Built Environment and Design in Australia: Challenges and Opportunities for Professional Education

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***Abstract**: This paper presents the findings of the Australian Learning and Teaching Council funded discipline based initiative study investigating Professional Education in Built Environment and Design (2008 – 2009).*

This project commenced with the aim of scoping the challenges facing Built Environment and Design (BED) Education (including disciplines of civil engineering, construction management, quantity surveying, property economics, urban and regional planning, project management, spatial science, planning, architecture, landscape architecture, interior design and industrial design). Early conversations with a range of stakeholders – academics, professionals and graduates in their early years of practice – quickly clarified that the singular challenge for most parties centres on the ways in which courses prepare graduates for the pace, diversity and flux of contemporary professional practice.

The study proceeded through the collection of qualitative and quantitative data including; literature review, focus groups, national online survey and workshops. This paper will report specifically on the findings of the national survey.

Introduction

In pursuing understanding of the central challenge outlined above, this study has focused on new graduates in BED disciplines by canvassing their views and those of two other major stakeholder groups (academic staff and professional practitioners in the disciplines studied).

A survey was utilised to explore the key challenges facing the built environment and design sectors, identify the role the university, industry and students play in meeting these challenges, and understand how prepared current graduates are for professional practice and what needs to be done to help better prepare students for this transition.

Three specific groups of participants were encouraged to complete an online survey: professionals, academics and final year student/recent graduates. The survey was distributed nationally via the project partners (5 universities, 4 large industry organisations) who forwarded the email and link to the survey to their networks. In addition, professional associations were contacted and asked to distribute the online survey to their membership. A total of 148 respondents completed the survey; professionals (n=61), academics (n=24), and final year students/recent graduates (FYS/RG, n=63).

The preliminary survey findings highlight the disparity between the understandings and expectations of different stakeholders, particularly the relative importance of specific graduate capabilities (e.g., technical skills, critical thought). Our research offers a beginning point for understanding how industry professionals, academics and graduates view the changing nature of professional practice in built environment and design, highlighting challenges and opportunities. For further information regarding

this study, please see Davis, Savage & Miller (2009) for an overview of the focus group findings as well as Savage, Davis & Miller (2009) for a preliminary overview of the project findings.

Background

In Australia, the need for built environment and design professionals is acute given the ongoing investment in infrastructure required to advance economic development and national prosperity. Changing modes of practice require new types of skills and knowledge sets so that graduates are well prepared for emerging practice paradigms. The importance of maintaining skills that are current and relevant on graduation is critical for the mass of recruits entering these disciplines each year. The Employability Skills for the Future report by the Commonwealth of Australia (2002, p. 1) states that *'all young people need a set of personal attributes and skills that will prepare them for both employment and further learning. It is also recognised that the ongoing employability of individuals is dependent on them having a set of relevant skills, as well as a capacity to learn how to learn new things'*. It is also essential that professional education prepares graduates to make sound, ethical (especially in relation to sustainability and globalisation), and technologically appropriate, well-founded decisions on behalf of the community (Sullivan & Rosin, 2008).

There have been numerous studies exploring the links between graduate capabilities from both working and academic contexts, most of which aim to better understand student capabilities, lifelong learning development and transition to work strategies (See for example, ACNielsen Research Services, 2000; Ahearn, Wise, McCann, & Goring, 2005; Askew, 2004; Barrie, 2006; Boles, Murray, Campbell, & Iyer, 2006; Bowden, Hart, King, Trigwell, & Watts, 2000; Commonwealth of Australia, 2002; Davies, Csete, & Poon, 1999; DEEWR, 2008; Duignan, 2002; Frank, 2005; Gibb, 2005; Hargreaves & Boles, 2005; Hutchings, Huber, & Golde, 2007; Johnston & McGregor, 2004; Jolly, 2001; Larkin, McKay, & Angelos, 2005; Love, Haynes, & Irani, 2001; Newport & Elms, 1997; Oliver, Tucker, Jones, & Ferns, 2007; Savage, 2005; and Zou, 2008)**.**

Understanding the learning that occurs during the transition-to-work phase is complex [see also Webster (2006); Williams (2005); and Williams, Ostwald and Fuller (2007)]. There are many competing agendas and so defining them all can be difficult. One major consideration is defining 'work ready' and the notion of lifelong learner versus 'training'[See for example Watson and Howarth (2006)].

The ADBED Review of Australian Higher Education (2008, p. 4) states that *'Professional bodies, through accreditation do not focus on innovation but compliance'*, furthermore:

> It is often noticed that graduate outcomes desired by individuals forming accreditation panels are those most needed for 'work-ready' graduates, able to perform for business in its current state. For universities to maintain their role in the formation of leaders for the emerging Australia, its economies and businesses, the accreditation processes need to maintain a focus on innovation and leadership rather than 'training for work' (Australian Deans of Built Environment and Design, 2008, p. 4).

Complicating the issue further, The Higher Education Council in their report on Professional Education and Credentialism (1996) outlines the difficulties facing universities and professional bodies – when defining the route for professional education.

> In investigating the relationship between academic preparation for professional practice and the full requirements for entry to professions, the Council discovered that representatives from universities and professional bodies often do not have a widely informed understanding of the various routes to practice in their own fields (Higher Education Council, 1996, p. xii).
>
> The interactions between universities and the professional bodies are complex, and their relationships over regulation and accreditation of courses are influenced by industry requirements, student demands, government policy, the regulatory environment, and globalisation (Higher Education Council, 1996, p. 65).

In order to generate a better understanding of what occurs during the transition-out phase from student-learner, to, engaged-professional, a better understanding of specific roles and responsibilities of each stakeholder is required [See also Anderson (1982; 1993) for definitions surrounding cognitive

skills development ie: *'it requires at least 100 hours of learning and practice to acquire any significant cognitive skill to a reasonable degree of proficiency'* (1982, p.369). Also, see Billett (1996) and Billett (2001)]. Furthermore, better defining the relationships between capability development, the context in which they are embedded and the subsequent learning that occurs is needed. The problem with this is that capabilities can vary between disciplines (e.g. technical skills, discipline specific knowledge etc). Literature indicates that better understanding of the specific learning that occurs during the transitional phase (within the first three years of graduation) is necessary.

Methods

Survey Measures

The survey contained six main sections (of questions) covering professional education in built environment and design (BED):

- General demographics
- Graduate Capabilities – Assessment
- Graduate Capabilities – Development
- Importance of Graduate Characteristics
- Demonstration of Graduate Characteristics, and
- Future Challenges for BED

In this instance 'graduate' is defined as a person who has completed a university qualification in a built environment and/or design discipline since 30th June 2005.

Stakeholder perspectives were examined using a survey instrument developed by the researchers. This instrument included questions inspired by relevant literature, including; the ACNielsen Research Services report (2000); Davis, Csete & Poon (1999); Love *et al.* (2001) and Oliver *et al*. (2007).

In all, the lead institutions' (QUT) research team developed the final survey. Through workshops and brainstorming the research team generated a list of desired skills and competencies. A research consultant was employed to oversee the survey development and to provide expert advice and guidance regarding the most appropriate line of questioning to ensure rich, valid qualitative and quantitative data were collected. It was decided that a current standardised method could not be used because this survey did not cater to one specific stakeholder. It was determined that to have greater impact, one survey would be distributed to all stakeholders. Participants would then (within the survey) be directed to subsequent questions based on their demographic profiling (the first section of the survey). It is for this reason that a new survey tool was workshopped, developed, trailed and then implemented. The final survey measures contained questions separated into three sections; Background, Graduate Capabilities and Perspectives.

The majority of questions utilised Likert-scale response categories with several open-ended questions on specific issues. Data were analysed using the Statistical Program for Social Science (SPSS) and Microsoft Excel, with only the key findings presented here.

Survey questions

The survey questions were centred around gathering stakeholder perspectives on a range of issues relating to professional education, particularly aspects of transition to the workplace, graduate capabilities and workplace competence. It was important that the opinions of each stakeholder were reflected within the survey. As a result combinations of closed and open-ended questions were used to gather both qualitative and quantitative data.

Findings

Participants: survey profile

A total of 148 respondents completed the survey; professionals (41.2%), academics (16.2%), and final year students/recent graduates (42.6%). Of this 57.4% were male and 42.6% were female. Table 1 presents an overview of the demographic characteristics of each cohort. It also highlights the differing response rates between academics and other stakeholders. This is an interesting outcome of the study,

however, understanding exactly why there was such a poor response rate from the academic cohort is difficult to define. Another point of difference is that the majority of respondents were from Queensland (43.2%) and New South Wales (41.2%).

The poor response rate from academics and the predominance of participants from QLD and NSW – should be considered when reading the data. It is important to note that all project partners including; participating universities and industry partners, were contacted equally and forwarded the survey details (via email) and requested to forward this onto final year students, recent graduates as well as any other networks and associations relevant to BED disciplines.

Table 1: Demographic characteristics of each cohort

	Professionals (n=61)	Academics (n=24)	Final year students (n=29)	Recent Graduates (n=34)
Average Age	35.1 yrs	42.3 yrs	25.7 yrs	25.6
Gender:				
Male	68.9%	50.0%	44.8%	52.9%
Female	31.1%	50.0%	55.2%	47.1%
Discipline (current)				
Quantity Surveying	8.2%	0%	6.9%	0%
Construction Management	3.3%	0%	6.9%	2.9%
Project Management	14.8%	0%	3.4%	11.8%
Property Economics	3.3%	8.3%	13.8%	2.9%
Spatial Science	0%	4.2%	0%	0%
Planning	14.8%	4.2%	10.3%	11.8%
Civil Engineering	4.9%	12.5%	3.4%	0%
Architecture	11.5%	25.0%	24.1%	23.5%
Interior Design	1.6%	12.5%	6.9%	11.8%
Industrial Design	13.1%	12.5%	13.8%	11.8%
Landscape Architecture	4.9%	4.2%	3.4%	0%
Other	19.7%	16.6%	6.9%	23.5%

Table 2 provides a summary of the main findings of each domain (and subsequent individual assessment item). This table underscores the alignment between professionals and FYS/RG regarding their views of graduate technical skills. It also shows the contrast in opinion from the academic cohort, particularly in relation to Domain 2, Personal Characteristics. In this instance, it is important to note that the academics that responded are critical of graduates' ability to work hard, learn new things and work in teams.

Interestingly, the response from the FYS/RG cohort indicates they are relatively self-assured of their ability to engage in Workplace skills. Contrastingly, professionals and academics expressed concern toward graduates' ability to understand broad commercial realities.

Table 2: Key findings of each assessment item

Key Domain	Individual assessment items (n=21)	Key findings
Domain 1: Technical Skills 2 items	1. Technically capable 2. Skills and knowledge in their field	• Professionals and FYS/RG are fairly aligned in their views regarding the performance of graduates technically
Domain 2: Personal Characteristics 8 items	3. Ambitious 4. Prepared to work hard 5. Mature 6. Articulate 7. Ability to learn new things 8. Tolerance of others 9. Ability to present well 10. Ability to work well in a team	• FYS/RG self rated their performance above that of professional and academic perspectives • Academics were more critical of graduate performance regarding ambition, prepared to work hard, ability to learn new things and ability to work well in a team

Table 2: Key findings of each assessment item (continued from page 4)

Key Domain	Individual assessment items (n=21)	Key findings
Domain 3: Workplace Skills 5 items	11. Ethics and corporate responsibility 12. Practical approach in a work environment 13. Ability to work autonomously 14. Flexible to a variety of work situations 15. Productive from day one	• Discrepancies regarding graduate performance and workplace skills were relatively minor across each stakeholder • FYS/RG self assessed their capabilities higher than that of academic or professional perspectives • Academic and professional perspectives regarding workplace skill performance were relatively on par • *Productive from day one*, overall academics believe graduates perform slightly below average on this item
Domain 4: Professional Skills 6 items	16. Research 17. Information literacy and computing 18. Critical and conceptual thinking 19. Analysis and problem solving 20. Broad understanding of commercial realities 21. Communication	• Professionals believe graduates perform very well in information literacy and computing • Professionals and academics were equally concerned about graduates performance regarding – broad understanding of commercial realities

Future Challenges for Built Environment and Design

Participants were provided with six challenges for the future of built environment and design education (this included an 'other' category) and were asked to indicate whether they thought each was a challenge (yes/no). Participants were able to select more than one 'challenge'.

In terms of future challenges for BED, there was general agreement that the greatest challenge is the need to work across discipline boundaries (71.6%)**,** as illustrated in Figure 1. Second to this – the rapid pace and chance of technologies (65.5%), engaging students (51.4%), followed by fluidity of the labour market (37.8%), preparing students to work globally (35.8%) and the changing context of the higher education sector (27.7%). The final category 'other' consisted of a variety of suggestions from participants including *"Practical experience", "Sustainability and limited availability to resources", "Teaching students to think critically*", through to *"Balancing privatisation/ market forces with quality education"*.

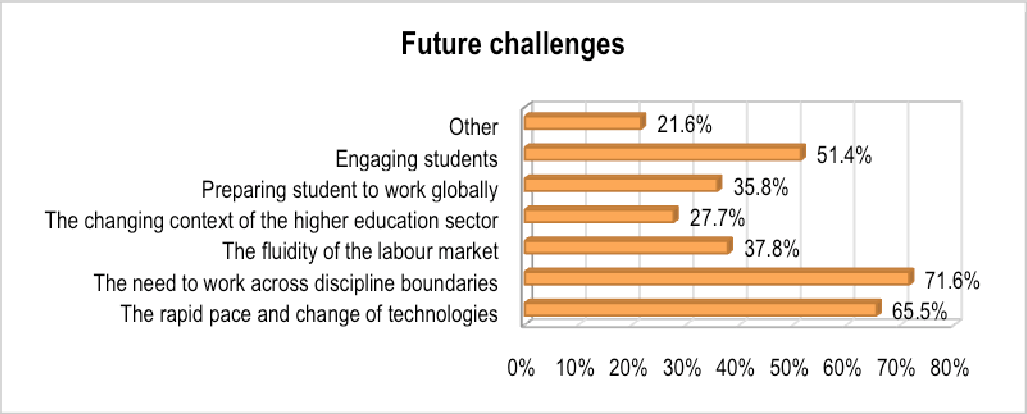

Figure 1: Future challenges for Built Environment and Design disciplines

Finally, participants were asked to indicate on a 5-point Likert scale, their confidence regarding university programs ability to prepare graduates for the first three years of working life. As illustrated in Figure 2, over a third (34.3%) of participants indicated they were Very or Somewhat confident; and a further 32.9% are Moderately confident.

Interestingly, over a quarter (32.9%) of participants express Little to No confidence in university programs regarding graduate preparedness. Further exploration of the survey data revels the participant profile of this cohort (n=48) to be predominantly design-based disciplines such as Architecture (33.3%), Industrial Design (16.7%) and Interior design (12.5%), followed closely by

Planning (12.5%) and Quantity Surveying (6.2%). Of particular interest is that of the 48 respondents who expressed Little to No confidence in academic programs – almost half (48%) of these were from the FYS/RG cohort, followed by Professionals (37.5%) and Academics (14.5%). Considering the poor response rate from the academic cohort, it is difficult to generalise their views from the data.

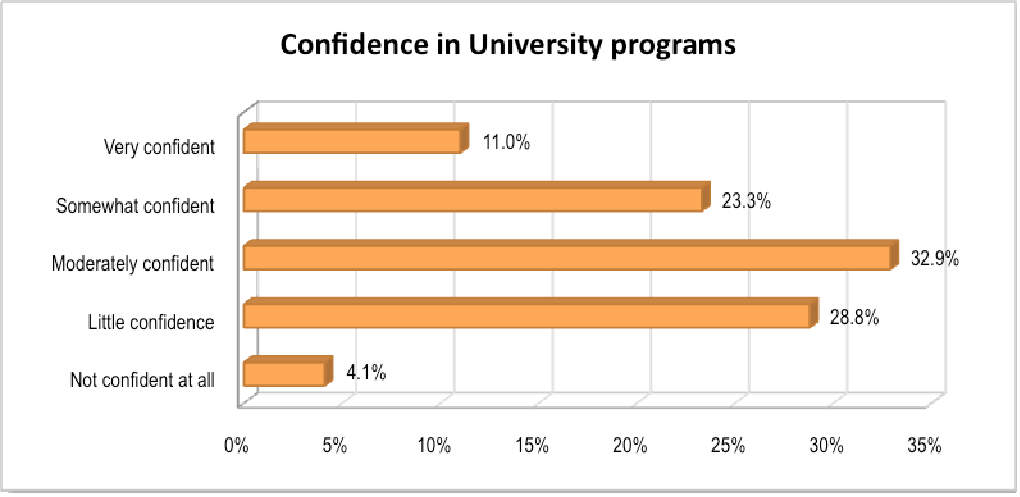

Figure 2: Confidence in University programs

Conclusion

In conclusion, it is clear that there is concern surrounding the confidence in capacity of universities to meet the needs of graduates (Figure 2). This is a particular concern, considering that participants' believe the majority of characteristics measured (76%) are developed at university. This means it is generally agreed upon by all that university plays a crucial role in ensuring graduates develop lifelong learning skills and attributes.

The survey findings indicate the importance of stakeholder expectations, roles and responsibilities in respect of the transition-to-work experience. Whilst full agreement about how these things should occur is not necessary, a process (amongst stakeholders) which seeks value alignment around transition through discussion, debate and agenda-setting would probably assist to address what is seen as a major challenge in built environment and deign education.

There is a great deal to be gained by establishing and nurturing the conversation about transitions-to-work and to use the resultant agreements and tensions to shape the outcomes of courses and the ways in which the professions meet graduates on entry.

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