# Talking to practitioners about their graduate hiring practices: How highly are technical skills valued?

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ABSTRACT: This paper reports on a study, which engages with important questions around whether the current educational focus within architecture schools is leading to a productive interface with industry.

More than 20 architectural practices around Australia, private and public, large, medium and small, who hired architectural graduates, were asked what they prioritised in the evaluation of graduates for employment. The study used the Commonwealth of Australia's employability skills list as a starting point, and a simplified summary of the published Graduate Attributes derived from the seventeen Schools of Architecture in Australia. A set of questions was compiled designed to elicit standard responses from potential employers of graduates during semi-structured interviews.

The study is nested within larger studies, such as that funded by the ALTC, who examined the transition of Built Environment and Design graduates from University to the Workplace from the perspective of graduates, employers and academics. This study has narrowed its scope and conclusions to elicit a clearer understanding of how highly architecture graduates' employers rate (from completely unimportant to critically important) various skills in hiring graduates. The paper reports on just one aspect of that research - the degree to which employers value graduates' technical skills.

Keywords: evaluation, graduate attributes, technical skills, graduates, employability

## INTRODUCTION

### Graduate Attributes

Many universities are addressing the importance of employability skills through their graduate attributes (Nair, Patil and Mertova, 2009, 132). But what are graduate attributes? The "West Review in 1998, (DEETYA 1998)...provided a framework of generic attributes that ideally every graduate should have" and that "analysis of graduate attributes from a significant number of universities shows that employability skills, as outlined in the Employability Skills Framework [(DEST, 2002A)], may reasonably be seen as a subset of graduate attributes" (Precision, 2007:2). The ATN universities agreed that graduate attributes are "the qualities, skills and understanding a university community agrees its students should develop during their time with the institution and consequently, shape the contribution they are able to make to their profession and as a citizen" (Bowden, Hart, King and Trigwell, 2002).

### Employability – General

Why is employability so important to Universities? Hesketh (2000:246) writes, concerning employers' perceptions of graduate education and training (in the UK context) "[a] primary purpose of higher education is to prepare students for the world of work eight…[t]his assertion…lacks no support in government, industrial or even student circles… recent research investigating industry's satisfaction with graduates suggests all is not well…employer dissatisfaction with the attributes of the individuals they recruit from our universities cannot be ignored…"

This question is answered in the Australian context by DEEWR (2002) in Franz (2008:165): "employability skills are the skills required to not only to gain employment but also to progress within an enterprise so as to achieve one's potential and contribute successfully to enterprise strategic directions… Systems currently in place [such as CEQs] hold universities accountable for their graduates' success in gaining employment" .

At the broadest Australian level, the Graduate Employability Skills Report, (Precision, 2007) prepared for the Business, Industry and Higher Education Council, presented the findings of a research consultancy which investigated how Universities develop and integrate employability skills into their programs of study; how Universities teach and assess employability skills, and how graduate employability skills might be assessed and reported on (Precision, 2007). Precision reflects that the Employability Skills Framework (DEST, 2002A) of "communication, team work, problem solving, self management, planning and organizing, technology, lifelong learning, and [creative]

initiative and enterprise" are still seen as highly relevant to the needs of industry in 2007. "Broadly speaking industry representatives are satisfied with the technical or discipline-specific skills of graduates, but for some there is a perception that employability skills are underdeveloped.  Some employers believe that universities are providing students with a strong knowledge base but without the ability to intelligently apply that knowledge in the work setting" (p.2).

Precision (2007:35) report on the LSAY (ACER 2005) (longitudinal survey of Australian youth) which comprises 1995 and 1998 Yr 9 cohorts surveyed in 2005 (when respondents were respectively 25 and 22 years old) about their employability skills (eligibility for this part of the survey hinged on whether they had completed a degree or honours degree in the previous 12 months).

> The proportion of respondents saying that the university course prepared then well or very well for the employability skills was lower than the proportion saying that these skills were important/ very important for all employability skills.  The average gap was just under seven percentage points for the younger cohort but over 11 percentage points for the older cohort. For the 1995 cohort, the gap was largest for teamwork, communication and planning/ organization.  For the 1998 cohort the disparity was greatest for communication, initiative and creativity and technology skills. The data indicates that employability skills are seen by graduates as highly relevant to their roles and that on the whole they believe that universities provided them with the skills they needed although slightly less so for the older cohort. (Precision 2007:36).

Precision (2007) conclude that Universities and industry, working together, can improve graduates' employability through a wide range of strategies, including improving and increasing access to Work Integrated Learning (WIL); enhancing the teaching and assessment of employability skills; and encouraging businesses to provide structured cadetships (pp. 47-59). They conclude further that through "increasing opportunities for business and higher education to work together to identify, promote, teach, assess and report employability skills" better outcomes would be experienced for all (p.5).

## 1.      EMPLOYABILITY – ARCHITECTURE GRADUATES

A literature review revealed no specific literature published about Australian architecture graduates' employer's recruitment practices. However, there is a modest literature concerning architecture graduates' employability, with again the benefits of work integrated learning (WIL) being uppermost in many author's minds.

Franz (2008:165) from QUT, Faculty of Built Environment and Engineering, posits that WIL provides an opportunity to marry hard and soft skills – graduate attributes and employability attributes.
> While work placements [also] provide students with the opportunity to learn 'academic' substantive and procedural knowledge (theory of structures, for instance, or the process of design) this substantive or procedural learning happens in  a context (physical, cultural and experiential) that affords,  even necessitates, other forms of learning not available or possible in a non-practice environment .

Savage (2005) also defends the role of WIL in developing graduate attributes, saying that the origins of institutionalised learning, as opposed to learning-on-the-job derived from the "belief emerging in the 19th century that universities taught the knowledge (the theory) that was later applied in practice… in the process denying, or at the very least, devaluing the role of practice as a learning environment" (Savage, 2005 in Franz, 2008: 166). Moreover Savage (2005:4) contends that "[P]practice knowledge is situated". "[I]n practice, knowledge is 'made' in offices, on building sites, a drawing boards and in consultation with clients, other professionals and statutory authorities". She advocates "[c]ritical engagement with practice… will add to the store of knowledge that a novice can acquire prior to graduation".

Savage, Davis and Miller (2009:3, 12-14) explored the transition of Built Environment and Design graduates from University to the workplace from the perspective of graduates, employers and academics in a 2007 ALTC funded study. "This study found that graduates and employers generally agree on the importance of a set of general skills" and that of these skills 16 of the 21 were "directly attributed as University developed characteristics. [T]hese 16 items include: Flexible to a variety of work situations, prepared to work hard, ability to learn new things, ability to work autonomously, ability to present well, tolerance of others, ethics and corporate responsibility, articulate, technically capable, ability to work in a team, skills and knowledge in their field, critical and conceptual thinking, analysis and problem solving, Information literacy and computing, communication, and finally research". Of critical importance is the belief of respondents that whilst "most of the capabilities should be developed at University (76%) versus the Workplace (14%) and Self developed (10%)… University plays a crucial role in ensuring graduates develop lifelong learning skills and attributes that can carry them onto a long a fruitful career, however, professionals and students [surveyed] feel universities are *not* doing enough to ensure this development occurs" .

Other papers which discuss architecture students' employability include Drake, Williams and Kingsland (2003). They argue that Cowdroy (1990) found in his commissioned research into architecture graduates aptitude for practice, that

"higher and more consistent skills at entry are required in Architectural Practice, Technical Draughting, Graphic Presentation and Construction and that there was no consensus between graduates, practitioners or employers and the Schools of Architecture as to the skills required of a recent graduate" (Drake, Williams and Kingsland, 2003:1). In their view, nothing had changed, in the intervening 13 years, with schools unable to state what skills their architecture graduates possess, and employers dissatisfied with the graduates they employ.

> It still appears imperative to recognise the shortcomings of schools in being able to convey clear, concise, and honest accounts of their objectives and strategies, to the employers and graduates, as identified by Cowdroy. Without this clarity and conciseness the employers of graduates will not to know what to expect of graduates and graduates will continue to experience unsatisfactory commencements to their professional careers. In order to recognise their shortcomings schools need feedback from surveys of recent graduates. They may then be better able to develop a definitive description of graduate attributes (or a graduate profile) that can be agreed on by academia and the profession so that universities can specifically address the requirements of new graduates entering the profession. (Drake, Williams and Kingsland, 2003: 8)

Williamson (2008:608) concurs:

> Unfortunately the needs of the architectural practitioners and the objectives of architectural education do not always coincide. The academics aim to prepare architectural students for the broader perspective of life in the profession by developing students' graduate capabilities and lifelong learning skills to enable the students to survive and adapt to changing circumstances. On the other hand practitioners are currently giving preference to students and graduates who already possess the practical skills to work immediately on projects.

Johnson (1997) posited the same thesis 10 years previously - that architectural education focuses on a very singular view of what an architect is - "a design architect, preferably working in her/his own architectural practice, designing buildings with 'poetics'… Thus is the architect's sphere of influence is relegated to the areas of the superficial. Thus is the architect's position in society marginalised. " (p.5). His belief was that education needed to be restructured to focus on student problem solving, not the teaching of information (p. 11).

Savage, Davis and Miller (2009) reveal that in the intervening years 1997 – 2009 the gap has not closed between the heterogeneous views of stakeholders in built environment education about whose responsibility it really is to deliver a well rounded graduate to industry. Their study articulates some of the differences between professionals, academics and final year students'/recent graduates' viewpoints. It reveals that academics ranked graduate performance lower than did professionals or final year students/recent graduates across 5 domains – productive from day one; ambitious; prepared to work hard; technically capable and [capability with] information literacy and computing (pp.9-10). "Nor do professionals feel the standard maintained by universities is high enough or equal to the standards expected in industry. Academics on the other hand cite time, resources constraints as well as changing paradigms in University priority structures to be critical aspects affecting their ability to effectively engage. Students and academics, whilst they cited differing reasons, overall feel it is important for industry to contribute more to assist with the learning process and in particular aid the transition-to-work process." (p. 14) Whitman, in Wallis, Whitman and Savage (2005: 34) concurs, stating that "[T]the cooperative education model necessitates a closer relationship between the academy and practice. In a traditional full time mode of education, practitioners simply inherit students once the academy has completed their education".

Many authors cited believe that this failure to bring practice and the academy together contributes to the gap between the expectations of practice, and the reality of outcomes from university education.If practices could understand more about what happened in the curriculum (Swift and Shannon, 2010) and universitites could understand more about what practices are looking for in a graduate through qualitiative investigations such as in Savage, Davis and Miller (2009) and this piece of research, there would potentially be less of a gap and greater satisfaction amongst all stakeholders.

## 2.    GOVERNMENT VIEW OF GRADUATE ATTRIBUTES

What is the official Commonwealth of Australia view of graduate skills in the built environment field and their view of the personal attributes possessed by those best suited to these occupations? Written for an audience of Year 10 students, the Australian "Job Guide provides an in-depth look at a range of occupations, and their education and training pathways. It also gives useful information about how to work out what occupations suit you best, based on your interests and abilities" (DEEWR 2010). The information confirms the US perspective (National Centre for O*net Development) in reiterating the "Personal Requirements" for the occupation "Architects" are:
- enjoy design
- creative flair
- able to analyse problems logically
- good communication skills.

The more generic information available on the Australian Government Skills Info website (Australian Government, 2010) extends the views cited by other academic authors, suggesting personal attributes are also important.

Employers consider that employability skills are as important as job-specific or technical skills. Employers will seek those employability skills that are most important to their business and will choose workers who are strong in these areas – leading to improved matching of jobs and job seekers, better job satisfaction and more productive enterprises.

There are two facets to employability skills: 'generic' skills and 'personal' attributes (for example, loyalty, enthusiasm. motivation and sense of humour).

The key generic skills identified, and how they contribute to the enterprise, are:
- Communication - productive and harmonious relations between employees and customers;
- Team work - productive working relationships and outcomes;
- Problem-solving - productive enterprise outcomes;
- Initiative/enterprise - innovative ideas and outcomes;
- Planning and organisation - long-term and short-term strategic planning for the enterprise;
- Self-management - employee satisfaction and growth;
- Learning - improvement and expansion in employee and company operations and outcomes;
- Technology - more effective work practices. (Australian Government 2010)

This generic skills list is the same as that developed by the Cutler Review (DEST 2002a) and continued to be valid in 2007 (Precision, 2007, 2). However, recognition of the valid teaching of these employability skills is not unproblematic in the field of architectural education, with Forsyth stating that an

important indicator of excellence for the Government is the …(CEQ) on the perception of the achievement of generic skills. In the CEQ all recent graduates are asked to rank their satisfaction with their course or program in terms of the imparting analytical, communication, problem-solving, teamwork skills etc… Evidence from Britain as well as Australia shows, however, that graduates have difficulty in recognising these life skills [analysis, communication, problem-solving, team work] in their fine arts and design tertiary education (Forsyth, 2007: 3).

Johnston (1997) concurred, noting that in the first 3 years of CEQs, Architecture graduates recorded the lowest satisfaction rating with their course experience "of all graduates in all discipline areas…this seems to be saying that all is not well in architectural education and that there may be a fundamental mismatch between the objectives of architecture schools and the objectives and aspirations of architecture students" (Johnston, 1997:2).

The development of the generic skills' subset of employability skills is an aspect of graduate attributes architecture education providers are addressing throughout Australia, at least in theory, if their graduate attributes listings are to be accepted at face value, although none have either expressed personal qualities as employability skills on their University Graduate Attributes website listing, nor professed to be able to develop, assess or warrant these personal qualities in their graduates. Is that important for architecture graduates? It does seem that may be the case from employers' perspectives. Cowdroy (1990:23) reported that personality problems are consistently referred to by graduates, employers and personnel consultants as "the primary cause of dissatisfaction with individual graduates. Graduates and students often referred to personality problems as the primary cause of dissatisfaction with the office". The University of New England (UNE, 2009) may offer a way forward "[W]here personal attributes and values cannot be certified (Clanchy and Ballard 1995), course objectives and teaching activities will demonstrate that students have been exposed to a broad range of perspectives, codes of conduct for the relevant profession, or role modelling."

The gap identified in the literature for this larger research study (Shannon, 2010) is in determining the contemporary recruitment behaviours of practices which hire M Arch (formerly B Arch) graduates with respect to how they prioritise the employability skills of graduates (so called "soft skills") and graduate attributes of the graduate (so called "discipline area skills"). This paper reports on only one of the graduate attributes – the importance of a graduate's technical skills to employers.

## 3.    METHOD

The research design involved four aspects. The first was conducting a literature review of existing published knowledge about Architecture graduate employer's recruitment practices, and more generally practices in the recruitment of graduates from professional Schools. It looked into desirable graduate attributes to ascertain themes for grounded theory analysis which could be translated to a questionnaire. This literature review is reported in the Introduction to this paper. The second was evaluating any published recruitment information available for Australian Architectural practices and public service employers of graduates. This literature review is also reported in the Introduction to this paper. The third was evaluating the published Graduate Attributes for Schools of Architecture in Australia to ascertain what Schools aspire to produce in a M Arch graduate. This drove the Quesrtionnaire which was used in the surveying. The fourth was conducting 21 structured interviews with the HR manager, or partner/associate responsible for recruitment at 21 large, medium sized and small architectural practices in Australian cities and regional centres (Perth, Adelaide, Sydney) as well as regional SA, Tas and NSW. The public service was included

through the personnel department or public servant responsible for selection of M Arch graduates during graduate recruitment in two departmentd of the State public service in SA.

All practices which responded to the invitation for an interview, and who employed graduates, were included in the results. The interviews were all conducted by telephone, by the researcher, during 2009, and took between 15-30 minutes. Human Research Ethics Committee approval was obtained for this research.

The employment or recruitment factors to be explored in the structured questionnaire (which was administered during the telephone interview) were determined by the results of the literature review (from the literature up grounded theory approach (Strauss and Corbin, 1997)). The questionnaire employed a 5 point Likert scale to ascertain the importance of each of the factors. The open ended results were themed and reported.

### 3.1    Limitations to the study

The two major limitations are (a) the number of practices interviewed – ideally would be in the hundreds to remove any inadvertent respondent bias due to the sample size, and (b) the length of the study – ideally would be longitudinal - conducted over several years to isolate the bias of a particular crop of graduates on a practice, or economic hard times being reflected in aspects of employability.

That said, regarding (a) the sampling was discontinued when no new data was being uncovered, and (b), the respondents generally commented that their response reflected their position over a number of years or even decades of graduate hiring.

## 4.    RESULTS

In this section, results for the extent to which employers of graduates differently valued the importance of the three discipline area skills, common to all M Arch Programs' Graduate Attributes, are reported. These M Arch discipline area skills were the third topic to be explored in the semi-structured interviews. First the demographic data for the firm was gathered (how many staff) then whether they recruited graduates. The interview was generally terminated if they did not employ M Arch (formerly B Arch) graduates, although some firms generally did employ M Arch graduates, but were not at that stage due to the impact of the Global Financial Crisis. Interviewees were asked from which Universities they recruited their graduates. Exploring the importance recruiters placed in the institution of study, the curriculum of that institution, the academic achievement of the graduate vs the on the job experience of the graduate, and the portfolio of the graduate came next. The swag of employability skills, from the Commonwealth and common to all Universities Graduate Attributes were next explored for their prioritisation in recruitment with the firms. Only then were enquiries made about the specific discipline area skills - design skills, technical skills and representation with Computer Aided Modelling (CAD) skills. Finally respondents were asked whether there were other comments they wished to make on the recruitment process. This section of the interviews is also reported in this paper.

Results (Table 1) were derived by determining the mean of the respondents' scores for each of three questions – "Thinking about a 5 point Likert Scale, where 1 = not important at all, 2= unimportant; 3 = neither important nor unimportant; 4 = important and 5 = critically important,
1.      How highly do you prioritise Design skills?
2.      How highly do you prioritise Technical Skills (by which we mean the ability to put a building together – constructability and detailing)? and
3.      How highly do you prioritise CAD Skills?"

**Table 1: OVERALL How highly do you prioritise key discipline area skills in recruitment?**

| Graduate attributes – Discipline Area Skills | | Mean 5 point Likert scale where 1= not important at all and 5=critically important |
|---|---|---|
| 1. | Representation - CAD Skills | 4.4 |
| 2. | Technical | 4 |
| 3. | Design | 3.9 |

## 5.    DISCUSSION

On average, respondents believed that technical skills were marginally more important than design skills, whereas the perceived wisdom in some Schools, through literature (eg Johnson, 1997) and the amount of coursework time devoted to them, is that Design and Representation skills are the skills critical to graduates. Employers, from a wide range of practices, and practice sizes, highly prioritise the demonstration of sound technical skills in graduate recruitment, at least equally with design skills. Respondents rated CAD Skills as more important than technical or design skills in graduate employment.

To unpack the data further, respondents from the largest private firms interviewed, with national and international profiles, and hundreds of employees, rated CAD Skills more highly than design skills and technical skills. One interviewee from this group (largest private firms of > 50 employees) responded: "We look for people with very strong graphics and communication skills, and if they don't understand anything [here technical skills were referred to], they must be very active in asking."

Another interviewee from this group (largest private firms) held the same view point:

> We expect to teach them [design and technical skills – they need to] express to us "We need to learn". [CAD is] inevitably what first year grads will be doing for 5 years. [We need them to be familiar with the] CAD platform relevant to the industry.

However one government area rated all the three graduate discipline area attributes as a 5 –critically important. Another government area said that they rated CAD skills as vital (4/5) along with technical skills (also a 4/5) and design skills as a lower 3. That was because their department's "preoccupation is risk and project management".

Interviewees from the medium sized firms (20 – 50 staff) held slightly different perspectives, with one employer equally valuing CAD Skills along with Design and Technical skills, whereas another was looking to develop technical skills within the firm:

> [My responses to the importance of these three skills] are probably equal. We employ all types of graduates. I am seeking to develop graduates – to run the grads – everyone has to learn to do everything. We look for people who are well rounded – not hopeless in one area. The nature of our business is that you can't have everyone wanting to be the person out the front. [I] can't teach attitudes – but I am looking for openness, willing to learn, ready to learn. If someone has the right attitude…

Another interviewee:
> I would give Design a 4, Technical a 2 and CAD Skills a 4. We look for grads who appear to have good design skills. My view of the learning institution is I want them to be design oriented, not technically oriented. [I] wouldn't employ a graduate who had excellent technical skills but not design skills. [They need] total exposure to design. If they have good design skills, we can develop the other attributes, and turn them into competent architects. [We] look to retain them for 10-15 years.

Smaller employers (less than 20 staff) need to recruit carefully, to suit their practices' exact needs now and for the future as they are often unable to share the work between several employees having different strengths in design, technical or representation skills: "[they need to be] in a smaller firm – good at a whole lot of things". Other employers stated that they carefully match the prospective employees', or graduates' skills to the philosophy of their office – particularly for offices which have a sustainability focus.

The relative importance of technical skills is shown for the thirteen small practices (Table 2). Representation remains the most desirable hiring attribute over all small practices, followed by technical skills and design skills.

**Table 2: SMALLER FIRMS How highly do you prioritise key discipline area skills in recruitment?**

| | Graduate attributes – Discipline Area Skills | Mean<br>5 point Likert scale where 1= not important at all and 5=critically important |
|---|---|---|
| 1. | Representation - CAD Skills | 4.69 |
| 2. | Technical | 3.94 |
| 3. | Design | 3.88 |

Summarising the employer perspective of small practices was the view that graduates needed to be job-ready with the understanding of how to convert theoretical design knowledge to technical outcomes (from an employer who rated technical skills a 4.5-5):

> I think that the practical experience as part of a course is very important in delivering a graduate – they can't be carried – [they must] produce work to justify their salary. Documentation skills – we're not teaching a graduate of a theoretical design school how to apply that knowledge. It's important they come here knowing how to apply it.

Further, from another employer about the critical importance of technical skills (which he rated a 5): [graduates must be able to] "demonstrate how buildings go together – [they] tend only to pick that up in the first 5 years" [in their education]. Another employer, who rated technical skills as a 4 (important), stated that possibly this skill was best developed in practice "[my expectation is] basic, but I wouldn't be expecting anything beyond what they've been taught at Uni". Another employer said that he rated technical skills as a 4, as his realistic expectation, and that is what he wants, (and is not getting), concurring with another employer thousands of kilometres away, stating that in terms

of technical skills "I wish for more than I ever get". A senior member of the profession said in regards to technical skills, that "these days [it's] critical – the potential to be developed – as opposed to just possessed by a graduate'. And from another "technical skills are an essential understanding".

One employer reflected upon sustainability, and how to develop and detail a design for sustainability (which was the focus of the responses from three small employers, whose practices are renowned for this type of commission)

> Construction and technical understanding is a 4. Sustainability is a key recruitment feature- [graduates must possess] both interest and desire. People who come out of the University with any sort of greenness about them often were not overly endowed with a knowledge of how to translate that into building – they need to have a passion to learn about translating this passion into constructability.

Importantly, whilst the means for design and technical skills were almost equivalent for the smaller practices as for the overall practice scores, the mean for CAD skills at 4.7 was higher than the overall 4.4. What this implies is that as well as understanding how to design and put buildings together, graduates employed in smaller practices must also be able to represent and communicate that building themselves, whereas in larger practices possibly more specialised representation staff are employed.

## CONCLUSIONS

The capacity to translate design ideas into constructability is at the heart of employers rating the importance of technical skills as equal to and for some, even higher than design skills, so that, when ratings are taken overall, from employers of all size practices, the importance of technical skilling is slightly more important in their hiring, than the importance of design skills. That is not necessarily the case for larger practices (> 50 employees), or mid-sized practices (20-50 employees) where more specialised staff can be employed, and fully deployed in their area of specialisation. But as there are more small practices, and sole practices in Australia than any other sort of practice, in these practices, the design work tends to be done either by the principal or a designated employee, with possibly by the same people who do the more technical aspects of documentation, as well as produce the drawings and technical documentation, also designing. Therefore broader skill sets are demanded by employers in small practices, and the competence with technical skills is emphasized

In conclusion, how highly are technical skills valued by employers of graduates of M Architecture (formerly B Architecture) degrees? The short answer: very highly – with the mean response from employers being 4 on a Likert scale = important. Technical skills are valued marginally more importantly than design skills, and overall only the graduate candidate's CAD (representation) skills are valued as being more important in evaluating graduates for employment at graduation. To discount the importance of technical skills in an architectural education is to deny graduates the broadest range of post graduation employment opportunities.

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