

BALANCING CHANGES TO CONSTRUCTION EDUCATION IN THE 21ST CENTURY: EXPLORING THE CHALLENGES CONSTRUCTION EDUCATORS FACE IN AUSTRALIA

Anthony Williams, William Sher and Catharine Simmons
The University of Newcastle, Australia

ABSTRACT

University education for construction professionals is currently facing enormous challenges. In addition to the current global financial crisis there are increased pressures from within universities as well as from industry and accrediting institutions. An Australian Learning and Teaching Council (ALTC) grant has provided an opportunity to review construction education. The project investigated issues via an online survey of full-time academic staff, and face-to-face interviews and focus groups with staff and students. This paper explores the pressures and opportunities identified in these investigations. It highlights some of the challenges construction disciplines face and identifies changes that should improve teaching and learning.

Keywords:

Construction education, challenges, students working, work integrated learning, resources, future staff, communication, industry demand.

INTRODUCTION

Graduates from *Construction* disciplines (construction management, quantity surveying and building surveying) are currently in demand at home and abroad. The education of construction and building professionals at universities is unique as the curricula straddle diverse areas such as building technology, design, law, management and finance. Graduates are ideally placed to exploit opportunities abroad and at home but the boom/bust nature of the industry has led to a hand-to-mouth existence for many Australian universities, especially in regards to the recent global financial crisis. The educational landscape for *Construction* programs has changed significantly due to a number of factors including changes

in Government funding, the integration of ICT initiatives and the provision of on-site training packages (Hager, Crowley et al. 2001).

An Australian Learning and Teaching Council (ALTC) grant has provided an opportunity to study *Construction* education in Australia and this paper discusses our findings and outlines some recommendations from this report. Initially, broad issues within *Construction* disciplines were studied and mapped through an online survey administered to full-time academic staff. An in-depth analysis was then conducted using qualitative research methods. Concurrently quantitative data were elicited from universities' records and websites as well as from the Department of Education, Employment and Workplace Relations (DEEWR). The project aimed to develop an understanding of key curriculum, teaching and instructional challenges and opportunities facing the *Construction* disciplines in Australia. It's intention is to underpin future targeted projects and allow for the development of benchmarking strategies to align Australian and international 'best practice'. This paper outlines the aims of our study and the methodological processes it employed. It then goes on to discuss broad trends observed from relevant DEEWR data. Issues emerging from the data and related literature are identified and then 'change' recommendations are made.

THE STUDY

What challenges face Australian *Construction* higher education in maintaining and improving its quality, responsiveness and competitiveness in a global educational environment? We endeavoured to identify indicators of the 'change readiness' of *Construction* education units, their staff, as well as that of relevant professional institutions, government bodies and business and employer organizations. Further outcomes from the project were to set in place an agenda for additional research into targeted initiatives to support and enhance educational practices across the sector. While the primary motivation for the study was to promote innovation and 'best practice', a substantial component involved gaining a broad perspective of the context in which this education is located. Thus, the results of our study have immediate relevance to *Construction* education as well as to related disciplines.

There are few current studies that analyse *Construction* education in Australia (Taylor 2004). It is argued that industry training has become increasingly fragmented and specialised and that this has resulted in a lack of breadth of skills being taught and learnt (Hager, Crowley et al. 2001). Other issues identified from relevant literature include:

- a low level of qualifications across the industry,
- modest access to resources,
- a decrease of industrial experience to support student learning,
- an increased number of students studying part-time,
- issues related to course structure (NCVER 2000; Hager, Crowley et al. 2001; Taylor 2004; Birch, Warren et al. 2005; Ashford and Mills 2006).

This research was supported by the key professional institutions representing the *Construction* disciplines including: the Australian Institute of Building (AIB), the Australian Institute of Building Surveyors (AIBS), the Australian Institute of Quantity Surveying (AIQS). The final results of this study will be disseminated through ALTC in April-May 2009.

METHODOLOGY

An empirical investigation of the 12 universities delivering *Construction* programs in Australia was conducted. Issues were initially elicited via an online survey. The survey was administered to full-time teaching staff and 63 responses were received. The survey population size was revised to 116 from 155 academics originally invited to participate in the survey, so a 54% response rate was achieved. These data were supplemented with historical data obtained from DEEWR and universities' websites. The study supported a comparison of quantitative and qualitative data (the latter being from the open-ended questions included in the survey). Semi-structured interviews with Heads of School, Discipline Heads and Subject Convenors were then conducted to further explore the issues that had been identified in the survey. Interviews and focus groups were then carried out with academic staff who taught *Construction* and students enrolled in the *Construction* programs. A discussion of some of the findings from these data are provided below.

DISCUSSION

Number of Students

Figure 1 shows *Construction* student numbers over the past six years, including the total, commencing and completing number of students.

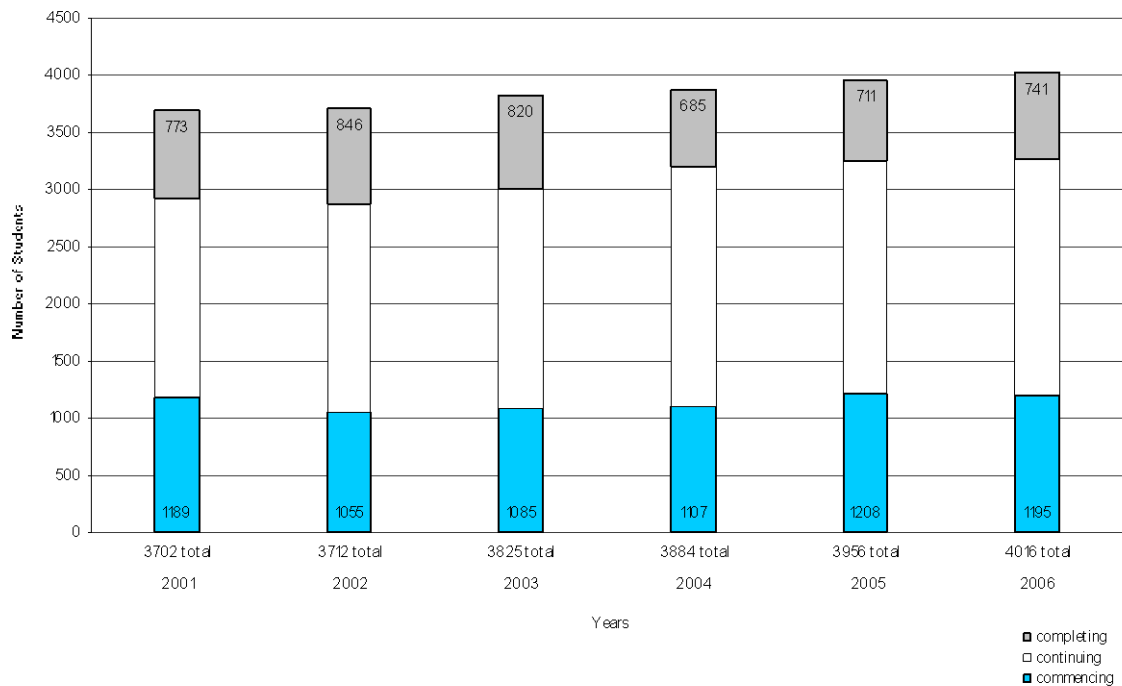


Figure 1: Total number of students, commencing, continuing and completing, 2001 – 2006 (Source: DEEWR).

Figure 2 shows the total number of students, EFTSL and total enrolments for the period 2001 to 2006. Both Figures 1 and 2 show a slow increase in enrolment in all three disciplines over the five years studied. According to Birch, Warren & Wescott (2005), prospective students do not appear to be aware of opportunities in *Construction* (in particular in Quantity Surveying and Building Surveying). Consequently, this rise in student intake could imply that students are increasingly becoming aware of the opportunities available to graduates in these disciplines.

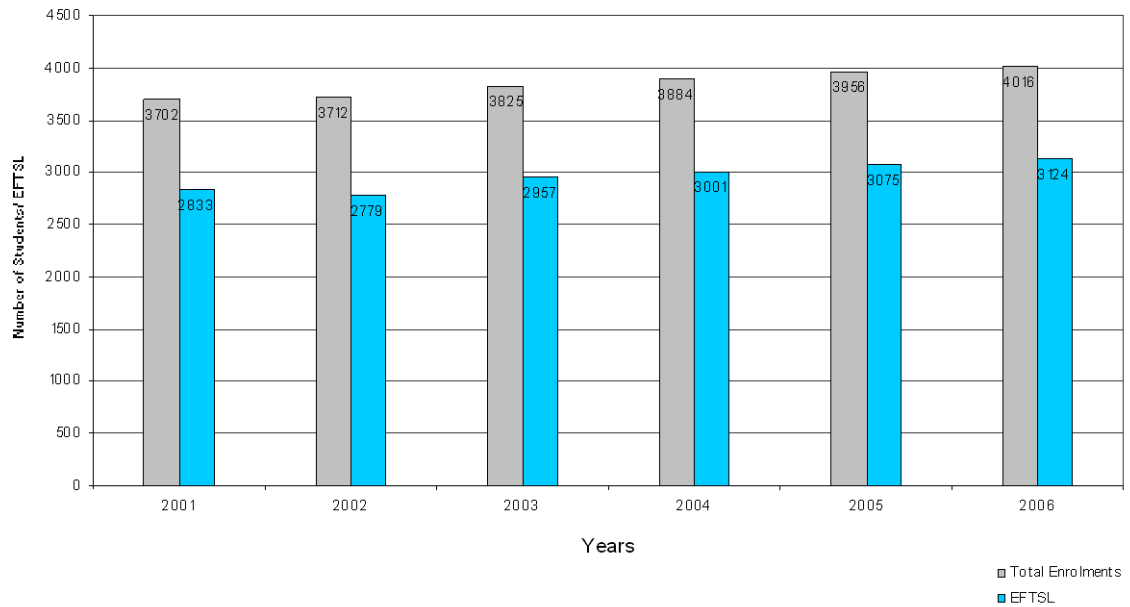


Figure 2: Total number of students, EFTSL and total enrolments, 2001 – 2006
(Source: DEEWR).

Gender

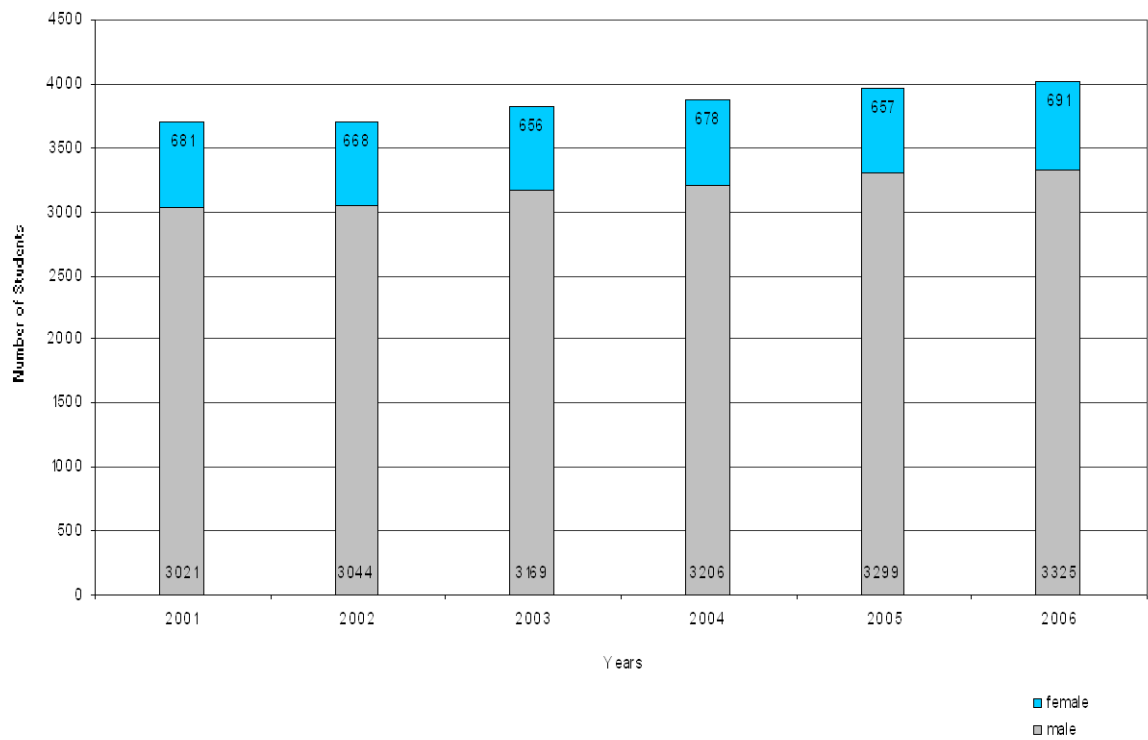


Figure 3: Total number of students by gender, 2001 – 2006 (Source: DEEWR).

Figure 3 shows that the gender of these disciplines is predominantly male. Literature notes that women do not consider *Construction* careers because these are regarded as male domain (Fielden, Davidson et al. 2000; Francis, Kestle et al. 2004). Figure 3 shows that this gender trend in student enrolment is continuing but with a slow increase.

Changes in Curricula

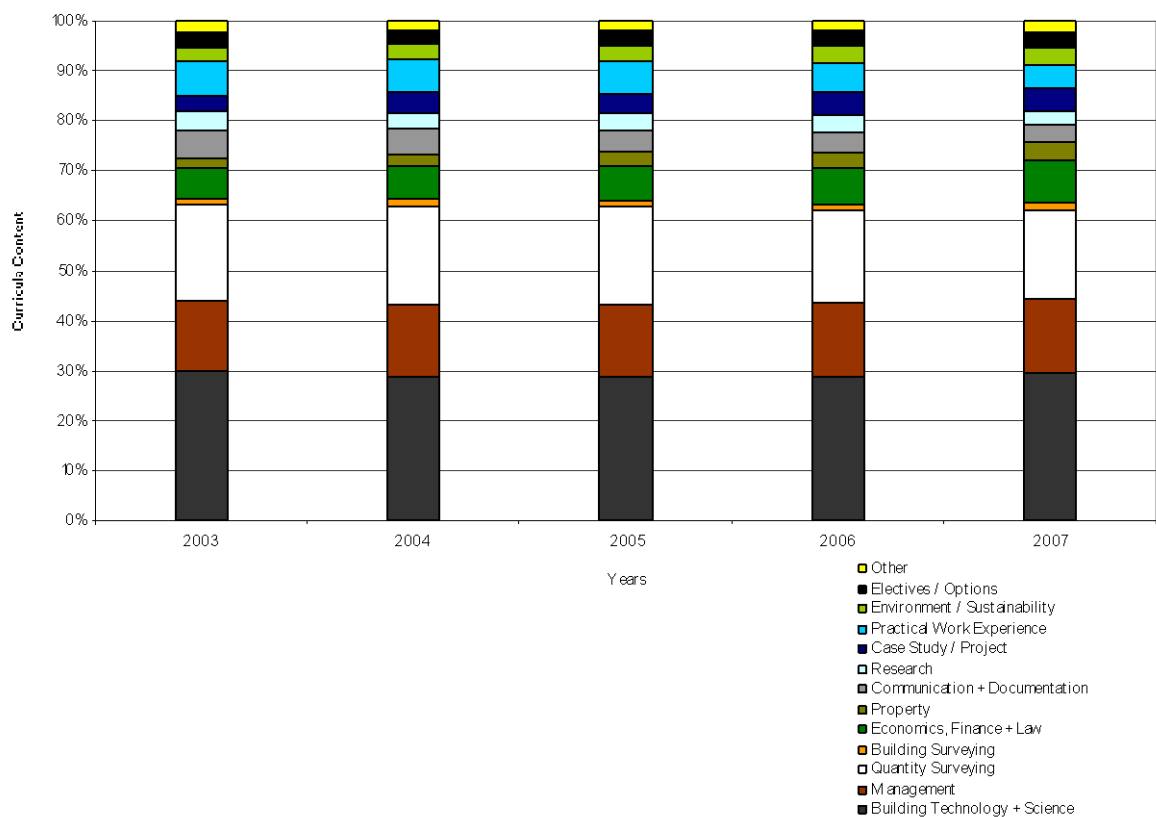


Figure 4: Curricula Content, 2003 - 2007

The data for figures 4 and 5 is drawn from AIQS handbooks and course handbooks on university websites. Figure 4 shows that “environment / sustainability” has had a slight increase from 2006-2007. This reflects changes in attitudes to the environment. Other changes may have been influenced by the introduction of the Bologna agreement (Ashford and Francis 2007).

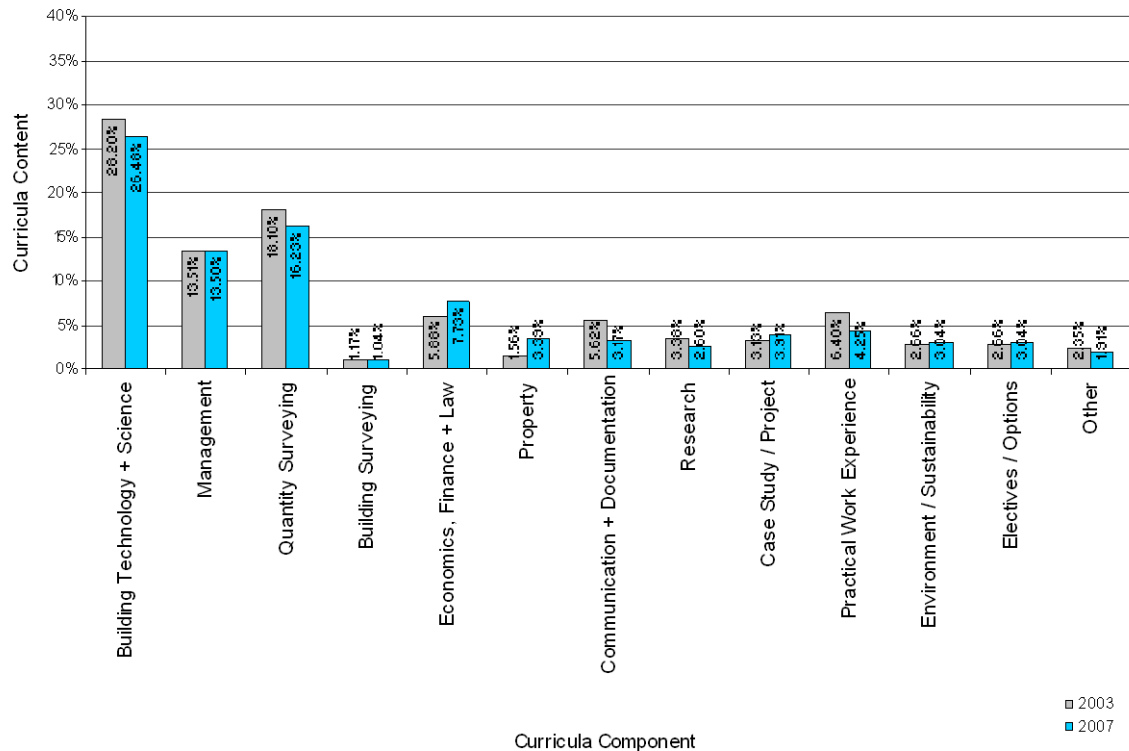


Figure 5: Curricula Content (%), 2003 compared to 2007 (Source: DEEWR)

Figure 5 indicates that there has been a reduction of practical work experience. It also shows reductions in areas of ‘Building Technology and Science’, ‘Practical Work Experience’ and ‘Quantity Surveying’. Conversely there has been an increase in ‘Economics, Finance and Law’. These trends reflect changes in the construction industry. For example, quantity surveying is increasingly being taken on by other professions. Staff also spoke about the administration and legal difficulties inherent in organising practical work experience. Figures 4 and 5 provide a record of curricula changes within the disciplines. Furthermore, and importantly the study also found that there are significant challenges that the disciplines face. Some of these are discussed below.

CONSTRUCTION EDUCATION - EMERGING CHALLENGES

This section discusses the challenges *Construction* disciplines face, as distilled from the online survey, interviews and focus groups. They are:

- the different ideologies of universities and the construction industry,

- staff and their increased workload,
- students and their workload, in particular students' paid work whilst studying.

It is apparent that the construction industry and universities have different ideological objectives. Hager et al (2001) note that employers view industry-related skills as being predominately acquired through on-site experience rather than formal education. Hager et al (2001) confirm this trend by stating that the construction industry has become increasingly IT sophisticated and competitive locally and globally (1990-2000) which has resulted in the need for new graduate skills. Professional bodies accrediting *Construction* degrees provide a connection between industry knowledge and academia. However, accreditation was pinpointed by staff respondents in this study as being resource intensive and disruptive at times as *Construction* programs are eligible for accreditation by numerous professional institutions. The data also highlighted other challenges including an overall increase in staff's administration and teaching workload due to an increase in class sizes, lack of up to date industry experience of staff, and students working whilst studying.

It was found that academic staff were increasingly finding it difficult to satisfy all areas of their workload quota. Preliminary data from the online survey suggests that staff are spending more time on administration and research and less time on teaching. Possible contributory factors for this include university funding cuts, lack of resources, new programs being implemented and existing degree programs being taught out (Ashford and Francis 2007) as well as the use which many programs make of sessional teaching staff. Recruiting academic staff with relevant industry experience is also problematic resulting in either staff shortages and / or staff with little industry experience. Salaries in industry far outweigh those in academia further exacerbating this issue. To compound this, graduates prefer to work in industry rather than continue in academia. In this connection, it is pertinent to consider the impact of retirement-triggered vacancies amongst university staff that are likely to occur during the next five years. The future of the disciplines is at risk from severe understaffing. The online survey also

indicated that staff in the *Construction* disciplines are infrequently promoted. Several staff noted a need to concurrently engage in higher degree studies as well as to meet their academic workload.

It was also found that many *Construction* students work whilst studying. This has been explored extensively by Ashford & Francis (2007) and Mills & Ashford (2004) who argue that students currently take on more paid employment than in the past. Working whilst studying has the potential to impact on learning performance. In addition, some students mentioned that they would prefer shorter degrees. Mills and Ashford (2004) found that students could accommodate their work responsibilities whilst studying though students were “unclear about their obligations to the university, and tend to spend less time on tasks that improve their learning experience” (McInnis 2003 cited in Mills and Ashford 2004:197).

REPORT RECOMMENDATIONS

Our final ALTC report contained 14 recommendations. Only some of these are briefly discussed here to address the three challenges highlighted above.

Rationalise and integrate accreditation requirements

Firstly, in regards to improving the balance between industry and academia the report proposes that accreditation processes are streamlined. An approach suggested is the creation of an arrangement between all accreditation bodies, similar to the Washington Accord (a system used for engineering degrees). It is important that any such streamlined accreditation initiative results from a coordinated strategic approach by universities, professional bodies and industry.

Improve communication between industry and academia

Another recommendation highlighted in the report was to ‘improve communication between industry and academia’ to create clear communication channels between the two. To support this recommendation the report suggests that industry practitioners’ involvement with the disciplines be increased, not only as sessional academics, but in curriculum development and renewal. For example, it is suggested that industry practitioners provide up to date knowledge about *Construction* IT applications. The report also recommends an increase in

the number of joint university-industry appointments, an increase in the amount of industry-sponsored programs and short courses, improved academic staff experience of current industry practice and increased financial support and input from industry into academia. Furthermore, it was noted that accreditation generates significant extra workload for staff and that a more streamlined approach would alleviate staff workload.

Address staff shortages for current and future needs

To further address the pressures on staff workload, the report proposes actions to address staff shortages. As mentioned, the *Construction* academic workforce is threatened by students choosing to work in industry rather than in academia. To improve this issue the report proposes that the university sector and the construction industry need to work collaboratively to encourage graduates to enter academia. Some of the responses suggested in this regard were: develop a collaborative approach to provide industry experience to academics, such as a short term industry ‘sabbaticals’ and advertising for industry professionals to teach in the disciplines.

Improve funding of *Construction* education

Another recommendation was to improve funding of *Construction* education, which would result in an increase in staffing and resourcing. It was noted that the current funding differentials between *Construction* and other disciplines are embedded in government models which are outdated and limit the extent to which *Construction* disciplines can reach their research and teaching potential. A suitable funding model needs to be devised and adopted to support the costs of *Construction* education. This would work towards alleviating staff workload pressures. Another recommendation related to staff workload was to ‘adopt strategic approaches to improve promotion rates’. It was found that academic staff workload inhibits promotion prospects as staff do not have time to conduct research. Balancing academic and industry commitments is difficult because staff lose credibility with the industry sector in direct proportion to the length of time they have not been employed in mainstream construction. The response to this issue was seen as attracting high quality staff to university teaching. This needs to be underpinned by attracting high-achieving students into *Construction* programs.

This could be achieved by promoting *Construction* degrees and by emphasizing the contributions of *Construction* professionals to society. In addition, stronger partnerships need to be developed between industry and universities to promote research projects that are industry focussed and improve the research profile of the disciplines.

Balance students' work and study

To address student workload pressures, in particular students working whilst studying, the report recommends students endeavour to achieve a balance between the two. The report suggests further research into this issue in the form of a comprehensive study of the implications of students' workloads. Questions such as 'should the duration of *Construction* programs reduced?' need to be robustly answered. It is suggested that industry needs to take a major role in this study as well as the universities offering *Construction* programs.

Exploit opportunities for work integrated learning (WIL)

The study questions whether working whilst studying compromises students' learning. The report suggests that opportunities for work integrated learning (WIL) be exploited to capitalise on. It was found that there was often little to connect the world of work and university learning. There is potential to develop an online WIL journaling system to map students' university learning against their workplace experiences. Such a system would use current online learning strategies, and align with university programs. This would enable students to relate their learning at university to their industrial placements and / or other paid employment.

The overall theme running through the report's recommendations is to improve industry's involvement with academia. The most vital change needed is to incorporate industry practitioners and experience in the teaching and organization of the disciplines.

CONCLUSION

This paper has introduced an ALTC study which addresses opportunities and challenges for *Construction* disciplines in Australian universities. Trends relating to student enrolments, gender and curriculum structures have been identified.

Challenges were then considered, these being contrasting ideals between industry and academia, academic staff workload and students working whilst studying. This paper then considered some of the recommendations to improve the state of *Construction* education in Australia in relation to the challenges considered. Some of these recommendations included: stronger industry involvement, streamlined accreditation processes, increased resources, promotion of the disciplines to encourage future staff, and a major study into the effects of students working whilst studying. A theme common to each recommendation was industry's lack of connection with academia. Addressing this should pave the way for positive future changes to *Construction* education.

REFERENCES

- Ashford, P. and V. Francis (2007). Creating and implementing new built environmental courses: The challenges and opportunities of the Melbourne model. AUBEA Conference. Swinburne University, Melbourne, Swinburne University.
- Ashford, P. and V. Francis (2007). The impact of working on the satisfaction and engagement of built environment students. AUBEA Swinburne University, Melbourne, Swinburne University. AUBEA 2007, Swinburne University, Melbourne, July 3-5
- 18 of 389
- Ashford, P. and A. Mills (2006). Evaluating the effectiveness of construction site visits as a learning experience for undergraduate students enrolled in a built environment course. In Experience of Learning Proceedings of the 15th Annual Teaching Learning Forum The University of Western Australia, Perth.
- Birch, A., C. Warren, et al. (2005). Course provision in building and quantity surveying for non-cognate graduates. COBRA Conference. Brisbane, Queensland University of Technology.
- Fielden, S. L., M. J. Davidson, et al. (2000). "Women in Construction: The untapped resource." *Construction Management & Economics* 18: 113-121.
- Francis, V., L. Kestle, et al. (2004). Women academics in the built environment - perspectives from Australia and New Zealand. AUBEA 2004 29th Annual Conference 'Higher Education Shaping the Built Environment'. The University of Newcastle, Newcastle Australia, The University of Newcastle.

- Hager, P., S. Crowley, et al. (2001). Challenges for skill formation in evolving industry: The case of the Australian building and construction industry. AARE Conference. University of Technology, Sydney, University of Technology, Sydney.
- Mills, A. and P. Ashford (2004). Full time student and part-time worker: Employment practices of undergraduate students in the built environment courses in Australia. AUBEA 29th Annual Conference 'Higher Education Shaping the Built Environment'. The University of Newcastle, Newcastle Australia, The University of Newcastle.
- NCVER (2000). Australian apprentice and trainee statistics: At a glance 1985 - 1999. Adelaide, National Centre for Vocational Education Research (NCVER).
- Taylor, A. (2004). Entering Industry: A case study of links between a vocational program and the building and construction industry. A. N. T. Authority, NCVER, Edith Cowan University: 1-95.