellow sessionals (where several are employed on a particular course) and to assist in creating an inclusive environment that these individuals can relate to. Accomplishing these tasks is not trivial, and it would be ill-informed to consider the employment of sessional staff as a palliative that addressed all fulltime academics' teaching workload concerns. This is not the case as the effective management of these part-time academics can clearly be an onerous task in itself.

7.5 Digital teaching and learning

This section deals with digital (online) teaching and learning. Many respondents would have liked to make greater use of online teaching and learning, and many foresaw that they would need to do this in the future. They noted that they would need to be trained to use these technologies effectively and would have to adopt new teaching approaches. Furthermore, they saw online teaching and learning as something their students were keen to see implemented. Several respondents highlighted students' expectations of online delivery of teaching and learning materials. They echoed one respondent's comment that such mechanisms allowed students to study "at a time that suits their work and social life".

Notwithstanding these observations, some reluctance to actively engage in online delivery may be inferred from Table 7.3. Respondents were ambivalent on these issues; they viewed Issue 1 (providing students with opportunities to learn in online environments) as less

important than Issue 2 (relevant and current computer software should be incorporated in teaching).

Table 7.3: Respondents' views about teaching and learning approaches

Issue	Not at all important	Not very important	Important	Very important	Extremely important	N/a
Students should be provided with opportunities to learn in online environments	4.8%	27%	34.9%	19%	7.9%	6.3%
Relevant and current computer software should be incorporated in teaching	0%	4.8%	25.4%	34.9%	28.6%	6.3%

Legend:

Area of dominant response	

The survey also provided details of the extent to which the construction management programs were delivered digitally. Respondents were asked whether they offered their degree in online mode. Seventeen point five per cent answered that they did, whilst 71.4% answered that they did not. Eleven point one per cent did not answer this question. Respondents who noted that their university did offer an online program were asked if it ran concurrently with their on-campus program. Ninety one per cent said that it did, whilst 9% said that it did not.

Of particular interest is the absence of any comment in relation to online teaching and learning that was made by representatives of the accrediting professional bodies.

It is unclear whether construction management academics generally viewed online delivery as a desirable teaching and learning approach. This is arguably unsurprising, bearing in mind the age profile of these academics (Section 9.1) and the general reluctance of older generations to engage with IT initiatives to the same extent as their Gen X and Y students (Section 3.10.2). Online delivery presents opportunities for academics to interact effectively with a large number of students, and the reluctance of some academics to harness these technologies foreshadows the challenges they face when engaging with new technologies. However, this may be short-term as older generations of construction management academics retire and are replaced by those more willing to harness ICT for teaching and learning.

7.5.1 On-campus vs. distance delivery

Participants were aware of the impact of the internet on universities, their peers and students. The ease with which courses may be delivered electronically has blurred the lines between

on-campus and distance-learning. Some universities have embraced opportunities to reach out to wider audiences, whilst others have retained their traditional focus on on-campus delivery. Examples of the latter strategy came from participants who stated explicitly that their universities would not provide distance-learning education. As one HoS said "(this) university is deliberately a face-to-face university. We make a deliberate decision to not go distance." Similarly, another HoS stated that "(this) university will never be an online institution. You'll never be able to go through and do a degree here, an undergraduate or a masters, online. It will not happen."

Whilst these universities have adopted an on-campus delivery strategy, they did not discount online delivery entirely. For example, the aforementioned HoS stated that "you're certainly not going to get online delivery, assessment, discussion groups here. (It) won't happen Even if you have an online subject, you cannot have it 100 per cent." The motivation for constraining online delivery appears to stem from concerns that it would compromise students' experiences of university life. This HoS went on to say that "(b)y the time you finish here, you'll have a terrific experience as a student. I don't think you can offer that online for somebody who's just off campus and never comes."

An additional factor motivating universities to position themselves as on-campus institutions may relate to perceived competition from international ivy-league universities. In this connection, a HoS argued that students considering studying at a distance were not constrained by geographical boundaries, and might gravitate to universities with well-respected international reputations. He said "(i)f everything is going to be online, why would you take an online course from this University or another University or whatever? Why wouldn't you just direct to Harvard and get their online course? Then you're a Harvard graduate."

Furthermore, it was observed that the general public may perceive differences between the academic rigour of on-campus education compared to distance-learning education. This is illustrated in the following observations of a student who stated

> "At the same time, going to someone saying 'I've got a university degree' means that you've been able to make a commitment and apply yourself… that says I've applied myself for three years and I've done lectures and I've done assignments and I've done exams and I've done all that, and that makes me able to apply myself. That makes employers look and say, you've done a degree at university. If all of a sudden

> everything was willy-nilly and everyone could just turn up and you could use everyone else's assignments and you could just get 98% mark for all your assignments and just sort of scribble your name and your favourite weekend activity and still pass and you don't have to go to any classes, then that would reduce what people would think. Oh, you've done a uni degree, anyone can do that."

Participants' responses show that digital teaching and learning has not been adopted to the same extent by all universities. Reasons for focussing on on-campus as opposed to distance delivery vary but include concerns about students' experiences whilst at university; perceived competition from ivy-league institutions; and public perceptions of distance-learning qualifications. Whilst some universities have made strategic decisions to focus on on-campus delivery, others have engaged more vigorously with online delivery. Examples of the latter approach are described in the next section.

7.5.2 Focus on distance-learning / blended-delivery

The convenience of digital education presents obvious opportunities for distance-learning education. However, digital teaching and learning involves more than simply making recordings of face-to-face lectures available to distance-learners. The following observation by a HoS highlights his concerns about teaching online.

> "We spend an awful lot more time online and preparing materials that are suitable for online delivery. That used not to be a consideration at all… the kinds of things that don't seem to be a problem to start off with because you're delivering them first and foremost to on-campus students, can become a horrendous problem when you start using the same materials with distance-learning students."

One university has adopted a blended approach where courses are delivered to both on-campus and distance-learning students. On-campus students attend face-to-face lectures and tutorials, whilst distance-learners study asynchronously using the university's learning management system (LMS). Whilst this may appear to be a pragmatic solution, blended-delivery presents a different set of challenges to those of distance-learning. For example, many distance-learning students are older than their on-campus counterparts (See Section 3.10.1) and the juxtaposition of these age groups is prone to be problematic as the following observation of a HoS indicates.

> "It's a challenge because on-campus and distance-learning students have traditionally had quite different cultures. The distance-learners would have predominantly been industry practitioners and I guess they still are whereas the on-campus students are predominantly school leavers. (t)o put it slightly differently, there are people on campus who come in knowing that they don't know much, whereas there are a lot of distance-learners who come into the program believing that they know everything. So when you bring those two groups together it can lead to a lot of friction."

Poor internet connectivity and speed have restricted some providers from using this medium, as the following HoS quote illustrates.

> "I have stayed on a paper-based system… I have many students in locations where they're down to the last copper pair of wires from Telstra. Now, the Broadband initiative will enhance that. I can see it coming very shortly where we need to be in an electronic environment… For many of my students, the Blackboard that we use here is a dog on dial-up internet. That's the only simple way to describe it. So if you didn't have Broadband access you actually were disadvantaging your students. So I stayed with paper by the post, with all its inherent problems, only because at least I could ensure a level platform for students to communicate."

These examples illustrate the different strategies universities have adopted in embracing digital teaching and learning. These contrast with those of other universities who have retained their focus on on-campus teaching and learning. Each university caters to the requirements of its own geographic region and student demographic. Regardless of the extent to which digital teaching and learning is adopted, it presents its own set of challenges, and observations in this regard are described in the next section.

7.5.3 Challenges of digital teaching and learning

Participants were generally conscious of the challenges presented by digital teaching and learning. In this connection, an academic observed that digital teaching and learning was part of a continually changing global environment, stating that "in that context, teaching and learning is – it's a different world. It's changing. It is a rapidly changing world."

Students recognised and appreciated the benefits of digital media, noting that some of their lecturers provided them with a range of resources including lecture notes (in word-processed or pdf format), PowerPoint presentation slides, audio files and videos. However, the format

used by lecturers appeared to be ad hoc and more related to the academic's familiarity with specific technologies rather than to the activity in question (except where bandwith was mentioned – see Section 7.5.2). Consequently, whilst some students were aware of the usefulness of, for example, recordings of lectures, these were not always provided by their lecturers. Furthermore, during a focus group, students commented that the LMS their university used was "user friendly", but noted "I've never had a lecturer that does any of that kind of stuff (recordings) but I think it would be good if that was more readily available"

In a staff focus group at the same institution, academics indicated their awareness of audio and video recording facilities, but had not used them. Students gave additional evidence of the haphazard use of digital media by academics. For example, one noted "(w)e've got all the online LMS stuff, like every subject has all these options, assignments and stuff, but none of it really gets used". Academics therefore appear to use online teaching and learning in an arbitrary manner and their skills in engaging students online appear to be ad hoc. This indicates that construction management academics would benefit from developing their online delivery skills. The extent to which academics engaged with personal development initiatives such as this is explored in Section 9.6.1.

7.5.4 Convenience of digital teaching and learning

Several students mentioned that they valued having teaching and learning resources available online. These were seen to supplement their other traditional materials and approaches as the following quotes indicate.

> "(F)or this particular class we've got online lecture videos that have been recorded in the past. So we can sort of go back and look at it again if we need to. So they're helpful"
>
> "It helps if there's a secondary resource(s) or something on paper or something physical …." (Interviewee 1)
>
> "Something you can refer back to." (Interviewee 2)
>
> "Yeah, to what you've taken in the class and what notes you've got, you can pick up from online resources." (Interviewee 1)

Some students noted that they valued being able to download and print lecture notes before a lecture. In this connection, a student said "I prefer to print (lecture notes) out so I can have it,

so I can then write on those notes where I can read them through first. A twenty-four hour period would be good." This student went on to say

> "(a) lot of (academic staff) put a lot of stuff up online that you can read before the class. So you can get there and they can sort of go through (it) and they're always available so that even if the lecture will finish early most of the time you're out of there, but if you've got something you want to ask about they're there… to ask."

Adding to this, another student observed that students are not able to attend every lecture, saying "You can't always be… ready to go every day". Having recordings and other digital resources available was seen to provide flexibility, thereby enabling students to dovetail their studies with their other commitments. Other students echoed these views, saying

> "I think you need options. Over the six months, the semester is not the same. I mean you start a subject and when you finish it a lot of the time you can't be here. A lot of it is work and we'll do fifty hours a week even though we're at uni and we travel. So I think you need to have the option…" (Interviewee 1).

> "Yes, good. To have the option would be good." (Interviewee 2).

> "So if the information is online and you can prepare for it that's great, you do need that otherwise, I mean we all have commitments" (Interviewee 1).

Academics generally acknowledged that students wanted to be able to view materials online, and do this at a time of their choosing. In this regard, a HoS said

> "There's all the facilities available these days for… broadcasting lectures and where a student potentially online can go and look at the material that's been on a learning management system… where they can view it any time they like. That's what Generation Y like. They want to see it – midnight, Sunday night, they decide they want to go and have a look at (it)."

Students saw digital media as an efficient way of accessing teaching and learning materials. For example, when asked what impact missing classes had on their learning, one noted that "(i)t makes a big difference if it's on the net. If it's on the net you can virtually do your own study in half the time it takes the lecturer, and get just as much out of it."

This observation highlights the reasons students found digital materials to be convenient. They are accessible at all times, and may be skimmed, fast forwarded and replayed as desired. Additionally, students argued that being able to access online materials saved time spent travelling to and from university. For example, one student noted "I'd rather do it online because I live in the eastern suburbs so if it's a two hour lecture I've got to travel for four and it kind of feels like a waste of time at times and you just don't end up coming."

Similarly academics were aware of the time students spent commuting between home, work and university. In this regard, HoSs said

> "(o)ne student last year found the online component a bit hard and she said 'I'd rather go back to having the second lecture' and I explained how much time she was saving and she didn't bother to argue with me again after that because… it was another night that she didn't have to come in. So she was actually saving a lot of time for the sake of spending four or five hours on each of these questions which she could do any time she liked and she was working and the flexibility of being able to do it in the evenings or the weekends or whatever, in my view, far outweighed – I mean she wouldn't have turned up to at least half the lectures… because it was just impractical."

> "(t)hey're from (a suburb). One of the second year units they… have to do it (is) at (a campus located in another suburb). It adds 20 minutes extra travelling. They were saying 'There's no way in the world we're going to be able to attend your tutorials'."

Despite being able to access materials before and after lectures, being able to access recordings at any time, being able to selectively review sections of such recordings, and being able to avoid travelling to and from university, participants identified some shortcomings of digital teaching and learning. These are described in the next section.

7.5.5 Shortcomings of digital teaching and learning

Some students were aware of the limitations of relying on recordings of lectures. They noted the likelihood of missing some of the activities that occurred in face-to-face environments. For example, in relation to face-to-face lectures, one student noted

> "(you would) (u)nderstand it better than you would just watching a video. And you'd miss out on the things that (we) do in our particular class… (In face-to-face lectures)

> (w)e usually come across things that you didn't even think you didn't know and then you realise you've never heard of that."

In addition some lecturers noted that online delivery was ineffective in communicating subtle visual cues, as the following quote shows

> "This facial and body language, it can't be described in word or in sound. Secondly, the communication with the lecturer is immediate. If I see you understand, if you missed something, or you don't understand the concept, I can immediately see, detect from your facial express(ions), right? And then I can adjust my delivery and emphasise a certain concept, give more illustrations. That can't be done (online)."

Notwithstanding the convenience of being able to access online teaching and learning materials at any time, some students argued that this approach would not work for them. They noted the pressures, distractions and demands of studying in a place other than a university, as the following quotes indicate.

> "(W)hen you're in a living environment… if you can say, I'm sorry I've got to go to uni. When I leave the office, I have to leave at 3:30pm to get here for a 4:00pm class, I'm like 'Sorry I have to go, see you later!' and (I'm) out the door. You can turn off from whatever you're doing. You can turn off from your work life you can turn off from your family life, you can come here to university and you go 'I'm at uni now'. I wear tracksuit pants and a footy jersey when I go to uni. I used to bring a skateboard to ride around in between (lectures)… So you're not a husband, or a father, or a son, or whatever, or an employee… You're a uni student and your job is to sit here and learn… So I think even though (lectures are) at night time, coming here and doing it at the university, it gets you in the right frame of mind. Whereas your kids could come and say 'Oh Dad, look I've just kicked my first goal!' but you can't say to your kid… 'Oh sorry'."

> "Personally when I'm at home I feel, that's it, you're at home… (Compared to when) we're in university, you're like 'I'm in uni, there's always going to be someone next to you studying harder"

Some students argued that online materials encouraged them to become complacent about their studies. They observed that, because they knew they could access them at any time, they delayed such activities. This is illustrated in the following exchange:

> "It's not laziness it's just if it's online I'm like, yeah, I'll look at it later [laughter]. Don't worry about it. I'll look at it later online." (Interviewee)
>
> "Do you think you would look at it later?" (Facilitator)
>
> "No I wouldn't." (Interviewee)

However, some students noted the overriding contribution their motivation made to their academic success. One noted that motivation was more important than the delivery approach used, saying

> "At the end of the day it comes down to motivation because it doesn't matter how far you live, close or far, it's motivation because if you're not motivated then you're complacent and then everything is in the last week of uni, studying and all that, rushing to get things in."

The shortcomings of digital teaching and learning identified above are significant. Face-to-face interactions were seen to enable students to engage with their lecturers and to help them to pick up on cues that they would miss using digital media. Furthermore, face-to-face environments were seen to allow academics to gauge students' reactions, and to modify their teaching behaviour accordingly. In addition, several students highlighted the distractions of studying at a location other than their university. However, motivation was seen to be of over-riding importance, as students' will to succeed was seen to be able to accommodate whatever teaching and learning approach academics used. The shortcomings identified in this section were not seen to be insurmountable as students acknowledged that they could succeed if they were sufficiently motivated. Construction management academics need to be aware of the rich variety of students' preferences and commitments if they are to engage successfully with online teaching and learning. They need to partake in various activities (including familiarising themselves with relevant literature, attending staff development activities and consulting their students), all of which make demands on the time they have available. Moving to online delivery therefore has definite workload implications if the shortcomings of online delivery are to be avoided.

7.5.6 Benefits of digital teaching and learning

Some participants saw digital approaches as a useful means of delivering large amounts of content to students. This was seen to result in students expecting to be provided with

materials rather than developing their research skills and identifying appropriate materials themselves. For example, a HoS observed

> "With the reduction in the number of hours of contact that they have… the complexity of what you've got to cover is what I would sort of call core information. It means that the students really, in a lot of cases, have to be given the information in hard format or learning management systems or whatever else. The key points of that discussed and explained. The volume of work that you need to get through in a lecture means that they can't really sit down there and copy diagrams that might take three or four minutes to do, because you just can't afford that sort of time. So there's been, I think, a reasonable shift to providing a lot more information to the students. They expect that now. They're just spoon-fed with 'What do I need to know? Tell me the bare ingredients that I need to know.' That's unfortunate when they don't have the experience or the maturity to see where this sits in the industry."

Reflecting on the convenience afforded to students by being able to review recordings of lectures, an academic noted that some lecturers were exploiting online media and engaging virtually with their own responsibilities.

> "There has been a change over the years, has there not, the more arm's length education system." (Interviewee 1)

> "I can pick this up when I want to, I do not have to turn up at the times prescribed to listen to all this stuff." (Interviewee 2)

> "I think it has even affected the staff. A number of staff, from people I have known over the years, do not come in every day. Sometimes some come in one day, work two days per week and they can manage because the students are at arm's length, they are talking through email from home, at their leisure." (Interviewee 1)

Building on these observations, academics suggested that working at "arm's length" was a way of coping with their increased workload. For example, one said "(i)t is probably a way though that staff have dealt with the increased workload that has come in. Change of new policies and needs, they spend less time at campus and compensate for it (elsewhere)."

Some members of academic staff thus saw that digital approaches could benefit them in a variety of ways including facilitating the delivery of teaching and learning materials to

students, and allowing them the flexibility to work from venues other than their university office. These work practices align with a general moves in industry and commerce to allow staff opportunities to work when and where they find convenient and may eventually change the ways in which academics teach.

7.6 Assessment

Assessment is a key component of teaching and learning. The often-articulated adage that assessment drives learning emphasises the relevance of participants' observations about this topic. The impact of the rapid growth in the size of construction management classes (described in Section 7.2) was apparent from staff's observations about the different approaches they were using to assess their students. They were conscious of the multiple demands on their time, and pragmatic about the effort they could afford to devote to assessment. Students were concerned about the lack of feedback they were receiving on their submissions. These aspects are described below.

7.6.1 Assessment strategies

Underpinning academics' views on assessment were concerns about the practicalities and effort involved in assessing large classes. As one academic said, "assessment is a problem in these big common classes where we have 300 students." In addition, other academics said

> "That's probably the real issue with assessment… you've got to really look at an assignment and say right, 30 minutes. Cause if you've got 120 of them to do…" (Interviewee 1)
>
> "I don't even want to think about it like that." (Interviewee 2)
>
> "And there's some staff, with the combined cohorts - it's 200 plus students. You almost think 'wow, I'll just give them one assignment or two assignments'. You're really looking at the numbers on that, because you just don't have the time. If you look at hours, 220 assignments - if you have no marking assistants, and that has happened in the past. And let's just say an hour, that's 220 hours. Where do you get those from? Your working week is supposed to be 45 or 40 or something. So a lot of weekends. (Because) we also have a university policy that says all assignments have to be back within three weeks. There's a lot of pressure there." (Interviewee 1)

The dialogue above highlights the extent to which academics are involved in assessing students' work. This depends on the number of assessment items they require their students to complete. Table 7.4 shows the importance respondents attached to students completing several assessment items. Respondents were asked how many assessment items per semester they generally set in a course. Twenty seven per cent stated they set two assessment items, 49% set three items, 5% set four items, and 11% set more than four. Eight percent of staff did not answer this question.

Table 7.4: Respondents' views about the importance of assessment practices

Assessment practice	Not at all important	Not very important	Important	Very important	Extremely important	N/a
Several assessment items	0%	14.3%	23.8%	33.3%	17.5%	11.1%
Online assessment as opposed to hardcopy assessments	9.5%	49.2%	14.3%	9.5%	3.2%	14.3%

Legend:

Area of dominant response	

Academics were also endeavouring to identify appropriate methods that would allow them to assess students' work in a timely and effective manner. For example, one said

> "I would like to try to develop some online assessment or automated assessment and that of course is all part of the effort to reduce marking time and liberate more time for other things."

Several academics reported using online approaches to assess their students. The online survey asked whether respondents had increased their use of online assessment over the past 5 years. Sixty eight per cent replied that this had occurred, whereas for 15.8% this was not the case. Six point three per cent did not know and 9.5% did not answer this question. They were also asked whether academics in their discipline had increased their provision of electronic feedback on assessment items over the past five years. Fifty point eight per cent answered that this had occurred, whilst 28.6 answered that it had not. Eleven point one per cent answered that they did not know and 9.5% did not answer this question. Notwithstanding these responses, academics do not have unanimous views about online assessment. Table 7.4 shows that almost 60% of respondents thought that online assessment was either not very important, or not at all important. These views may be influenced by concerns about multiple-choice assessment as an effective way of assessing students.

It is good practice for students to be assessed using a variety of approaches (Rust, 2005). This appeared to be happening at several universities, as responses to the online survey indicated that a variety of assessment approaches were being used including exams, peer assessment, groupwork, online assessment, continuous assessment, projects / reports / assignments, mid-semester tests and face-to-face interviewees. Furthermore, academics reported

> "(W)e are looking at the assessments of all the units within the course. I think one of the purposes of that would be to obtain a balance of the various types of assessment that we do have, to really do that, to provide balance for the students. We've been told that it's to provide variety for the students, so we don't get into too much focus on a written report or an examination"

> "We've got lots of different models of assessment in the school. We've encouraged people to try different way of undertaking assessment, so there's some people who are doing every week assessment (sic), some who are doing just exams at the end, some who are doing other types of continuous feedback."

The topic of exams provoked markedly different views from academics and students. As noted above, formal exams are used in several institutions. The following extracts encapsulate the main reasons academic staff gave for setting exams

> "I always have exams, all my units have exams, because I feel that if they don't do an exam it's very hard to assess from the assignment alone because I'm marking an assignment right now and there is a lot of similarities between the things. They've just changed the figures here and there, and they say this is their original assignment. So the only way that I feel that I can really test whether they know what they are doing is through an exam. I have exams for all of my units."

> "Perhaps the biggest concern that I've got is that the building industry, when you get out there, is a very stressful one, can be a very stressful one. I don't know what other way you can use to simulate that stress other than an exam. So to a certain extent, the exam simulates the stress factor that you're likely to encounter when you need to make a decision"

By way of contrast, some students expressed reservations about how effective exams were in promoting deep learning, as the following exchanges between participants show.

"as assessment I prefer coursework which is assignments and those kinds of things rather than exams because I think with exams a lot of students just brainstorm for a week and try and remember everything they can for the exam and then a week after the exam they've forgotten everything they learned." (Interviewee 1)

"Yeah, exactly. Whereas when you're doing something practical you tend to retain it more. Well I find anyway." (Interviewee 2)

"The thing that I've never understood (about why exams are so important) is… I understand it's important to remember things but you refer to stuff all the time. No-one is going to – like some people will, remember (a) single Australian Standard. They've got a book that tells them. They can look it up any time. I think it's more important, and this is especially having done legal (studies) where all our exams were open book, you have to know where to find your information. That is the most important thing because if you don't know something you have to know where to look for it instead of just trying to rely on having the knowledge up there which is not possible all the time." (Interviewee 1)

"And like you said it's not real." (Facilitator)

"Exactly, it's not realistic. In the workplace you have to look for your information if you don't know it. Or you use your resources, ask someone else." (Interviewee 1)

In summary, the data collected show that construction management academics used a variety of assessment approaches. Whilst there was evidence of appropriate assessment practices being in place at some universities, it appeared that academic's motivation for selecting a particular approach was influenced to a marked degree by a desire to cope with the large numbers of students they taught. However, academics showed little enthusiasm for online assessment. It was not possible to establish what the causes of this reluctance were but the usefulness of such approaches should not be disregarded because they offer opportunities for academics to rationalise the amount of effort they spend assessing students.

7.6.2 Feedback

Respondents' views about providing students with feedback on their assessment items are summarised in Table 7.5. Whilst there was general agreement that feedback was important, very important and extremely important, the distribution of responses indicated divergent

views about the manner in which this might be provided. For example, whilst assessment rubrics were seen to be important, but they were not seen to be as important as written feedback.

Table 7.5: Respondents' views about the importance of feedback practices

Assessment practice	Not at all important	Not very important	Important	Very important	Extremely important	N/a
Detailed description of levels of attainment (rubric), at the beginning of an assignment	0%	11.1%	36.5%	23.8%	17.5%	11.1%
Written feedback for students' assessment items (formative)	1.6%	0%	15.9%	42.9%	30.2%	9.5%
Verbal feedback for students' assessment items (formative)	1.6%	11.1%	34.9%	28.6%	9.5%	14.3%
A grade (summative) for assessment items	0%	3.2%	23.8%	34.9%	28.6%	9.5%

Legend:

Area of dominant response	

Feedback on assessment items was a topic that dominated students' focus group discussions. Participants in six of the nine student focus groups spent considerable time discussing this. Their main concern was the lack of feedback they received and, when they did receive feedback, its quality. For example

> "(Y)ou're lucky if you get a tick on the page for doing it right and your mark on the front page for a lot of subjects and I'm just - like, well how can I learn from this? If I've done it well obviously I know to do the same thing again but if I haven't, I just don't think it's good."

> "It's good when you don't just get a mark. I hate it when you get a mark. Like, what does that mean? Why have I been given this mark? It's frustrating. Even if you get like 97 per cent, it sounds ridiculous, but you want to know why and what it is. I think overall this university is not very good at giving feedback. I think it's just a mark or a few ticks. What does that actually mean, and how can we better ourselves for the exam?" (Interviewee 1)

> "Maybe 50 per cent of the time I don't even get my assignments back because they're not even in the office before the exam. Then, once I've done the exams, it's like - just

> forget about it. Then you don't pick them up the next semester, so they just disappear and turn into numbers on your report." (Interviewee 2)

> "We hardly ever get any feedback. I think generally we need to approach lecturers or tutors for any information that we need." (Interviewee 1)

> "And sometimes they're not very responsive at all, which worries us because we're like so did you actually mark it or did you just give me a mark based on what you thought I was going to get? Do you know what I mean? It's a worry. Like when you spend so much time on an assignment and you don't even think it has been read because they can't give you feedback..." (Interviewee 2)

> "I just don't like it when lecturers won't explain why they've given you a certain mark. If you think that you've done (reasonably) why do you have to go out of your way for them to explain something to you...?"

> "I thought I'd done a really good job and I got a fairly good mark. There was a couple of things apparently I got marked down for but I had no feedback of what I did wrong. You know like all that we got was group feedback, like how the group went. So these are architects and construction management students. I don't care how everyone else went I just want to know how I went. You know if I've stuffed something up, I want to know so that if I ever had do this again I won't be doing the same thing again."

Academics were aware of these concerns as the following quotation shows.

> "On the other side, the student is expecting more than just a mark. They expect that you read through it many times and give them a lot of comments, a lot of supportive statements and stuff like that, to make their life easier. So it's quite a big expectation from your marking, or your assessment. Some would say 30 minutes per assignment, but sometimes it's impossible. When you're writing down your comments there, you find other things…"

Students were aware of the workload facing their lecturers and tutors. The following quotes show that they appreciated that marking submissions from large classes was an onerous and time consuming task, as the following quotes indicate.

> "But I do think simply you've got 120 people to mark you know you don't want to give - it takes a long time to give individual feedback."

> "If it's a small group, like in just the (quantity surveying) based subjects there's only about 40 students, if that, and you seem to get feedback on your work then but... even when (construction managers) and quantity surveyors combine in lectures I haven't received much."

> "I mean an individual (feedback) is pretty unlikely. Nobody has the time, and neither does the lecturer. Just feedback on where you actually went wrong. Don't say where it's really good or anything. Just say, this bit here is where you went wrong."

> "It would be difficult for a lecturer because he has got to do 50 or so. But compared to other faculties like law and arts and stuff, where there are hundreds of students, you expect that it would be a little bit easier in this faculty seeing as there's only about 40 or 30 of us."

> "I understand the lecturer has 150 things to mark. If he's marking them all he's not going to go through each one with the same… like when he gets to about 140 he goes 'I'm over this, yeah this looks alright, this is about 60' when they've obviously done more or less work than what the first person got."

In summary, feedback on assessment items was a topic that attracted vigorous comment from students and academics alike. Academics recognised the need to provide feedback but students were dissatisfied with what they received. Academics were concerned with the onerous workload that resulted from having to assess large numbers of submissions within short timeframes. This again emphasises the workload and stress-related implications of construction management academics teaching responsibilities.

7.7 Site visits

Academics recognised the contribution that first-hand experience of construction practices and personnel could make to students' learning. They saw these opportunities as important, very important and extremely important, as shown in Table 7.6.

Table 7.6: Respondents' views about exposing students to industry

Issue	Not at all important	Not very important	Important	Very important	Extremely important	N/a
Industry involvement should be encouraged (for example: guest lectures, employee scholarships)	1.6%	3.2%	19%	46%	23.8%	6.3%
Visits to construction sites	1.6%	7.9%	22.2%	36.5%	25.4%	6.3%

Legend:

Area of dominant response	

Students agreed that visits to construction sites were useful and helped them relate the theoretical concepts they were taught at university to the practicalities that occurred on site. For example, they said

> "(I)t was awesome. They took us around the site and we had project managers, they were both graduates from this uni… They were explaining about, you know, when you put the rods into the walls to secure (it) and you spray shotcrete concrete over the outside... I was wanting to do something about that for a (retaining) wall for one of my assignments. And so I knew theoretically about what it was. But he was like talking about it and I was thinking, man these anchors are huge! I had no concept of what (was going on) in the real world".

> "And you know on a piece of paper, like you said, okay you know 600 square metres of concrete will be poured in one day and that's good. You know that in your head. This is a slab of 1,200 (square metres). I've got to pour that in two days because you can't pour (it in) one. But actually, to see that slab being poured on site, (it) is… completely different. It actually sets into your mind and you go, 'Geez!' You know you've got the truck, you've got the pump, you've got the guy that pours it, you've got four or five guys working on that instead of a number saying '600 square metres a day'."

> "Go on site to actually get a better understanding of what you're learning."

> "It's… the practical side of it, you just pick up so much more, being able to visualise it and see it rather than just (see it) on a slideshow or in a handout."

Notwithstanding these positive views about visiting construction sites, academics highlighted some of the difficulties they experienced when trying to arrange such visits. Some observed that construction staff were not amenable to such activities. The following quote illustrates this.

> "Contractors do not want students on sites. We cannot take them on site, they have got to have blue cards, red cards, all the other types of things to do it. In the old days of you could just let us go for a site visit are way gone. You have to make sure they are done properly. You have an induction when you go on the site, the contractor's agreement must be reached. So all that joy of going to look at a new project, many lecturers are just saying 'It is just too much. It is just too hard. I will go and take some photographs and show them the photographs rather than taking them on the project.' I think in our discipline that is quite sad."

The aforementioned academic went on to highlight the risks lecturers faced when they took students to site.

> "In practice, within an institution, we have not even been getting insurance for it and why should you take the risk. It may be a personal commitment you are actually taking on and you cannot expose staff to sort of personal commitment, losing your house. Everything else is just not easy."

Academics identified pragmatic reasons for contractors' hesitancy to facilitate students visiting their sites. A key difficulty was the number of students that lecturers were seeking to bring onto site. Contractors were hesitant to allow large numbers of students onto site as the following quote shows.

> "The academics sitting around the table were actually saying you should do more to actually facilitate this sort of thing. Most contractors would like to help but when you look at the legal regulations and their insurance and so on. Any group that is more than ten they get a bit worried about. Then you come along with forty, that is just not convincible."

> "(W)hile the industry are marvellously cooperative, they are very busy. And with the increasing numbers of students it's very hard to provide what our university is now calling Active Learning Opportunities because the industry people, while they are

willing, are less and less able to accommodate even just a site visit let alone, you know, anything else more constructive"

Similarly, a HoS said

> "They did offer to have students through… But the difficulty we had was our numbers of students and the numbers they were expecting. Because they were quite happy to show 20 around but we were going to turn up with 90. So it was not such a good situation."

Academics' opinions about other difficulties relating to arranging site visits and workshop activities were identified from responses to the online survey. They were asked to identify the impact on cost (budget) and occupational health and safety (OHS) of conducting visits to construction sites and of workshop activities. The implications for site visits of cost and OHS are summarized in Table 7.7 whilst those for workshop activities are shown in Table 7.8.

Table 7.7: Respondents' views of cost and OHS implications of site visits

Budget		OHS	
No Impact	31.7%	No Impact	12.7%
Some Impact	27%	Some Impact	14.3%
Large Impact	9.5%	Large Impact	31.7%
N/A	12.7%	N/A	12.7%
No answer	19.1%	No answer	28.6%

Table 7.8: Respondents' views of cost and OHS implications of workshop activities

Budget		OHS	
No Impact	22.2%	No Impact	20.7%
Some Impact	20.7%	Some Impact	15.9%
Large Impact	19%	Large Impact	12.7%
N/A	19%	N/A	19%
No answer	19%	No answer	31.7%

In summary, academics and students appreciated the benefits of visiting construction sites as part of their studies. However, logistics and legal implications made arranging such visits difficult especially where class sizes were large. These obstacles compound the difficulties construction management academics experience in delivering some construction courses. This is further exacerbated in instances where the academics may themselves be unfamiliar with certain site-based techniques.

7.8 *Work integrated learning*

In addition to visiting construction sites (Section 7.7), academics recognised the benefits and importance of students having opportunities to work in the construction industry as part of their studies. Their views on the importance of such activities are shown in Table 7.9.

Table 7.9: Respondents' views about WIL

Issue	Not at all important	Not very important	Important	Very important	Extremely important	N/a
Relevant industry experience is an essential component of a student's education	1.6%	12.7%	25.4%	38.1%	15.9%	6.3%

Legend:

Area of dominant response	

Notwithstanding the importance ascribed to WIL, several difficulties needed to be overcome in facilitating such experiences. For example, a HoS said

> "Well industry experience is vital. I don't see how you can talk about professional training without giving students exposure to the profession, to the cutting edge. Problems associated with it I suppose would be finding appropriate sources of experience providers, also OH & S issues associated with it. That seems to be a big, big problem at the moment. You know really that's important, no question about it."

These problems are explored in the following section.

7.8.1 Problems organising work-integrated learning

Most construction management degrees require students to complete periods of industrial experience to meet the requirements of their accrediting professional institutions. The term WIL is used in this section to encompass both industrial placements and other work-integrated learning (WIL) activities. The resources required to support WIL depend on how it is implemented. Some universities have adopted a minimalist approach and require students to organise their own industrial placements. This laissez-faire approach has consequences as the following observations of HoSs indicate.

> "But at the moment when a student goes off and works we don't know about it. We don't know what they do at work; they don't tell us and we don't ask. The employer doesn't want to know either, so it's not helping us as a university and not helping the

> university to get full learning experiences for our students. It has become an impediment and a lost opportunity."

> "(W)e never had the resources to go off and monitor them, so you were dependent on the industry to actually do the right thing by them and you know, not put them in a back room somewhere or put them on the end of a crowbar or something on a building site, which happens."

Academics noted that students found it relatively easy to obtain placements when economic conditions were favourable. However, they were apprehensive about what might happen as and when the economy turned, as the following concern of a HoS shows

> "I mean accreditation (requires) 16 weeks industry experience. But the problem is (students) have to find their own places. Up to now, I don't think we had any very serious issues with that, like students saying that they couldn't find anything. But it could become an issue if a recession hits. Now it's a boom so everyone is going to find jobs"

Furthermore, and in a similar context, academics noted the following.

> "I think the difficulty will come again when there is that eventual downturn, because it's (industrial placements are) still required then. And then it goes back to what we had before. You've got to insist that the companies take them on. I can remember having this discussion again around the AIQS Chapter Council. They want to complain about our (program) 'What's in the (program)?' You go 'Hold on, but none of you have taken any of the students, because you're saying you haven't got any money to take students on'." (Interviewee 1)

> "That's right, I remember that." (Interviewee 2)

Some construction management disciplines were adopting a proactive approach to WIL. The following examples were provided by HoSs. They illustrate instances where resources have been deployed to facilitate and monitor WIL.

> "In the old course we would have a dedicated staff member who in our case was actually a part-timer and he would travel around from student to student to student, meeting up with each one a couple of times during the semester. We had it over two semesters and he would run seminars and presentations and all sorts of things. When

> we go to the new mode, with the work-integrated learning units, it will be the same sort of thing but there will be a much more centralised approach. Central to the faculty approach because it is available to all students of the faculty. It is properly co-ordinated."

> "(W)e try to encourage them to work in applied work rather than go down to (McDonalds) to work. So my philosophy is to actually get everyone to actually be working part-time possibly, but in their applied area. Now, at this university we have a central … officer, and each faculty has their own … officer. Ours is located on the ground floor here." (HoS)

> "I noticed that." (Facilitator)

> "And that person is there so that if somebody is interested in some part-time work, that person is there to help them find it." (HoS)

Both academics and students recognised the benefits of WIL. However, the manner in which WIL is administered varies from university to university. Factors contributing to this arguably include the infrequency with which some professional institutes have audited their industrial experience requirements (Section Table 9.11) and their ill-defined industrial placement requirements. These circumstances contribute to the stress that construction management academics cope with on a daily basis.

7.8.2 Variation in assessment of WIL

Practices for assessing WIL varied from university to university. In some instances students' WIL activities were not explicitly assessed. For example, a student said

> "it's kind of relaxed and you just need to get a company letter from the director saying this what you've kind of experienced, this is what you've done for our company. And that's satisfactory."

Academics also noted a laissez-faire approach to assessment of WIL. For example, one responded to a question about assessment by saying "That's a very good question (laughs). It's not a unit, but the handbook says if you don't do it you won't get your certificate, so that's a very bizarre thing."

However, at some other universities WIL activities were formally assessed. A HoS explained the following.

> "In the new course, all undergraduate courses within the faculty have the opportunity of doing a work-integrated learning minor. So four unit's worth of industrial experience." (HoS)
>
> "Would it be assessed?" (Facilitator)
>
> "Yes. The whole idea is if we are going to require them to do it then they should get some credit for it, it will replace four units of normal study. Well supplement four units of normal study. A whole semester of activity they get recognised for." (HoS)

In this regard, it is relevant to note the approach adopted by a university that has revised its degree structure to meet the requirements of the Bologna Accord (European Commission - Education & Training, 2010). According to the HoS, WIL activities are assessed and contribute to the requirements of a Masters qualification, as the following quote shows.

> "There has to be the encouragement – and we've got that there… instead of (having) a two year masters, which was what the University model is, a two year masters program, that by going out at the end of third year and doing 12 months worth of industry experience, writing that industry experience up in a specific way, they will be eligible for 50 points credit, which is half a year. So they can actually do the masters in a year and a half. So there's a big incentive."

In summary, academic staff recognised the benefits and importance of giving students opportunities to experience real-world construction activities. However, arranging WIL was seen to be difficult and some academics were concerned about the problems of organising this in poor economic conditions. Furthermore, different universities facilitate and assess WIL in different ways. There are opportunities to harness WIL to enhance teaching and learning that are yet to be exploited.

7.9 Discussion

This chapter has shown that the ways in which construction management academics teach and assess were influenced to a marked extent by the increasingly large classes they were required to teach and assess. The staff to student ratios of many of these classes are well in excess of those recommended by the AIB (2006) (who recommend a ratio of "one full-time staff

equivalent to 25 full-time student equivalent" (p. 7)). They saw their seemingly ever-increasing teaching-related workload as demoralising and daunting and many of their observations explored the difficulties they experienced in this regard. To cope, some of them were using teaching and assessment approaches that specifically target large classes. However, the use of such non-traditional teaching, learning and assessment strategies was not typical of the discipline as several respondents and participants appeared to be teaching in the ways they were used to.

Where academics had changed their approaches, several appeared to be primarily motivated by a desire to limit their workload. For example, Table 7.1 highlights simulation projects, peer and self assessment, as well as group work as approaches academics used in their day-to-day teaching. Irrespective of the educational merits of these methods, they all allow some responsibility for assessment to be delegated to students. Such approaches might seem, prima facie, to be attractive ways of reducing academic workload. However, to implement them effectively, academics need to be well-informed about these approaches. The observations of Topping (1998) about the need for diligent and effective organisation and management of such activities are relevant and important in this regard. However, there is little evidence that construction management academics engage in teaching-related continuing professional development activities (approximately a third of respondents attended one teaching-related workshop a year – see Table 9.9). Whilst not discounting the likelihood that some academics researched best practice from other sources, it appears likely that some of them may not be using these methods effectively. Teaching-related workload is clearly of concern to academics and many of them are actively seeking ways to contain it. However, the pragmatic approaches adopted by some of them are potentially problematic because they may compromise teaching and learning quality.

The resources that respondents indicated would support them in teaching and assessing large classes are listed in Table 7.2. The most frequent suggestion was for more academic staff again highlighting the desire of academics to contain their teaching-related workload by distributing teaching and learning activities between more individuals. However, universities experience considerable difficulties recruiting suitably qualified construction management academics (Sections 5.6.4 and 9.5). A pragmatic solution that many construction management disciplines have adopted is to employ sessional academics to supplement the efforts of their full-time colleagues. This approach has met with varying degrees of success as finding suitably qualified and experienced sessional academics is subject to similar

challenges to those of full-time academics. In addition, the tasks of training, supporting and managing these staff as well as of retaining them was seen to place a considerable burden on construction management academics. Whilst sessional staff were acknowledged to provide valuable assistance to academics, they required the aforementioned support from academics.

The practice of employing sessional academics is not confined to the construction management discipline – it is widespread at Australian universities as well as in the UK and USA (Bryson, 2004; Cowley, 2010; Ehrenberg & Zhang, 2005; Halcomb, Andrew, Peters, Salamonson, & Jackson, 2010; Kimber, 2003). Indeed, Australian universities have become increasingly reliant on the efforts of sessional academics. According to Brown, Goodman and Yasukawa (2010) about a tenth of all university teaching was delivered by these staff in 1990. By 2008 between a third and a half of university teaching was delivered by sessional academics. However, the casualisation of academic employment has attracted widespread criticism. Brown, Goodman and Yasukawa (2010) identify a sharpening class divide among academics in Australia, which has become institutionally embedded. They report that sessionals are underpaid, experience persistent income insecurity and are without a voice in the academic workplace. Furthermore the Bradley report (2008) notes that the use of casual staff is compromising the quality of teaching in Australian universities because these staff are generally not effectively trained, consistently managed and supervised, and included into faculty arrangements. Some of these concerns are reflected in the observations of respondents and participants noted above, though the extent to which teaching and learning quality was affected has not been addressed here.

Whilst there is evidence that sessional academics make a valuable contribution to construction management education at some universities, this practice is not widespread. With its existing academic workforce aging, and its difficulties in recruiting full time academics unlikely to change in the short- to medium-term future, the discipline needs to recruit, retain and manage sessional staff as best it can. In this regard, the outcomes of a recent ALTC funded project (Percy, et al., 2008) offer Australia-focussed recommendations as to how sessional academics may be nurtured and supported. Should sessional staff become disaffected and resign from their appointments this would have a serious impact on the universities that employed them. Clearly academics would be well advised to encourage, support and seek to retain the sessional staff currently in their employ.

No clear trend in the use of online teaching and learning was apparent from the study. Participants and respondents described a range of methods they were using, including those that involved delivery of course content in more sophisticated, student-centred approaches. Both academics and students were aware of a range of benefits and advantages that online teaching and learning attracted and many recognised the pitfalls of these approaches as well. Whilst academics appeared generally willing to use online methods, they highlighted the need for supporting resources and staff so that they could deploy them effectively.

It is pertinent to reflect on age differences between academics and students when considering the uptake of online delivery and learning. The aged profile of construction management academics (Section 9.1) contrasts starkly with that of construction management students (Section 3.10.1). The student body is generally older than other disciplines in Australia (Figure 3.4, Figure 3.5 and Figure 3.6) with Gen X students having dominated the discipline since 2005 (Table 3.12). Notwithstanding these differences, Gen X and Gen Y are characterised by their familiarity with ICT and their desire to engage with it. However, older (Baby Boomer) generations are characterised by their lack of appreciation of and engagement with ICT. These traits were apparent in the data collected for this study and, in common with other academic disciplines, challenge academics' efforts to harness online teaching, learning and assessment approaches (Barnes, et al., 2007; Mabrito & Medley, 2008; D. Oblinger & J. Oblinger, 2005; Oblinger, 2008; D. G. Oblinger & J. L. Oblinger, 2005). Whilst some construction management academics appear to be harnessing online technologies effectively, this was not generally the case. Some academics noted that they needed to be trained in the use of these technologies, drawing attention to the seemingly contradictory lack of teaching and learning CPD activities that they engage with. This again underscores the difficulties construction management academics experience in coping with the multiple and varied demands on their time. If the discipline is to engage current generations of students, ways need to be found to encourage academics to develop and enhance their online teaching and learning skills.

Further evidence of the impact of large classes was apparent from data relating to assessment. Academics were seeking ways of assessing large numbers of assessment items, and of providing meaningful feedback to students. Frequently the strategies they used were those which they thought would reduce their work-load. However, few examples of online tools being harnessed for these purposes were noted. Furthermore, few academics appeared willing to attend teaching-related CPD activities, and to learn about different approaches they might

use. This emphasises the observations in the previous paragraph, which highlight the time pressures construction management academics work under, and the need to support them in developing their skills.

Providing students with opportunities to experience the construction industry first-hand was seen by the accrediting bodies, academics and students as a valuable complement to their university studies and these views are supported by other studies (Sher & Sherratt, 2010b). Various ways of achieving this were identified, including guest lectures from industry practitioners, site visits, and industrial placements. These approaches were all being used to different degrees by the universities. Several respondents and participants noted that they invited industry personnel to deliver specialist guest lecturers. It addition, many of the sessional academics (Section 7.4) appointed to assist academic staff were industry practitioners. With respect to visiting construction sites, many respondents and participants noted the difficulties of arranging such activities. As many students currently work in the industry, it may be that such visits are no longer as important as they once were. However, the extent and nature of students' work experiences are unclear. An independent study by Sher and Sherratt (2010a) found that 25% of students were not working. Furthermore, it is not clear whether students' work experiences are relevant and meaningful. It may be that some construction students' are not employed in the construction industry at all and this is clearly to the detriment of their learning experiences.

In theory, all construction management programs accredited by the AIB should require their students to work in the construction industry, and provide evidence of the same. The AIB's accreditation documentation (2006) requires students to "obtain Building industry experience during the (program). Such experience should be documented by the student and employer and monitored by the university… A minimum of 80 days experience before starting the final year of (program) is considered to be desirable." (p. 7). In practice, this requirement is not implemented by all universities, and is not audited by AIB (R. Hunt, 2011b). The haphazard nature with which this requirement is addressed is clearly inequitable, unsatisfactory and an issue that needs to be addressed.

Many universities in Australia are currently exploring WIL, and opportunities clearly exist for construction management programs to investigate innovative and pragmatic approaches to workplace learning. In this regard, a recently completed ALTC funded project entitled "Facilitating work integrated learning (WIL) through skills-enabled e-portfolios in

Construction and Nursing" is informative (Simmons, Williams, & Sher, 2011). Construction management is a profession that is based on the practicalities and challenges of constructing buildings and other structures. Closely aligning students' education to actual construction projects presents a range of challenges and possibilities for the discipline. Should such an approach be adopted, the working lives of construction management academics could be significantly affected as program and course curricula may need to be revised. The advantages and disadvantages of such an approach would need to be carefully evaluated, taking into account the wider responsibilities and commitments of the discipline to its stakeholders as well as to individual academics' career prospects. Clearly the additional workload involved in such activities would compromise academics research efforts.

8 Who construction management academics teach

8.1 Introduction

This chapter focuses on the students that construction management academics teach. As teaching is a major component of construction academics' lives, whom they teach has a marked affect on their working lives. Some of the ways in which academics engage with students include face-to-face and online individual, group and class discussions, as well as telephone and Skype conversations. These occur daily, with interactions frequently extending outside of academic semesters. Academics provide lectures, deliver tutorials, supervise student's projects, assess their submissions, and engage in a range of other student-centred educational activities. They also provide careers advice to their students, assist them in finding industrial placements, offer pastoral advice and involve themselves in a range of other ad hoc activities. These multifarious interactions with students thus form an integral and essential part of academics' working lives.

The unique profile of construction management students has been explored in Section 3.10. The key points identified include the marked increase in the number of students enrolling in construction management programs, their age profile (which is considerably older that the average for all Australian students), as well as their generational characteristics. These aspects provide the context for this chapter. Respondents' and participants' views about students' skills are provided first, followed by those about students' attitudes and their expectations of university education. The next topic deals with students working whilst they study. The extent to which this occurs is of concern to respondents and participants, and this section explores students' reasons for working and the pressures this exerts on the students as well as their educators. The final section deals with the timetabling of teaching and learning activities, a topic which concerned students. Collectively the situations described in the following sections highlight the implications for academics of the nature and characteristics of the students they teach. Each section focuses on the challenges that these academics face in their daily lives as a result of their interactions with their students.

The data presented and discussed in this chapter are drawn predominantly from the interviews and focus groups that were conducted for this study. The term 'participants' has been used to indicate those who took part in these activities. Supplementary data from the on-line survey

has also been used, with the term 'respondents' indicating replies from people who responded to this survey.

8.2 Academics' views of students' skills

The online survey asked respondents to assess how important they believed it was for students to develop specific generic skills. Their responses are shown in Table 8.1.

Table 8.1: Respondents' views about the importance of students' skills

Skill	Not at all important	Not very important	Important	Very important	Extremely important	N/a
Critical thinking	0%	0%	4.8%	31.2%	55.6%	7.9%
Teamwork	0%	3.2%	14.3%	36.5%	38.1%	7.9%
Written communication	0%	0%	12.7%	46%	33.3%	7.9%
Oral presentation	0%	0%	17.5%	46%	28.6%	7.9%
Visual presentation	0%	3.2%	33.3%	36.5%	19%	7.9%
Time management	0%	0%	9.5%	41.2%	41.2%	7.9%
Problem solving	0%	0%	6.3%	20.6%	65.4%	7.9%
Assignment writing	0%	1.6%	38%	31.7%	20.6	7.9%
ICT skills	0%	1.6%	25.3%	47.6%	17.5%	7.9%

Legend:

Area of dominant response	

The data shown in Table 8.1 were not helpful in identifying the relative importance of these skills. The majority of responses for each skill were "important", "very important" or "extremely important". No skill was identified as "not at all important" and very few skills were seen as "not very important". However, these data do indicate that construction management academics recognise the importance of students developing generic graduate attributes. This demonstrates that the discipline relates the importance of these skills to the quality of their graduates and that these align with the qualities industry requires as defined in their accreditation requirements.

8.3 Academics' views about students' attitudes

In the online survey, many academics identified the personal characteristics of their students as an issue that concerned them. They identified that many of their students were poorly motivated, did not attend class and had short attention spans. Several respondents also noted that many of their students were disinterested, apathetic, and focused on other things (e.g. "industry/social" activities). In addition, some academics were concerned about students' poor academic skills and their expectations of succeeding in their studies. Some academics indicated that the amount of time students spent working contributed to these negative characteristics.

Respondents were asked to indicate their agreement with a set of statements about students' attitudes. Their views are summarised in Table 8.2.

Table 8.2: Respondents' views about students' attitudes

Attitude	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/a
Student regularly attend my classes	6.3%	11.1%	7.9%	50.8%	14.3%	9.5%
Student absenteeism does not impact on students' learning	25.4%	44.4%	11.1%	7.9%	1.6%	9.5%
Students rarely complain about their workload	6.3%	39.7%	19%	27%	1.6%	6.3%
Students often take on part-time employment whilst completing their studies	0%	0%	1.6%	22.2%	69.8%	6.3%
Students are increasingly expecting entertainment-orientated lectures	0%	12.7%	31.7%	33.3%	14.3%	7.9%
Students readily accept constructive feedback	1.6%	15.8%	17.5%	49.2%	9.5%	6.3%
Students are able to give critique of their own and others' work	6.3%	19%	31.7%	30.2%	3.2%	9.5%
Students are motivated to achieve high grades	3.2%	19%	36.5%	31.7%	3.2%	6.3%

Legend:

Area of dominant response	

Some of the data contained in Table 8.2 are ambiguous. For example, those indicating that students do attend classes regularly contradict the open-ended responses that academics noted at the start of this section (which recorded their concerns about students not attending classes) as well as those noted in Section 8.5.5. Unsurprisingly, these open-ended responses indicated concerns that absenteeism was to the detriment of students' learning. In addition, the data,

indicating agreement (65% agree / strongly agree) that students attend classes, conflict with those relating to the extent to which students work whilst studying (over 90% of agreeing / strongly agreeing that students work and study); it is thus likely that students' work commitments contribute to absenteeism. Notwithstanding the ambiguity of these results, absenteeism is of concern to some academics and is likely to hamper the ways in which they deliver their courses. Having to react to requests for materials to be repeated is distracting not only to academics but to students who attend classes regularly.

Academics views about students' preferences for entertainment-oriented lectures were less ambiguous with almost half (47.6%) either agreeing or strongly agreeing that this was the case. The generational characteristics of Gen X and Y students noted in Section 3.10.2 support this observation. As mentioned in Section 7.5.3 some academics were ambivalent about online delivery and is unlikely that they would consider games-oriented lectures in a favourable light. Such views highlight the generational divide between the majority of academics (Section 9.1) and their students.

8.4 Academics' views of students' expectations of teaching

Academics were asked in the online survey whether they thought students' expectations of teaching had changed over the past five years. 68.3% answered in the affirmative, whilst 15.9% thought there had been no change. 9.5% said that they had not taught for the past five years and 6.3% did not answer this question.

Respondents were then asked to identify the three most significant ways that student expectations of teaching had changed in the last five years. In their open-ended replies, students were seen to be consumer-oriented individuals who sought value for money. Respondents observed that students felt that, as they had paid their fees, they were entitled to service from staff. In addition, respondents noted that some students expected help and support when it suited them, rather than at timetabled times. Furthermore, some students were seen to expect their academic studies to be timetabled to suit their work commitments.

Respondents noted that paid employment appeared to be foremost in students' minds and that they wanted to complete their degree as quickly as possible, and with the least amount of effort. Many respondents commented on students' expectations of being "spoon fed" the materials they needed to complete their degree. For example, several respondents commented that students lacked basic study skills (such as note taking, and searching for information) and

expected academics to supply them with handouts. To compound this, some academics noted that many of their students "come out of high school with a largely inflated opinion of their abilities in a whole array of important skills from cognitive abilities, reasoning and argument, grammar and expression, mathematical and scientific abilities etc".

Several respondents also noted that students expected to do the minimum work to pass their degree. Indeed, some academics noted that students felt that, as they had paid their fees, they were entitled to pass. Respondents also noted an expectation amongst students who were working in the construction industry that their real-world experiences "assured" them of obtaining their construction management degree. As such, they seemed to expect to be granted an easier passage though their studies.

Academics were ill-at-ease with many of the students' views noted in this section. Although they noted the extent to which students worked whilst they studied (Section 8.5), they were concerned about many of the actions that students took. Such reservations may have contributed to their work-place stress and may have affected their interactions with their students.

8.5 Academics views of students working and studying

One of the key concerns of most academics was the extent to which their students were studying and working, as illustrated in the following quotations

> "I think one of the biggest issues facing our discipline is this full-time student, full-time employee issue"
>
> "They're neither full-time students or full-time workers." (Interviewee 1)
>
> "They try to be both." (Interviewee 2)
>
> "And it's not possible." (Interviewee 1)

In addition, a HoS said that "one of the biggest issues I think is just the struggle for students to find the time to do the study they have to do. Because we find increasingly they're working"

Several academics noted that some students were attempting to study and work full-time. For example, HoSs observed that

> "(T)hey are working 40 to 60 hours per week; they are still trying to carry four to five subjects per week."

> "I was talking to five students yesterday. They were third year students. They actually work full-time and they're doing four units, which is a full-time workload."

Similarly, an academic said

> "Because you're working say 40 hours a week, just a bare minimum of 40 hours a week. Even if they can manage their studies, 40 hours a week, they can't because that's full-time… be 20 hours or something like that. That poses a problem, yes, to some of the students who are doing full-time out there and full-time here."

Other participants noted lower rates of employment. For example, HoSs noted that

> "So on the whole they're probably spending 20 to 30 hours a week working and spending the minimum amount of time with us. And often less than the minimum because they choose not to come in for a few weeks."

> "I would say, I'm guessing here but most students probably are working 15 to 20 hours a week… It's interesting now that they (allow) foreign students to now work 20 hours a week. So even the Federal Government accepts that a full-time university student has the capability to do 20 hours a week. So it's formally acknowledged as acceptable."

> "It's awful, absolutely awful, and again, it doesn't help the way they teach, especially once they get into second year here, most of the students have got a job. And they will probably be working in locations maybe 10 or 20 hours a week."

Academics held similar views, as the following quotes show

> "Oh 30... like our standard week. It's full-time work so 7.25 hours a day and then they give us a day off pretty much for uni. I'm not sure what the hours work out to be."

> "All of our students, even second year students are working part-time. The fourth years are literally working 80% of the time."

The practice of construction management students working whilst they were studying was found to pervade all universities. The quotations above attest to this. This troubled

academics and Section 7.3.2 records these concerns. However, one HoS noted that this state of affairs was unlikely to change. He said "there's nothing you can do about it except accept that. That's how life is."

Participants identified several reasons why students worked whilst they studied, including the opportunities presented by a buoyant construction sector, being able to improve their employment prospects, fast-tracking their careers and studies, having opportunities to learn from their workplace experiences and to support themselves and/or their life-style. Each of these is described below.

8.5.1 Buoyant construction sector

The buoyant state of the Australian construction industry (Section 2.2) was seen as one of the reasons why students were working. HoSs identified this as a factor that encouraged students to work, as the following quotes illustrate

> "(S)tudents join this program from high school. They immediately start looking for part-time jobs to get a foot in the door with some company, and because the industry seems to be so buoyant at the moment, there's so much work out there, they're all getting jobs. I think just about all of our students are working at least part-time, many are working full-time and studying."

> "Our students are pretty much full-time students, full-time employees. Three or four years ago we had a student cohort that… would stay full-time, I suppose, for maybe the first 18 months and then we would start to notice the numbers changing. These days by the end of first semester they typically have a job in the industry and that would typically be about 80 per cent of the student cohort. Because (a state) is just booming at the moment"

Representatives of the professional bodies were of a similar view, saying "because of the buoyant nature of the industry at the moment, most of them are working full-time rather than just a couple of days a week and doing two or three days of uni."

Notwithstanding these observations, the construction industry is notoriously cyclical. As at the start of 2012, anecdotal evidence indicates that the global financial crisis may be affecting the industry, and it is possible that students may not find it possible to secure employment in the short-term future.

8.5.2 Fast-tracking careers

Some academics observed that students were motivated to succeed and that this influenced them to work whilst studying. These participants felt that students saw employment whilst studying as a way to secure promotion earlier. For example, a HoS said "People want to be successful very quickly. They want to finish things ahead of time and it's a social phenomena (sic) that pushes that, pushes that thing, changes things."

Academics held similar views. One said

> "I think one of the biggest issues facing our discipline is this full-time student, full-time employee issue. And that is a Gen Y thing. You want to get to the top salary as fast as possible and education is to be fitted into the cracks as best you can. And you want to start working from day one at a top salary."

Students saw working whilst studying as a way of securing a competitive advantage over their peers when they sought full-time employment after graduation. In this regard, some students said

> "(I)f I'm doing a cadetship and you're just working, going through university full-time, it means I actually get a better head start than you when I finish. I might be working harder but when I finish I've got a job and then you have to look for a job"

> "I just think you'd probably get a job easier. Like if one of the boys finished second year and was working during his third and fourth and the other guy came out of his fourth year and they've got two options to choose from. They know someone that's in the industry. They haven't got a clue. He's not going to get the job over him. Even if he was an Honours student he wouldn't get it over him because they'd say they know this guy, they know how he works and they know he is this and that."

Academics need to be cognisant of their students' ambitions. Those highlighted above emphasise the focussed manner in which many students engage with their studies, and highlight the way in which they view the materials delivered by their teachers. Unless students are able to see a relationship between the workplace and what they are being taught, academics are unlikely to be able to motivate them.

8.5.3 Fast-tracking studies

Students who work and study are generally advised not to take on a full-time study load. However, this may mean that they are not able to adhere to the sequence of courses recommended for their studies. This is because a full-time study load is generally taken to be four courses per semester. Completing fewer courses per semester results in the intended progression path needing to be extended as many courses are only offered once a year. As a consequence, some students enrol in additional courses so as to not to delay their progression. The following exchange between two students illustrates this issue

> "I need the options. I don't want to hang around another year because I've got to do one other subject in the same session next year. For me I'd rather squeeze in an extra subject then share the effort amongst five subjects than four. But…" (Student 1)
>
> "So you're doing five subjects and you're working full-time?" (Student 2)

Similarly, an academic said

> "It's the fact that the students have tried to do the work and the course, and they want to do a full-time course at the same time. So you'll have some students working 50 hours a week and are maybe doing one or two units, and they're managing it quite well. Others that are doing the 50 hours a week and insist that they want to get through the course in the shortest time possible"

There are clear consequences for students who work and enrol in a full-time study load. Their wish to fast-track their careers leads in many cases to mediocre academic results. The academics who teach these students are frequently called upon to exercise leniency with regard to assignment submission deadlines, and to make similar allowances for students' outside work commitments. Whilst most academics are likely to treat each case on its merits, it is clear that requests of this nature take time to consider and add to the many ancillary duties that are expected of them.

8.5.4 Support for a life-style or to live

Some participants thought that students were working to support their life-style. The words of the following HoS encapsulate such views.

> "Partly too because virtually everybody is working and there's all sorts of reasons behind that. Some of them are life-style things. They have to support their mobile

phone and café society life-styles, which frankly we didn't have to meet when I was at university the first time around. We drank twenty cents a cup of coffee at the uni, however bad it was, and I lived in houses that didn't even have a landline because that was 100 years before there was mobile phones. So there is a lot of financial pressure on them plus also I went to university the first time around in the Whitlam years when university education was free so you just had to live however frugally living five to a house near the university. But that style is much different now. So they're all working."

Other academics observed that students needed to work to pay for their university tuition and related expenses. More participants were of this opinion than that stated above. The following quotes reflect these views.

"I understand that they need to work because for income purposes, to keep themselves alive, to pay the rent and whatnot, which is logical, which makes sense, which is understandable."

"I think it's also the dynamic of the student, in as much as they're under considerably more pressure now to work to pay for the bills that enable them to come to University."

"(M)ost of the students are working. They have big fees to the university education, no doubt about it. At the same time, that's why they need to keep working. I believe that that is the main (reason why students work) at this moment."

"Why do students work? Is it a life-style decision or is it economic decision? Most students will tell you they have to. It's an economic necessity."

One student argued that, for some students, necessity and life-style reasons for working and studying coalesced, as the following quote shows

"For some students there's always a financial thing. We do actually need to work, so being told that you shouldn't work is irrelevant because some of us need to pay rent For some of us it's not an option for mum and dad to pay for everything. So, at the same time, once you start working it actually becomes a vicious cycle. Because you're used to earning that much, you want to keep earning it. You're used to getting good marks at uni, so you put yourself under an immense amount of pressure to keep

> achieving at uni, at work, bringing money home, and it just becomes… Like, for some people, we can't live on Youth Allowance because that's just not enough for the way we decided to live our lives. So it doesn't only become just because I think we want to work, it's just kind of because we need to work too."

These observations suggest various reasons why many students work and study to the extent that they do. These work / study patterns appear likely to continue and academics will conceivably have to accommodate them for some time to come. The economic fallout from the global financial crisis is becoming increasingly apparent, and it is likely that increasing numbers of students will need to work to fund their studies.

8.5.5 Impact of employment on class attendance

According to participants, when students studied and worked simultaneously, there was a marked reduction in their attendance at lectures, tutorials and related activities. For example, some participants noted

> "(U)sually you get less and less people coming to class"

> "(A)nother fairly big issue for a few years now has just been working students, especially in the third and fourth year. They are very busy maybe working one, two or three days or even more (days per week)… So things like class attendance and submission of assignments on time do become a bit of an issue."

Similarly, a HoS said "I've noticed a drop off, particularly in the last few years".

Recognising that they had to adapt to the realities of students working whilst they studied, several academics were endeavouring to engage students in different ways. They described how learning management systems could be used to respond to the challenges these attendance patterns posed. Their suggestions are illustrated in the following quotes.

> "There is a challenge of course, if they don't come to class. Are there other ways of transferring that information? … (W)e have Blackboard and stuff like that. So we try to put up more information on the Blackboard… Do you just want to fail them because they are not turning up to class or should we concentrate on some other way to encourage them to acquire knowledge?"

> "I think we've got to stop thinking about students having to come down here and sit in a room for a couple of hours. It's not about that. The challenge is to design the curriculum including the assessment and the method of delivery and the spaces we use to suit the students."

Not all participants were supportive of making changes to accommodate students' attendance patterns. For example, some academics said

> "(I)t just seems like the universities have folded to the idea that you can be a full-time employee and a full-time student and they cannot stop it. They cannot do anything about it. In fact they facilitate it by putting all the lecture (materials) online, giving all the assignments out in week one online. You do not have to turn up. In fact a lot of students think turning up is bloody boring."

> "I think there should be some form of legislation or rules that applies to students that if they're working full-time out there they cannot be studying full-time here… If they study part-time here, it makes sense, full-time out there. If they are studying full-time it makes sense it's only part-time here. There should be some kind of a minimum standards or maximum standards."

Similarly, a representative of the professional bodies said

> "When I went through my university I didn't work. So I dedicated a lot of time and that's one of the reasons sometimes I find (it) very hard when I look at very poor work to justify it in terms of the content. But there could be other academic staff members who have gone through the same process and they may have more sympathy towards those grounds."

A HoS was of the same view, saying

> "So for example in the lecturing format, it would be very interesting to know what percentage of students turned up to lectures. I don't know that. It would be very good to survey that. It probably should be done. But when a lecture is a PowerPoint presentation and when that is immediately or usually demanded prior to the lecture you put up on the web, then there was no interest for a student to actually attend a lecture as such."

Academics mentioned that students who only attended face-to-face lectures sporadically often interrupted teaching and learning activities by requesting information that had already been delivered. This is illustrated in the following exchange during a student group discussion

> "You're right there is a lot of time taken up because you can't clearly identify that somebody necessarily has just not been bothering…" (Interviewee 4)
>
> "You can respond 'I covered it in class'." (Interviewee 3)
>
> "Yeah, yeah you can try that." (Interviewee 4)
>
> "They say I don't understand I don't know what's required. Even though you say I explained to the class what the assignment requirement is and they say well I forgot." (Interviewee 6)
>
> "You always give the student the benefit of the doubt." (Interviewee 5)
>
> "Yeah we do." (Interviewee 3)
>
> "That's what we're here for aren't we?" (Interviewee 5)

In this regard a HoS said

> "So I see it as an enormous imposition, most of it onto the students and just probably the frustration from the start. They're forever being bombarded by students who couldn't get to their class, who couldn't do the assignment on time because they're working and it's just a fact of life."

Students that were employed acknowledged that their work commitments took precedence over their studies. For example they said

> "it's a bit unfortunate, but you have to miss classes. Say, if you've got a meeting or something with professionals and that's set at a set time. Yeah, it's alright, some things get missed."
>
> "You're going to have to let go of something and do it 50% because I don't have the time. In other areas where it's more critical I'm going to spend a lot more time. So if I'm doing five subjects this session, as an example, to finish, I know I can't give every subject all the effort and then I've got to work 50 hours a week (at work)."

Academics' experiences confirmed that students' studies took second place to their work commitments. In the quotation below, a lecturer commented that poor attendance made it difficult for him to teach his students

> "I had a student in yesterday morning who failed to get a piece of work in on time and he said he's doing a course – I'm not sure if it's full-time – but he's working in industry 50 hours a week. So, you know, it makes our job harder as well, because we've got more problems to contend with, with students that are giving studies secondary consideration over work."

Another agreed with this, saying "once the students come here, they're working. It's terribly difficult. They don't have the time then to devote to the unit outside the contact hours. It's terribly difficult."

Present day students experience a markedly different environment to those that teach them. The expectations of Gen X and Y students for their studies to be enabled by ICT (Sections 3.10.2.3 and 3.10.2.4) are in stark contrast to many of the views of academics noted above. Students experience multiple demands on their time that those who teach them did not need to grapple with when they studied. It may well be that students do not attend lectures because they see no value in them. The challenges for construction management academics are clear – they need to find different ways to engage their students. This again brings into stark focus the dilemmas facing academics. How are they to incorporate the research and development necessary to revitalise their teaching and at the same time meet the requirements of their universities to conduct research, secure research funding, engage in administrative duties and to engage with their wider community? Ways in which these challenges may be addressed are provided in Chapter 10.

8.6 Timetabling of teaching and learning activities

Historically, the mode of delivery that was popular for construction management higher education was for students to attend classes after work. Many of the personnel currently employed in the construction industry were educated in this manner as the following observation of a student indicates "I suppose our industries have a long history of people doing night school… that's what a lot of the carpenters and all the chippies did… they did night school for so many years, or they did surveying at night school for six years, because a lot of my bosses were like that."

Similarly, a HoS observed that "people used to go to (technical college) at night and they would go three nights a week. They'd work a full-time job and go three or even four nights a week for classes and it was long and it was hard but they did it."

The skills shortage (Section 2.5) presents employment opportunities for construction management students, and most participants noted that many were employed in the industry. However, it appeared that students' study commitments were in some cases not accommodated by their employers. For example, in the following quote, a student noted that his employer frowned upon him taking time off work for his studies.

> "(B)ut that restricts you from working full-time because if the subject's on at three or two or one or twelve (o'clock) you can't make it here. And if you think it's a subject where you have to participate, where you have labs or something, you can't go to your work every week 'Oh, I'm taking off Thursday." If you're working full-time they go 'No you're not or you don't have a job.' Or you get blacklisted one way or another with the company."

It is likely that some students may face similar attitudes to those of the employers noted above. These exacerbate the pressures students face and highlight the importance of teaching and learning activity timetables that are structured to accommodate these wherever possible. Recognising this, some universities have implemented timetables that schedule teaching and learning activities for discrete weekdays. The following observations of HoSs provide examples of classes being scheduled to allow students to have days when they do not need to attend classes

> "I try and timetable one day off a week and sometimes two. For example today Wednesday, our first, fourth and third years aren't in. I think there's (sic) other days, particularly the fourth years where we have a lower workload and total hours in the curriculum. They're only in for two days a week."

> "So effectively what we do is at the undergraduate level, all our lectures are actually pushed into the first three days of the week – Monday, Tuesday, Wednesday. That frees up Thursday and Friday of every week. That was done (to) encourage students to be able to do some reasonable work experience, 'cause it's not split up by having to run off to a lecture."

> "(W)e structured the timetable so they're only in two days a week - so they should have two days clear from work and then go back. If they're in here Monday and Tuesday then they can work Wednesday, Thursday, Friday, maybe Saturday."

Timetabling is an inherently difficult activity as many constraints and requirements need to be accommodated. In the past, construction academics were able to schedule lectures and tutorials themselves, but many universities have grown in size and have devolved timetabling activities to central administrative departments. As a consequence, they have lost some control over their timetables. This is illustrated in the following HoS's quotes.

> "We used to control our timetabling within the school and we could do single day block-releases which worked really well. We cannot do that in a university this size now, so they get classes, largely, wherever."

> "Timetabling's out of the faculty's control. It's centrally timetabled. So we don't have control really – or not to a great degree – over when the lectures are going to be."

> "We tended to keep the five (pm) to seven (pm) slot for part-time staff so that they could come in after work and do a two hour class. So a few of the full-time staff never had an evening class. But that changed. The university, actually, just assumes that they can timetable with the teaching any time between nine am and nine pm."

In some cases central timetabling has not been optimal, as noted by the following academics.

> "So we could not really get the students coming back again for the same class on a different day… Now what I have been getting over last three years, those comments that Monday night is not a good night because it's too long, no good. Better to have it a different day. This was completely proven to be failed this year. Because more and more students are working in the industry. What the students were doing, three years ago, is even different from what they are doing now. They are more busy indeed, of course."

> "At the same time, our core subjects that we nominate students to undertake in this area, are not as flexible as they wish. When they come to the course, they think that, 'Okay. This course is great. We'll do that.' But when they come and know the timetable, they all try to shift to various other subjects because these subjects are no good… They cannot make it because of their very, very busy working."

In summary, a prime concern of students was for their teaching and learning activities to be scheduled to accommodate their work commitments. This has presented difficulties for some disciplines, as they no longer have as much control over timetabling as they used to have. Some disciplines have been able to structure their timetables in ways that recognise and accommodate the working patterns of their students and it is likely that the academics that teach these students are subject to fewer requests for extensions of time and leniency than their counterparts at other universities.

8.7 Discussion

Academics expressed concern about their students' motivation to learn, their attendance at classes and their ability to concentrate for extended periods. An in-depth examination of these concerns is outside the scope of this study but the data collected offer insights into possible causes. It is likely, for example, that students' expectations of being able to engage electronically with their studies (Hartman, Charles Dziuban, & Brophy-Ellison, 2007; Mabrito & Medley, 2008; D. Oblinger & J. Oblinger, 2005) are not being met by some of the traditional teaching approaches adopted by their lecturers (Section 7.3 and 7.9). A common characteristic of Gen X and Y (the age groups from which construction management students are drawn - Table 3.12) is their familiarity with and use of ICT (Sections 3.10.2.3 and 3.10.2.4). Focus group discussions with students indicated that digital delivery of construction management education was not widely adopted in the discipline. It is therefore possible that the manner in which some construction management courses are delivered does not engage students, and that this leads to them becoming disaffected.

In this regard, respondents' observations that students expect to be entertained in lectures (Table 8.2) are also informative and may indicate a level of agreement amongst academics that non-traditional methods of delivery trivialise teaching. These views may thus be interpreted as reinforcing the argument that some academics are not responding to the challenges of engaging their students in appealing ways. In Hartman et al's (2007) opinion, this is because most academics (who are not of the Net Generation) are unlikely to share the same learning styles as their students. While many academics are ICT literate, most did not grow up in the digital culture common to many of their students. Mabrito (2008) notes that "while N-Gens interact with the world through multimedia, online social networking, and routine multitasking, their professors tend to approach learning linearly, one task at a time, and as an individual activity that is centered largely around printed text" (p. 1).

Furthermore, the atypical age profile of construction management students is potentially problematic. The age distribution of construction management students differs markedly to that of other disciplines (Section 3.10.1). Construction management enrols fewer under-19 year old students on average than other disciplines (Figure 3.4). The ratio of these Gen Y students to those of the remainder of the construction management student population has risen from 1 to 1 in 2004 to 1 to 1.45 in 2008 (based on Table 3.12). This widening age gap between students in the same class may lead to tensions and misunderstandings between them and these may consequently challenge academics. In their report on a decade of first year studies in Australia, Krause, Hartley, James and McInnis (2005) observed that older students were generally very focused on their objectives and expressed high levels of satisfaction with their study. In contrast, students who were school leavers were far less certain about their choice of degree and more likely to have considered deferring their studies (McInnis, James, & Hartley, 2000). This miss-match of motivations was noted to generate misunderstandings between students (Section 7.5.2), and create difficulties when students work in groups. It is likely that these feelings contribute to their motivation, attendance at classes and their ability to concentrate noted at the start of this section.

Allied to students' feelings, academics were of the view that their students had become more customer-focussed in recent years. This was manifested in their expectation to have lectures scheduled at times that were convenient to them (rather than at the times allocated by university systems), and to be given course-related information (rather than develop research skills themselves).

Of considerable concern to academics was the extent to which their students worked whilst they studied. This well-documented worldwide trend is seen to be fuelled by students' needs to support themselves, the cost of their tuition, socio-demographic factors and in some cases, students' desires to support their lifestyles (Darmody & Smyth, 2008; Lingard, et al., 2007; Moreau & Leathwood, 2006). Unless the ways in which students fund their university education change, it is unlikely that they will alter their work / study habits. In view of the disinclination of the Australian government to change the way it funds students' university studies (Section 3.3), it is unrealistic to expect that this will occur in the short- to medium-term future. Construction management students are thus likely to continue to combine their paid work with their university studies, regardless of whether the aftermath of the global financial crisis makes it difficult for them to obtain construction-related employment.

Academics generally recognised the benefits students gained from their real-world experiences. The focus of their concerns was the pre-eminent status students attached to their paid work. This is aptly revealed in the words of a student who said "Yeah, because sometimes uni seems a bit trivial compared to work because work is the real thing. Sometimes uni can take a backseat. Sometimes you've got to make a concerted effort to make sure you know you're on top of all your assignments, or your work." Several participants and respondents confirmed this student's view. They became frustrated by the disruptions students caused when they tried to catch up with what they had missed in lectures. Some students, on the other hand, argued that they had responsibilities they needed to meet, and could not afford to take time off work.

Regardless of the relative merits of these arguments, tensions between paid work and university study are inevitable. Recognising this, some participants had consolidated their discipline's teaching activities into discrete days, thereby enabling students to allocate other days in the week to their paid employment. However, some universities have devolved all timetabling responsibilities to central administrative personnel, and this has meant that construction management academics have not been able to schedule their discipline's teaching activities in an optimal manner. It is likely that such instances have contributed to students' poor attendance patterns and that construction management academics have consequently been subjected to extra work and stress in responding to the requests of students who have not been able to attend class.

Further compounding academics' concerns about the extent to which their students worked and studied were employers' expectations of them. The skills shortage (Section 2.5) was seen to be a major cause of employers' reliance on students. The responsibilities employers put on them made it difficult for students to quarantine periods of time for their studies. This is illustrated in the words of a student who said "I'm a part-time employee but I almost carry on a full-time job. Like, even when I'm in a lecture I'll receive calls and have to call people back and stuff". In such circumstances, it is understandably difficult for students to attend some university activities. The reality of students working whilst studying was thus seen as a two-edged sword. The merits of students having opportunities to relate their real-world experiences to their studies were widely acknowledged. However, the undue reliance of employers on their student workers was to the detriment of their academic studies. As mentioned in Section 5.9, at least one university has tried to rein in employers' expectation by

requiring them to sign up to a code of conduct when employing their students (RMIT School of Property Construction and Project Management).

Finding effective ways of facilitating students' learning whilst they work is thus one of the significant challenges facing construction management academics. Students are unlikely to change their work / study patterns, and industry is unlikely to find an alternate source of construction professionals. Innovative approaches to this already in use include the delivery of teaching sessions at times that do not impinge of students work commitments, and distance and / or blended learning. In addition, the opportunities and challenges of WIL (Section 7.8) are yet to receive serious consideration by stakeholders. There is thus a range of different ways in which construction management academics might seek to better engage their students and accommodate the demands their paid employment makes of them. However, these approaches necessitate the investment of academics time in investigating different options and adapting them to meet the specific requirements of each discipline. The reality is that construction management academics are hard pressed to meet their immediate responsibilities (Section 9.2) let alone engage in other activities. Whether or not they are able to conduct such investigations will depend upon stakeholders' recognition of the changed profile of construction management students, the emphasis they place on developing new approaches and the resources they are able to garner. It is clear that present teaching methods are strained and that developing ways of enabling academics to engage effectively with their students is likely to impact positively on them as well as their students.

9 How construction management academics are managed and supported

9.1 Introduction

This chapter deals with the ways in which construction management academics are managed and supported in their university careers. It deals first of all with their workload, exploring the competing demands of teaching, research, administration, accreditation and other constraints on their time. The consequences of this workload on construction management academics' working lives are then explored. Aspects relating to how these academics are managed and how their discipline is resourced are considered next, followed by an exploration of their career paths and the continuing professional development activities they engage in. Finally, the topic of accreditation is revisited in the context of the support these academics and their disciplines receive from the professional institutions.

The data presented and discussed in this chapter are drawn predominantly from the interviews and focus groups that were conducted for this study. The term 'participants' has been used to indicate those who took part in these activities. Supplementary data from the on-line survey has also been used, with the term 'respondents' indicating replies from people who responded to this survey.

To set this chapter in context, the following are the demographics of the construction management academic workforce (who responded to the online survey). Most (84%) of the respondents were male and the majority (93.6%) were older than 36 years. Thirty one point eight per cent were aged between 36 and 45 years, 33.3% between 46 and 55 years, and 28.6 % were over 55 years old.

Furthermore, most academics were employed as either lecturers (36.5%) or as senior lecturers (33.3%). Senior staff accounted for 22.2% (9.5% were professors and 12.7%. were associate professors). Similarly, a small percentage (7.9%) was junior staff (3.2% were assistant / associate lecturer and an 'other' category accounted for 4.8%).

Academics were asked about their highest academic qualification. Almost half (49%) had PhDs and 39.6% had Masters degrees (23.8% had a research Masters and 15.8% had a coursework Masters). One academic had a Higher Doctorate, one a Postgraduate diploma / certificate and five (7.9%) had a Bachelors degree.

9.2 Academics' workload

In addition to their teaching commitments (Section 6.3), respondents were asked to identify their other academic roles and or responsibilities. Their replies are summarised in Table 9.1. In total 130 instances were recorded with respondents taking on an average of two extra roles / responsibilities each.

Table 9.1: Additional roles and responsibilities taken on by construction staff

Roles or responsibilities	Number of instances reported
Course Coordinator	46
Head of Department or Discipline	23
Supervisor for Postgraduate/s	21
Head of School	12
Other	12
Research Director	7
Assistant Dean	4
No additional roles or responsibilities	4
Dean	1

Respondents were asked how many hours they worked to complete their academic responsibilities in an average week. Their responses are tabulated in Table 9.2.

Table 9.2: Respondents' working hours

Hours worked per week	Percentage
Less than 38 hours	9.5%
38-43 hours	23.8%
43-49 hours	25.4%
49-55 hours	14.3%
55-65 hours	12.7%
Over 65 hours	3.2%
No answer	11.1%

They were also asked how their academic work was distributed between teaching, research and administration across a year. Their answers are shown in Table 9.3. A small number (seven) of respondents identified other additional activities including community / industry engagement, conferences, seminars, executive training, marketing, membership of professional committees, careers mentoring and advice as well as consultancy projects. The distribution of teaching, research, administration and other for these respondents was 33.71%, 26.86%, 26.43% and 13% respectively.

Table 9.3: Work breakdown of respondents' activities

	Teaching percentage	Research percentage	Administration percentage
Average	43.33	26.46	30.21
Range	10 to 90	0 to 70	0 to 70
Standard deviation	19.63	16.63	18.51

The percentages shown in Table 9.3 provide an overview of respondents' assessments of the manner in which their work is divided between teaching, research and administration. Answers to open-ended survey questions provided additional details in this regard. For example, one academic observed that "the workload indicates it's 20% research and 80% for everything else, because there is one day, supposedly, awarded towards research day. So if it is one day for research and the other day's for your other activities that's a 20%:80% split."

At another university, more emphasis was placed on research. The HoS at this institution stated that "40% of the time should be in teaching and teaching-related activities, 40% of the time is in research and research activities. A full-time academic here will teach four subjects a year. If they teach more than that they get paid extra."

One academic was cynical about the percentages allocated to teaching and research. He observed that attempting to target teaching as well as research produced mediocre results

> "Even talking to the same person, if you were to say to them how important is teaching? 'Spend 100% of your time on it.' How about research? 'Spend 100% of your time on it.' They want everything out of you and of course what comes from that is there is no real overall direction, so you get mediocrity. The way that it's been driven can only drive mediocrity."

Other participants expressed reservations about the merits of workload formulae. They mentioned several difficulties in identifying the tasks that constituted academic workload, as well as the effort that should be spent on these tasks. For example, a HoS asked "(h)ow much is a tutorial worth as against a lecture? How much extra is a lecture with 100 people in it as opposed to a lecture with 30 people in it? Well it's all about the marking. Well how (many) pieces of assessment do you have? What about a studio, how does that count?".

Furthermore, an academic saw workload formulae as irrelevant. He argued that academics who are able to cope with their workload were pragmatic and able to identify the important parts of their job. He said

> "(b)ut at the end of the day, if the job is done well and efficiently, does it actually matter? There are some people who just aren't going to be able to cope with the workload, but others are. That's how it works in the real world. You do the work that's required to do the job well, and you do the bits that count. But to be told, we buy your time, and you do a bit of this, and a bit of that - well what are you going to do? Some people are going to take on a lot and others are going to hide in the system because there's no transparency."

In summary, academic staff took on various roles and responsibilities in addition to teaching. Only one-third of them worked 43hrs or less per week, with the rest working longer (approximately 10% of respondents did not answer this question). Respondents indicated the distribution of their teaching, research and administrations workloads, but these varied considerably. Participants were generally sceptical about the workload formula in place at their universities, arguing that the either served little purpose or were ineffective.

9.2.1 Balancing teaching, research and administration workload

There was general agreement that academics were overworked. Some participants considered the extent of this overwork to be between 10 and 30%. In this regard, a HoS stated that "they are genuinely over-worked. I think they are probably carrying about – well it is variable – but I would say anywhere between 10-20% more load than perhaps what they should… I think genuinely they are overloaded. I think that needs to change somehow." Similarly, an academic noted that his line manager "actually has a workload assessment, which I think most universities do… (P)robably people are – the good ones – are 20 to 30% over in most cases."

In addition, a HoS observed that construction management academics needed to work more than a five days week to progress their career, as the following quote illustrates.

> "(I)t's more than five days a week for the job if you are going to get on. Particularly if you are starting at the bottom of the range and you are trying to build up a career. It means you're just working all the time, and I just don't think it's fair, but there doesn't seem to be any other way around it."

Another academic agreed that academics needed to work over weekends. He said "(t)here are a number of people that I know who are just on the edge of what is possible to do. They are working long hours and weekends trying to keep up with what they think they have to do to fulfil their requirements in their job." In addition, several academics were enrolled in

research higher degrees, and these were seen to increase their workload. In this regard a HoS said

> "So I would say yes, that I have a difficulty balancing, and of course most of them, five out of eight or six out of eight have for the last four years been doing it full-time – well not full-time – but a part-time PhD at the same time. Now if that's not a workload issue for people… I don't know what would be."

Representatives of the professional bodies agreed that academics were overworked, saying: "From the accreditation visits that I've done over the last two years… the general feeling is that they have too heavy a workload and a lot of that workload is administration work rather than the real business of why they are there, and that's the teaching of students."

The perception that academics were overworked was thus widely held. Workload was understandably a major concern to academics. They found it difficult to balance their teaching, research and administrative workloads as the following quotes indicate.

> "Trying to get that balance, as (a colleague) says, is very difficult when the pressures are on you to produce, to publish, to be members of committees, to interact with the community and the various professional bodies. It leaves very little time for… my teaching, and fortunately I have built up a number of years where I have got a lot of material. But if I was a new teacher I would find it extremely difficult to have enough time to build up that critical mass of really good teaching so I could take time in the other activities that the university is saying are very important too."

> "But last semester break (was) one of the most busiest time that I have ever spent at the university, without doing anything on my research. I did more and more admin. More and more other things are basically prevailing. Research is something that is very easy to keep aside… So I think sometimes it's very difficult to really get a balance right."

These concerns were not confined to academics. In similar vein, a HoS noted that "(i)t's just that, honestly, with course management and administration and trying to keep up teaching, it's been a frustration because I've been unable to progress very well in my research. That's a big thing for me. I need to do that." The views of this HoS summarise those of other HoSs.

There is thus considerable evidence that respondents and participants feel that they are overworked, with these views being confirmed by their line managers. This state of affairs makes it difficult for academics to engage in any activity that is not of immediate benefit to them. The imperatives for academics to complete a research higher degree and to bid for research grant income have a clear impact on individual's prospects for promotion (Section 9.4). These considerations overshadow many of the decisions that academics make about where to deploy their efforts and bring into focus the reasoning that underpins the decisions they make.

9.2.2 Teaching workload

Several teaching-related causes of excessive workload were identified. These included the size of classes participants taught, the number of academics employed, additional workload resulting from changes to curricula, the impact of students' actions, responding to queries on online discussion boards, and research expectations. These are described below.

- **Size of classes taught by participants**

  One of the most frequently cited reasons for overwork was that the number of students enrolling in construction management degrees had increased considerably in recent years. This, in turn, had increased participants' workload to an appreciable degree. The following observations of academics illustrate this point.

  > "Increased student enrolments. We've got bigger numbers, which is a two-edged sword. That's great - it says that it's a healthy program and it's valued, so they're the positives. But you must ensure that you can service the numbers."
  >
  > "But the other thing is the class sizes… Because if you have like in one course, I think the intake's about 120 to 160. So with the number of staff now, yeah still quite a heavy workload for the teaching."

  Similarly, a HoS observed that

  > "When I started 20 years ago we had maybe 30 first year students, and now we have 130. If you're teaching the same subjects that's a lot more time you spend coordinating a course, producing the teaching material, answering

> student questions because they come knocking on your door or want you to talk to (you) individually, rather than asking in class."

- **Numeric strength of academic staff**

Some participants noted that, despite the number of students having increased, the number of academics had remained constant, or in some cases, had decreased. For example, a HoS said

> "I think it's principally due to the way staff were shed during the last restructure. We had a staff of 11 maybe and if we discard the professor who never actually taught into our program, that's still three extra staff members over what we have now. And we would have had an average intake… of maybe 80 students per year. Well this year I think we're 160. And with three - that's with three less staff."

Another HoS also stated that he did not have enough staff. This resulted in a poor staff-to-student ratio as the following quote shows.

> "We don't have enough staff. I don't mind telling you we've got eight and a half full-time staff but in terms of bums on seats, including our international programs, we've got well over 600 students. Our staff teaching ratio is one of the worst and so I have to use a lot (of) industry people which is fine but you know that it's a double edged sword."

Staff-student ratios were also of concern at another university as the following observation of a HoS shows.

> "(Y)ou've only got to look at our staff-student ratio to see where our overwork comes from. It's probably double – it's probably double what the accrediting bodies would expect. It might even be higher than that. It depends for us whether you count staff who are on study leave as contributing towards the program. So we always have a staff member on study leave. So effectively we don't have a staff of seven, we have a staff of six."

- **Workload resulting from changes to curricula**

Academics from two universities noted that their workload was due to curriculum renewal. One hoped that this situation would improve with time, saying

> "(T)he last few years we have workload problem because we have two curriculum at the same times, transition between the old and the new one. So there's some extra number of units being taught in one semester… So probably up to next year I think we should be still heavy workload. After that we can concentrate mostly on the new area."

A HoS from another university stated that "this is the transition to the university model. (It) means that you're teaching the old subjects whilst the new ones are coming in. So for a couple of years, for three years, there'll be a lot of things that need to be taught twice."

- **Impact of students' actions**

Several participants mentioned that the actions of their students increased their workload. As the following quotes show, academics noted that attendance at lectures was poor, resulting in a constant flow of questions from students.

> "It is causing a lot of problems especially teaching to a final year group, they don't come to class. They are given an assignment and they don't know what to do and individually they come knocking on the door, ringing me up…" (Interviewee 6)
>
> "You've got to answer that, you say…" (Interviewee 3)
>
> "…emails and so on and I respond to all of those, I never turn anybody away and I say 'Well I explained this in the class'. They say 'Well I don't understand'. We don't take attendance, you don't know who is there and who is not and you've just got to entertain them and it just takes up a lot more time." (Interviewee 6)

Similarly, the HoS from another university noted the poor attendance record of his students. Commenting of this and the requests for clarification he regularly received, he said

> "(t)here are 650 studying property and construction in some form. So classes are pretty big, there's (sic) a lot of them, they're very demanding even though they don't turn up much. You know, you're getting emails all the time and phone calls all the time and so on and it just takes a lot out of your day."

Furthermore, some academics observed that current generations of students were more likely to challenge their assessment results than previous generations. One academic noted that these interactions were time-consuming and potentially stressful, particularly for new academics, as the following extract shows:

> "Students are more demanding than they were say ten years ago. We do have to spend a bit more time, I think particularly on the teaching side, taking care of them. They often see their grades as the starting point of negotiation rather than the final grade which is a phenomenon that I think has increased in the last ten years… They are always trying to push it a bit further and it puts a lot more pressure on the staff. I think without experience of dealing with these situations it is often very hard for them to turn down any claims by students that their marks ought to be reassessed or to go to a higher authority for review and so on. That puts a lot of pressure on staff and it is a lot of time as well. I think that is a new element that has come in the last ten years."

- **Online discussion boards**

Responding to students' queries through online discussion boards was seen to be a further source of workload. This is illustrated in the following exchange between academics.

> "There's arguably an impact of going electronic as well. Because you've got to keep in touch with all the discussion forums as well. My experience is if you leave it to once a week, it becomes an insurmountable task, so you've got to do it once a day." (Interviewee 1)
>
> "That's right." (Interviewee 2)
>
> "I agree. I personally have a constant knot in my stomach, thinking of these discussion posts building up. [Laughter, over speaking] And you have this

> thing in the back of your head if you haven't looked at it for a week. You think what am I going to see?" (Interviewee 3)

In summary, participants identified several teaching-related reasons for their overwork including the large classes they taught with much the same number of academic staff, the changes which some participants had had to implement in their curricula, students' poor patterns of attendance and their subsequent requests for clarification, the confrontational manner of some students when engaging with academic staff, and having to respond to digital discussion board postings. Collectively these aspects illustrate the range of challenges construction management academics need to cope with, their ongoing nature as well as their potential to accumulate and pressurise these academics.

9.2.3 Research workload

The requirements for academics to have PhDs and to conduct research were seen as major factors affecting the time and effort they could devote to their other responsibilities. For example, a HoS stated that

> "I think some of the challenges are workload pressures. I think trying to dedicate and provide a good teaching experience for student(s) is hampered by the fact (that), like a lot of academic(s), not just in construction, (they) have… research, leadership, community involvement. So it's probably difficult to dedicate as much time and effort into providing a good teaching experience or learning experience when you've got all these other pressures."

Noting this, a representative of the accrediting professional bodies expressed his concern that the efforts academic staff devoted to their research were threatening teaching. He said

> "I don't see admin, while it's a pressure, as being the biggest threat to teaching; I see the imbalance that's occurring, especially in vocational training, between research priorities versus teaching as being the focus. In that, with research, more and more funding is linked to how many articles you publish, having staff of a certain calibre for example."

Similarly, another HoS observed that focusing on research was likely to be at the expense of teaching quality. He said

> "(I)f you say 'Okay, research is the thing so, okay, I've got to play the game', kind of thing, 'I've got to start upping that bit'… and then one's teaching becomes, let's say only satisfactory. You know, you're doing the job to a point, but you're not trying to excel at it, which I think, to me, is not particularly healthy, certainly not for the students anyway."

However, some participants argued that research credentials were important if their discipline was to gain respect and recognition from within their institutions. Securing recognition was seen as key to these disciplines retaining some of the funding that came from their student intake. These views are illustrated in the following HoS's quote

> "I think the research agenda is absolutely vital and I think we have to respond to that. I do not think necessarily that most construction departments have responded as fully as they might have. Mine included. But I think they need to if they are going to be taken seriously by universities. I think there is a lack of focus on that which is why universities just see us as a source of undergraduate income rather than perhaps in many cases a serious discipline I think. I think that is a bit of a challenge."

Furthermore, some participants highlighted the contribution a strong research pedigree could make to the construction management discipline. This was seen to lead to success in obtaining research grants, and also as a means of distinguishing graduates as people who had more than technical skills. In this regard a HoS said

> "(d)iscipline-specific research. Yeah it's important, very important. It's very important on two levels. It's important because we're required to do it to generate research income and it's also important for the growth of the discipline of the profession. If our profession is only to be a TAFE-driven technical officer type job, then no, research isn't important. But I would question (that) even though there seem to be forces driving us towards that. I think a mature professional is defined by the maturity of the research that is conducted on its behalf."

In summary, participants' involvement in their own post-graduate studies and research was seen by some to be at the expense of their teaching responsibilities. Others argued that these activities enhanced the standing of the construction management discipline, and that looking at teaching in isolation did not allow a broad perspective to be obtained. The advantages of a strong and well-respected construction management discipline are noted in Section 9.3.2 and

have over-arching implications for the working environment and opportunities that construction management academics experience in their working lives.

9.2.4 Administration workload

Participants noted that their administrative workload had increased over the years. Some said that it had come to occupy a central part of their working life. For example, an academic said

> "I suppose to me it's the amount of administration that we do. I didn't come here to be an administrator but when I sit on the train with my wife and explain or mention what I've been doing through the day, she often picks me up and actually asks me whether I'm an actually academic staff member or an administrative staff member. I think the admin has just become a huge proportion of my day, that's one of the biggest changes I've noticed."

A HoS expressed similar sentiments, saying

> "(y)eah I've been here 20 years, too long. I've been from lecturer, senior lecturer, associate professor, and now I've been head of department for a while and I run two of the courses we run. So I've gone from worker to management. The things I've seen particularly is the level of administration and paperwork, and not just because I'm head of the department, but just we'll get surveys all the time and (the) things we've got to do. It seems that a lot of the work admin creates we now have to do, whereas you feel if it was correctly processed we wouldn't get so involved."

Representatives of the accrediting professional institutions were aware of this increase, as the following quotation shows.

> "I have to reiterate the heavy administration burden is something that concerns me. People who are experts in teaching should let them be experts in teaching not experts in paper waving. I appreciate administration is a task everybody has to deal with but we need to let the people who have got the expertise shine and use the skills they have."

Furthermore, representatives of the accrediting professional institutions were concerned about the implications for teaching of staff engaging in onerous amounts of administrative activity, as the following quotes show.

> "So that's an obvious concern to us as a professional body - that the teachers or the lecturers are not doing what they're paid to do, so to speak. And I don't mean that in a disrespectful way, I mean they're being taken away from that teaching to do administration work."

> "From the accreditation visits that I've done over the last two years… the general feeling is that they (academics) have too heavy a workload and a lot of that workload is administration work rather than the real business of why they are there, and that's the teaching of students. So that's an obvious concern to us as a professional body".

Several reasons were identified for the increases in administration workload. Representatives of the accrediting professional institutions saw these to be a result of universities' bureaucratic requirements. One of them said

> "(T)he sort of admin tasks that are taking up your academics time (it's) not your photocopying, clerical assistance stuff that's really a problem. It's administration within the university structures, admin in terms of accreditation, admin in terms of higher level committee participation; those sorts of administrative tasks"

Some participants saw the lack of support personnel as a reason their administration workload had increased. In this regard, a HoS said "I would say that admin support for our program is minimal to non-existent. It's no accident or it's no coincidence that the admin support for our school was dramatically slashed at the same time."

Furthermore, some participants argued that the allocation of administrative support in their universities was inequitable. The observations of HoSs below indicate a shift of these resources to central university divisions, resulting in those responsible for teaching attracting extra administration workload.

> "The bump in the middle is the head of school who does have… personal administrative support, whereas the individual staff member doesn't have personal administrative support… Whereas if you go to the administrative entities, student admin, academic admin, whatever they're called, they have a much more step-wise hierarchical system, and the people who are doing the administrative – it sounds a bit odd saying it this way – doing the administrative functions have administrative support… so you have the teacher whose job it is just to teach who does their own admin support kind of thing."

> "All the administration… gets filtered down to lower levels within the university At the same time… the university administration seems to be growing with more and more people being employed as pure administration, not academics. At the same time a lot of what I used to do is now down on my level or course coordinators levels."

Participants also noted that the proliferation of ICT systems had resulted in them now completing tasks that would have been delegated to secretarial staff in years gone by. For example, some HoSs said

> "(s)omething I think about sometimes from time to time is that IT development seems to have contributed to this a little bit. You know, you do a lot of whereas you didn't used to have a computer and all that kind of thing. So you almost do a lot of the admin sort of side yourself"

> "There are all those forms you've got to fill out… when you come back about what you spend and how much and all that stuff. Booking tickets, booking all of that stuff. Everybody does that themselves, which means you have to go around and see somebody to find out what the protocol is now because it changes every so often. So you ask 'What forms do I have to fill out this time?' I get it wrong every time. I try once or twice a year, usually I get it right."

> "This is the electronic revolution. Even recovering petty cash you have to do through an online system now. Instead of just writing it out, taking it around to the [unclear]. She used to get it out of a cash box or out of a safe and give you the $25 or whatever it was. Now you have to do it online and it has to be authorised here and authorised there and so it goes around. But you've got to do it yourself."

Notwithstanding these observations, ICT was seen to have streamlined administrative tasks at some universities. In this regard a HoS said

> "(w)e tried to do it, tried to improve it… we're trying to do it, like, electronically. If the student submits a form electronically I don't even need to print it out. (I) sign it, I just forward it to the Student Admin and say 'These are forms I approve' and by sending that email they can act on that straightaway. I think that's a good system"

In summary, academics' administrative workload was seen to have increased over the years. Concerns were raised that this was at the expense of their teaching responsibilities. This

increased workload was seen to be partly due to universities' bureaucratic requirements, a reduction / re-allocation of administrative support staff, and partly as a result of academics having to use ICT systems themselves (although this was seen to have streamlined academics' work in some instances). These increases have come at a time when academics are having to cope with other pressures including increases in the number of students they are teaching, pressures to engage with online delivery of their teaching, as well as pressures to conduct research. The implications of this high workload are discussed in Section 9.2.6.

9.2.5 Accreditation workload

HoSs as well as academics commented on the workload involved in preparing for accreditation. All concerned saw this as a time-consuming, resource intensive and significant task. Those responsible for preparing accreditation documentation and making the necessary arrangements for the visiting panel had to juggle these tasks with their other day-to-day responsibilities. The following quotes are those of academics.

> "But I just think in the tertiary sector at the moment, imposing (accreditation) on this discipline's staff is a huge impost right across the sector. Because we have demands, not only for teaching undergraduates. We have demands for teaching post-graduate programs and supervising post-graduate research students, and also doing our own research. Then also in all of that mix, engaging with the industry and the profession and their community. So we have a lot of demands, and we can't be running around doing accreditation course documentation, program documentation every two years. It takes a full staff member out for about nine months."
>
> "It's a huge workload on the person that's got to prepare it. Huge workload.

In addition, a HoS said

> "I think the resource requirement to support an accreditation visit is an issue. I think with the associations they make two assumptions. One is that we only deal with one body. We do not (The accrediting bodies) all have similar but not exactly the same requirements They need to tone down what they require out of us I think the other assumption is they just do not understand quite what they are asking for. The sort of data they need might seem appropriate but they cannot explain why they are asking for it and they just assume that schools have it to hand. They forget universities are large, complex organisations and student services are not really interested in generating data

for 300 students when they have got 40,000 students to deal with. The sorts of requests they make and how they want their data sometimes can be a bit onerous With limited resources of full-time staff in the schools, to devote to that task, well that is a big time at the moment. So what subject do we not teach? Or do we get someone else to teach while we actually pull someone offline to do it? That is the issue."

Accreditation (and especially accreditation by overseas professional institutions) was noted to be an expensive exercise. One HoS suggested that ways be found to rationalise the process, saying "While I value accreditation, I question the thousands of dollars that you have to put aside for the whole process and also the time taken to prepare the self-assessment document."

Another academic questioned the period that accreditation was valid for. His argument was that, where accreditation was for three years, the interval between visits was overly short. He said "(y)ou really take a good nine to twelve months to gear up. And if you've only got a three-year accreditation, you're in a two-year cycle. So what are you accrediting? There are no major changes."

In summary, academic staff perceived the workload and costs associated with accreditation as significant. Their prime concern was that these tasks frequently had to be completed in addition to their other day-to-day responsibilities.

9.2.6 Consequences of the high workload

Workload was seen to hinder academics from keeping up-to-date with industry practices, encourage them to rationalise the ways in which they assessed students' work and provided feedback, discourage them from implementing innovations and renewing their curricula, compromise their administration duties, and inhibit the rate at which they were promoted. However, some participants observed that the consequences of their workload were no different to those experienced in other industry sectors. The significant effects of the workload are described below.

- **Not keeping up-to-date with current industry practices**

  Some participants commented on the difficulties of maintaining currency with industry practices and procedures. For example, a HoS observed that the academic workload expected of lecturers discouraged them from taking on complementary employment in industry. He said

> "(i)f you look at… the policies, if you need to work out in the industry, the amount of stringent conditions put onto that doesn't actually encourage people to go and work. And the workload inside the university is significant enough, you don't have enough time to go and work in the industry."

Another HoS agreed with these sentiments, stating that it was getting "harder and harder" to stay in touch with the "real world".

This lack of exposure to current industry practices is likely to compromise academic's teaching. One commented that

> "Again I think… an issue, again related with workload, is the currency of what we're teaching (students). Being able to bring experience (of) the industry, into what we teach. Because with the time limits on teaching and research it will be very difficult to justify additional time then - to be able to go out then and actually practice and understand what's happening in the industry."

- **Rationalising assessment and feedback**

Assessing the work of students enrolled in large classes is time-consuming. In some cases this resulted in academics reducing the number of assessment items they required their students to complete. For example, one academic said

> "(w)ith the combined cohorts – it's 200 plus students. You almost think, wow, I'll just give them one assignment or two assignments. You're really looking at the numbers on that, because you just don't have the time. If you look at hours, 220 assignments – if you have no marking assistants, and that has happened in the past. And let's just say an hour, that's 220 hours. Where do you get those from? Your working week is supposed to be 45 or 40 or something. So a lot of weekends."

Another academic commented on the workload required to mark students' submissions. He noted that he provided less feedback to students as a result of the time pressures he had to work within. He said

> "(b)ut when I realise when I do less now, I set the standard. So when I start reducing… (t)hen they say… why the comments less now? I think the costs … I cannot mark in the way I've marked in the past when there is … Because if I

> do that, I cannot finish the marking in time. Because somehow the uni has a weird rule that you've got to finish in two weeks time or something like that, for each assignment."

Another academic noted that students expected detailed feedback on their assessment items. He noted that meeting these expectations was time-consuming and increased his workload. He said

> "On the other side, the student is expecting more than just a mark. They expect that you read through it many times and give them a lot of comments, a lot of supportive statements and stuff like that, to make their life easier. So it's quite a big expectation from your marking, or your assessment. Some would say 30 minutes per assignment, but sometimes it's impossible."

The high workload academics had to cope with also impacted on the way deferred exams were administered in at least one university. The HoS at this institution observed that

> "(O)nce you start removing these constraints, people stop doing the, not the…well the right thing, not because they don't want to just because they haven't got time. I'm referring to things, like typical things like deferred exams. Now normally it should be at least 50% different from your primary, you know what I mean, things like that?" (HoS)
>
> "Yes." (Facilitator)
>
> "People will avoid even setting a deferred exam and they will just reissue the primary, because we've reduced or slackened back on our review process." (HoS).

- **Stifling innovation and renewal**

Some participants observed that their workload discouraged them from introducing innovations in their teaching and learning. For example, an academic said

> "One thing that has struck me this year is that if you do something innovative you end up carrying the basket for it. So there's actually a penalty for being innovative. If you get a grant to do something, it's in addition to everything

> else you do. If you take on an additional project because you're interested in it… you actually end up making a rod for your own back. It's better to just do what you've always done and then your workload doesn't increase."

Similarly, one HoS noted that workload was one of the reasons preventing some academics from reviewing and updating their teaching materials. Talking about differences between academics who updated their materials and those who didn't, he observed that "(t)here is (a difference) between the rubbish and those who are each year reviewing their notes and adding a little bit extra… I think the reason they don't update is that (1) they're slack, it's just their nature, or (2) workload."

Another academic endorsed these views, saying "(y)es, I think again time-related I suppose, is the ability under the current workload to develop units further from where they are at the moment. Most of that again tends to be done in your own time, rather than the normal working week."

In addition, academics observed that they did not have the time to innovate if they worked within the constraints of their workload model. They said

> "(i)f we want to try and do some different things, it's difficult. You could do it and you'd probably be allowed to do things within bounds, but it would be out of your own time, the workload would be increased related to the merits of the situation." (Interviewee 1)
>
> "The workload model dictates much how we teach." (Interviewee 2)
>
> "Yes." (Interviewee 1)
>
> "Rather than us dictating how we teach." (Interviewee 2)
>
> "I'm trying my best to work within the workload model for the teaching that I do. By giving a straight lecture, without changing what I've got from the previous year, I can get the materials ready and give the lecture for the workload that I get. So it excludes any revision of materials or the marking. So we're being squeezed. Either we comply with that or we run (ourselves) ragged." (Interviewee 1)

An academic reinforced these views, saying "if you've got areas where people are struggling to survive and do what they're told they should be doing, they don't have the time to look at new, innovative ways of pulling an entire course together… The workload issue I think drives that…".

Implementing innovative teaching practices requires academics to spend time investigating, planning and reflecting on alternative approaches. One academic aptly encapsulated the consequence of a high workload as not having time to do this. He said "(w)e don't have time to sit around and talk about ideas; that's the worst thing."

- **Compromising administration duties**

High workload was also seen to have an impact on the administrative duties of academic staff. For example, one HoS stated that

> "I would have to say that I'm finding more and more admin work is not being properly (addressed). Sometimes allowances are given but I'm finding those to be very shy and generally when they're questioned it's a case of take it or leave it. But our organisation won't allow you to leave it. So you can draw your own conclusions from that."

- **Stifling promotion**

Some participants argued that the expectations placed on academics were onerous, and that failing to cope with workload requirements jeopardised their prospects for promotion. For example, a HoS stated: "Workload, workload and it's a pre requisite for promotion as well, so career paths hinge on a mix of teaching and research practice."

Similarly, an academic said

> "We have to do everything now. That is the sort of common theme running through everything. You have got to try and cover all the various spaces that the university is wanting; teaching publications, community service, connections with industry and the professions."

- **Workload consequences no different to those of other industry sectors**

  Notwithstanding the aforementioned views about workload, participants at another university offered a different view. They felt that the academic workplace was no different to that of other workplaces, arguing that individuals' personalities, motivations and aspirations all contributed to their capacity to cope with what was expected of them. They said

  > "I'd be lying if I said that some staff don't appear to have a lot on their plate while others do. It's unethical to sit here and pretend otherwise. And this is no different to any other workplace in Australia, where in general there are those staff who have a lot on their plate and those who have very little - for a variety of reasons. Some don't fit into what we can offer them, and so therefore they've got very little to do. Others deliberately arrange it so they don't have to do much. Others take on more than they should. And there's the go to people when you want something done." (Interviewee 1)

  > "There's also the teaching styles too. Some lecturers would put in, maybe not necessarily here, but put in the bare minimum and others put in 110 per cent for a particular class, looking after the students. That's another issue as well. Bare minimum, you've got plenty of time to do other things." (Interviewee 2)

  > "Workload is a matter of perception." (Interviewee 1)

In summary, participants identified several consequences stemming from their high workload, including not having the capacity to keep up-to-date with current industry practices, reducing the number of assessment tasks they set their students and of the feedback they provided, stifling their efforts to introduce innovations and renew their curricula, compromising their administration duties, and inhibiting the rate at which they were promoted. Notwithstanding the observations of some academics that the consequences of their workload were no different to those experienced in other industry sectors, the consequences noted in this section are daunting. It is small wonder then that academics in the discipline feel pressurised and that the discipline is finding it difficult to recruit new academic staff.

9.3 Management and resourcing of the discipline

This section describes the challenges of managing and resourcing construction management disciplines. To set these in context, observations about the general public's perception of construction management are provided first, followed by those concerning the nature and status of the discipline. These are followed by some examples of how the discipline has been positioned within university structures, and the impact this has had. The challenges that leaders of construction management disciplines face are described next, followed by those of funding and the quality of the facilities in these disciplines.

9.3.1 General public's perception of construction management

Participants observed that the general public were mostly unaware of construction management as an academic discipline. Several participants contrasted the public's knowledge of recognised, traditional disciplines (such as architecture and engineering) with that of construction management. The following comments are those of three HoSs.

> "The job title Construction Manager is relatively new, and if you stop the proverbial person in the street and say 'Well, do you know what an architect does?', 'Yes'; 'Do you know what a lawyer does?', 'Yeah'; 'Do you know what a construction manager does?'… gee, you're really struggling there kind of thing, you know."

> "There's an issue with the discipline and the (program). It is our lack of identity still, with the general public in particular. Within the disciplines itself, the quantity surveyors are well known and I think well regarded in the core disciplines in architecture and engineering disciplines, but externally it's a problem. So we do need to market a lot. "

> "Architecture has been around for so long. You know. 'Oh, what are you doing?' 'Oh, I'm doing an architecture degree.' 'Oh yeah, okay. You're doing?' 'Oh, construction management'. They say 'Well, yeah, okay. Well you must be working on one of those construction sites or something.' I think there's probably still a public perception that, if you're working in the construction industry, you're one of those sort of tradesmen type people on a construction site with fluorescent jacket on and all that."

Similarly, some participants commented that there were members of the public who thought that construction management degrees graduated students as tradespeople. In this regard an

academic said "We did have problems a few years back as well. People had the perception if their kids finished the course they were going to be bricklayers or something. There were those issues".

A HoS agreed, saying

> "I think if you go and ask the general public, they know what an engineer is, they know what an architect is, they know what a dentist is and so on. But if you say that you're going to be a (construction manager), they think you're talking about laying bricks and carpentry and the like."

This lack of awareness was particularly surprising to some participants as construction managers currently earn high salaries (which are frequently higher than those earned by graduates in traditional, well-respected degrees), as a HoS noted.

> "(T)he general public have almost no conception of construction management as a career and as a role, which is kind of surprising because the earning capacity is enormous, far greater than engineering or architecture, yeah. In fact that's quite interesting, if you go and look at the Sydney Morning Herald's careers page and the median salaries for the professions really outside of law, accountancy and medicine, construction management is pretty much up there in terms of median salary."

Notwithstanding the aforementioned comments, another HoS felt that the situation might be changing. He argued that some members of the public had become aware of construction management, despite its image, as the following quote indicates.

> "Yeah I suppose construction has always got the hard hat blokey type of image unfortunately, it would be hard to combat that. Whereas other courses like law and medicine are always perceived as the echelon of education. I think by the inherent nature of what construction is and people see it as a fairly crude, technical, blokey type of career, and that's the reason they may not see it in the same high light as say architecture… I personally think that is changing. I don't know about in other states… In here, we're booming and people hear about the salaries… and realise that in construction people end up getting quite a bit more than architecture".

Some participants observed that the public's lack of awareness of construction management could be due, in part, to its lack of a distinct identity. This made it difficult for members of

the public to associate the discipline of construction management with anything other than the previously mentioned images of construction tradespeople. This is evident in the following HoSs' comments.

> "I think it could be argued that construction management arose as a result of the apathy of the architecture profession towards managing construction projects. That was traditionally their role, and as they relinquished that… and construction management as a distinct discipline arose, in a sense there's a problem of actually trying to figure out our identity, what it is that makes us different and distinct from say mainstream business management or from project management, which in some ways seems to have a more mature and clear identity."

Another academic extended this observation to that of the discipline's professional identity. She argued that construction management was compromising its identity by seeking accreditation from multiple professional institutions. Graduates might work in a number of professions, and this made it difficult to attach a unique identity to any one of them, as the following quotation shows.

> "It's not a profession. Architecture is a recognised profession with a body of knowledge. Engineering is the same… and the construction-related professions… it's not a profession… it's everything to everybody… and so we get torn between, you know, six different accrediting bodies and try to cover everything."

Some academics believedku that the broad range of activities and projects that construction managers engaged in was difficult for the general public to appreciate. They observed that the general public found it difficult to distinguish between domestic scale buildings and those that were of high-rise construction. This is illustrated in the following quote.

> "The industry also is once again diverse isn't it? Because you know, at the one end you've got house building and then you've got you know high-rise. And I think this concept, this identity crisis is possibly as a result of, you know, the two ends of the market. And we're aiming at the leaders for the upper end of the market, you know, the high-rise, the big projects, the construction engineering style projects. And I think the perception of the public is more geared towards the houses being built next door and the subcontractors who are coming in and leaving and so on. I think that's where the confusion arises because the industry is very, very different at those two ends."

In an attempt to influence the general public's (and universities') perception of construction management degrees, some universities have recently changed the name of their degrees from "building" to "construction management". The word "building" has been omitted to avoid association being made with tradespeople, and in an attempt to sound more professional as indicated by a HoS.

> "I think that's why, over the last decade or so, just about all the construction management type programs in the country have changed. We used to be a 'Bachelor of Building', and before that it was a 'Bachelor of Science and Building Studies', I think… Now we're 'Construction Management and Economics', because it sounds more professional somehow. Because being a builder means that you're a tradesman, while being an architect or an engineer is a professional."

To further augment the respectability and recognition of the discipline, a HoS highlighted the move at his institution to include the words "project management" in the name of their degree. He suggested that this might further influence the general public's perceptions of the discipline. He said

> "I find if you put the (words) 'project management' in there it seems to go up in the eyes of everybody as being a much more sophisticated profession. I think a lot of our courses are actually called degrees in project management in brackets construction. I think you'll find, it sounds bizarre, but just the change in that wording would perhaps change the perception."

In summary, participants felt that the general public had a poor understanding of the construction management discipline, frequently associating it with construction tradespeople. They felt that the discipline had no clear identity, and that this was a result of the variety of different professions and activities that graduates could engage in. The names of some construction management degrees had been altered to influence the public's perceptions.

9.3.2 University perceptions of the construction management discipline

There were marked similarities between the general public's perceptions of the construction management discipline and those of academics in other disciplines. Many participants noted that the discipline of construction management was not well understood by colleagues in the rest of their university. They observed that those outside of the discipline saw it as one that

was manual and vocational, and argued that these views influenced their perceptions and understanding of the discipline. The views of a HoS illustrate this.

> "I think there was (sic) some people in this university, and maybe in other universities too, who really did think on the Bachelor of Building, the students doing the course, were learning how to build buildings. I mean literally lay bricks and paint walls and that kind of thing. Now not only that, but I do believe they thought that was part of what we were doing"

Similarly, an academic said

> "(w)hat are these construction managers doing? We've got a university course teaching people to go out with a pair of stubbies and T-shirt and wolf-whistle at people down the road. So we don't really need those and we'll reallocate those resources in somewhere else. That's the mindset (of the rest of the university) I believe and I reckon it would be around most of the universities".

An additional factor exacerbating the abovementioned lack of academic kudos of the discipline is its age. Some participants argued that the discipline was not recognised and respected because it had not been existence for a long time, as noted in the views of the following HoSs.

> "Well, within the university I would argue that we aren't recognised because - well we're not recognised, accorded the same recognition because it's a relatively young profession. It's not really well known and it covers actually, quite a wide variety of careers. Quantity surveying is understood as a career, construction management isn't necessarily; facility management is almost unheard of. And yet they're all professions that our program sort of feeds graduates into."

> "You see, the thing is at the university level anyway these kind(s) of courses are, relatively speaking, are new. Like there are university courses in civil engineering, which seem like forever. It's a very old profession, and like all the other fields, you know, chemistry, physics, English, poetry, literature, all those kinds of things. The university courses in the fields that we are talking about are relatively new, probably at university level. You're probably talking about early 70s."

Research credentials takes time to accumulate. The relatively young age of the construction management discipline therefore places it at a disadvantage relative to older, traditional disciplines. For example, a respondent stated: "there is no respect for non-engineering qualifications or experience". Several academics highlighted the importance of research in augmenting the standing of a discipline. They argued that unless the construction management discipline developed its research capability, it would find it difficult to raise its profile and be taken seriously by the rest of the academic community. The views of these HoSs illustrate this point.

> "I think the research agenda is absolutely vital and I think we have to respond to that. I do not think necessarily that most construction departments have responded as fully as they might have. Mine included. But I think they need to if they are going to be taken seriously by universities. I think there is a lack of focus on that which is why universities just see us as a source of undergraduate income rather than perhaps in many cases a serious discipline"

> "(W)e don't contribute in research at the moment, not as heavily as other disciplines do. So they see that this is a teaching only course. If they have the high demand then they will keep it, but because it's not doing research the academics are not valued that highly. Therefore, the discipline gets a little bit downgraded. So I would say that is the hidden side of it. So, if we can improve our research performance I'm sure we will be regarded very highly."

For the abovementioned reasons, several participants observed that the discipline was seen as a poor relation to the rest of the academic community. This is illustrated in the observation of one HoS who said "(w)e are in a faculty that is dominated by architecture and design and that always has been the case. We're pretty much the poor cousin."

Some participants viewed this lack of appreciation of the discipline as an anomaly when viewed in relation to the major contribution of the construction sector to the national economy (see Section 2.2). The following quotes highlight this contradiction.

> "Strange to talk about value isn't it? Ours is an industry that's worth anything up to 10% (of) GDP, and yet here we are (wondering) how to show that there is some value. It is one of the biggest industries in the economy, after resources really. It's strange isn't it?" (Interviewee 5)

> "But our own University doesn't associate us with the boom in WA and resources and things." (Interviewee 1)

> "Not associating and whilst there may be a boom in resources and it's not necessarily just construction but resources, as X said, construction is one of the major drivers in the economy. So therefore, technically, it should be one of the drivers in the university". (Interviewee 2)

Despite this lack of recognition, some participants argued that their universities could not ignore their disciplines. Student enrolments in construction management had been buoyant for several years (as described in Section 3.9) and the income earned from these enrolments had placed some disciplines in favourable financial circumstances. Indeed, some participants observed that they were subsidising other disciplines. For example, one HoS said "we're a cash cow as far as I can tell. We contribute more back to the university than any other school in the (faculty)... I think that would be fairly common amongst construction-related courses."

As an extension of this argument, several participants felt that their discipline's ability to contribute to the financial well-being of their school / discipline was an important reason why others in the university paid them any attention at all. The following quotations are from HoSs.

> "At the end of the day, when we are running our admission procedures at the start of every year, the university also knows the construction and property, largely, as well as architecture… are those that can generate numbers really easily. We can fill our quota two or three times over - it is just a question of quality. So when they have a deficit, as they often do these days at universities, the question comes back to us. So we become really important for about a week and then life goes on after that."

> "My gut feeling is generally, across Australia, I would say yes most upper management don't have a full understanding and don't value the construction course. Even though, in the scheme of things, it's probably one of those courses which is quite healthy, whereas social science and all those are in the firing line. My gut feeling is construction and architecture are good solid courses that keep the university going."

> "What do you think the general upper management's understanding of the domain is?" (Facilitator)

> "Of our domain?" (HoS)
>
> "Yes, construction." (Facilitator)
>
> "I think in our case I'm not sure they know a lot about it. But all our stats are so good they just leave us alone and I like it that way." (HoS)
>
> "It wouldn't have made them value us any more. We've doubled our numbers, within the institution we've doubled our numbers, but we haven't doubled our credibility or our value."

In summary, many participants believed that construction management disciplines were not understood or appreciated by their university colleagues in other disciplines. This was seen to be a result of the construction management discipline's relative youth and the lack of research capital they have been able to accumulate to date. Notwithstanding these factors, participants argued that universities could not afford to neglect these disciplines because they recruited significant numbers of students. Furthermore, they argued that the revenue, which these enrolments attracted, meant that university authorities were forced to take notice of them. The comments of some academics that they felt undervalued by their institutions are therefore unfortunate in view of the valuable contributions they make to the discipline and to their university as a whole.

9.3.3 Position of disciplines in universities' organisational structures

Some HoSs and academics expressed concern about the seemingly un-informed manner in which organisational restructures had occurred within their universities. They observed that the university leaders responsible for such reorganisations were unfamiliar with construction management as an academic discipline and did not have an appreciation of how it related to others. These concerns are reflected in the following observations of HoSs

> "The other mindset is that people in schools of engineering and the hierarchy of the university just acquaint construction (with) engineering and it simply doesn't. So the problem that we've got is that if we want some marketing or we want to look at more law or we want to look at any of the management sides, we've actually got to go out of school to get those areas taught."
>
> "I won't mention the university but there is one that I know well at the moment that is basically been taken over by engineering and all the new staff seem to be engineering

> staff and so on. So the end product will be a product that is unlikely to be recognised by the construction industry."

However, it became clear that making generalisations about the differences and synergies between disciplines was difficult. Another HoS noted (in the quote below) that, should a restructure take place at his institution, he did not foresee a problem with a move to engineering.

> "(I)f you were going to split this faculty up… the construction part of our course could easily fit in with engineering because the engineering course here has a little construction project management group. So basically teaching the same sort of stuff but applied to engineering projects rather than building projects. What's the difference? Well the only things I can come up are scale and detail."

Organisational restructures are thus challenging, and those making strategic decisions need to be informed and aware of the nature and vagaries of the disciplines concerned. The extent to which university leaders are familiar with construction management was questioned by several academics. The positioning of disciplines within universities' organisational structures was seen to have the potential to impact on the viability and effectiveness of these disciplines and hence to affect the lives of individual academics.

9.3.4 Discipline leadership

One of the challenges HoSs experienced in leading their discipline was that of coping with their other day-to-day responsibilities. Some of the activities that impinge on the time they have available for leadership activities include teaching, preparing accreditation documentation, and answering queries (sometimes from students who cannot locate sessional teaching staff). Examples are given in the observations of the following HoSs.

> "(I)t does create a lot of work… you get a little bit of a dispensation from the teaching load but because we're so short of staff I've got more than a full teaching load anyway."

> "The big part of what takes up my time is the accrediting bodies and the number of annual reports and external examiners and all those sorts of things that we're now dealing with. We have so many of these accrediting bodies. This year we'll have two

> visits from two different groups. Last year we had the Americans here. Every year it takes up a lot of time."

> "(I)t's really the increasing student numbers and they're not shy any more, they come and knock on your door and want to have answers to whatever questions. If they can't find the lecturer they'll come to me. We have a number of industry people that come and teach… (when) the students can't find them they'll come and knock on my door."

HoSs observed that the abovementioned factors contributed to them not being as effective in providing the quality of leadership as they would have liked. HoSs commenting on this topic noted that they had little opportunity to develop strategic, long-term views and plans. They were preoccupied with their day-to-day responsibilities, as the following quotes show.

> "(W)hat I find is that you tend to get swamped with just admin stuff and phone calls and emails, people at your door all the time. You don't feel like a leader. You feel like more of an administrator and you don't really have much time for the more strategic the more kind of visionary kind of leadership that's really necessary."

> "Probably leadership is a bigger challenge for me personally… thinking about… where the challenge is, thinking a bit more visionary and where can we go as a department? What can we do? I probably don't provide enough of that and (there are) two reasons, one is workload, you don't get the time to contemplate, and the second one is just each person's personality…"

In this regard, some respondents believed that poor leadership / supervision had hampered their career paths. One wrote that s/he had received "(p)oor advice/leadership, resulting in years wasted pursuing activities that have not helped me in my career progression".

In addition, some HoSs commented that they lacked authority to execute some of their plans. This exacerbated their feelings of not being effective leaders of their disciplines. As the following quotation shows, this situation is detrimental to the disciplines as HoSs understandably became disillusioned and are hesitant to embark on future initiatives.

> "(B)ecause you don't have any power - no power isn't the right word. It's authority. You don't have the authority. It's only in name, and you can't actually implement things. It's very difficult. And it's interesting, it gets to a stage where you start to think, well is it worth even trying to implement something because where is it going to

> get you? It'll cause a lot of angst with people and it's not going to help you at all, yet it'll help the students. It's tough."

To summarise, discipline leadership thus appears to be constrained by incumbents' workloads. Participants noted that HoSs have many responsibilities, and that these constrain their ability to develop long-term strategies for their disciplines. Moreover, when HoSs have had time to develop such plans they do not always have authority to implement them. The impact of such leadership on the lives of individual academics is unclear from the data gathered. It is likely that construction management academics would benefit from leadership by those who were not overworked, who possessed skills and experience in academic management, and who had the authority to execute their plans.

9.3.5 Funding

This section deals with the funding of construction management disciplines. Several academics identified a shortage of funds for teaching as a factor that was restraining their activities. The observed that extra staff were required for teaching-related activities to service the increasingly large number of students enrolling in these programs, as well as for the online delivery of courses. This is illustrated in the following quotes

> "And the resourcing, librarians, teacher-aides, special education. All of these things are non-existent yet even the poorest of our high school has ratios that are different to others." (Interviewee 1)
>
> "It's probably more to do with the institution…" (Interviewee 2)
>
> "Probably construction and project management specific to here because we've grown so quickly and there hasn't been any willingness from this University to resource that." (Interviewee 1)
>
> "So you're a victim of your own success?" (Facilitator)
>
> "Yes." (Interviewee 1)
>
> "What are the main resources you need for delivering these disciplines? (W)hat would be the most beneficial to you?" (Facilitator)
>
> "Probably some more bodies. We have a lot of the technology." (Interviewee 1)
>
> "Wouldn't it be good if we had technology bodies too?" (Interviewee 3)

> "To manage the technology." (Interviewee 2)

> "We don't have some support people in the school who could do things like help us organise online class work. (F)rom classroom into online requires a lot of preparation, you've got to do it all up front. It would also be good to have people who have skills in merging technologies like CAD and GIS that could work with the students."

In some cases it appeared that the lack of funding could be attributed, at least in part, to the low status of the construction management discipline within universities (Section 9.3.2). As a result, funding for construction management resources was not always a priority for those allocating university budgets. For example, an academic said "(T)hat is maybe the risk to construction management. We know how we're viewed in terms of resources and allocation and resources we're sort of last cab off the rank."

A related perspective on funding was that, in certain instances, it appeared to have been reduced. One HoS stated that "(t)here is a lot of pressure on your teaching quality and there are issues on how do you improve the teaching quality if the resources are pulled back?".

Some academics observed that their ability to cope with current levels of funding provided a false picture. They argued that they were only able to manage because of poor attendance by students at lectures and related activities (Section 8.5.5). In essence, they suggested that this poor attendance masked resource shortages, as the following quotation shows.

> "(Y)ou've got enough resources really; you're not constrained by lack of facilities or anything like that?" (Facilitator)

> "Well I think at the moment that is not an issue but (if) everybody started to go to every (class) it can become an issue, you would not have enough resources." (Interviewee)

Constrained funding for academic and support staff as well as for resources was therefore seen to be of concern to participants. Shortfalls were seen to be due, in part, to the status of the discipline, as it appears that other higher-profile disciplines receive priority over construction management. Participants also observed that staff shortages may be more severe than is currently appreciated because students were not attending face-to-face teaching and learning activities. It therefore appears that construction management academics may be contending with fewer resources than their colleagues in other disciplines.

9.3.6 Quality of facilities

Several participants noted that their facilities were poor. For example, a HoS noted that "the facilities are probably substandard and that reflects certainly on the outcomes and the student's experience." Similarly, another HoS said

> "(t)he facilities here are actually crap. It's embarrassing now. You get new students coming in, and most of the students have fantastic facilities at the schools they're coming from. The majority are from private schools. But even public schools to some extent have better facilities. But private schools, most of them have got top facilities. Then you come here and it's pretty poor."

An academic agreed with these observations, saying

> "(t)he second thing that worries me is that the quality of facilities we offer students is inferior to what they're receiving in their secondary school education in this country. So we now have a situation where students come to us from even the poorest of our high schools having better teaching and learning facilities and resources in terms of staff to student ratios, materials, than we are offering in this school."

Large classes require large venues but most universities have a limited number of lecture theatres capable of accommodating the number of students noted above. This situation is exacerbated where generic courses are offered to multiple cohorts of students (Section **Error! Reference source not found.**). As an example, a HoS said that "the rooms are at a premium. You can't get rooms. Sometimes that dictates how you're going to teach because you can't get large spaces or even small rooms now for that matter." This participant went on to note that class sizes have stretched the resources of his university to the extent that some lectures were delivered in a nearby cinema. A further difficulty was that, where large rooms were available, they were not always suitably equipped. For example, another HoS observed that "once you get a class that's got more than 70 or so in it, it's hard to find a flat room with tables… I mean we used to run things like measurement classes which we'd run as a lecture tutorial."

In summary, construction management academics expressed concern about the quality of the resources provided to them and their students. A lack of funds was seen to restrict the appointment of academic and support staff, and to affect the quality of resources and facilities deployed for these disciplines.

9.4 Career paths of construction management academics

Academics were asked how long they had been employed at their current university. Their responses are shown in Figure 9.1. When asked if they had worked in more than one university during their academic career, 55.5% answered in the affirmative, 38.1% stated that they had worked in one only, and 6.4% did not answer this question. Respondents who had moved universities were asked if they had moved inter-state. A third answered that they had, whilst 19% had not. Forty seven point six per cent of respondents did not reply to this question.

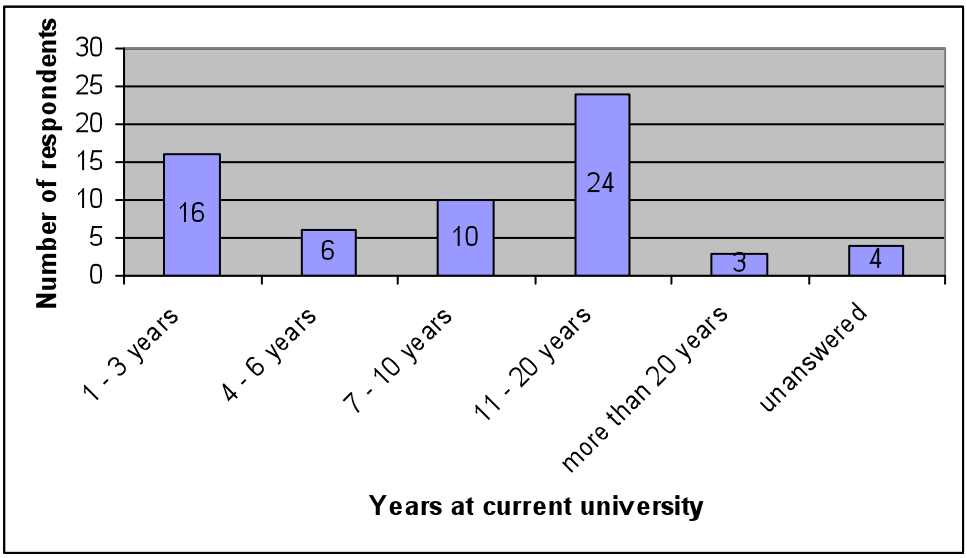

Figure 9.1: Length of time respondents employed in their current university

Respondents were asked why they had moved from one university to another. Their replies are summarized in Figure 9.2. The 'other' responses identified changing countries, and a change of career path as reasons for moving.

Two thirds of respondents had been teaching in their primary discipline for between 5 and 20 years (20.6% between 5 and 10 years, and 46% between 11 and 20 years). Only a small percentage (12.7%) were novice teachers with up to four years experience. 14.3% had taught for more than 21 years while 6.3% did not specify the extent of their experience.

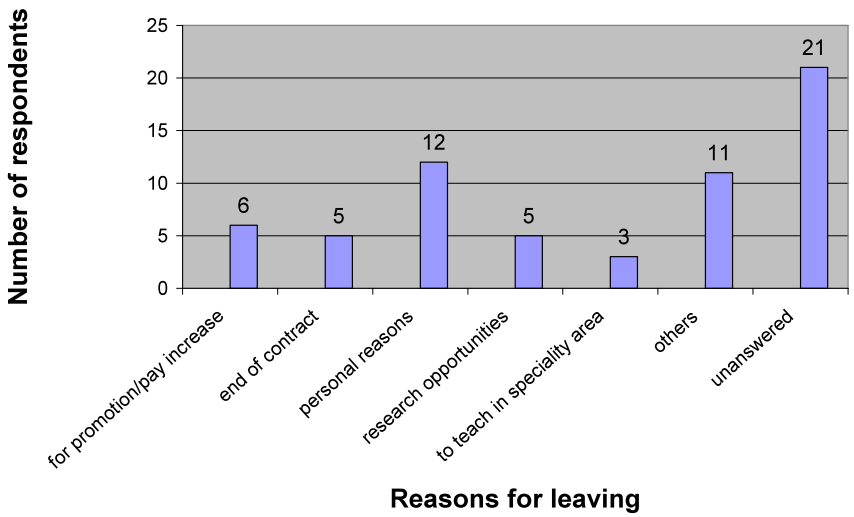

Figure 9.2: Reasons for staff leaving one university for another

During this time 28.6% of academics had not been promoted, while a third had been promoted once. 15.9% had been promoted twice, 7.9% three times and 7.9% four or more times. 6.3% of respondents did not answer this question.

Those who had been promoted were asked to indicate the academic level from which they were promoted and the level they were promoted to for each instance of promotion. Their responses are shown in Table 9.4, Table 9.5, Table 9.6 and Table 9.7.

Table 9.4: First promotion of construction management academics

Gender	From…	To…	Number
Males	Assistant / Associate Lecturer	Lecturer	11
	Lecturer	Senior Lecturer	21
	Senior Lecturer	Associate Professor	1
Females	Assistant / Associate Lecturer	Lecturer	5
	Lecturer	Senior Lecturer	1

Table 9.5: Second promotion of construction management academics

Gender	From…	To…	Number
Males	Lecturer	Senior Lecturer	6
	Senior Lecturer	Associate Professor	8
	Senior Lecturer	Professor	1
Females	Lecturer	Senior Lecturer	2

Table 9.6: Third promotion of construction management academics

Gender	From…	To…	Number
Males	Senior Lecturer	Associate Professor	2
	Associate Professor	Professor	5
Females	Senior Lecturer	Associate Professor	1

Table 9.7: Fourth promotion of construction management academics

Gender	From…	To…	Number
Males	Associate Professor	Professor	1
Females	Lecturer	Senior Lecturer	1

Respondents identified the following issues as those that had significantly affected their careers viz. research, bureaucracy, administration, difficulties getting promoted, poor leadership, teaching, lack of respect for construction disciplines, low pay, casualisation of teaching, unsupportive professional institutions, funding and their curriculum. Positive influences were seen to be mentors and colleagues, good management and experience overseas.

Participants were asked to explore the issues affecting the low rate of promotions experienced by construction management academics. The aspects they identified are described in the following sections.

9.4.1 PhD requirement

One of the main promotion requirements noted by participants was to either have completed their PhD or be in the process of completing it, as the following HoS's observations show.

> "We've got seven staff here and the staff that haven't been promoted haven't got PhDs. It's as simple as that."

> "I've never seen anyone promoted except from level A to level B. I've never seen that happen. And it won't happen for anyone until they have their PhD."

> "So you piggyback on the experience you've got before you became a staff member and then the whole issue is your promotion and everything is turned back because your higher degrees have not been completed."

Similarly, an academic participant said "if you're not doing a PhD definitely you will not be promoted" and a respondent stated that "without a PhD there is no future (career progression wise) regardless of my ability".

The quality of research supervision was of concern to some academics. In this connection a respondent wrote that they had received "(v)ery poor mentorship and pathetic PhD supervision which has retarded my development as a research-active academic and hindered my potential and advancement."

It is pertinent to note that no dissenting observations were made about the need for academics to obtain a research higher degree. This may indicate appreciation about the value of such qualifications. However, this requirement was seen to restrict construction management academics from being promoted.

9.4.2 Research output

Several respondents observed that promotion also depended on applicants being able to provide evidence of their research output (e.g. research funding and publications). This requirement was also noted by academic participants, one of whom said

> "(t)here's no question about the fact that not only do you have to publish, but you've got to write chapters of books or whatever the case may be. So it is driven – research drives the promotional prospects of the people… Any university will judge a staff member's promotional prospects by PhD and research outcomes. In fact, research grant applications and success"

Similarly, a HoS noted that "promotions (are) very largely are driven by research performance." In this connection, one participant noted the disparities between the funding of some other disciplines and that of construction management disciplines. This was seen to exacerbate the challenges construction management academics faced in being promoted. This academic said

> "(w)e are in an industry which doesn't by its nature have lots of money for its research. Where if you look at any form of medical industry and there is research money for them all over the place. Just looking at the name of the major institute that manages the research is of course a medical institute."

Funding for research was seen as a compounding issue. A respondent observed that a "(t)eaching career is now attached to research and (the) limited capacity of the industry to fund adequate research will hinder (construction management) academics to climb the academic ladder."

In relation to conducting research, a HoS went on to say "(t)he only advantage I think that engineers might have compared to people a long time in construction management is that they have a much stronger tradition in writing papers and doing research. I think research in construction management is newer."

These observations highlight the need for construction management academics to have a research track record to be promoted. However, modest funding opportunities and the relative youth of the discipline were seen to compound the difficulties these academics faced.

9.4.3 Contribution of teaching to promotion prospects

Several respondents noted that their prospects for promotion were limited, especially for those whose main interests related to teaching. In this regard, one respondent wished for "(b)etter opportunities for promotion within the universities especially for those academics who are mainly interested in providing good education."

Furthermore, several participants observed that the teaching-related promotion criteria espoused by some universities were subservient to those of research. Examples of the views of these academics include

> "Even so-called teaching universities, they'll put the spin that teaching is important. But the promotional prospects are very dependent on research. So let's not kid each other."
>
> "Focusing on teaching here is not going to do you any good at all if you're going for a promotion, as we found out; three occasions failed, two occasions failed to get promotion because not enough research. Not teaching research, this is research, research."
>
> "if you don't have a fairly strong research profile and then a stellar teaching profile, you won't get promoted."

> "I attended a promotion session earlier this year and after that I was depressed to say the least, all the work I put in on administrating and teaching is lost, down the drain, it's not recognised. If you want to get a promotion you've got to research."

HoSs held similar views, as the following quotes show.

> "Suppose you could present two people… Person A, fantastic performance in research, satisfactory performance in teaching; person B, fantastic performance in teaching, satisfactory performance in research. If it were a competition… suppose it was a case of saying 'Well, we can only promote one person this year'. Without a doubt the researcher would get the nod, and remember what I said about person B, satisfactory research… You show me someone who's promoted from associate professor to professor based on extraordinary, excellent - whatever adjective you want to use - teaching, and okay research, then I'll show you a very rare object."

> "(P)romotions are done on the fact that you've got research and publications I know it's just changed in the last few weeks, but I still believe promotion is done on that rather than on teaching. It doesn't matter what you do in teaching. A lot of people here know that and will only do the bare minimum teaching."

> "The University's strategy here at this university has made it very clear that it's aiming to move up the pecking order and teaching is very important but it's not really rewarded even though if you look at all the documentation it talks about promotion. Teaching is a very important part of promotion but it's almost impossible to get promoted unless you do very well in research."

Furthermore, several respondents identified tensions between teaching and research as something that had influenced their career paths. Their views are summarised in the words of one who wrote "(t)eaching is not highly valued by university in (the) current environment… it is research that is required and particularly the ability to win /attract research funds."

Many construction management academics embarked on academic careers with the main objective being to teach. As a HoS said "most people teaching construction are probably baby boomers, over 40, when they joined and become teacher for the love of teaching."

Notwithstanding these observations, some participants noted that promotion practices at some universities were changing and that account was being taken of teaching performance, as an academic noted.

> "I've sat on the promotion committee every year since I've been here, except the year I applied. At the beginning when I first came here, there was no way that you would get promoted if you didn't have a PhD and didn't have publication(s), and a really good research track record. Just absolutely no way. Now it has changed. There is a greater support for teaching."

Adding to this, the HoS at one university described the promotion process at his university as follows.

> "(W)e require them, and all the unis are the same, require them to achieve a threshold across the three basic areas of teaching, research and administration and to excel in one of them. And it's usually research that they're looking to be the point of excellence. But it doesn't have to be. People will be promoted on the basis of teaching excellence but they will still have had to achieve the threshold in research and so on… And I've even seen people appointed to (Associate Professors) on the basis of administrative excellence, but again they have had to have achieved the threshold in the others. So you can't hide, you've got to do everything."

Participants therefore generally believed that the teaching performance promotion criteria in place at their universities were ineffective. They reiterated the observations noted in Section 9.4.2 that their research performance was all-important. This situation may be changing as some noted that their universities were acknowledging teaching performance as promotion metric. Such developments are likely to be welcomed by construction management academics.

9.4.4 Moving university to secure promotion

A view commonly held by academics was that it was easier to get promoted by moving to a different university than it was to get promoted internally. For example

> "To get a promotion it's easier to go to another university. [Laughs] I think so."

> "Actually my view is that it is actually quite easy to get promoted in our discipline, you just have to move university."

> "I think there's probably an idea there that if you were really ambitious and wanted to you know creep up the academic ladder, you would have to be prepared to change institutions."

Whilst a HoS supported these views, saying "(i)t's much easier to come in off the street into a job than get promoted into it once you're here, no question", another HoS said "(t)hey all will probably, I think, they'll trot out the 'Internal promotion's very difficult. If you want promotion apply for the more senior job at another university', is I think is what people will tend to think, yeah." Another HoS said "I think a lot of people might choose to apply for other jobs at other places, because that's much easier to get a promotion that way, rather than staying where you are and applying for promotion."

Moving from one university to another potentially makes it more difficult for internal candidates to be promoted. This is illustrated by one academic who noted that those appointing new staff appeared to favour new applicants over existing staff, saying

> "(a)lso I think the people who are judging you know you. And they think that they know everything that you can do. Therefore when they see someone else, even though that other person might be maybe less capable, they kind of do not actually know that. They are a bit more optimistic that this new person could bring a change and it is untested really. Until you test it you will not really know."

A HoS echoed these views, arguing that his colleagues did not appreciate the capabilities of their peers. He said

> "I think it is almost impossible to get promoted in your own university. You're never appreciated in your own backyard. I've chosen for example – we'll talk about myself. I've chosen to stay here. I have been lucky enough to be promoted. I've only gone for it once and was fortunate but I've had colleagues that have gone for it more than once and not been successful and yet, had they moved to another state (in our situation you've got to move interstate which makes it awkward) they would easily get the jobs. It's the routine that you're never appreciated in your own backyard is the major consideration."

The view was also expressed that universities may actually encourage applicants from outside of their institution to attract those with different perspectives to existing incumbents. In this regard, one HoS stated

> "(t)here is also belief amongst some senior university academics (and I think this is Australia wide) that it's better to get outside talent than to use the people inside. It's not that they necessarily think they're better but that they come with fresh ideas and I can see that. If I put on my university wide hat I can see the merits of that."

Similarly, another HoS observed that "it's quite short-sighted within the university. But I don't (know) whether there's a view that it's good to have people moving around because you get some sort of cross fertilisation."

According to participants, construction management academics appear to find it easier to secure promotion by changing universities than to go through internal promotion processes. This has the knock-on affect of making it more difficult for those who remain to be promoted. Some participants were of the view that universities preferred to appoint external candidates to instil fresh perspectives amongst their staff. All in all, the observations recorded in this section confirm the difficulties construction managers experience in being promoted.

9.4.5 Legacy of industry careers

Some participants argued that prior employment in the construction industry restricted the promotion prospects of construction management academics. Many had worked in industry after completing their undergraduate education, and returned to academic life several years later. By way of contrast, many non-construction academics progressed seamlessly from undergraduate to postgraduate studies, and thereafter to academic careers. The following exchange between academics illustrates their feelings of being disadvantaged by their industry experience.

> "We often come into the discipline a lot later. In a number of the really outstanding research schools in our uni, (academic staff) come through from undergraduate, they do a PhD here, then they start tutoring, and then they start teaching. So they've had this really quite long association with the university. And most of our staff graduate, go out and work, minimum five to eight years or so, and then come back in. So we're eight, ten years behind really, aren't we? We might have snuck in a masters somewhere by coursework or research maybe. Most of us come back into academia and then start our academic career, don't we?" (Interviewee 3)

> "I think that's a good point. It's different from engineering or physics or pure mathematics students. As you say, they finish their undergrad and then do their PhD at a very early age." (Interviewee 2)

As these quotes show, some construction management academics argue that their late entry into academic life potentially disadvantages them relative to academics from other disciplines. Furthermore, these quotes also indicate that construction management academics frequently find themselves compared to engineers who generally have a stronger research tradition than that of construction (Section 9.4.6). Other participants supported the view that construction management academics entered academic life later in their careers, and that this pathway inhibited their ability to progress their research. For example, a HoS said "we are struggling to become researchers. Most of the people, say 80 per cent of the discipline, would be probably, across Australia, would be professional based disciplines, because that's what the industry bodies want."

Participants therefore agreed that late entry into academic life, as well as a practical (rather than a research-based) background augmented the challenges construction management academics face when they seek promotion. It is therefore clear that difficulties recruiting new academics to the construction management discipline are likely to be exacerbated if the accrediting professional institutes continue to recommend that lecturers have recent and relevant experience of the construction industry.

9.4.6 Influence of research-active disciplines

The promotion procedures at most universities are not discipline-specific. Construction management academics seek to progress in parallel with their peers from other disciplines. Some participants observed that the accomplishments of other research active disciplines were difficult to compete with. For example, one HoS said

> "(M)y guess would be that the reason is that a technical discipline such as construction is often considered to be similar to engineering. Therefore 'Why are you not earning as much research income, where are your publication counts, compared to your civil engineering colleagues?' "

This HoS went on to note that construction management academics seeking promotion were "compared to engineering. And it is really hard to look good next to a civil engineer who has got $5 million worth of grants and 600 publications." The strong research performance of

more research-active disciplines was therefore seen as difficult to emulate. This strengthens the requirement for academics to pursue their research endeavours as it is likely that they will experience difficulties being promoted without them.

9.4.7 Familiarity with university policies and processes

Notwithstanding the reasons for low promotion rates described above, some participants observed that their peers were not familiar with university policies and processes, and did not know how to "play the system". For example, a HoS said

> "I think in reality many construction staff, (quantity surveying) and property staff simply do not work the system… It is an issue though, if you get all of my staff in the school from any of the disciplines and they will simply tell you that (this university's) promotions system does not work. It does. They just do not work the system."

Another construction academic, commenting on promotion systems, made similar observations. He said

> "So you can imagine if you have a Professor from Health Sciences, who is going to look at people with a long, long publication list and PhD years ago, and then see somebody from construction. We just don't seem to understand the challenge."

These observations indicate that construction academics are generally not aware of some of the policies and procedures in operation at their universities. Such oversight may be symptomatic of the difficulties these academics experience in engaging in with activities that are not of immediate benefit and again highlight their high workload.

9.4.8 Successful promotions

In contrast to the observations above, some participants highlighted the successful promotion applications of their colleagues. The following examples were noted by HoSs.

> "(W)e have had had some successes in our school. There are… colleagues of mine that have had a go and have been promoted. We do have someone in the school who joined as a lecturer and is now an associate professor, so has gone through two (promotions)."

> "We have had a couple that have gone through. I have got one now that is sitting at an (Associate Professor) level, who has come through from lecturer. I have got another

> that was not promoted but applied from a lecturer level to a senior lecturer level and got that without question. There might be one or two others, I would have to dig through and see. It can happen."

> "Well apart from people that we've taken on in the last two years, everybody that I've been involved with in the 12 years I've been here has been promoted at least once."

These observations indicate that some construction management academics have been successful in being promoted.

9.5 Succession planning

Many participants observed that it was difficult to recruit academics with the combination of academic qualifications and industry experience required by universities. For example, some HoSs said

> "I think the inability to attract in general good quality academic staff with solid industry experience as well as academic experience… is the biggest challenge."

> "We're looking for two teaching staff. Now who are you looking for? Of course, in this day and age there's a requirement for post-graduate qualifications before you come in. But I'm just talking about the issue just purely in general terms, that it is difficult to find staff."

In addition, a representative of the professional institutions said

> "(A university) asked last week to help them find someone with a doctorate to fill the positions that they're going to advertise next week. To be honest there's not that many people… you probably know the people in QS who have doctorates, they're not out there."

Furthermore, some academics said

> "(w)e have gone beyond the stage now where there was a sort of surplus of good people to call upon. I think we are at the stage where it is very difficult to find good teachers." (Interviewee 1)

> "I agree with you 100 per cent. I will even go a step further and say what we really need is good teachers and researchers. Getting that balance is something that is getting more difficult to do." (Interviewee 2)

The reason frequently mentioned for this shortage of academic staff was the pay differential between industry and university. Graduate construction managers were earning substantially more than academics and this made the life-style of university lecturers financially unattractive. In this regard, HoSs was said

> "Well one of the reasons why it exists is because industry people can earn a heap more money in industry than they would do as academics. Half of my students earn more than I do. So I'm talking about prior to graduation. So I don't think there's an awful lot of incentive to come into academia. You don't pursue an academic career because of the money."

> "It is in the following manner. One, finding people within the industry who want to become academics. The answer is there's a couple of challenges, one, people don't want to do it because the money is crap compared with outside, particularly here, your salary would be double..."

> "Staffing is a real issue. The salary levels, compared with what industry's paying. There's no attraction for an industry professional to come – to turn around and become an academic. Not with the pay rates. A lot of the institutions wouldn't accept – unless you've got a PhD and you've written ten – you've written a book or you've got five published articles in journals, recognised journals, you won't get a job. Even though these people in particular applications are the perfect person to actually teach, because they've got years of industry experience which is pertinent to teach the students."

> "A personal perspective of mine is that I think it's very difficult to attract the next generation and to grow the business of the construction management programs here at this university. That's because the differential between industry and our salaries has widened to a point whereby it's not as attractive considering the way the universities are still; particularly in our type of business, which is essentially training practitioners…"

> "Finding qualified people is certainly an issue. Finding young people is a real issue but that's also tied up with the fact that universities really pay peanuts and they're getting monkeys."

To address the shortage of lecturers, several participants mentioned that academics from overseas were finding employment in Australia. However, whilst these academics might have post-graduate qualifications, they were unlikely to be familiar with local conditions. In this regard some HoSs said

> "(y)ou have to go (overseas) to source (academic staff). The problem is of course then the work experience becomes dubious. There are a lot more potential candidates overseas, particularly in our region that have PhDs, but won't necessarily have the relevant work experience." (HoS)

> "(s)o you're recruiting from that pool are you?" (Facilitator)

> "Yes, that's where we have. Just in general terms, that's where we have to go, because there is no interest, or very little interest (from locals)." (HoS)

> "(I)t's very hard to attract people in the business. So when we advertise for staff (we get applications from) maybe a local applicant and maybe not. We tend to get some from Baghdad and some from other places. But they have little or no industry experience and they certainly have very little knowledge of the Australian experience. So that's hard."

Similarly, an academic said

> "(s)o I actually think if I come back in 20 years time, all the academic staff will be international, they'll be from China and Africa, because they're the only ones who will accept the money and will have a PhD at the age of 24."

To summarise, most HoSs agreed that recruiting appropriately qualified staff was a significant challenge for them. The dearth of local applicants had resulted in the appointment of overseas applicants in several cases, and this trend was seen to continue. These new academics will need to familiarise themselves with local conditions and regulations if they are to successfully engage their students. Those responsible for their appointment have a duty of care to ensure they are adequately inducted and supported in their academic lives.

9.6 *Continuing professional development*

Australian universities provide opportunities for their academic staff to enhance and develop their teaching-related skills throughout their university careers. In addition, members of most professional bodies are expected to engage in on-going continuing professional development (CPD) activities. Construction management academics thus have several opportunities to complete such activities. The extent to which they do so is described below.

9.6.1 Teaching related CPD

Respondents were asked to identify the methods they felt were most effective in updating their knowledge of teaching practices. They were asked to rank a set of options provided in the questionnaire, and their responses are shown in Table 9.8.

Table 9.8: Respondents' ranking of methods of updating knowledge of teaching practices

Rank	Method of updating knowledge
1	Academic conferences
2	Being up to date with industry
3	Attendance at workshops/seminars/short courses
4	Networking
5	Academic journals
6	Education conferences
7	Belonging to professional or academic associations
8	Web sites and e-newsletters
9	Postgraduate study
10	Being a member of the School and Practice Advisory Board

Respondents were asked to indicate the teaching and learning development activities they had participated in 2006 and 2007, and had planned for 2008. These activities as well as the frequency with which respondents engaged in them are shown in Table 9.9.

Table 9.9: Respondents' teaching and learning continuing professional development activities (2006 – 2008)

Continuing professional development activity	2006	2007	2008
Induction programs	8	14	7
Symposium/conference	27	32	21
Workshop	23	30	20
One on one advice from a teaching and learning advisor	10	18	15
Peer review of teaching	4	7	4
Teaching development grants	6	9	9
Higher degree study in university teaching and learning	6	8	7
Other please specify	0	0	3
TOTAL	**84**	**118**	**86**

9.6.2 Industry-related CPD

Respondents were then asked to identify the methods that they used to keep abreast of current industry developments in the area/s in which they taught. They were asked to rank a set of options provided in the questionnaire. Their responses are shown in Table 9.10.

Table 9.10: Respondents' ranking of methods of keeping abreast of industry developments

Rank	Method of keeping abreast
1 (joint)	Academic Conferences
1 (joint)	Industry journals and magazines
2	Academic Journals
3	Web sites and e-newsletters
4	Networking
5	Professional body (AIB, AIQS, AIBS etc.)
6	Attendance at workshops/seminars/short courses
6	Belonging to professional or academic associations
8	Being a member of the School and Practice Advisory Board
9	Postgraduate study

Several respondents also mentioned that they undertook consulting work and that this provided them with an effective means of keeping up-to-date.

9.6.3 Reflections on industry-related CPD

Some participants recognised the need for construction management academics to keep abreast of industry-related practices and procedures. For example, one HoS said

> "I think it does have some effect if the academics don't keep up to date with the news, do the research, and liaise with industry and some forum like being a member of a

> committee or going to the odd breakfast function… I have a couple of academics who do nothing and probably what they're teaching is a bit out of date."

Students were able to identify the academic staff they felt were not familiar with current practices. The following quote from a student focus group illustrates this point.

> "So the currency of the content can be a little bit outdated?" (Facilitator)
>
> "Yes… Some of the lecturers haven't worked in the industry for 15 years." (Interviewee 1)
>
> "One is running the same set of slides he had in the late 80s or early 90s. The drawings we use are completely unrealistic." (Interviewee 2)

Participants were aware of these shortcomings. They identified several ways in which they attempted to keep up-to-date. For example, one academic suggested that practising as a consultant was a beneficial approach, as the following quote illustrates.

> "You can also do consultancy, technically, although again this University went through a period of when it more or less closed consultancy down for a good number of years because of the ridiculous attitude that they have. Consultancy would be frowned upon because if you were doing that you're not doing research."

Similarly, the quote below highlights the personal example set by one HoS who has maintained his own private practice.

> "Because I'm a creature of industry myself I've always believed that if you're going to teach then you'd better understand what you're teaching. I don't mean to speak about myself but I still have retained my right to private practice and I do that and it's the world's second smallest private practice but I insist on doing it so that I can talk to the students with a degree of confidence about what happens."

Some HoSs suggested that academic staff be allowed to work for periods in industry. These were seen as variants of the sabbaticals available to academic staff at some universities. For example

> "I think a good practice would be for staff to be released for periods of industry experience. Study leave would be an opportunity, however if a staff member even got approval to do that, the chances are it would be difficult to actually convert that into

> something useful. Study leave is supposed to allow staff to, if you like, provide a springboard for another two and a bit years worth of productive research. It would be far easier to do that by touring universities and conducting research projects than it would be to say shadow industry practitioners."

> "We have, as other universities do, a PEP leave, a professional experience period where you can take six months every three and a half (or) four years. That can be research-focused or it can be industry-focused. So I try – I discuss with my staff if they need research support I suggest they take that period to do research. If they're really lacking in industry (experience) then I suggest they go in industry."

> "Most staff are genuinely over-worked in the university sector and I think there is just a weariness that would be refreshed if there were easy ways to get the academics back into the industry for maybe six months or twelve months… It is really difficult to do that because for someone to go for six months we have got (a) hole for six months. We need some way to maybe rotate industry people in for six months and give them a break from what they are doing… If we could just find a way of cycling through then I think we could overcome some of that weariness I think."

Another suggestion was for academic staff to keep current by attending continuing professional development (CPD) events. The following exchange between academics highlights this avenue.

> "I think the networking… you mentioned is important and the collegial events at CPD and that sort of thing, is really the only way you can realistically do it." (Interviewee 5)

> "Course conferences are another one. But of course our conference allowances were virtually taken down to nothing." (Interviewee 2)

Similarly, another academic said "so you do it by networking with industry people that you know… CPD events, those types of things, but these are all in your own time."

Participants were therefore in agreement that they needed to keep up-to-date with industry practices and procedures, and suggested several approaches by which this might be achieved. Whether or not these suggestions are acted upon depends on many factors including the extent to which academics can allocate time to such activities.

9.7 Discussion

There was general agreement amongst HoSs and academics that they were overworked. Responses to the online survey indicated that approximately 55% of construction management academics (including HoSs) worked more than 43 hrs per week (Table 9.2). Respondents as well as participants noted that they found it difficult to balance the competing demands on their time for teaching, research and administration. Some observed that their prospects of being promoted would be jeopardised if they did not meet the expectations placed upon them, and extended their working hours accordingly. Teaching, research and administration presented different challenges to individual academics as well as those responsible to managing them, and these are discussed below.

A key contributor to teaching workload was the increasingly large number of students that academics were expected to teach. These large cohorts were seen to have resulted in academics being pragmatic about the manner in which they taught and assessed their students (Section 7.9) and to have potentially compromised the manner in which they maintained and renewed their curricula (Section 6.6). To redress the imbalance in numbers between staff and students, and to maintain staff-to-student ratios at the levels recommended by the accrediting bodies (AIB, 2006), there was widespread acceptance that additional academics needed to be recruited. However, this had not generally occurred primarily due to the difficulties encountered in recruiting suitably qualified and experienced candidates. The challenges currently facing construction management disciplines in Australia are similar to those experienced in the UK in the 1980's. There Weimer (1987) noted that many feared the increased number of students enrolling in university degrees would reduce the quality of education unless these increases were accompanied by more staff. She argued that "without rapidly changing teaching and assessment methods there will be a dramatic decline in the quality of British higher education" (p. 2). Furthermore Gibbs and Jenkins (1992) observe that as class sizes increase "the practical problems faced by teachers and students become more marked, and change in nature" (p. 16). To alleviate the shortages of full-time academics, some disciplines had been able to engage the assistance of sessional academics. Even when sessional academics were employed, they still need to be briefed and their activities co-ordinated, and these activities necessitate the involvement of full-time academics (Section 7.4.6). Thus, whilst these part-time academics were seen to take on some of the workload of full-time academics, their efforts needed to be supported and managed. The

workload of sessional academics thus only partially eased the work pressures experienced by full-time academics.

Respondents and participants noted two other sources of teaching-related workload. Firstly, the actions of some students were seen to be disruptive, with these students attending lectures intermittently, and interrupting lectures with questions relating to topics that had been dealt with previously. Secondly, several participants made mention of the onerous and time-consuming nature of responding to students queries and observations on online discussion boards. These two points are relevant because they highlight trends that pervade higher education viz. that of students working whilst they study, and the increasing uptake of online learning. As such these are realities of the current higher education environment, and construction management academics need to find ways of adapting to them.

Research was also seen to be a major source of academics' workload. Whilst approximately half of those surveyed had obtained their PhDs (Section 9.1), the remainder noted the difficulties they were experiencing in trying to complete their higher degrees. Here it is pertinent to note that these academics and many of their students were both working and studying simultaneously. Whilst academics generally acknowledged the advantages and disadvantages of students' industry-based work (Section 8.5), none related the pressures their students experienced to the stress they felt when trying to combine their teaching and research responsibilities and commitments. This is arguably a missed opportunity, as sharing experiences is one way of creating empathy between those involved (Broome, 1991; Hakansson & Montgomery, 2003).

Whilst some observations were made that academics' research was conducted at the expense of their teaching, others emphasised the importance of a strong research track record for the academic health of the discipline. Success in research was seen to have the potential to not only raise the status of construction management in the eyes of the general public (Section 9.3.1), but to improve the standing of the discipline with academics in other disciplines (Section 9.3.2). A strong research profile was seen to be of strategic advantage to the discipline, providing it with more leverage and influence in university and faculty matters (Section 9.3.3). In this respect academics in the USA experience similar preconceived ideas about their discipline from their peers. Badger (2007) notes that "(a)cademics in engineering and architectural schools must realize that CM research can create value that rivals their own." (p. 1).

In addition, administration was also seen to have contributed significantly to academics' workload. Academics involvement in administrative tasks had increased over the years, mainly as a result of universities economising (Section 3.3) and reducing the number of administrative staff allocated to academic disciplines. Furthermore, academics' administration workload was seen to have increased in response to the bureaucratic requirements of some universities. In some cases ICT was also seen to have increased workload, with academics now having to complete tasks that would previously have been the work of others (including typing and making claims for pretty cash). However, participants also noted instances where ICT had improved the ways in which they worked.

An additional source of academics' workload was seen to be the multiple professional bodies these disciplines seek accreditation from. In an effort to ameliorate this situation, attempts have been made by the AIB, AIQS and AIBS to rationalize their accreditation requirements (AIB, AIBS, & AIQS, 2006). These efforts were initiated at the Australasian Universities Building Education Association (AUBEA) conference in 2000 but little progress has been made to date. The topic was discussed again at AUBEA 2011, and it was agreed that further efforts would be made in this regard. More recently, ALTC funding has been obtained to "ensure the various professional accreditation requirements and emerging national regulatory frameworks are better aligned" (Newton, 2011a, p. 1). It is too early to tell whether these renewed efforts will be successful, and thus whether or not the workload associated with multiple accreditations will be reduced. These accreditations augment the already considerable workload of academics.

Whether or not universities will continue to seek multiple accreditations is unclear. What is likely is that the workload associated with managing academic disciplines will spike with the introduction of TEQSA (Australian Government, 2012). TEQSA will in the near future require universities to introduce threshold learning outcomes similar to those identified by Newton (2011b) and these will inevitably require disciplines to revise their curricula. Universities own internal quality assurance processes and procedures (Section 3.7.1) will also need to respond to these new requirements, further exacerbating workloads. With academics currently expressing concern about workload, these further increases may cause some universities to question the value of multiple professional accreditations, especially those with onerous audit requirements.

Tensions between academics' responsibilities as teachers and researchers are longstanding. According to Jenkins (2004), academics' commitments to teaching and research can be synergistic and complementary or antagonistic and competing. He argued that the relationships between research, teaching, broader work expectations, and rewards needed to be defined and managed at institutional, departmental, and individual levels to avoid potentially undesirable effects and counterproductive behaviours (Jenkins, 2004). Some of these effects are reflected in the chain-reactions that respondents and participants saw resulting from their teaching, research, administration and accreditation workloads. As already mentioned, many academics worked long hours and found it difficult to balance their teaching, research and administrative responsibilities. This, in turn, was seen to result in academics seeking ways to streamline their teaching activities by adopting traditional lecture-based approaches to teaching, reducing the number of assessment items they required their students to complete, and by discouraging innovative teaching and renewal of curricula. Furthermore, some academics considered incorporating online assessment as a way of containing their workload. In general, it thus appears that most academics preferred to teach and assess in the ways that were familiar to them, rather that invest in teaching-related CPD that might help them teach and assess more effectively (Section 9.6.1 and 7.9). It is likely that these academics felt that engaging in such activities would further increase their workload.

An over-arching concern is that the aforementioned actions all have the potential to compromise teaching and learning quality. Whether or not this is the case is difficult to establish because little current data are available. Pending the implementation of TEQSA, the AIB (the main accrediting body for construction management degrees in Australia) extended their existing accreditations to "30 June 2011" (R. Hunt, 2011a, p. 2). The result of this is that over half of these programs have not been audited for six years or more (Table 9.11), and two have not been reviewed for ten years. AIB accreditation thus cannot thus be relied on as a reliable measure of current teaching and learning quality. Another indicator is that of the Australian Government's audits. Table 9.12 indicates that the universities offering construction management degrees have been audited more recently, but the reports provided by AUQA (Australian Government, 2012) detail findings for each institution, rather than a report on individual disciplines. TEQSA (the successor to AUQA, Section 3.7.1) commenced its regulatory functions on 29 January 2012 and the remit and timing of their audits are yet to be released. Data are as yet not available to establish whether or not the quality of teaching

and learning offered at Australian universities has been affected by the aforementioned factors.

Table 9.11: Year when construction management degrees last accredited (The Australian Institute of Building, 2012)

University	Degree	Year last accredited
University of New South Wales	Bachelor of Construction Management	2002
University of South Australia	Bachelor of Construction Management and Economics	2002
University of Technology Sydney	Bachelor of Construction	2003
University of Newcastle	Bachelor of Construction Management (Building)	2004
Central Queensland University	Bachelor of Construction Management	2004
Deakin University	Bachelor of Construction Management	2005
Royal Melbourne Institute of Technology	Bachelor of Applied Science (Construction Management)	2006
Curtin University	Bachelor of Applied Science (Construction Management and Economics)	2007
University of Melbourne	Bachelor of Environment and Master of Construction	2008
University of Canberra	Bachelor of Building and Construction Management	2009
Queensland University of Technology	Bachelor of Urban Development (Construction Management)	2009

Table 9.12: Recent AUQA audits of universities (Australian Universities Quality Agency, 2012)

University	Last AUQA audit
Bond University	October 2004, April 2010
Central Queensland University	October 2005, October 2010
Curtin University of Technology	August 2002, October 2008
Deakin University	October 2004, June 2011
Queensland University of Technology	April 2005, October 2011
Royal Melbourne Institute of Technology	July 2003, March 2009
University of Canberra	March 2003, October 2008, August 2011
University of Melbourne	August 2005, May 2010
University of New South Wales	October 2001, October 2005, June 2011
University of Newcastle	September 2002, April 2008
University of South Australia	March 2004, August 2009
University of Technology, Sydney	May 2006, May 2012
University of Western Sydney	October 2006, May 2011

Although construction management disciplines enrolled substantial numbers of students, some academics believed that their discipline subsidised other disciplines. Subsidisation between disciplines (and other academic units) is not unusual in higher education (Winston, 1999). Indeed, this has been the case for some decades, as James (1978) observed that "(u)ndergraduate education is now a profitable "production" activity at universities, used to subsidize their "consumption" of loss-making graduate education." (p. 157). However, notwithstanding the widespread practice of subsidisation, the lacklustre image of construction management as a professional discipline was seen to create difficulties when it came to securing an appropriate allocation of resources and funding. In the main, respondents and participants felt that both the general public and academics in other disciplines were not well informed about construction management, stereotypically thinking of it as education for tradespeople. Similarities with the USA are relevant here as Badger (2007) notes "(t)he perception continues that construction is primitive, outdated and inefficient" (p. 1). Participants felt that this placed the discipline at a disadvantage when it came to the allocation of resources and funds between academic disciplines.

Few observations were made about academic leadership. Those in leadership positions generally agreed that their workload made it difficult for them to take a long-term view of where their discipline was going, and for them to develop strategies to achieve their goals. Some also commented that they felt they did not have authority to execute some of their plans. In this context it is relevant to note the observations of Badger (2007) about academic leaders in construction management at universities in the USA. He argues that "(s)ome (construction management) professors, even young ones, seem to be oriented and trained to manage, control and inspect. Concepts of leadership, optimized use of resources and transfer of risk and control to increase accountability are underappreciated" (p. 1). Badger's observations are supported by the work of Kekäle (1999) who investigated management and leadership in higher education. He noted that different disciplinary cultures prevail in different disciplines and that "diverse disciplinary perspectives seem to be consistent with certain preferences" (p. 233). These observations resonate with the data that were collected for this study. Here, universities have focussed on meeting industry's demand for construction management professionals (Section 2.5), with curricula (Figure 3.2) being designed primarily to equip graduates as managers. Little is known about the leadership experience of construction management academics in Australia. Whilst most had considerable industry experience (Section 5.6.2), the level of their industrial appointment is

not known. The extent to which these academics have been able to transfer their industry-based leadership skills and experiences to university life have yet to be investigated. It would seem likely that those who have been successful construction managers should have the potential to be successful managers of academic disciplines.

Academic leadership is currently of concern to the Australian Government. In this regard it is pertinent to note the words of Lynn Meek (2012), director of the Australian Government-supported LH Martin Institute. He noted that this institute was established

> "to help leaders, professionals and academics gain an understanding of the rapidly changing sector and translate that knowledge into effective management strategies for their institution. In other words, we aim to improve management and leadership in the tertiary education sector by assisting its current and aspiring leaders in fulfilling their missions."

It would this appear that academic leaders of construction management disciplines are not alone in the Australian context, and would benefit from continuing professional development activities such as those provided by the LH Martin Institute.

Promotion was a topic that attracted considerable comment from respondents and participants. This is understandable because promotion is critically important to career progression (J. S. Long, Allison, & McGinnis, 1993; Tierney, 1996). Long et al(1993) argues that "unlike increases in salary, reduced teaching loads, and other perks, promotion… is a highly public reward - successful promotions are listed in university publications and recorded in a scientist's curriculum vitae" (p. 703). The perception of many construction management academics was that it was difficult to get promoted. However, dissatisfaction with rates of promotion is not confined to the construction management discipline. In their study of academics' job satisfaction across eight nations (Australia, Germany, Hong Kong, Israel, Mexico, Sweden, UK, USA), Lacy and Sheehan (1997) found that a substantial proportion of respondents (44.1%) was dissatisfied with their prospects for promotion, compared with 27.6% who indicated satisfaction. Furthermore, the data they extracted for 11 disciplines in Australia (Table 9.13) indicates that eight were more dissatisfied than construction management (built environment) academics.

Table 9.13: Australian data: percent satisfaction and dissatisfaction with prospects for promotion by academic department (Lacy & Sheehan, 1997)

	Dissatisfied	Neutral	Satisfied
Humanities	33.9	30.4	35.7
Social & Behavioural Sciences	44.0	25.7	30.3
Education	58.7	26.6	14.7
Science	42.1	36.5	21.3
Mathematics/Computing	47.3	32.1	20.5
Visual & Performing Arts	41.0	33.3	25.6
Engineering/Processing	48.7	34.6	16.7
Health Sciences	49.8	24.9	25.4
Administration, Business, Economics, Law	34.4	31.3	34.4
Built Environment	40.5	27.0	32.4
Agriculture/Renewable Resources	68.6	17.1	14.3

Notwithstanding these observations, the data provided by respondents confirm that promotion rates for construction management academics are low. Although many (66.6%) had been teaching in their discipline for between 5 and 20 years (Section 9.4), almost 30% had never been promoted, whilst 33.3% had been promoted once. It is pertinent to note these low promotion rates are largely unaffected by the lower rates of promotion experienced by female academics (Todd & Bird, 2000). Only 16% of respondents to the online survey were female and this small representation thus has little effect on the overall percentages noted above.

Workload was seen to contribute to these low promotion rates. Most universities currently require academics to have completed a research higher degree before they are appointed. However, approximately half the complement of existing construction management academics surveyed did not have PhDs (Section 9.1) and many of these noted that they found it difficult to complete their studies in tandem with their other responsibilities. Many were despondent about this state of affairs. Some felt that their industry experiences placed them at a disadvantage because academics in other disciplines were seen to progress seamlessly from graduate to post graduate studies. Whilst academics' real-world experiences were appreciated by industry, as well as students and some HoSs, this was not seen to assist promotion prospects.

Construction management academics were also expected to bid for and conduct research. It is usual for new academics to begin their careers with a period of probation, the requirements of which vary from university to university. Generally new academics are not expected to bid for research income whilst they are still in the process of completing their PhDs, so the

observations in this regard noted in Section 9.4.2 are likely to emanate from the approximately 50% of academics who had already completed their PhDs (Section 9). These participants noted the difficulties they experienced when competing with academics from other older, well-established disciplines for research income. Until construction management has developed a robust research pedigree and track record, it is unlikely to be taken seriously by academics in other disciplines.

Several respondents and participants expressed their disquiet about what they saw as the extent to which universities' promotion policies did not recognise teaching. Although mention was made of promotion criteria changing at some universities, the perception of most respondents and participants was that research was the most important promotion criterion. It is relevant to compare these observations with Parker's (2008) review of the promotion criteria used in UK universities. He found parity in the criteria for senior and principal lecturers had largely been adopted, but that "for the higher and more prestigious ranks of reader and professor most universities exclusively require research excellence and do not allow similar applications based on teaching activities." (p. 237). Little evidence was found to suggest that the situation in Australia differs from this.

The successful strategies for securing a promotion identified by respondents and participants included moving to a different university, and being familiar with the requirements of universities' promotion policies and processes. In the context of the latter strategy, the comments that were made seemingly referred to academics not recognising the importance of research. In effect, these observations emphasise the overarching importance of research.

To maintain currency as a construction professional, it is usual to complete continuing professional development (CPD) on an on-going basis (Webster-Wright, 2009). The Australian Institute of Building (AIB) encourages its members to complete a minimum of 20 CPD points each year, and accumulate a minimum of 90 CPD points over three years (AIB, 2012). In broad terms one CPD point is equivalent to an hour of study, attendance at a workshop or seminar, or similar activity (AIB, 2012). In this regard it is interesting and relevant to review construction academics' CPD. Whilst the data collected for this study did not seek to quantify their CPD, it is possible to extrapolate the extent of construction management academics' teaching-related CPD from Table 9.9. As 63 academics responded to the online survey, the average number of teaching-related CPD activities each academic completed per year was 1.3 (2006), 1.87 (2007) and 1.37 (2008). Based on an optimistic

assumption that these activities were of one-day duration, the extent of CPD engagement falls far below the minimum recommended by AIB. This analysis relates only to teaching-related CPD. Construction academics need to keep abreast of current industry-related developments as well. As noted in Figure 5.1, approximately half of those surveyed had considerable industry experience (between 6 and 20 years) but for almost two thirds (65.1%), it was more than five years since they worked in industry. Whilst academics generally recognised the need to keep up-to-date, some HoSs noted that some of their academic staff were not as familiar with current practices as they might be. Bearing in mind the aforementioned pressures on academics to complete higher degrees, and to secure and conduct funded research, it is understandable that some activities have a low priority attached to them. It appears that CPD falls in this category.

Construction management academics are not alone in finding it challenging to keep abreast of current developments. Clegg (2003) notes that academic life is dominated by "undergraduate provision and this acts to shift other activities to the margins of academic life. Even where staff have considerable commitment to development activities, they may experience difficulties matching these to the imperatives of mainstream teaching" (p. 38). Many of the construction management academics surveyed and interviewed were preoccupied with the demands of teaching and assessing their increasingly large classes. Indeed, there was evidence that some academics were using practices that were ill-suited to teaching large classes. There are numerous strategies which academics can use to teach large cohorts. Most Australian universities assist academics to develop their teaching and assessment skills and offer courses on a variety of teaching-related topics. These courses are generally managed and delivered by specialist teaching and learning units which are structured either as entities servicing the entire university, or as units dedicated to a faculty or school. It is noteworthy that little mention was made of such skills development opportunities in responses to the online survey or during the interviews and focus groups. This is important because it implies one of three alternatives. Firstly, that academics are not aware of these opportunities, or secondly, that they are not engaging in them. A third alternative may be that they are engaging in these activities, but are not finding them to be helpful. When viewed in tandem with their poor attendance at teaching-related CPD activities (Table 9.9), this lack of comment highlights the lack of priority construction management academics attach to developing their teaching-related skills. This arguably does not mean that they are not interested in developing

their teaching skills; rather it emphasises the pressures exerted by other aspects of their working lives.

The discussion above relates to teaching-related CPD. As previously noted, construction management academics are also expected to maintain currency with what is occurring in industry. During focus group discussions with the accrediting professional institutions, concerns were raised that some academics were not familiar with current local practices. Furthermore, Hunt (2011a), the CEO of the Australian Institute of Building, observed that the rationalisation of university structures and courses has resulted in "the dilution of the discipline of building by replacing retiring building academics with research active staff who are not qualified or experienced in mainstream building subjects" (p. 2). In addition, some HoS confirmed that some of their academic staff were not as conversant with current local practices as they might be.

Some of the reasons for this lack of awareness may be explained by the nature of the industry-related CPD activities respondents engaged in (Table 9.10). The activities cited provide superficial opportunities for academics to gain an in-depth knowledge and understanding of contemporary developments, and serve to confirm the aforementioned observations of the accrediting professional institutions and HoSs. Again, this lack of engagement in industry-related CPD should not be taken as an indication of construction management academics' unwillingness to keep up to date. Rather, it serves to emphasise the difficulties they experience when trying to prioritise their workload.

It is relevant to note that the dissemination activities that frequently accompany academic research may be construed as CPD. Clegg (2003) observed that universities are, in many cases, the providers of CPD to other professions. However, these activities are largely of benefit to industry and academics in other disciplines rather than to the construction management academics themselves. Furthermore, the construction industry's lack of engagement with academic research (Section 5.8) makes these CPD activities a questionable source of information about current industry practices for construction management academics. The need for construction management academics to keep up-to-date is not addressed by such CPD activities.

Interestingly, respondents were conscious of the need to keep up-to-date and ranked "(b)eing up to date with industry" very highly. As noted above, they did not act on this conviction, as the CPD opportunities they engaged in favoured academic rather than industry-based

activities. This is not surprising, as respondents were conscious of enhancing their career prospects. The CPD activities that they ranked highly thus related to academic rather than industry-based activities.

10 Conclusions

This study adopted a phenomenological hermeneutic approach to better understand the lived experiences of construction management academics. The qualitatively-dominant mixed methods research approach adopted made possible a rich understanding of the factors that impact on the day-to-day lives and longer-term activities of these academics. The study drew together the key issues that emerged from a review of the construction industry (Chapter 2), which highlighted the economic health of the construction industry and the demand for construction professionals. It also reviewed tertiary construction education (Chapter 3), exploring the nature and structure of tertiary construction education in Australia, teaching and learning quality, professional accreditation and key characteristics of construction management academics and the students they teach. In addition, it investigated the construction industry's expectations of construction management education (Chapter 5) highlighting the need for academics to be familiar with current industry practices. The university curricula taught in these disciplines were examined in Chapter 6, noting the numerous pressures that are exerted on discipline academics to expand the content of what is delivered. Various approaches to deliver these curricula were considered in Chapter 7 as well as the impact of the increasingly large classes that construction management academics are required to teach. The support of sessional academics was described in this chapter, as well as the potential for students' work experiences to be harnessed to support their learning. The next chapter (Chapter 8) dealt with issues relating to construction management students, including their attitudes and expectations and the extent to which they engaged in paid employment whilst they studied. Chapter 9 investigated how construction management academics are managed and supported, including their workload, the management and resourcing of their discipline, their career paths, succession planning for the discipline, as well as the extent to which they engage in continuing professional development. This final chapter marshals the findings from these chapters to address the four objectives of this study, which were to

- identify the changes and challenges that have impacted on tertiary construction management education
- identify interrelationships between these changes and challenges
- explore the implications of these changes and challenges
- postulate how these changes and challenges affect the current and future lived-experiences of construction management academics

A conceptual overview of the complex ways these issues intersect is provided in Figure 10.1. The lives of construction management academics are embedded in the activities represented in this figure. They teach students who work in the relatively buoyant Australian economic environment that is constrained by a shortage of construction professionals. Employment opportunities abound for construction managers, and academics have found themselves pressured to graduate students in as short a space of time as possible. Immediacy was also reflected in the focus of students and industry (represented by the accrediting professional institutions). Both prioritised topics that related to current industry requirements, and attached less importance to curriculum topics that did not relate to the here and now. Construction management academics have to work within these constraints and develop curricula that respond to these as well as to other pressures (including the proliferation of new content contributing to over-crowded curricula, and the multiple accreditations and audits of teaching and learning quality that their programs are regularly subjected to). The manner in which each research objective has been addressed is described below.

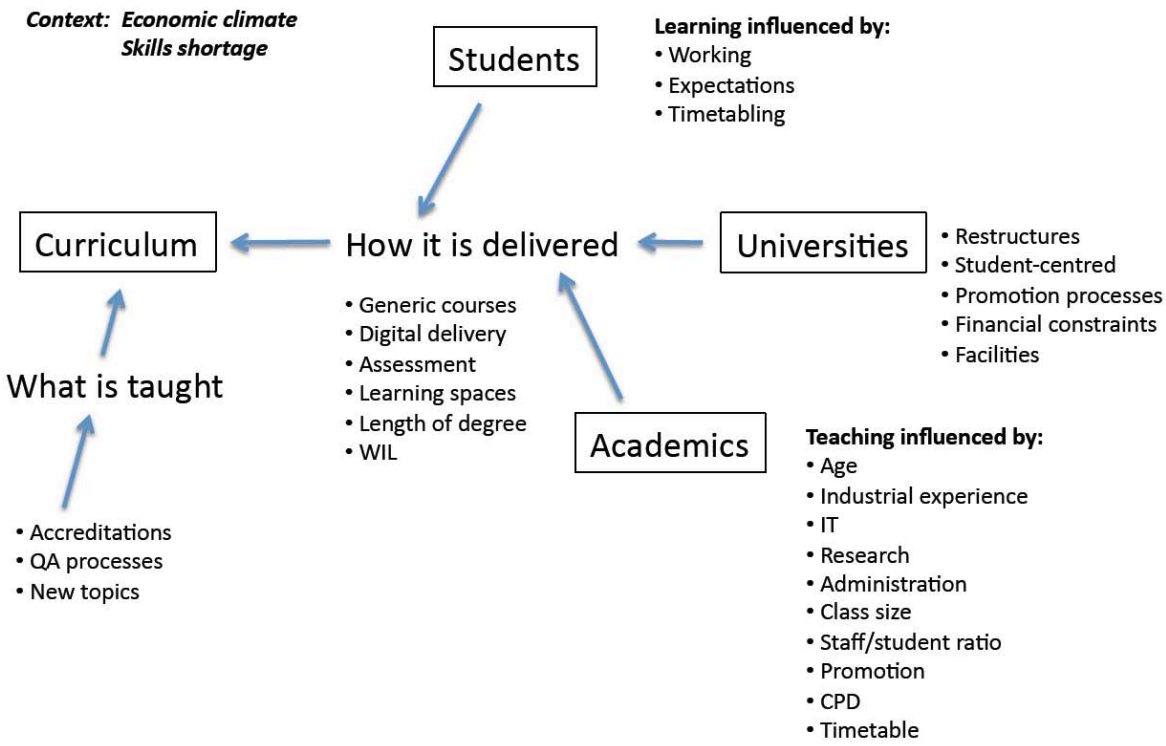

Figure 10.1: Overview of the ways construction management academic staff interact with their environment

10.1 The changes and challenges affecting university construction management education

10.1.1 Changes

Government funding of university education has changed in recent times. It was curtailed under the Howard government but in 2012 a student demand-driven system of funding for university places was introduced (Bradley, et al., 2008). Data on the extent to which this has impacted on the construction management disciplines are, as yet, unavailable. However, at least one university (University of Southern Queensland) and a TAFE (Holmesglen) has decided to offer a construction management undergraduate program in addition to those institutions noted in Table 3.10. Construction management academics are thus likely to experience the impact of this increased competition as universities and TAFEs vie for students and associated funding.

Change in the way the quality of university teaching and learning is evaluated by the government has had a knock-on effect on construction management programs. In anticipating the requirements of TEQSA, the AIB has rolled over accreditation of most construction management programs for several years. This effectively means that there has been no external audit of teaching quality for some considerable time (Table 9.11). It is therefore likely that these disciplines will be subjected to a plethora of audits in the next two to three years. This will exacerbate the already heavy workload of construction management academics by involving them in preparing for audits by multiple professional institutes (construction management disciplines are the most heavily accredited in Australia (Williams, et al., 2009) with some being audited by up to nine (Table 3.10) professional institutes) as well as by TEQSA, in addition to the internal audits of teaching and learning quality that each university conducts.

Furthermore, an analysis of the age profile of the increasing number of students enrolling in construction management programs has shown them to be noticeably different to mainstream students in Australia. They are significantly older than their counterparts when they start their studies. In addition, and in common with student populations in other Western countries, many construction management students work whilst they study. Whilst construction management academics were well aware that many of their students worked whilst they studied, they were generally unaware of the older age profile of these students. The increased responsibilities older students carry contribute to the pressures they in turn exert on their

lecturers and tutors. In this regard many construction management academics noted aspects of their students' conduct that they found to be challenging and adding to the work-related stresses some of them identified.

10.1.2 Challenges

This study identified several challenges to construction management education. The first relates to the shortage of construction professionals. The construction sector makes a significant contribution to the Australian economy. Notwithstanding the immediate impact of the global financial crisis, this sector has been in a buoyant state for some years and this has led to a marked and sustained increase in the number of students enrolling in construction management programs. Several factors have contributed to this, including the employment opportunities the sector provides, the generalist nature of these degrees (which prepare students for a range of construction-related occupations), and the dearth of university graduates who currently populate the construction industry. These factors have combined to produce a growing number of students seeking admission to undergraduate construction management degrees. Accommodating these students is one of the key challenges identified in this study.

Construction management education is also challenged by a lack of funding, as government funding for tertiary education remains constrained. Australian universities have historically relied on the fees paid by overseas students to supplement government funding. In addition, it is not unknown for universities to use teaching-related funds to subsidise research and other expenses. In these circumstances, and in light of the current national and international economic climate, it is unlikely that the short to medium term future endeavours of the discipline will be adequately funded.

With respect to construction management curricula, several factors coalesced to challenge their development and renewal. Firstly, the relative youth of the discipline has meant that there is no well-established curriculum as is the case in other more established disciplines (such as civil engineering and architecture). Secondly, the rapid pace of the technological developments that impact on the construction industry has resulted in a proliferation of course content, making it difficult for curriculum developers to decide what to include or exclude. Construction management degrees are amongst the most heavily accredited programs in Australia and the construction management disciplines seek to capitalise upon the kudos and student enrolments which these accreditations attract. However, developing curricula that

address the multiple requirements of these professional bodies is difficult, especially as some of them provide little assistance in identifying and prioritising course content. Indeed, the requirements of some of them are ill-defined and exacerbate the challenges these curriculum developers face.

A challenge related to the youth of the construction management discipline was seen to be its poor research track record. The discipline has, to date, not been able to generate research outcomes comparable to those of other well-established disciplines such as engineering. This was seen to have consequences over and above restricting academics' promotion prospects. The lack of research profile was seen to contribute to the lack of esteem that other academic disciplines attached to construction management. This, in turn, was seen to compromise the equitable allocation of resources to construction management disciplines. In general, other academics and the general population did not hold the construction management discipline in high regard and this was seen to compound the difficulties construction management academics experienced in obtaining research grants. The circuitous consequences of a lack of research profile are thus evident as a lack of research funds makes it difficult for academics to generate research outcomes, which in turn makes it difficult to obtain research funding. When deciding how to allocate their time and resources, construction management academics thus need to consider not only their personal aspirations but also the health and reputation of their discipline.

In common with the mainstream academic workforce in Australia, the construction management discipline is dominated by academics of senior age. Academia in general is finding it difficult to recruit suitably qualified academics and this is particularly the case in the construction management discipline where the salaries commanded by construction professionals in industry far outweigh those paid by universities. In addition, academics are required to have a research higher degree as well as current relevant industry experience. These needs were seen to be mutually exclusive by some construction management academics. These factors are likely to have a major impact on the discipline in future as the recruitment of academics is becoming increasingly difficult.

The general perception noted in the literature that academics were stressed and overworked resonated strongly with those of the construction management discipline. The classes they teach have been increasing in size since 2001. Furthermore, limited funding has meant that they have had to accomplish this with little increase in resources. At the same time, many of

these academics have been completing research higher degrees, and engaging in research, administration and service-related activities. These and the multitude of additional tasks noted in this study contribute to their levels of stress and overwork.

As current generations of academics leave or retire, it is likely that it will be increasingly difficult to recruit academics with current knowledge of the Australian construction industry and the required research higher degree qualifications. The likely outcomes of this include further increases in academics' workload, the appointment of overseas academics (possibly with scant knowledge of local conditions and possibly non-native English speakers), the utilisation of academics from other disciplines to teach construction management related courses and the increased use of sessional academics. Whatever strategy universities employ, the discipline is likely to face further challenges associated with supporting, developing and managing new academic appointees.

10.2 The interrelationships between these changes and challenges

These changes and challenges fuse to generate diverse consequences. Chief amongst these are the consequences for the curricula that are taught. Curricula vary considerably from university to university and whilst it is not unusual for different undergraduate degrees to promote different perspectives, some concerns were raised about how effectively construction management curricula equipped students for the needs of industry. Several reasons for this variability were identified, including the conflicting requirements construction management academics have to accommodate when developing curricula. For example, students wish to graduate in as short a time as possible, and industry is keen to employ them but all stakeholders acknowledge that tuition needs to address relevant new and emerging technologies and practices. Clearly compromises need to be made when deciding on the content and form of curricula. The dilemmas that academics face have been compounded by the lack of clarity and specificity of the requirements of some of the professional institutes that accredit these degrees. In addition, concerns were raised about some academics' lack of familiarity with current industry practices and procedures, with such shortcomings being seen as having the potential to compromise curricula as well as students' learning. The vocational nature of construction management education means that any lack of currency on a lecturer's part is quickly exposed by students, many of whom work in the construction industry. In addition, there is considerable evidence that the construction industry is changing rapidly

(Some of the more noticeable developments in this regard include the increasing adoption of BIM, emphasis on sustainability, and introduction of modular construction). Clearly academics need to prioritise their activities, and those that relate to progressing their academic career appear to be those to which construction management academics have responded. In this regard it appears that academics attach a relatively low priority to renewing the curricula they are responsible for.

Concerns about variability in the content as well as of the quality of teaching and learning pervade higher education in Australia; they are not confined to the construction management discipline. The Australian government, through the newly constituted TEQSA (DEEWR, 2011) will be specifying teaching and learning standards for all tertiary education programs, and these are likely to be measured against threshold learning outcomes similar to those developed and piloted by Newton (2011b). What distinguishes construction management from other disciplines is the extent to which TEQSA's requirements will be compounded by the requirements of the multiple professional institutes from which construction management disciplines seek accreditation. Accommodating their various and multiple requirements compounds the difficulties curriculum developers face, and this situation is exacerbated by tensions between the accrediting institutes themselves.

The second set of consequences of the changes and challenges summarised in Section 10.1 relate to the increased numbers of students construction management programs have attracted and are continuing to attract. The popularity of undergraduate construction management programs has become apparent to other sectors of the tertiary education sector. New degree programs have been developed, and others are likely to follow. In addition, the TAFE sector has embarked on the provision of construction / building degrees. It is therefore clear that existing providers of construction management degrees will face increased competition in attracting students and that construction management academics may need to involve themselves to some degree in marketing their programs. However, the extent to which these institutions are able to resource these student places is unclear as government funding for the entire tertiary education sector is becoming increasingly constrained. Furthermore, the ways in which universities manage their finances are varied and frequently involve cross-subsidisation of one academic discipline by another, and of research by teaching. It would indeed be unusual if the discipline of construction management was to be the exception to the rule. Some construction management disciplines may be at a disadvantage when negotiating

budgets and the allocation of resources because they are not as well respected as other well-established disciplines with robust research track records.

Thirdly, the demographic profile of construction management academics impacts on several of the activities they engage in. They are generally of senior years and many have worked in industry before embarking on their academic careers. Whilst their real-world and industry experiences contribute authenticity to their teaching responsibilities, these activities were generally seen to have jeopardized their career progression. Starting academic life without a research higher degree was seen to present challenges that many academics found difficult to overcome. They are expected to progress their research endeavours, teach and assess increasingly large classes, and engage in other administrative and service-related duties. Academics found it difficult to accommodate their high workload and attached low priority to activities that they saw as optional. Survey data showed little evidence of construction management academics engaging in either teaching or industry-related CPD, indicating that they classified these activities as non-essential.

Fourthly, the demographic profile of construction management students was seen to impact on aspects of their academic lives. Students were noted to be significantly older than the general student population in Australia. In addition, and in common with students elsewhere, many combined their studies with paid part or full-time employment. Construction management students experienced similar pressures to the academics who taught them, having to manage their time to meet their commitments. The older age profile of the students that construction management academics teach is thus likely to be mean that they are time-poor and subject to more stress than the student population in general. This may have influenced them make significant demands of their lecturers and tutors, thereby potentially adding to academics' stress levels.

10.3 The implications of these changes and challenges

There are several implications of the aforementioned changes and challenges on the working lives of construction management academics. Industry representatives as well as construction management academics expressed concern about aspects of the curricula currently being taught. Chief amongst these was the lack of clearly defined learning outcomes specified by the professional accrediting institutes. This was exacerbated by the extent to which these disciplines sought accreditation from several professional institutes. The national introduction of threshold learning outcomes as part of TEQSA's requirements should address

these shortcomings to some extent. However, accommodating the multiple strands of construction management education (including construction management, project management, quantity surveying, building surveying, facilities management, property development as well as others) will challenge curriculum developers. It is likely that some universities will not be able to sustain the generalist focus of their degrees, and that nuanced offerings will replace some of the more broadly-focussed qualifications currently being offered. To date the number of students applying for construction management degrees has meant that some specifically focussed offerings have not been financially viable. However, the recent increased growth in the number of students applying for these degrees has changed this. Some sectors of the construction industry are experiencing extreme skill shortages (e.g. quantity surveying and building surveying) and may well be able to attract a sufficiently large enough number of students to make a discrete qualification financially viable. The challenge is to communicate these opportunities to students and to inform them of the opportunities these industry sectors offer.

Other concerns were around gaps in the curricula. On the one hand, industry (represented by the accrediting professional institutes) questioned the currency of some parts of the curricula being taught and, by implication, the lack of familiarity of some academics with current industry processes and practices. On the other hand academics argued that curricula which focused on current practices and procedures did not equip students for the challenges they were likely to encounter later in their careers. This mismatch in the expectations of stakeholders warrants further investigation. The work of Lang, Cruse, McVey and McMasters (1999) and more recently of Domal and Trevelyan (2009) has questioned the relevance of engineering curricula to the practices of engineers currently working in the field. These authors recognised the pace with which industry practices continue to evolve and reported on studies that sought to establish the nature and content of the activities which engineers currently conduct. The purpose of these studies was to provide a robust foundation for the renewal of engineering curricula. No similar studies into the work of modern-day construction management graduates have been conducted.

Criticism of construction management academics' apparent lack of knowledge and appreciation of current industry practices appeared to have some foundation. Their workload is such that only activities that have a direct bearing on their everyday responsibilities can be accommodated. Activities such as CPD appear to be considered as luxuries because their links with career progression were seen to be tenuous. It is therefore concerning but not

surprising to note that keeping up-to-date with industry is sometimes considered by academics to be non-essential.

The continuing increase in the number of students enrolling in construction management degrees bodes well for the discipline. Notwithstanding the current economic slowdown, the most current Clarius Skills Index (Clarius Group, 2012) still identifies construction management as an occupation in demand in Australia. It is likely that existing providers of construction management education will experience increased competition from others seeking to exploit the buoyant nature of this sector. As universities position themselves to meet this demand, they would be foolhardy not to re-evaluate the demographic profile of their students. A key characteristic is that construction management students in Australia enter higher education at an older age than other students. This means that they are more likely than other students to have family and financial commitments and to be working whilst studying. The necessity to pay their way, combined with the expectations of these students for quick responses, and hard facts that are expertly delivered, as well as their willingness to engage with IT, need to be considered by the developers of construction management curricula. Non-traditional programs that allow students to combine work and study and recognise their workplace activities as learning opportunities are likely to be well-received because these strategies respond to the aforementioned personal traits of these students. Opportunities exist for construction management disciplines to develop novel approaches to work integrated learning (WIL) that respond not only to students' requirements but align with the requirements of the professional institutes that accredit these degrees. Such an approach has been successfully employed in the UK where the skills and competencies of the Chartered Institute of Building were incorporated into an e-portfolio (Maddocks, Sher, & Wilson, 2000). This e-portfolio has subsequently been used in a variety of ways including supporting students' learning and personal development during the periods of industrial placement (Maddocks & Wright, 2004).

Finally, construction management academics need to develop their research profile. It is only when they have secured respect for its research endeavours that they will be able to compete with other academic disciplines effectively. Time-management is thus of critical importance for construction management academics.

10.4 How the changes and challenges affect current and future lived-experiences

This study has explored the lived experience of construction management academics. It has investigated the various changes and challenges that have impacted on their current working lives as well as the connections between these changes and challenges. Furthermore, it has investigated the impacts these have on these individuals. This section extends these findings by describing the challenges that construction management academics face in the future with a specific focus on academic workload. In turn, this will enable a better understanding to be gained of the ways in which the trends identified are likely to impact on construction management academics. This will inform strategic planning for the discipline to allow well-informed decision-making.

10.4.1 Teaching

Construction management academics are unlikely to experience a reduction of their workloads. Indeed, there are indications that the reverse is more likely (Houston, et al., 2006). The increased size of classes academics are required to teach means that they will need to employ new ways of delivering and assessing courses. This in turn implies that they will need to involve themselves in teaching-related CPD including developing their online delivery and assessment skills. Furthermore, complying with the requirements of TEQSA is likely to involve academics in renewing and redeveloping their program and course curricula. The workload involved in these activities is is likely to be augmented by the requirements of the professional institutes that accredit these degrees. For example, the establishment of TEQSA has been long awaited by the Australian Institute of Building (AIB) who, in response, have recently announced revised accreditation requirements (AIB, 2011a, 2011b). Whilst other Australian construction management-related institutes have yet to respond to the announcement of TEQSA, it is likely that their requirements will also be revised to align with those of TEQSA. However, complications are likely to result from divisions between some of these institutes. The AIB has recently withdrawn from a cooperative agreement on accreditation (AIB, et al., 2006) with the Australian Institute of Quantity Surveyors (AIQS) and Australian Institute of Building Surveyors (AIBS). Whilst it is not possible to predict the outcomes of this development, it is unlikely that it will reduce construction management academics' workload. The lack of agreement between the institutes means that disciplines

will need to meet multiple sets of requirements rather than the harmonised ones that stakeholders were hoping for.

10.4.2 Work integrated learning

Whilst the widespread practice of students working whilst they study has some negative ramifications, the practice also presents opportunities for construction management education. Several factors indicate that overhauling the current arbitrary structure and assessment of industrial placements should address some of the concerns expressed by some stakeholders. Over and above the well-documented educational benefits of work integrated learning (WIL) (Orrell, Cooper, & Bowden, 2010; Watts & Pickering, 2000), well-structured employment opportunities for students could contribute to alleviating the shortage of construction professionals the industry continues to experience. Furthermore, students graduating with industry experience are more likely to be able to meet their employers' expectations for job-readiness than students who have no working experience. The reality is that meaningful WIL is both difficult to organise and resource. Although industry placements are mandated by some of the accrediting professional institutes, these institutes are currently reviewing this requirement in response to the concerns expressed by some universities. Dispensing with this would not only contradict these institutes' espoused wishes for students to be exposed to more industry practices rather than less, they would flout accepted wisdom about the educational benefits of WIL (Robotham; Watts & Pickering, 2000). The challenge for construction management academics, industry and other stakeholders is to investigate and develop novel WIL initiatives that address the peculiarities of the Australian construction industry. These opportunities have been recognised by Williams and Simmons (in press) who advocate, amongst other suggestions, consideration of the use of e-portfolios that allow students to record the attainment and development of skills in line with the requirements of relevant accrediting institutes. These recommendations draw on the work of Maddocks and Wright (2004) and warrant further investigation.

10.4.3 Research

At the current time a watershed is occurring in the employment of university academics. The traditional role of teaching and researching is being challenged with some universities distinguishing between those who teach, those who conduct research, and those who both teach and research. This practice appears to be spreading (Brew, 2006). The vocational nature of construction education is likely to bring this into sharp focus as many construction

management academics started their working lives in industry and embarked on a career in academia to teach. Many were not in possession of a research higher degree when they started their academic careers. The preference of construction management academics to focus solely on teaching, only on research or on both is, as yet, untested. Based on their age, industry background and lack of a research higher degree, it is likely that a considerable proportion will elect to teach rather than research, given the choice. This does not augur well for the discipline. If construction management is to be recognised in the wider academic community, it needs to demonstrate that it is capable of competing with other disciplines. Failure to capitalise on the growth these disciplines are experiencing in some universities would squander this opportunity. It is therefore clear that construction management academics need to engage with research for their own personal development, as well as for the good of their discipline. Equally clear is that such endeavours are unlikely to reduce their workload.

10.4.4 Administration

Funding for tertiary education is likely to remain constrained in the short- to medium-term future. Notwithstanding this, administrative workload is increasing, and academics will conceivably be expected to take on at least some of these activities. Examples of these activities include tasks that are related to the increasing number of students enrolled in courses and programs, preparing for audits of teaching and learning quality, preparing for professional accreditation audits, managing the increased number of sessional academics frequently employed to help service the large number of students enrolling in construction management programs, and marketing activities promoting strands of degree programs to raise the awareness of school leavers (e.g. quantity surveying and building surveying).

This increased administration workload will have implications for individual academics as well as for their managers and leaders. Individually, academics will need to be strategic about the activities they devote their time to. In addition, those responsible for managing these academics will need to seek out ways of containing growth in administrative tasks at a time when university policies and processes are tending to become both more complex and diverse.

10.4.5 Continuing professional development

There are indications that industry and teaching-related continuing professional development (CPD) activities are viewed by construction management academics as discretionary. The extent of their current workload appeared to motivate them to focus their efforts on tasks that

required their immediate attention. Activities that generated longer-term benefits were largely seen as luxuries that they could not afford to pursue. The practice of allowing academics to take sabbaticals, in place at some universities, provides opportunities for them to engage in a range of activities whilst being relieved of their teaching responsibilities. Generally these focus on developing individual's research activities. This is largely a result of Australian universities seeking to position themselves as advantageously as they can for the Excellence in Research for Australia (ERA) initiative. It is unlikely that this emphasis will change because universities see benefit in enhancing their research standing and reputation. It therefore appears that construction management academics' CPD activities will continue to be considered as low priority activities. Whilst academics arguably have opportunities to enhance and update their teaching-related skills and abilities, it is likely those related to mainstream construction may not be afforded the same opportunities.

10.5 Lived experience vignette

It is not possible to adequately communicate the outcomes of a study of this nature in a concise manner. Nevertheless a succinct account of what it means to be a construction management academic at this time is useful as a summary of the rich data that this study has collected, analysed and discussed. This section provides such a vignette.

The construction industry that many construction management academics used to work in has changed. New legislative requirements, new construction techniques and technologies, as well as new forms of procuring and managing construction projects mean that the industry experienced 10 to 15 years ago is markedly different to the one students currently graduate into. The pace of change in the university sector has also accelerated, with new teaching and learning technologies coming on stream, the demographics of students changing, and more onerous teaching and learning quality and accreditation requirements being implemented. Whilst trying to cope with these changes and challenges, construction management academics have been expected to complete research higher degrees (if they do not already possess such qualifications), bid for competitive research grants, and teach increasingly large cohorts of students. In addition, the expectations of students have changed, with the distance between those who teach and those who learn being likened to not so much a gap but a chasm. The key difference between these generations is their willingness to use ICT to assist and inform their everyday activities. Furthermore, the professional institutes that accredit construction management programs strongly recommend that the academics that teach into the discipline

have current and relevant experience of the construction industry. The nexus between such industry-based experience and universities' requirements for doctorates is problematic and seen by many construction management academics to be mutually exclusive. Those with such industry experience are unlikely to have been able to progress postgraduate research studies, and find themselves disadvantaged by their real-world experience when trying to gain promotion. The construction management discipline is finding it difficult to recruit new academics to replace the academics that either leave academia or retire and the foregoing situations provide an understanding of why this is the case.

Construction management academics thus need to respond to a range of pressures. New ways of aligning the academic attributes and industry experience of construction management academics need to be found if the discipline is to compete with other academic disciplines and maintain its relevance to industry.

10.6 Recommendations

The following recommendations stem from this study.

10.6.1 Investigate the lived experience of construction professionals

A considerable portion of the working lives of construction management academics revolves around the curricula they teach. This study has highlighted and discussed their concerns about the lack of a defined body of knowledge that relates to the discipline, as well as the need to accommodate current and new industry practices and procedures, and to foreshadow those that are likely to occur. However, the basis for construction management curricula is yet to be studied. What do modern day construction managers actually do? None of the professional institutes that accredit these degrees has conducted such studies, and no academic papers have been located on this topic. Evidence that such an exercise would be informative and valuable is provided in Domal and Trevelyn's (2009) study of civil engineers' working lives. The rapid change in industry practices since the global uptake of the IBM PC in the early 1980's has revolutionised both the construction and allied industries. Academic curricula have endeavoured to keep pace, but have not been able to accommodate the widespread structural changes that have occurred. A study of the working lives of construction managers would serve to prime the renewal of curricula from an informed perspective.

10.6.2 Promote interaction between industry and academia

This study has highlighted the ad hoc and intermittent nature of communications between industry and academia. Closer communication would benefit both sectors in several ways. Industry would have opportunities to influence the nature of the courses taught, network with students and become more aware of the pressures and challenges of academic life. Academics would have opportunities to inform industry of their research activities, and seek to engage and interest industry in them. Such endeavours would be beneficial to both parties as well as the industry sector.

10.6.3 Improve interactions between professional institutes and academia

The multiple professional institutes that construction management disciplines seek accreditation from present them with significant challenges. This is because meeting the subtly different requirements of these institutes involves academics in appreciable duplication of effort. Mutual recognition of and between institutes, as exists for engineering disciplines through the Washington Accord (International Engineering Alliance, 2011), is desirable from an academic perspective because this would significantly reduce academics' workload and ensure international recognition of qualifications for graduates.

The summative manner in which accreditation audits are commonly conducted by institutes is seen as outdated, and a more collaborative and inclusive approach needs to developed. In this regard, the partnerships approach adopted by the RICS presents a worthwhile model to investigate. The institutes need to be encouraged to introduce flexibility into their requirements so academics' efforts of to introduce innovative topics and teaching and learning approaches are supported.

Furthermore, it is desirable for communication between institutes and academic disciplines to be improved. To progress this, construction management academics need to engage with these institutes to better inform them of the realities facing this academic discipline.

10.6.4 Methodological approaches to teaching and their currency

The methods by which construction management students are taught need to be reviewed in terms of their efficacy and currency. Different delivery strategies need to be investigated to engage Gen X and Y students. In particular, the opportunities of WIL need to be reviewed and investigated to harness the teaching and learning opportunities presented by the world of

work. The potential of e-portfolios should be explored in this regard. Similarly, consideration needs to be given to ways of recognising the prior learning of construction management students.

10.6.5 Encourage industry and teaching CPD

Discipline leaders need to identify ways of allowing academics to update their knowledge and skills (from both an industry as well as from a teaching and learning perspective) without jeopardising their career prospects. The suggestions of Williams et al (2009) for academics to be seconded to industry warrant to serious investigation.

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Appendix 1 Terms of reference for a university review of a program

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

The University of Newcastle

Faculty of Engineering and Built Environment

Review of the Bachelor of Construction Management (Building) Program

TERMS OF REFERENCE

1. Evaluate the currency of the program, in terms of the contemporary knowledge, skills and practices of the relevant sector.
2. Critique the extent to which the program succeeds in achieving:
   a. the University's graduate attributes;
   b. its stated Graduate Profile(s); and
   c. Program Outcomes.
3. Evaluate the coherency of the curriculum, including all core, and directed courses offered within the program.
4. Assess the effectiveness of quality assurance procedures and other management practices which implicate the learning experience and outcomes of the program.
5. Consider feedback about the program, including:
   a. the perceptions and experiences of students and graduates of the program(s);
   b. how the program responds to student feedback;
   c. ways in which these might be improved.
6. Evaluate the potential of Work-Integrated Learning (WIL) as a component of the degree program, or how it could be added to the program and in what manner.
7. Examine the progression and retention rates of students in the program and ways in which they can be improved. Where appropriate, comment on the progression and retention rates of specific demographic groups, as differentiated by age, international versus local, ethnicity and or gender.
8. Assess (for each location of offer, where appropriate):

a. the appropriateness of academic staff, taking into consideration qualifications, experience, and levels of appointment, in terms of their capability to deliver the program(s) now and in the context of possible future developments;

b. the teaching quality and research currency of academic staff, as evidenced by their research and professional development activities/portfolio; and

c. the appropriateness and levels of administrative support

d. the appropriateness and adequacy of resources, including learning support materials as well as facilities and equipment within the relevant Faculty and in the University more generally.

9. Comment on current practices and the potential scope for including Indigenous content within the program, as per current University strategic objectives, and how the needs of students from the equity target groups are met, with particular reference to indigenous and low SES students.

10. Comment on the current and longer term sustainability of the program, with consideration given but not limited to student load trends, international and other revenue generated by the program and costs (direct and indirect) of the program, including additional costs associated with any proposed expansion.

11. Comment on the online distance mode delivery approach and possible future improvement.

The above Terms of Reference should be considered in the light of:

- the self-review documentation on the program(s);
- any major changes in program structure, course availability or course content which have occurred since the introduction of the program(s) in 2003.

** People from low SES backgrounds, Aboriginal and Torres Strait Islander people, people with a disability, people from a non English speaking background, people from rural and isolated areas, women in non traditional areas of study and postgraduate study.*

Appendix 2 Ethics approval

HUMAN RESEARCH ETHICS COMMITTEE

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

Notification of Expedited Approval

To Chief Investigator or Project Supervisor:	**Associate Professor Anthony Williams**
Cc Co-investigators / Research Students:	**Mr William Sher** **Mr Brendan Pitt** **Miss Catharine Simmons**
Re Protocol:	**Identification of teaching and instructional issues and opportunities for construction management, quantity surveying and building surveying disciplines**
Date:	**01-Apr-2008**
Reference No:	**H-2008-0042**

Thank you for your **Response to Conditional Approval** submission to the Human Research Ethics Committee (HREC) seeking approval in relation to the above protocol.

Your submission was considered under **Expedited** review by the Chair/Deputy Chair.

I am pleased to advise that the decision on your submission is **Approved** effective **01-Apr-2008**.

The full Committee will be asked to ratify this decision at its next scheduled meeting whereupon a formal *Certificate of Approval* will be issued. In the interim your approval number is **H-2008-0042**.

If the research requires the use of an Information Statement, ensure this number is inserted at the relevant point in the Complaints paragraph prior to distribution to potential participants

You may then proceed with the research. Best wishes for a successful project.

Professor Val Robertson
Chair, Human Research Ethics Committee

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Funding Details

Funding body	Funding project title	First named investigator	Administering institution	Uni of Newc G Reference
Carrick Institute	Identification of teaching and instructional issues...	A/Prof Anthony Williams	University of Newcastle	G0188064

Appendix 3 On-line survey

Construction Management, Quantity Surveying and Building Surveying Education 2008

Thank you for taking time to respond to this survey. You've been selected because you are a full-time or near to full-time academic teaching construction related subjects at a University. Our research is funded by the Carrick Institute and will identify the current state of education and the major issues facing Construction Management, Quantity Surveying and Building Surveying (CMQSBS) in Australia.

Taking part in this survey is your opportunity to voice your opinions about your teaching experiences.

The findings of our study will be used to identify the opportunities and challenges facing CMQSBS education.

We greatly appreciate your involvement in this survey.

Further details can be obtained from the Information Statement

Please Note:

- ***The survey should take approximately 25 minutes to complete***
- ***Please take your time and answer the questions as thoroughly as possible***
- ***If you cannot complete the survey in one sitting you may save your answers and return at a later time***
- ***Some questions are compulsory. You won't be able to move to the next section until all questions in the current section have been answered***
- ***If you have no knowledge or experience of a topic, select N/A (not applicable)***
- ***Some responses will automatically 'jump' you to the next section without the need to 'Save Answers'***
- ***If you have any questions about the content of the survey, please email Dr Catharine Simmons, or phone Catharine on (02) 4921 5779***
- ***If you have any technical problems, please email the Survey Administrator***

About You

AY1... What is your gender?

- (1) R1_1 Male
- (2) R1_1 Female

AY2... What is your age?

- (1) R2_1 Under 30 years
- (2) R2_1 30 - 35 years
- (3) R2_1 36 - 45 years
- (4) R2_1 46 - 55 years
- (5) R2_1 Over 55 years

AY3... What is your current academic position?

- (1) R3_1 Assistant/Associate Lecturer
- (2) R3_1 Lecturer
- (3) R3_1 Senior Lecturer
- (4) R3_1 Associate Professor
- (5) R3_1 Professor
- (6) R3_1 Other *(please specify below)*

R4_1 .....

AY4... What is the highest degree you have obtained?

- (1) R5_1 Diploma
- (2) R5_1 Bachelor (Pass or Honours)
- (3) R5_1 Postgraduate Diploma/Certificate
- (4) R5_1 Masters (by coursework)
- (5) R5_1 Masters (by research)
- (6) R5_1 Doctorate
- (7) R5_1 Higher Doctorate
- (8) R5_1 Other *(please specify below)*

R6_1 .....

About You

AY5a... Please identify the undergraduate study content areas in which you CURRENTLY TEACH.
(select as many as apply)

- R7_1 ☐ Building Materials
- R7_2 ☐ Building Science
- R7_3 ☐ Building Services

R7_4 ☐ Business Management
R7_5 ☐ Communication and Documentation
R7_6 ☐ Computer Skills
R7_7 ☐ Construction Technology
R7_8 ☐ Cost Control
R7_9 ☐ Drawing and Surveying
R7_10 ☐ Economics
R7_11 ☐ Environment
R7_12 ☐ Estimating and Tendering
R7_13 ☐ Facilities Management
R7_14 ☐ Health and Safety
R7_15 ☐ Law
R7_16 ☐ Measurement or Quantity Surveying
R7_17 ☐ Procurement
R7_18 ☐ Project Management
R7_19 ☐ Quality Management
R7_20 ☐ Research
R7_21 ☐ Risk Management
R7_22 ☐ Structures
R7_23 ☐ Sustainable Development

AY5b... Please identify the undergraduate study content areas in which you HAVE PREVIOUSLY TAUGHT. ***(select as many as apply)***

R8_1 ☐ **SAME AS ABOVE**
R9_1 ☐ Building Materials
R9_2 ☐ Building Science
R9_3 ☐ Building Services
R9_4 ☐ Business Management
R9_5 ☐ Communication and Documentation
R9_6 ☐ Computer Skills
R9_7 ☐ Construction Technology
R9_8 ☐ Cost Control
R9_9 ☐ Drawing and Surveying
R9_10 ☐ Economics
R9_11 ☐ Environment
R9_12 ☐ Estimating and Tendering
R9_13 ☐ Facilities Management
R9_14 ☐ Health and Safety
R9_15 ☐ Law
R9_16 ☐ Measurement or Quantity Surveying
R9_17 ☐ Procurement

R9_18 ☐ Project Management

R9_19 ☐ Quality Management

R9_20 ☐ Research

R9_21 ☐ Risk Management

R9_22 ☐ Structures

R9_23 ☐ Sustainable Development

AY6... From the following list, please choose the primary discipline which most closely aligns with the content you teach.

○ *(1)* R10_1 Construction Management

○ *(2)* R10_1 Quantity Surveying

○ *(3)* R10_1 Building Surveying

AY7... How many years have you been teaching in this primary discipline?

○ *(1)* R11_1 0-4 years

○ *(2)* R11_1 5-10 years

○ *(3)* R11_1 11-20 years

○ *(4)* R11_1 21-30 years

○ *(5)* R11_1 Over 30 years

AY8a... Have you had a promotion during this time?

○ *(1)* R12_1 No, never

○ *(2)* R12_1 Yes, once

○ *(3)* R12_1 Yes, twice

○ *(4)* R12_1 Yes, three times

○ *(5)* R12_1 Yes, four or more times

About You

AY8b... For each of your promotions, please indicate

- **the academic level you held prior to promotion**
- **the level to which you were promoted**
- **the year of your promotion**

Promotion 1

Level prior to promotion R13_1

○ *(1)* R13_1 Associate/Assistant Lecturer

○ *(2)* R13_1 Lecturer

○ *(3)* R13_1 Senior Lecturer

○ *(4)* R13_1 Associate Professor

(5) R13_1
Professor

(1) R14_1
Associate/Assistant
Lecturer

(2) R14_1
Lecturer

(3) R14_1 Senior Level of promotion R14_1
Lecturer

(4) R14_1
Associate Professor

(5) R14_1
Professor

R15_1 yyyy
Year of Promotion
.....
.

Promotion 2

(1) R16_1
Associate/Assistant
Lecturer

(2) R16_1
Lecturer

(3) R16_1 Senior Level prior to promotion R16_1
Lecturer

(4) R16_1
Associate Professor

(5) R16_1
Professor

(1) R17_1
Associate/Assistant
Lecturer

(2) R17_1
Lecturer

(3) R17_1 Senior Level of promotion R17_1
Lecturer

(4) R17_1
Associate Professor

(5) R17_1
Professor

R18_1 yyyy
Year of Promotion
.....
.

Promotion 3

(1) R19_1
Associate/Assistant
Lecturer

(2) R19_1
Lecturer Level prior to promotion R19_1

(3) R19_1 Senior
Lecturer

(4) R19_1
Associate Professor

(5) R19_1

Professor

(1) R20_1
Associate/Assistant
Lecturer

(2) R20_1
Lecturer

(3) R20_1 Senior Level of promotion R20_1
Lecturer

(4) R20_1
Associate Professor

(5) R20_1
Professor

R21_1 yyyy
Year of Promotion
.....

Promotion 4

(1) R22_1
Associate/Assistant
Lecturer

(2) R22_1
Lecturer

(3) R22_1 Senior Level prior to promotion R22_1
Lecturer

(4) R22_1
Associate Professor

(5) R22_1
Professor

(1) R23_1
Associate/Assistant
Lecturer

(2) R23_1
Lecturer

(3) R23_1 Senior Level of promotion R23_1
Lecturer

(4) R23_1
Associate Professor

(5) R23_1
Professor

R24_1 yyyy
Year of Promotion
.....

About You

AY8c... During your employment have you had any of the following additional roles or responsibilities?
(select as many as apply)

R25_1 ☐ Dean

R25_2 ☐ Assistant Dean

R25_3 ☐ Supervisor for Postgraduate/s

R25_4 ☐ Research Director

R25_5 ☐ Head of School

R25_6 ☐ Head of Department or Discipline

R25_7 ☐ Course Coordinator

R25_8 ☐ Other *(please specify below)*

R25_9 ☐ No additional roles or responsibilities

R26_1

.....

AY9... How many years industry experience do you have in the area in which you teach?

- ○ *(1)* R27_1 0
- ○ *(2)* R27_1 less than 2 years
- ○ *(3)* R27_1 2 - 5 years
- ○ *(4)* R27_1 6 - 10 years
- ○ *(5)* R27_1 11 - 20 years
- ○ *(6)* R27_1 21 - 30 years
- ○ *(7)* R27_1 more than 30 years

About You

AY10... Are you currently working in a part-time capacity in an industry related to the discipline in which you primarily teach?

- ○ *(1)* R28_1 Yes
- ○ *(2)* R28_1 No

About You

AY10a... How many years has it been since you worked in the industry?

- ○ *(1)* R29_1 less than 1 year
- ○ *(2)* R29_1 1 - 2 years
- ○ *(3)* R29_1 2 - 3 years
- ○ *(4)* R29_1 3 - 4 years
- ○ *(5)* R29_1 4 - 5 years
- ○ *(6)* R29_1 more than 5 years

About You

AY11... How long have you been employed at your current university?

- ○ *(1)* R30_1 1 - 3 years

- (2) R30_1 4 - 6 years
- (3) R30_1 7 - 10 years
- (4) R30_1 11 - 20 years
- (5) R30_1 more than 20 years

AY12... Have you worked at more than one university during your academic career?

- (1) R31_1 Yes
- (2) R31_1 No

About You

AY12a... Were any of the Universities you changed to in a different State?

- (1) R32_1 Yes
- (2) R32_1 No

AY12b... Why did you change Universities?
(select as many as apply)

- R33_1 ☐ For promotion/ pay increase
- R33_2 ☐ End of contract
- R33_3 ☐ Personal reasons
- R33_4 ☐ Research opportunities
- R33_5 ☐ To teach in your speciality area
- R33_6 ☐ Other *(please specify below)*

R34_1
.....

Curriculum Issues

CI1... Please consider each of the following factors and rate their importance to your primary discipline of (no answer supplied)

	Not at all important	Not very important	Important	Very important	Extremely important
a... Curricula should not be overcrowded R35_1	(1)	(2)	(3)	(4)	(5)
b... Students, as part of their degree, have the opportunities to take elective subjects outside of their discipline R36_1	(1)	(2)	(3)	(4)	(5)
c... Students should be provided with opportunities to learn in online environments R37_1	(1)	(2)	(3)	(4)	(5)
d... Relevant industry experience is an essential component of a student's education R38_1	(1)	(2)	(3)	(4)	(5)
e... Industry involvement should be encouraged (for example: guest lectures, employee scholarships) R39_1	(1)	(2)	(3)	(4)	(5)

f... Relevant and current computer software should be incorporated in teaching R40_1	(1)	(2)	(3)	(4)	(5)
g... Visits to construction sites R41_1	(1)	(2)	(3)	(4)	(5)

CI2... In your opinion, what are the 3 most significant issues facing (no answer supplied)

a... Issue 1

R42_1 .....

b... Issue 2

R43_1 .....

c... Issue 3

R44_1 .....

CI3... Please list 3 changes you would like to see in (no answer supplied)

a... Change 1

R45_1 .....

b... Change 2

R46_1 .....

c... Change 3

R47_1 .....

CI4... Can you identify 3 key obstacles to implementing these changes?

a... Obstacle 1

R48_1 .....

b... Obstacle 2

R49_1 .....

c... Obstacle 3

R50_1 .....

Learning, Teaching and Generating Academic Knowledge

LT1... In your opinion, how many contact hours per week are necessary for full-time students to reach their full potential in your primary discipline of (no answer supplied)?

- (1) R51_1 less than 12 hours
- (2) R51_1 12 - 15 hours
- (3) R51_1 16 - 19 hours
- (4) R51_1 20 - 24 hours
- (5) R51_1 more than 24 hours

LT2... In your opinion, how important are the following student skills?

	Not at all important	Not very important	Important	Very important	Extremely important	N/A
a... Critical thinking R52_1	(1)	(2)	(3)	(4)	(5)	(0)
b... Teamwork R53_1	(1)	(2)	(3)	(4)	(5)	(0)
c... Written communication R54_1	(1)	(2)	(3)	(4)	(5)	(0)
d... Oral presentation R55_1	(1)	(2)	(3)	(4)	(5)	(0)

e... Visual presentation R56_1

	(1)	(2)	(3)	(4)	(5)	(0)
f... Time management R57_1	(1)	(2)	(3)	(4)	(5)	(0)
g... Problem solving R58_1	(1)	(2)	(3)	(4)	(5)	(0)
h... Assignment writing R59_1	(1)	(2)	(3)	(4)	(5)	(0)
i... IT skills R60_1	(1)	(2)	(3)	(4)	(5)	(0)

LT3... Please indicate your level of agreement with each of the following statements about student attitudes.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
a... Students regularly attend my classes. R61_1	(1)	(2)	(3)	(4)	(5)	(0)
b... Student absenteeism does not impact on students' learning. R62_1	(1)	(2)	(3)	(4)	(5)	(0)
c... Students rarely complain about their workload. R63_1	(1)	(2)	(3)	(4)	(5)	(0)
d... Students often take on part-time employment whilst completing their studies. R64_1	(1)	(2)	(3)	(4)	(5)	(0)
e... Students are increasingly expecting entertainment-oriented lectures. R65_1	(1)	(2)	(3)	(4)	(5)	(0)
f... Students readily accept constructive feedback R66_1	(1)	(2)	(3)	(4)	(5)	(0)
g... Students are able to give critique of their own and others' work. R67_1	(1)	(2)	(3)	(4)	(5)	(0)
h... Students are motivated to achieve high grades. R68_1	(1)	(2)	(3)	(4)	(5)	(0)

Learning, Teaching and Generating Academic Knowledge

LT4... Do you think students' expectations of teaching have changed over the past 5 years?

- (1) R69_1 Yes
- (2) R69_1 No
- (3) R69_1 I haven't been teaching for the past 5 years

Learning, Teaching and Generating Academic Knowledge

LT4a... Please list the three most significant ways that student expectations of teaching have changed over the past 5 years.

Change 1

R70_1 .....

Change 2

R71_1 .....

Change 3

R72_1 .....

Learning, Teaching and Generating Academic Knowledge

LT5... How many assessment tasks do you generally set in a course in one semester?
Note: The term 'course' could refer to 'module', 'study area' or 'unit' at some schools

- (1) R73_1 0
- (2) R73_1 1
- (3) R73_1 2
- (4) R73_1 3
- (5) R73_1 4
- (6) R73_1 more than 4

LT6... Has your discipline increased its use of online environments for administering assessment tasks over the past 5 years?

- (1) R74_1 Yes
- (2) R74_1 No
- (3) R74_1 Don't know

LT7... Have staff in your discipline increased giving electronic feedback on assessment items over the past 5 years?

- (1) R75_1 Yes
- (2) R75_1 No
- (3) R75_1 Don't know

LT8... In your typical assessment practice, how important is it to provide the following?

	Not at all important	Not very important	Important	Very important	Extremely important	N/A
a... Detailed description of levels of attainment (rubric), at the beginning of an assignment R76_1	(1)	(2)	(3)	(4)	(5)	(0)
b... Written feedback for students' assessment items (formative) R77_1	(1)	(2)	(3)	(4)	(5)	(0)
c... Verbal feedback for students' assessment items (formative) R78_1	(1)	(2)	(3)	(4)	(5)	(0)
d... A grade (summative) for assessment items R79_1	(1)	(2)	(3)	(4)	(5)	(0)
e... Online assessment as opposed to hardcopy assessments R80_1	(1)	(2)	(3)	(4)	(5)	(0)
f... Several assessment items R81_1	(1)	(2)	(3)	(4)	(5)	(0)

Learning, Teaching and Generating Academic Knowledge

LT9... Please identify the most effective methods you use to update your knowledge of teaching practices (up to 5 methods can be selected).

(Place a 1 in the box next to the method that is most useful for you to update your knowledge of teaching practices; if you wish to select more than one method, use the numbers 2, 3, 4 and 5 to indicate the next most useful methods in order of effectiveness.)

R82_1 ..... a... Academic conferences

R82_2 ..... b... Education conferences
R82_3 ..... c... Academic journals
R82_4 ..... d... Web sites and e-newsletters
R82_5 ..... e... Attendance at workshops/seminars/short courses
R82_6 ..... f... Networking
R82_7 ..... g... Belonging to professional or academic associations
R82_8 ..... h... Postgraduate study
R82_9 ..... i... Being a member of the School and Practice Advisory Board
R82_10 ..... j... Being up to date with Industry
R82_11 ..... k... Other *(please specify below)*

R83_1
.....

LT10... Please identify the methods that you use to keep abreast of current industry developments in the area/s in which you teach (up to 5 methods can be selected).

(Place a 1 in the box next to the method that is most useful for you to keep abreast of current industry developments in the area/s in which you teach; if you wish to select more than one method, use the numbers 2, 3, 4 and 5 to indicate any other methods that you use.)

R84_1 ..... a... Academic conferences
R84_2 ..... b... Academic journals
R84_3 ..... c... Industry journals and magazines
R84_4 ..... d... Websites and e-newsletters
R84_5 ..... e... Attendance at workshops/ seminars/ short courses
R84_6 ..... f... Networking
R84_7 ..... g... Belonging to professional or academic associations
R84_8 ..... h... Postgraduate study
R84_9 ..... i... Being a member of the School and Practice Advisory Board
R84_10 ..... j... Professional body (AIB, AIQS, AIBS etc.)
R84_11 ..... k... Other *(please specify below)*

R85_1
.....

LT11... Please indicate if you use any of the following approaches in your Discipline.

	Do not use/ Do not intend to use	Currently use	Intend to use	Not applicable to my teaching practices
a... Learning contracts R86_1	(1)	(2)	(3)	(4)
b... Simulation projects R87_1	(1)	(2)	(3)	(4)
c... Peer assessment R88_1	(1)	(2)	(3)	(4)
d... Self assessment R89_1	(1)	(2)	(3)	(4)
e... Group work R90_1	(1)	(2)	(3)	(4)
f... Other *(please specify below)* R91_1	(1)	(2)	(3)	(4)

R92_1
.....

Learning, Teaching and Generating Academic Knowledge

LT12... Does your institution offer an online degree program for your Discipline?

- (1) R93_1 Yes
- (2) R93_1 No
- (3) R93_1 Intending to implement

LT12a... Does your online program run concurrently with your on-campus program?

- (1) R94_1 Yes
- (2) R94_1 No
- (3) R94_1 Intending to implement

LT12b... Does the delivery of virtual team work skills form part of your online program?

- (1) R95_1 Yes
- (2) R95_1 No
- (3) R95_1 Don't know

LT12c... Is students' participation in virtual team work an assessment component in your online program?

- (1) R96_1 Yes
- (2) R96_1 No
- (3) R96_1 Intending to implement

Learning, Teaching and Generating Academic Knowledge

LT13... In the future, does your University intend to change the length of the degree program in (no answer supplied)?

- (1) R97_1 Yes
- (2) R97_1 No
- (3) R97_1 Don't know

Learning, Teaching and Generating Academic Knowledge

LT13a... Please indicate the length change.

- (1) R98_1 Decrease from 4 to 3 years
- (2) R98_1 Increase from 4 to 5 years
- (3) R98_1 Other *(please specify below)*

R99_1

.....

Learning, Teaching and Generating Academic Knowledge

LT14... In the table below, please indicate the teaching and learning development in which you have participated in 2006 and 2007, and have planned for 2008.

	2006	2007	2008
a... Induction programs	R100_1 ☐	R100_2 ☐	R100_3 ☐
b... Symposium/ Conference	R101_1 ☐	R101_2 ☐	R101_3 ☐
c... Workshop	R102_1 ☐	R102_2 ☐	R102_3 ☐
d... One-on-one advice from a teaching and learning adviser	R103_1 ☐	R103_2 ☐	R103_3 ☐
e... Peer review of teaching	R104_1 ☐	R104_2 ☐	R104_3 ☐
f... Teaching development grants	R105_1 ☐	R105_2 ☐	R105_3 ☐
g... Higher degree study in university teaching and learning	R106_1 ☐	R106_2 ☐	R106_3 ☐
h... Other *(please specify below)*	R107_1 ☐	R107_2 ☐	R107_3 ☐

R108_1 .....

Academic Staff Conditions

AS1... In an average week, how many hours do you work to complete your academic responsibilities?

- ○ *(1)* R109_1 less than 38 hours
- ○ *(2)* R109_1 38 - 43 hours
- ○ *(3)* R109_1 43 - 49 hours
- ○ *(4)* R109_1 49 - 55 hours
- ○ *(5)* R109_1 55 - 65 hours
- ○ *(6)* R109_1 over 65 hours

AS2... Across a year, how is your academic work broken down into the following activities?
Your responses should be percentages and total 100.

R110_1 %	Teaching
R111_1 %	Research
R112_1 %	Administration
R113_1 %	Other *(please specify below)*

R114_1 .....

Academic Staff Conditions

AS3... From your current teaching experiences, what are the 3 most significant strengths of your teaching?
Strength 1

R115_1 .....

Strength 2

R116_1 .....

Strength 3

R117_1 .....

AS4... From your current teaching experiences, what are the 3 most significant issues affecting the strengths of your teaching?

Issue 1

R118_1 .....

Issue 2

R119_1 .....

Issue 3

R120_1 .....

AS5... In the next five years, what are the 3 most significant challenges that you expect to encounter in your teaching?

Challenge 1

R121_1 .....

Challenge 2

R122_1 .....

Challenge 3

R123_1 .....

AS6... Are there any other issues that have significantly affected your teaching career?

R124_1 .....

Academic Staff Conditions

AS7... From the following list, please select the greatest areas of need confronting your discipline's teaching practices (Up to 5 needs can be selected).

(Place a 1 in the box next the greatest area of need; if you wish to select more than one area, use the numbers 2, 3, 4 and 5 to indicate the next greatest areas of need.)

R125_1 ..... a... Tutorial spaces

R125_2 ..... b... Lecture rooms/ theatres

R125_3 ..... c... Computer laboratories

R125_4 ..... d... Up-to-date visual equipment

R125_5 ..... e... Up-to-date academic books/journals

R125_6 ..... f... Staff offices

R125_7 ..... g... Student meeting rooms

R125_8 ..... h... Increase in staff numbers

R125_9 ..... i... Professional development

R125_10 ..... j... Curriculum reforms

R125_11 ..... k... Staff and student internet access

R125_12 ..... l... Online teaching and learning resources

R125_13 ..... m... Other *(please specify below)*

R126_1 .....

AS8... What are the current impacts of your school's budget and OHS on the following areas?

	Budget				OHS			
	No impact	Some impact	Large impact	N/A	No impact	Some impact	Large impact	N/A
a... Site visits R127_1 / R127_2	(1)	(2)	(3)	(0)	(1)	(2)	(3)	(0)
b... Workshop activities R128_1 / R128_2	(1)	(2)	(3)	(0)	(1)	(2)	(3)	(0)
c... Other *(please specify below)* R129_1 / R129_2	(1)	(2)	(3)	(0)	(1)	(2)	(3)	(0)

R130_1 .....

AS9... In your opinion, how important is the accreditation process to:

	Not at all important	Not very important	Important	Very important	Extremely important	N/A
a... Maintain standards R131_1	(1)	(2)	(3)	(4)	(5)	(0)
b... Set an agenda for future directions R132_1	(1)	(2)	(3)	(4)	(5)	(0)

AS10... Please indicate your level of agreement with each of the following statements.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
a... Preparation for accreditation increases my workload. R133_1	(1)	(2)	(3)	(4)	(5)	(0)
b... Feedback from the accreditation process has improved the school's curriculum. R134_1	(1)	(2)	(3)	(4)	(5)	(0)
c... The accreditation process encourages diversity in my discipline. R135_1	(1)	(2)	(3)	(4)	(5)	(0)
d... The accreditation process is valued by the academic community. R136_1	(1)	(2)	(3)	(4)	(5)	(0)

AS11... Any further overall comments?

R137_1 .....

Appendix 4 Theme codes

	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Accreditation - general	15	4	1	9	0	*29*
Accreditation - resrictions imposed by	5	1	0	2	0	*8*
Accreditation - multiple	5	0	0	2	0	*7*
Accreditation - work preparing for	3	0	0	3	0	*6*
Accreditation - measurement	3	0	0	2	0	*5*
Accreditation - institutes specifiying industry needs	3	1	0	0	0	*4*
Accreditation - definition of rqumnts	1	0	0	1	0	*2*
Accreditation - ind experienced staff	0	0	0	1	0	*1*
Accreditation - unis aren't producing rqd product	1	0	0	0	0	*1*

	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Assessment - types of	3	1	0	6	6	*16*
Assessment - general	4	0	0	5	6	*15*
Assessment - staff workload inc feedback	0	1	0	6	0	*7*
Assessment - feedback students views of	0	0	0	0	6	*6*
Assessment - rubrics and QA	1	0	0	4	0	*5*
Assessment - of teamwork skills	2	0	0	1	0	*3*
Assessment - staff views of students expectations	0	1	0	0	0	*1*
Assessment - of groupwork	0	0	0	0	0	*0*

	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Class size - general	8	7	0	2	1	*18*
Class size - change due to	6	3	0	3	1	*13*
Class size - problems with	3	0	0	2	1	*6*

	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Curriculum - fragmentation	13	2	0	6	0	*21*
Curriculum - multi-disciplinary cohorts	8	3	0	4	2	*17*
Curriculum - general	8	0	0	6	2	*16*
Curriculum - renewal	13	1	0	2	0	*16*
Curriculum - design	7	4	0	3	0	*14*
Curriculum - program duration	2	1	1	1	7	*12*
Curriculum - impact of accreditation	2	5	0	1	0	*8*
Curriculum - impact of PBL	4	1	1	1	1	*8*
Curriculum - impact of distance learning	2	0	0	1	0	*3*
Curriculum - inclusion of sustainability	1	1	0	0	1	*3*
Curriculum - changes	0	0	0	2	0	*2*
Curriculum - development with industry	1	0	0	1	0	*2*
Curriculum - building surveying	1	0	0	0	0	*1*
Curriculum - industry invovlement	1	0	0	0	0	*1*
Curriculum - transitioning	1	0	0	0	0	*1*

	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Digital - challenges of	6	6	0	3	3	*18*
Digital - flexibility of	1	1	1	2	5	*10*
Digital - BIM and construction IT	1	3	0	0	2	*6*
Digital - discouraging attendance	2	1	0	2	0	*5*
Digital - pedagogy	3	0	0	2	0	*5*
Digital - workload implications	1	1	0	2	0	*4*
Digital - IT saviness	1	0	0	1	1	*3*
Digital - training for	0	1	0	2	0	*3*
Digital - as distance learning	1	0	1	0	0	*2*
Digital - IT multimedia T&L	0	2	0	0	0	*2*
Digital - F2F or online learning	0	0	0	0	1	*1*

	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Discipline - TAFE vs Uni	7	1	1	6	3	*18*
Discipline - leadership	14	0	0	0	0	*14*
Discipline - demand for graduates	4	0	1	4	1	*10*
Discipline - strategic management of discipline	7	0	0	2	0	*9*
Discipline - uni policies	3	2	0	2	0	*7*
Discipline - beauracracy	1	3	0	2	0	*6*
Discipline - changes in tertiary sector	3	1	1	1	0	*6*
Discipline - future initiatives	4	0	0	2	0	*6*
Discipline - restructuring	2	2	1	0	0	*5*
Discipline - government policies	1	0	1	1	0	*3*
Discipline - resistance to change	1	1	0	1	0	*3*
Discipline - structure	1	0	0	0	0	*1*
Discipline - vision or lack of	0	1	0	0	0	*1*
Discipline - uni strategy	0	0	0	0	0	*0*
	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Funding - facilities, support	8	6	0	6	0	*20*
Funding - shortage	3	4	0	1	0	*8*
Funding - inequity	1	0	0	1	0	*2*
Funding - lag	1	0	0	1	0	*2*
	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Image - construction as 2nd class at Uni	13	4	1	5	0	*23*
Image - construction as 2nd class in public	8	1	0	4	0	*13*
Image - prof bodies, branding of construction	2	0	0	0	0	*2*
	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Industry - expectations	8	0	0	10	0	*18*
Industry - uni interaction	8	2	0	6	0	*16*
Industry - involvement in teaching	4	1	1	3	1	*10*
Industry - attitudes	3	4	1	1	0	*9*
Industry - changes in...	0	3	0	1	0	*4*
	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Staff - workload	19	6	1	10	0	*36*
Staff - promotion of staff	19	5	1	9	0	*34*
Staff - industry experience	15	4	1	7	3	*30*
Staff - shortage	15	5	1	7	0	*28*
Staff - salaries	12	4	1	2	0	*19*
Staff - development and CPD	7	7	1	3	0	*18*
Staff - casual staffing	8	3	1	3	0	*15*
Staff - casual staff problems with	7	3	0	2	1	*13*
Staff - PhD, new staff	6	0	1	4	1	*12*
Staff - PhD, existing staff	5	3	0	4	0	*12*
Staff - attitudes	3	5	0	0	0	*8*
Staff - aging	2	1	1	3	0	*7*
Staff - attrition	3	0	0	2	0	*5*
Staff - expectations	1	3	0	0	0	*4*
Staff - from overseas	1	0	0	0	1	*2*
Staff - retaining staff	1	0	0	0	0	*1*
Staff - availability of staff	0	0	0	0	1	*1*

	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Students - working and studying	18	5	1	10	8	*42*
Students - working in teams or groups	13	0	0	7	7	*27*
Students - motivations	6	6	0	1	8	*21*
Students - timetabling	7	3	0	4	4	*18*
Students - attending classes	5	5	0	3	1	*14*
Students - views of program	3	1	0	2	6	*12*
Students - evaluations	2	0	0	6	2	*10*
Students - just wanting to pass or get degree	6	1	0	2	0	*9*
Students - intake quality	3	3	0	2	0	*8*
Students - international students	2	3	1	2	0	*8*
Students - at different levels	5	2	0	0	1	*8*
Students - views of lecturers	1	0	0	0	7	*8*
Students - working and studying financial need	3	0	1	3	1	*8*
Students - entertaining engaging lectures	3	1	0	3	0	*7*
Students - Gen Y skills, challenges of	3	1	0	3	0	*7*
Students - views of resources	1	1	0	0	5	*7*
Students - working and studying low marks	4	0	0	2	1	*7*
Students - expectations	1	4	0	1	0	*6*
Students - spoon feeding	2	1	0	3	0	*6*
Students - working and studying industry pressure	2	0	1	1	2	*6*
Students - customer is king	2	1	0	2	0	*5*
Students - instant gratification	1	2	1	1	0	*5*
Students - overseas students	1	2	0	1	0	*4*
Students - doing research RHD	1	0	0	3	0	*4*
Students - expect learning to be relevant	1	1	0	1	1	*4*
Students - expectation to pass	1	2	0	1	0	*4*
Students - workloads	1	0	0	0	3	*4*
Students - expect IT and online delivery	1	1	0	1	0	*3*
Students - issues	2	0	0	0	1	*3*
Students - perceptions	0	0	0	1	2	*3*
Students - querying marks	1	1	0	1	0	*3*
Students - scholarships	1	0	0	0	1	*2*
Students - secondary school	0	0	0	2	0	*2*
Students - expect instant answers	1	1	0	0	0	*2*
Students - fees	0	1	0	0	1	*2*
Students - impact of assessment	0	1	0	0	1	*2*
Students - inflated sense of abilities	1	1	0	0	0	*2*
Students - lack of respect for staff	0	2	0	0	0	*2*
Students - visiting sites	0	1	0	1	0	*2*
Students - work 1st study later	0	1	0	0	1	*2*
Students - working & studying, relationships with o/	1	0	0	0	1	*2*
Students - overseas experience	0	0	0	1	0	*1*
Students - expectations for feedback	0	0	0	1	0	*1*

	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
Teaching - research admin balance	19	8	1	8	0	*36*
Teaching - site visits	3	3	0	2	5	*13*
Teaching - skills of teachers	2	8	0	1	0	*11*
Teaching - new approaches to	2	2	0	4	0	*8*
Teaching - quality	3	3	0	2	0	*8*
Teaching - lack of rooms, labs, space	1	2	0	2	0	*5*
Teaching - future teaching	2	0	0	0	2	*4*
Teaching - tutorials	0	0	0	0	4	*4*
Teaching - keeping up to date	1	2	0	0	0	*3*
Teaching - unfamiliar topics	1	2	0	0	0	*3*
Teaching - qualifications	1	0	0	1	0	*2*
Teaching - credit articulation	0	0	0	0	1	*1*
Teaching - currency of students projects	0	0	0	0	1	*1*
Teaching - skills lack of	0	0	1	0	0	*1*
	HoS Interviews	Online survey	Prof bodies FG	Staff FG	Student FG	*Frequency*
WIL - assesssment of	5	2	0	3	4	*14*
WIL - problems organising	8	0	0	3	1	*12*
WIL - complements Uni courses	0	0	1	3	5	*9*
WIL - students views of problems	0	0	0	0	7	*7*
WIL - Prof bodies rqmnts	2	0	0	1	0	*3*
WIL - paid or unpaid	1	0	1	0	0	*2*
WIL - advantage to graduates	0	0	1	0	0	*1*
WIL - legislated requirement for	0	0	1	0	0	*1*
WIL - need for	0	0	1	0	0	*1*
WIL - providing organisations	0	0	1	0	0	*1*

Appendix 5 Example accreditation documentation submitted to professional bodies (table of contents)

Application for re-accreditation by the Australian Institute of Building (AIB), and the Australian Institute of Quantity Surveyors (AIQS)

Prepared by

The Discipline of Building
School of Architecture and the Built Environment
Faculty of Engineering and the Built Environment
The University of Newcastle

for the

Bachelor of Construction Management (Building)
Program Code: 10859 (On-Campus; Distance; 11363 TMC Singapore)
CRICOS Code: 003693G

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Appendix 6 Explanation of data analysis

This appendix builds on Section 4.6.4 by providing supplementary information which describes the manner in which transcribed data were coded and subsequently analysed. Figure A replicates Figure 4.5 (Chapter 4) as the starting point for this explanation. Subsequent figures in this appendix provide additional details about each of the stages represented in Figure A.

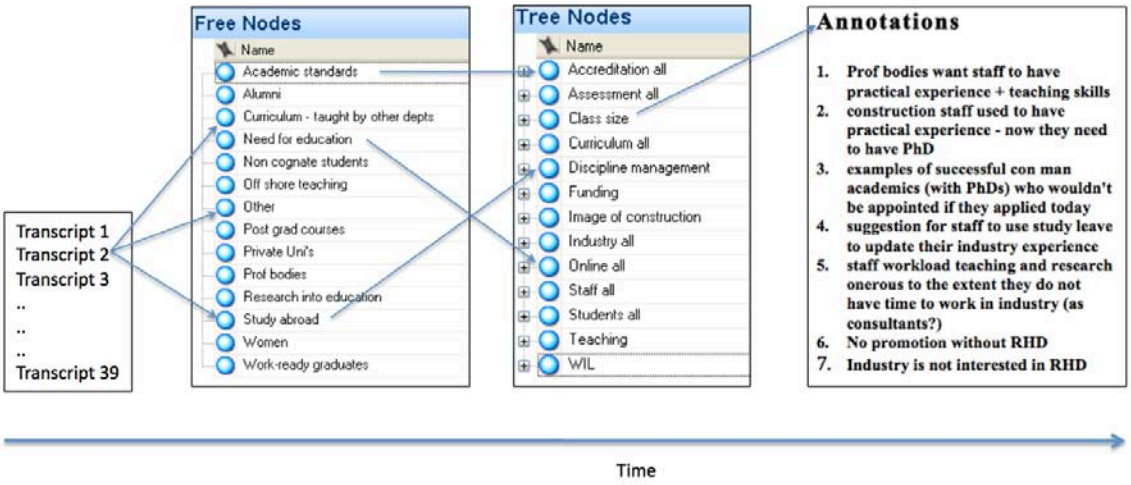


Figure A: Method of coding qualitative data (as per Figure 4.5)

Audio recordings of interviews and focus groups were transcribed by a professional transcription service. The resulting text files which were then loaded into NVivo.

Figure B shows the transcribed data files as stored in NVivo. An identifier known only to members of the research team was used for each file.

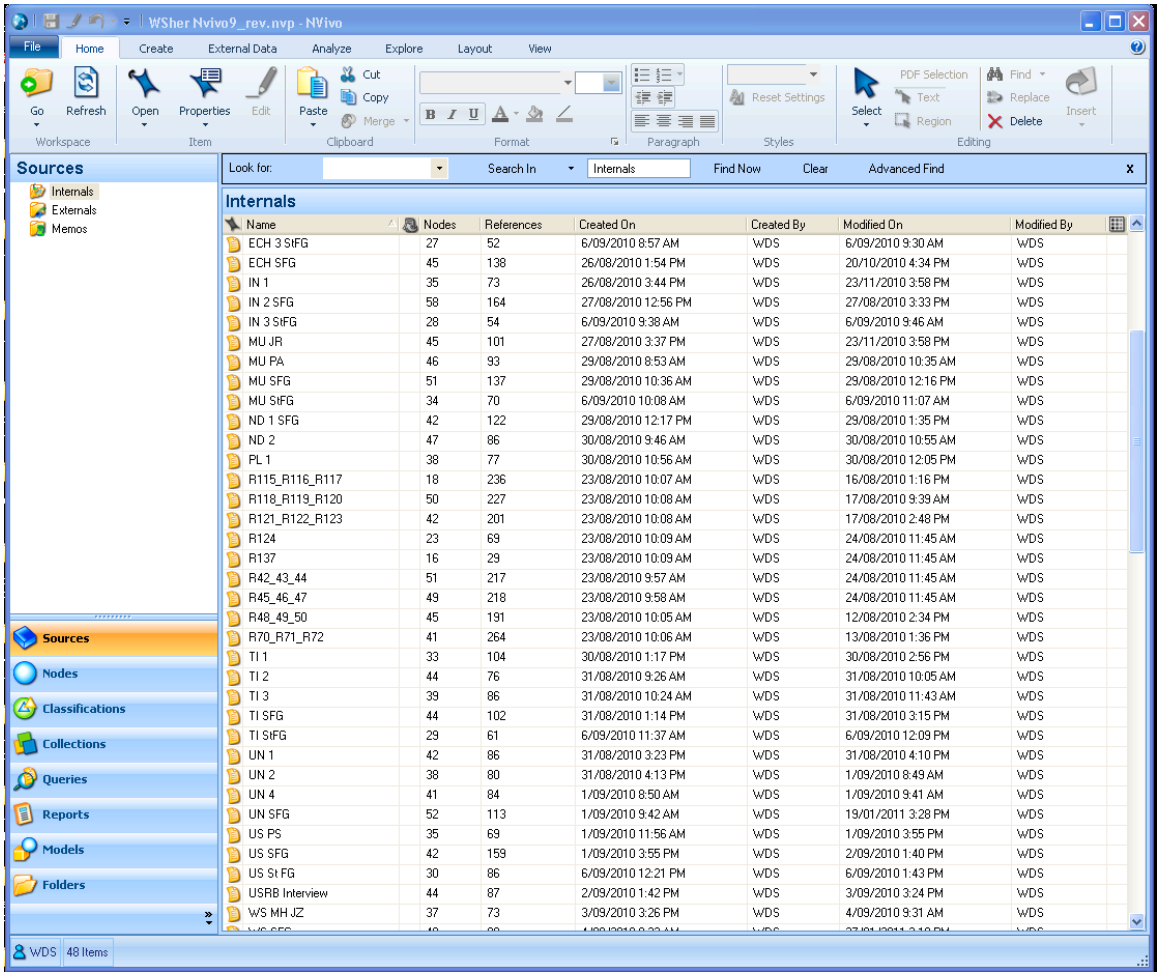


Figure B: The transcribed data files

Transcribed text files were examined to gain an understanding of what was said.

Subsequently, the researcher re-read each file and allocated codes (or **Nodes** as they are referred to in NVivo) to sections of text.

Figure C shows the allocation of two **Nodes** (*MUJR* and *Curriculum fragmentation* represented by the vertical bars in Figure C) to the paragraph of text.

The researcher also added **annotations** to sections of text as and where he felt it appropriate. These **annotations** were used as reminders for subsequent analysis and are shown below the paragraph of text in Figure C.

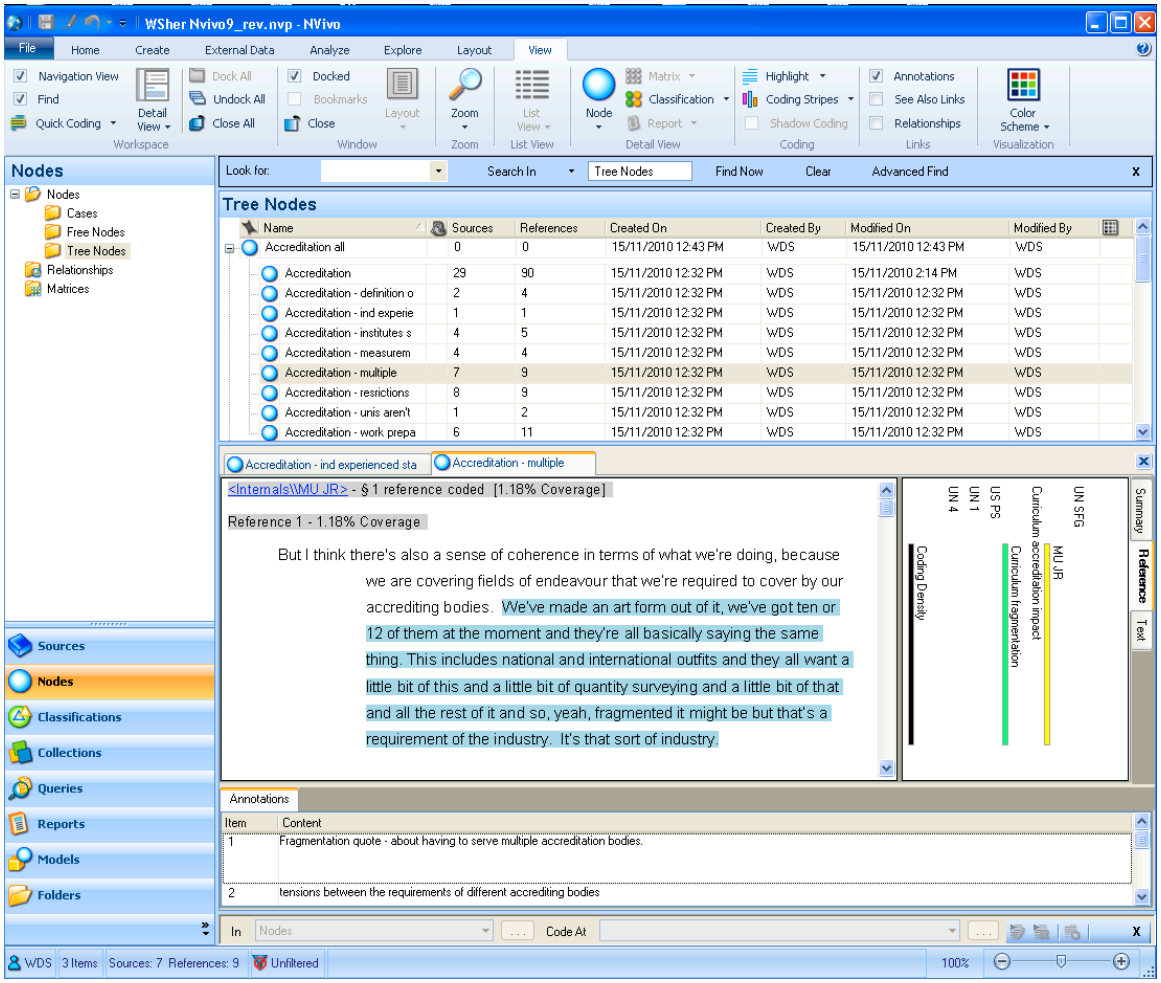
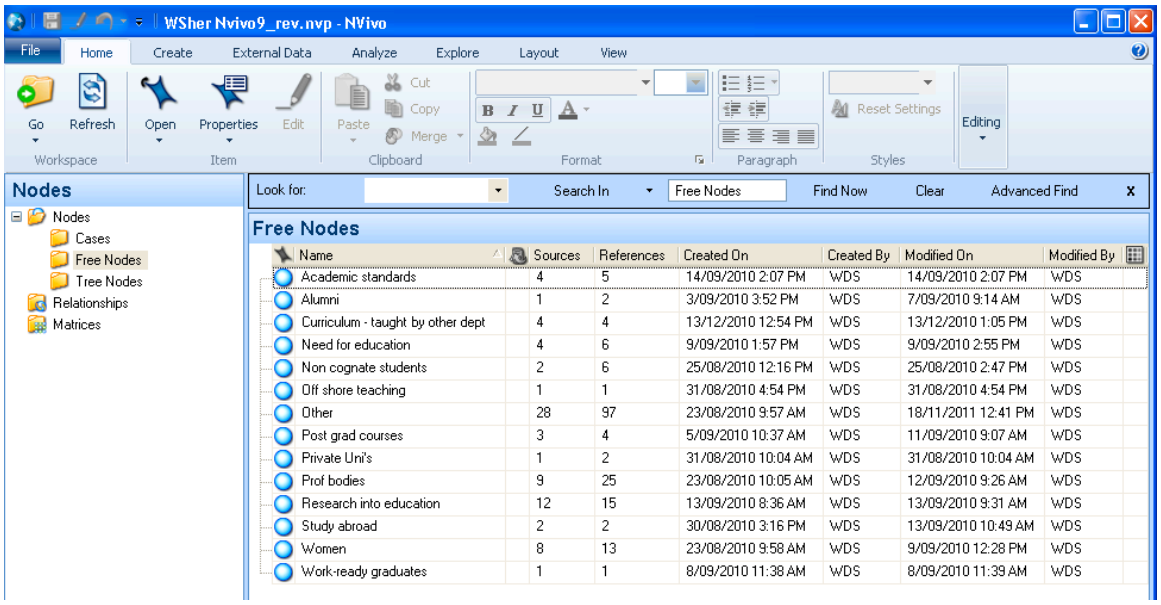


Figure C: Annotation of source text

The codes evolved during the process of coding. New codes were added as and where necessary, whilst existing codes were changed when it became apparent this was required.

Initially codes took the form of 'Free Nodes' as shown in Figure D. 'Free nodes' are stand-alone codes. These were later collected together into 'tree nodes' as described on the next page.



Name	Sources	References	Created On	Created By	Modified On	Modified By
Academic standards	4	5	14/09/2010 2:07 PM	WDS	14/09/2010 2:07 PM	WDS
Alumni	1	2	3/09/2010 3:52 PM	WDS	7/09/2010 9:14 AM	WDS
Curriculum - taught by other dept	4	4	13/12/2010 12:54 PM	WDS	13/12/2010 1:05 PM	WDS
Need for education	4	6	9/09/2010 1:57 PM	WDS	9/09/2010 2:55 PM	WDS
Non cognate students	2	6	25/08/2010 12:16 PM	WDS	25/08/2010 2:47 PM	WDS
Off shore teaching	1	1	31/08/2010 4:54 PM	WDS	31/08/2010 4:54 PM	WDS
Other	28	97	23/08/2010 9:57 AM	WDS	18/11/2011 12:41 PM	WDS
Post grad courses	3	4	5/09/2010 10:37 AM	WDS	11/09/2010 9:07 AM	WDS
Private Uni's	1	2	31/08/2010 10:04 AM	WDS	31/08/2010 10:04 AM	WDS
Prof bodies	9	25	23/08/2010 10:05 AM	WDS	12/09/2010 9:26 AM	WDS
Research into education	12	15	13/09/2010 8:36 AM	WDS	13/09/2010 9:31 AM	WDS
Study abroad	2	2	30/08/2010 3:16 PM	WDS	13/09/2010 10:49 AM	WDS
Women	8	13	23/08/2010 9:58 AM	WDS	9/09/2010 12:28 PM	WDS
Work-ready graduates	1	1	8/09/2010 11:38 AM	WDS	8/09/2010 11:39 AM	WDS

Figure D: Free nodes

Figure E shows the 'tree nodes' used in this study. Each 'tree node' contains several 'free' nodes. Tree nodes thus allowed hierarchies of nodes to be assembled. This was done after free nodes had been allocated to the transcriptions.

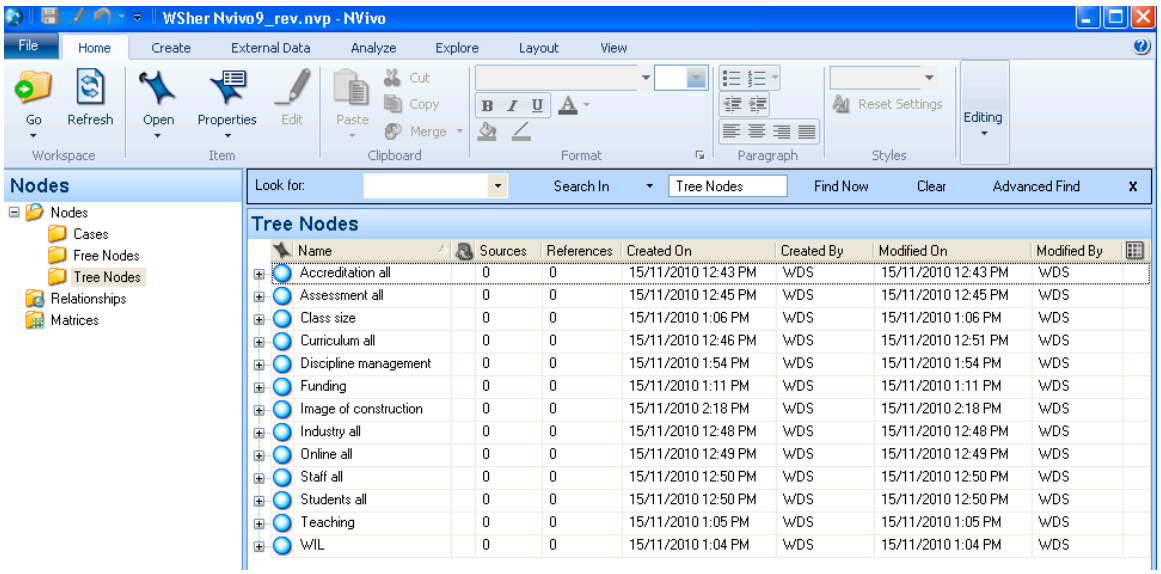


Figure E: Tree nodes

Figure F shows the free nodes contained within the 'Accreditation all' tree node.

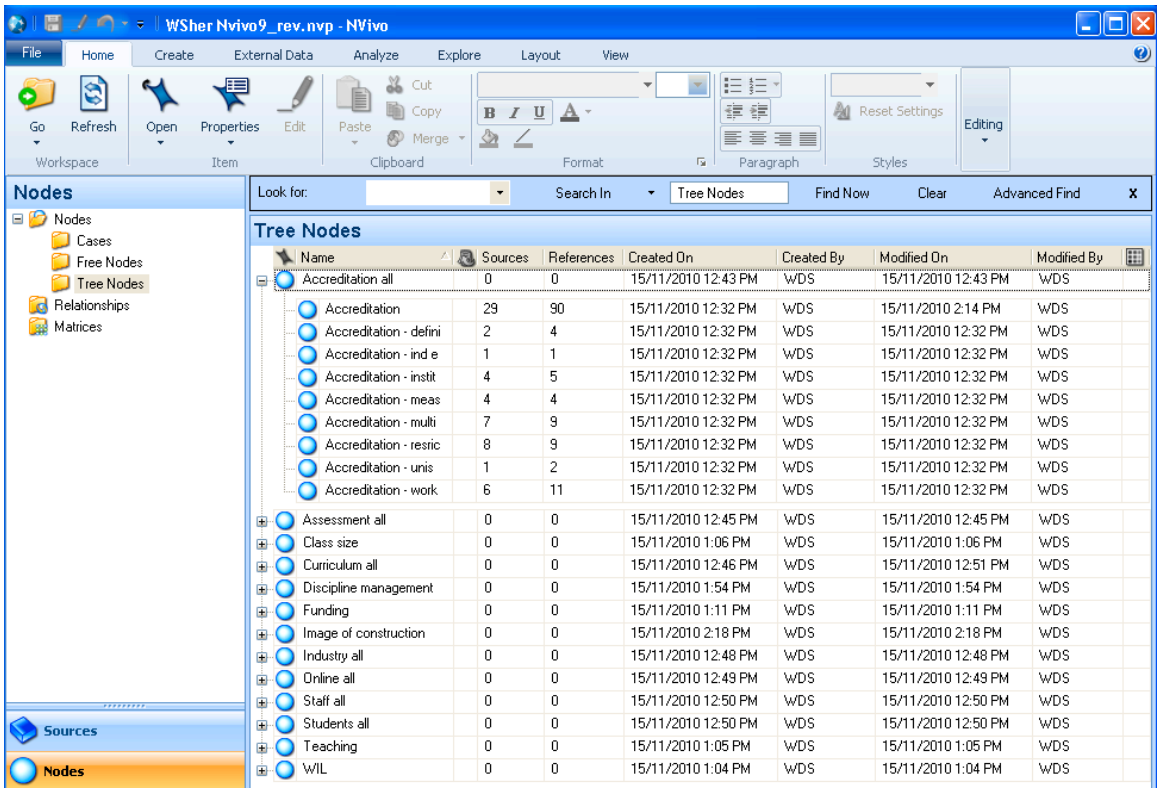


Figure F: 'Free nodes' contained within a the 'Accreditation all tree node'

When coding was complete, text relevant to each free node was extracted and analysed. Figure G provides an example of the text extracted for a particular free node (MUJR). These and other reports enabled the data to be analysed in a structured manner.

<Internals\\MU JR> - § 1 reference coded [1.18% Coverage]

Reference 1 - 1.18% Coverage

But I think there's also a sense of coherence in terms of what we're doing, because we are covering fields of endeavour that we're required to cover by our accrediting bodies. We've made an art form out of it, we've got ten or 12 of them at the moment and they're all basically saying the same thing. This includes national and international outfits and they all want a little bit of this and a little bit of quantity surveying and a little bit of that and all the rest of it and so, yeah, fragmented it might be but that's a requirement of the industry. It's that sort of industry.

<Internals\\MU SFG> - § 1 reference coded [1.16% Coverage]

Reference 1 - 1.16% Coverage

Again, I am not sure what you are trying to cover here. But our push is basically pretty much in line of…requirements. I think we have got the maximum number of propositional…in the program. In our old program, basically we had about 14 accreditating bodies. But in our new model, basically we have all been asked why we need to have that many…I think that is something that we, at this moment, looking at it. Yeah. We didn't have any problems getting…some of our course, from all the leading bodies.

<Internals\\PL 1> - § 1 reference coded [1.30% Coverage]

Reference 1 - 1.30% Coverage

Interviewee: I have to say that I'm starting to think on that, because the AIB and AIBS – particularly the AIBS – have quite an extensive accreditation curriculum to meet. For AIBS, there are eleven areas and then you can get anything up to about ten sub-points. The AIBS tend to be a bit more prescriptive, whereas the AIB basically have their professional and their knowledge sets. I think that it's better that they're not as prescriptive in their understanding and performance-type curriculum.

Figure G: Example of coded transcript