Transitioning into Professional Practice: The Employer Perspective

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CONTEXT
Employers recognise that universities cannot teach students everything that is required to work and to succeed in the workplace. Entry-level engineering positions are seen to be a learning experience and formal and informal methods are used to aid graduates to transition into their professional careers. Some organisations spend significant amounts of time and resources on formal Graduate Development Programs. These Programs appear to be standalone initiatives arranged by each individual organisation. Literature on the training and development that occur in the workplace is scarce and little is known about the purpose of these Programs.

PURPOSE
This paper investigates industry Graduate Development Programs, presenting new insight into the competencies employers seek and perceive to be important for graduate success, areas they observe graduates being unprepared in, and the purpose for which they offer their Program. This research provides unique insight into the views of employers who have the privilege of shortlisting and recruiting high ranking graduates as part of their highly competitive Programs. It adds new insight into the competencies expected of graduates, areas in which even the-best-of-the-best of graduates are unprepared for the workplace, providing insight into areas to be addressed at the university level.

APPROACH
Data collection involved a two-stage process of initial document analysis followed by semi-structured interviews with industry personnel. Interviews were conducted with eleven graduate development program managers and professionals from seven organisations that recruit engineering graduates as part of a formal Graduate Development Program. The data was managed and coded on NVivo and evaluated using thematic analyses.

RESULTS
Employers seek graduates with excellent communication skills, the ability to learn and research on the job, and skills such as leadership, project management, time management and teamwork. Personal attributes such as resilience and an interest and passion for the industry are also highly sought after. Graduates go through a learning curve as they transition from the educational context into the reality of the work environment. This is not only in relation to learning the specifics of the organisation, as one would expect. Even across different industry sectors, Graduate Development Programs have similar structures and initiatives and exist to provide the support and structure required by graduates to successfully transition into their respective organisations and professional careers; to develop the future leaders of the organisation from the bottom up; and, to formally integrate graduates into the organisation; thus, providing confidence to graduates for their new role and assurance for employers.

CONCLUSIONS
A disconnection exists between university education and its practicality in the workplace. High academic results are not seen to be a key decider in the selection of graduates and emphasis is placed on the importance of communication skills and the ability to learn on the job. Key gaps are evident in graduates' knowledge of the context of engineering and of the profession, and the lack of practical experience. Graduate Development Programs exist to close this gap by recognising the need for graduates to have development opportunities and guidance if they are to successfully and effectively transition into both the workplace and their profession.

KEYWORDS
Engineering Industry, Graduate Development Program, Entry-level, Transition.

Introduction

The prospect of employment upon graduation of a professionally qualified degree and the establishment of a career path are key reasons for which universities exist and for which students attend universities. Commentary given by universities in this area include being 'transformed into a highly sought-after professional across industries, cultures and continents' (Monash University, 2016), being given the 'theoretic and practical knowledge and skills for professional work' (RMIT University, 2016), being given the 'confidence and skills to apply knowledge to the workplace' (Swinburne University, 2016) and 'entering the engineering profession at an advanced level with the ideal combination of technical, analytical and interpersonal skills' (University of Melbourne, 2012); the list of career opportunities and career outcomes are also endless. Each of these statements reflects a multi-dimensional view of the education, not simply restricted to the 'theoretical' aspect of engineering, recognising that the role of an engineer transcends technical knowledge and problem solving skills.

This notion is formally encoded by the accrediting body, Engineers Australia (EA), in the Stage 1 Competency Standards for the Professional Engineer, which describes the competencies that 'must be demonstrated by engineering graduates at the point of entry into the profession'. These include knowledge and skill base, engineering application abilities, and professional skills, values and attitudes (Engineers Australia (EA), 2016). Skill gaps are, nevertheless, often highlighted by employers, graduates and experienced engineers and there exists a mismatch between the graduate attributes developed at university and those required in industry (Patil, 2005; Nair, Patil, and Mertova, 2009).

Employers do recognise that universities cannot teach students everything that is required to work and succeed in the workplace and entry-level engineering positions are seen to be a learning and development experience (Katz, 2007). Some organisations also spend significant amounts of time and resources each year on formal Graduate Development Programs which offer formal and informal frameworks and methods to aid graduates to transition to the workplace. These programs are common, yet appear to be standalone initiatives arranged by individual organisations. Little research exists as to the purpose and structure of these programs (Connor and Shaw, 2008) and the transformation that occurs as graduate engineers transition from the educational context into the workplace and into their professional careers.

This paper reviews industry Graduate Development Programs, presenting new insight into employer perceptions of highly sought after graduate characteristics, areas in which they see gaps, and the purpose for which they offer their Program. This paper goes beyond current literature by investigating how graduates are supported beyond tertiary education and evaluating the perceptions of employers who have the unique opportunity of shortlisting and selecting high ranking applicants as part of their competitive recruitment process into their Graduate Development Program.

Methodology

Data collection involved a two-stage process of document analysis followed by semi-structured interviews. Recruitment directories were used to shortlist organisations that offer a Graduate Development Program for which graduates of undergraduate engineering degrees are eligible. With 92% of employers using their organisational website to promote their Graduate Program (Graduate Careers Australia (GCA), 2015), desktop research was conducted using information provided on organisational websites. Online data was captured and imported using NCapture and managed using qualitative data management software NVivo 10 and 11. The recruitment data was thematically analysed to determine the opportunities made available to graduates as part of the Program being advertised.

Interest to take part in semi-structured interviews was obtained from seven organisations (labelled hereafter as C1 through to C7).

Semi-structured interviews were conducted with 11 personnel from 7 organisations. Interviewees were personnel involved in either managing the program or involved in managing the graduates once they begin work. All seven organisations are large enterprises with the number of employees ranging from 150 to 155,000 and each having several locations in Australia; all but one also operate internationally. All organisations are in the private sector: Construction (2), Minerals and Energy (1), Transport (1), Telecommunications (1), Fast Moving Consumer Goods (FMCG) (1) and Industrial Solutions (1). The duration of the graduate programs varies with the shortest being 1.5 years (1) and the others ranging from 2 years (3), 3 years (1) and the longest programs running for up to 4 years (2). The data was coded and evaluated using thematic analyses in NVivo.

Results and Discussion

Recruiting graduates – What attributes are sought?

Technical Competency. Technical knowledge and academic results is observed to be the key area that all employers initially consider during the recruitment process, with C2 stating "we've always been in a position where ultimately we want the best people and an initial broad indicator is that that person will have good academic marks'. C3 also states "GPA is important. It's the way we distinguish or differentiate candidates".

However, while employers agree that technical competence in essential, particularly in engineering, thinking about the context of the engineering profession and engineering in 'industry', they recognise that "[graduates] don't have a very large…practical knowledge…So what we're finding is that they've got a foundation in theories and maths and some applications but they really learn very quickly what it's like to work on real problems" (C2).

This is consistent with current literature which indicates that technical competence is important but students are limited in their ability to apply it to industry problems (Spinks, Silburn and Birchall, 2006). What is surprising is the manner in which two organisations describe how, during the recruitment stage, they consider applicants' academic results and set a minimum score for consideration, for example, a minimum overall score of 75, 80 or 85; "once we look at our cut off, we don't really go back and look at their GPA again, as long as they meet the minimum requirement" (C6). After meeting the minimum cut-off score, evaluation of the applicant is based purely on other considerations, for example, the work experience completed, ability to communicate, work in teams etc. These organisations highlight the importance they place on 'other' aspects of what a graduate has to offer and the importance of practical experience.

A key theme also arises here with five organisations describing their perception that very high academic achievement may even also be an indicator that the candidate lacks competence and experience in other non-academic areas. C6 explains that when looking at where their 'best graduates' have come from "it's not the smartest, 90+, 95+ GPA results, it's more of the middle of the road ones that are top performers". C2 describes how, in some students, "you couldn't want any better marks, almost 100 in every subject, but they didn't even meet the minimal level of communication". C6 also states "the individual who hasn't had to work, has been able to dedicate themselves 100% to their studies…to make sure they get that 99.9 and that's not necessarily the type of employee that we would be looking for. We're looking for the other individual who has the work experience". This perception appears to be new in the literature and quite significant for engineering educators, highlighting both the view of industry and the importance placed on non-technical skills for engineering success.

Specific Skills. Thebuwana and Hadgraft (2013) report career motivation, teamwork and interpersonal skills, and initiative to be the top three attributes mentioned in recruitment material as being sought by employers. These attributes are inclusive of the seven

organisations in their research, though interviews reveal that the value placed on them varies and other key attributes also appear to be sought at the site and selection level.

Communication skills were mentioned by four organisations to be of significant importance, in agreement with current literature (GCA, 2015; Male, Bush and Chapman, 2011; Nguyen, 1998; Riemer, 2002). C1 talks about the importance of being "comfortable talking to others in their team, comfortable talking to team leaders and other people at nearly all levels across the business". Within this theme, communication skills also involve graduates being able to build rapport, how they articulate answers and handle tricky or challenging questions (C2).

Another key area, mentioned by four organisations, was the need for graduates to be able to learn and research. C6 describes "the ability to develop and learn at a pretty quick rate is important to be able to perform on the job". Emphasis is placed on the ability for graduates to learn the intricacies of the organisation, as opposed to the concept of life-long learning or the ability to source or research information being an integral dimension of the work of an engineer as mentioned in previous literature (Jollands, Jolly, and Molyneaux, 2012).

Leadership, project management, time management and teamwork are also amongst the specific skills that were mentioned, each by at least two organisations.

Personal Attributes. Several personal attributes were mentioned to be of importance, with the key two being resilience and having an interest and passion for the industry. Resilience is described in this sense as having adaptability and flexibility and not being afraid of change, being comfortable in an ever changing environment. Interest and passion for the industry relates to being able to show knowledge or interest in both the organisation that the graduate is applying for and the relevant industry. Drive, motivation and the right attitude also play a part here, in agreement with, to some extent, with the finding that employers seek graduates who are able to engage in problem solving with drive and energy (Spinks et al., 2006).

The ability to relate and network was also mentioned, involving aptitudes such as being able to build relationships with others, being respectful, being able to work well in a team, being conscious of other people's ideas and beliefs and opinions (C3). C6 also describes how they have "so many different stakeholders within [the] organisation that, if you can't relate to people and if you can't work in groups…then you're going to really struggle".

Cream of the Crop - The reality?

It is necessary to emphasise here the unique opportunity that the organisations involved in this research have to attract and recruit the 'best-of-the-best' of graduates into their programs. C6 mentions how they "received around 10,000 people who started an application. 6,000 of those were eligible"; C2 reflects how "it can be very difficult to short list down to potentially six applications out of 200, particularly when you start getting to the top 20 and they're all very good" and C4 describes how they "get a high level of good candidates and…generally get between 150-200 applicants. Generally speaking, all are at quite a good standard as well".

Yet, reflecting on graduate performance once hired into the program, employers acknowledge that graduates are all different and there is a "massive wide ranging level of maturity and experience" and "it's very hard to pin point and say 'this is your typical graduate'" (C1). "We find that the majority are relatively prepared" states C2. When speaking about lack of preparation, graduates are seen as lacking workplace understanding and an understanding of what their role as an engineer involves.

Some areas exist, for example, understanding of specific **organisational programs and procedures**, where it appears reasonable that graduates would not have such understanding. C7 reflects how this holistic understanding is not actually acquired until the second year of their 3-year program when they become "quite comfortable with the mechanisms, the processes that we use, the systems that we have for safety, commercial, an ability to understand how the factory works and how to get things done in the factory". C4

also explains “particularly that first couple of months when they really know nothing and you’ve got to show them everything”.

Another aspect of this is the concept that universities develop foundational understandings of engineering, but do not delve deeper into **specialised areas and contexts** found in industry. C4 mentions “a lot of our work is more planning related than purely engineering related, so when our graduates come in…they know ‘engineering’ very much, but they usually never even touched anything to do with planning”. C7 also reflects that they “don't deal with a lot of detail design calculations and the application of typical engineering theory. We’re often more involved in the project management, the rollout, the implementation of those things, which is an area they typically don’t have much experience in”.

Here, a disconnection is observed between the education that students receive at university and its **practicality in the workplace**. C1 explains that “university work is quite different from real life work, for a lack of a better term, in the sense that you’re given a problem to solve on a university project and…all the data is there for you. To some extent, you don’t need to interpret real information, whereas when you come into real life, you might be using drawings that are 20 years old...Or you might have incomplete information”. In relation to the content covered, C5 mentions “I’m recruiting process engineers. The chemical engineering degree isn’t a safety qualification but that component of the work is really important…that is one particular area that all of the graduates…don’t really have a good idea.”

Looking at the areas in which these expectedly high performing graduates lack competence in, there are a surprisingly alarming number that would be expected to be developed at the university level, considering both the purpose of the formal education and the importance placed on these areas by industry. The two key areas apparent here are around (i) knowledge of the context of engineering and the profession and (ii) practical experience.

In relation to understanding the **role of an engineer and context**, C1 explains, “sometimes you do get people coming in, who do believe that engineering is all about that technical side, and there are many aspects to it that need to be brought in”. An example is given by C3 regarding communication skills where “while graduates may have good communication skills in general, they may need more support or development around how to communicate in a professional environment”. C2 also explains “all of a sudden they’re realising that the subjects that they’ve done in power or water or economics isn’t necessarily applying to what they need to do on a day to day basis when they join us”.

Further areas relating to the context of the engineering profession include monetary realities where graduates lack the understanding that “everything needs funding, everything needs to be signed off”; business skills in terms of the ability to “understand how to pitch in a particular meeting, or how to present a pack to a stakeholder group”; and, a lack of knowledge and appreciation for the interdisciplinary aspect of engineering, with C1 explaining “if they’ve been doing a civil engineering degree for four years, they’ll think an interdisciplinary project is one that involves water engineering, structural engineering and environmental engineering…They might not realise that they’ll need a mechanic to talk to, a mechanical engineer and what they need to know is different from what somebody else might need to know…that aspect of interdisciplinary work is not necessarily well understood”.

Five organisations refer to the **importance of ‘experience’** and the benefits that come with it in preparing graduates for the ‘realities’ of the engineering profession. C1 explains “that awareness of what the job actually looks like - when people have done work experience…a lot of people come with that awareness”. Vacation work is another example with C2 stating that graduates who have completed vacation work “probably know more than our grads that have been here for a couple of years” and so too is on-the-job experience, with C4 describing how “[graduates] probably learn more in the first month or two here than they learnt in the four years in their undergraduate degree”.

‘Practicality’ is also important here, with C7 explaining “a lot of their experience is probably not relevant to the day to day here. It is essential ultimately that they have a good

fundamental understanding of that but it's not applied on a daily basis in what we're doing. We're almost teaching them a whole new skill set around the application and the hands-on". C6 also describes the importance of having awareness for how the industry operates, where, without experience, graduates "haven't had to develop relationships with multiple stakeholders in different organisations or customers…I think our grads coming in really struggle to comprehend how to interact in those environments".

Employers acknowledge that graduates are inexperienced, and aim to develop them through the Program. C2 finds that graduates are "prepared 'enough' to come and join us and, within the first few months, work out what they need to do and what their role is" and C3 explains that "it is reasonable to expect that [graduates] won't come in with a lot of that stuff". And it is here that the Graduate Development Program plays its role.

The Graduate Development Program

The Programs at each of the seven organisations vary in structure and form, yet all are well embedded as the key initiative for integrating graduates into the organisation and, further, is used as a foundation to support graduates as they embark on their professional careers.

The number of graduates hired into each organisation on average per year as part of a program varies between a few to up to 170, with the number of engineering graduates hired ranging between 1 and 80. This number varies year on year depending on work flow and the economic climate, with one organisation not hiring any graduates in 2015.

At the corporate level, the program framework is the same for all graduates, regardless of their degree and discipline. All graduates, whether a business graduate or an engineering graduate, undergo the same induction and on-boarding programs. C3, however, observes a key difference around the technical development of their engineers, compared to other disciplines. For example, engineering graduates are given a technical mentor as well as a non-technical mentor, where the technical mentor's role is to nurture the graduate in order to become a Chartered Professional Engineer (CPEng).

Looking at the day-to-day management of engineering graduates, five organisations describe that each graduate has a direct link with a line manager or team leader who is responsible for their training and providing opportunities to learn, as well as ensuring they have work and are getting involved (C4). The Human Resources function, on the other hand, tends to focus on the recruitment stage, managing rotations (where applicable) and addressing issues. C5 also made the observation that graduates' experience can be limited and/or more rewarding depending on the proactiveness of their direct manager, where 'some people are more proactive on projects and some people are more proactive on training'.

Purpose of the Program

The three key reasons for offering a Program include: to provide support and structure for graduates, to develop the future leaders of the organisation, and to formally integrate graduates into the organisation.

Support and Structure. Interviewees acknowledge the gap between the university and the workplace contexts and the importance of the graduate program in providing a framework and formal structure to bridge that gap. They also recognise that the structure needs to fade as graduates settle into the workplace, "creating a smooth transition into the workplace and the professional role" (C1). Five of the seven organisations also describe support networks to be key in providing advice and guidance. Methods include through peers and 'buddies', mentors, managers, the development team and leaders within the line of business.

Talent pipeline. Six of the seven organisations talk of the importance of their program to attract and develop the future leaders and managers of the organisation, thereby establishing a talent pipeline. The concept of developing graduates in 'non-engineering' areas is evident, with examples like:

> *Our graduate program is really around hiring in managers of the future. For instance, I have a graduate engineer in engineering this year, but next year we're purposely taking him out of engineering and he's going to go get a broader experience outside of engineering. We're really grooming him not so much to be an engineer but to be more of a manager of the future.* (C7)

Jollands et. al. (2012) describe the importance of such skills as project management, problem solving and communication and define 'work-readiness' as a complex of generic attributes that allow graduates to apply their technical knowledge to problem identification and solving once they join the workforce. This concept of generic attributes enabling graduates to enforce their technical skills is reflected in the current research and is shown to be of paramount importance, considering industry intentions to utilise graduate skills in areas other than just the technical.

Integration. Integration into the organisation also appeared as a key purpose of the program in six organisations. Several aspects of this 'integration' theme exist, including the concept of giving graduates an understanding of the organisation and helping to develop an innate understanding of the organisation and its different parts as well as its culture. It also aims to give graduates an understating of 'their' place in the organisation and what their role is.

Another theme, evident in three organisations, is the concept of gaining 'assurance' by having development opportunities within the program. Organisations recognise that graduates are not 'job ready' and hence this idea of ensuring "everyone's at least got a baseline to work from, [we] set a standard, set a level of expectation" (C1). By running development opportunities for 'all' graduates, regardless of individual competence, organisations also assume confidence that graduates are now, therefore, prepared for the expectations of 'real' engineering, as opposed to what they have learnt at university. For example, "[so that] we know that they're able to write reports in that style. You know, the good old case of how I write a report at uni and how I write a report at work...different again" (C1) and "the program itself really starts to just get them into a mindset and start to enhance those skills that…they already have" (C2).

While the literature highlights the potential to integrate university and industry expectations, for example, in terms of written communication through provision of sample work and development of guides for writing workplace outputs (Milke, Upton, Koorey, O'Sullivan, Comer, 2013), universities continue to define their own standards for written communications and employers reflect here that it is reasonable to re-train graduates once in the workplace.

Following on from this, the idea of recruiting graduates into the program with the intention of being able to 'mould' and train and develop them from a starting level in the manner that the organisation requires has become apparent. C4 states "we're looking for someone who's a bit generalist…a jack of all trades, particularly at that level, because everyone's coming in with pretty limited knowledge". Culture also plays a part here whereby,

> *You grow talent from within, you get people who are very much aligned culturally with the way the business works. When you're bringing people from external, there can sometimes be problems in understanding [our] way of doing things and the culture and the values that we have. (C7)*

Three organisations also touched on the 'networking' aspect of the graduate program as being a key benefit. Here, the opportunity to get to know other graduates in a similar starting position is important. C6 highlights a benefit of having a solid network of individuals "who you can relate to and speak with across the organisation" and its importance in career progression, whereby graduates would, "five years from now, they'll still have individuals within the business, who work in different parts of the business, who they're able to leverage to, ask questions, to get favours done or whatever it might be, that network is 'so' important and they're so lucky that they've got that network".

Development. A key aim is also to offer development opportunities to graduates in areas of gaps in competence, as well as areas that the organisation places particular importance on.

We've realised that when graduates join us, they don't have the skill sets, or full developed skill sets, that we're after, so we need to take responsibility in doing that. (C2)

C2 sees engineering graduates as "someone with fairly raw skills and foundational knowledge" whom they aim to develop to become more technically competent and in areas of managing projects and becoming an expert in their field. This is also agreed by C3, who aims to develop graduates in terms of both technical and non-technical capability.

Two organisations also made reference to the 70:20:10 Framework for learning and development (70:20:10 Forum, 2016) and the importance of 'on the job' work and "actually getting out there and doing that sort of work" (C7). It is also apparent that the 'development' being referred to focuses on soft skills while backing up technical development (C2).

Implications

Criteria used by industry in selecting high potential graduates do not solely rely on academic transcripts and technical knowledge; other competencies are sometimes given greater value. Graduates go through a learning curve as they transition into the reality of the work environment, but this is not only in relation to learning the specifics of the organisation, as one would expect. There is a disconnection between the education received at university and its practicality in the workplace. Key gaps exist in the form of graduates' knowledge of the context of engineering and the profession and lack of practical experience.

'If universities state that their engineering graduates will be work ready, then there is an obligation to ensure that graduates are, in fact, work ready.'

Looking holistically at these Programs and employer perceptions of graduate preparedness, it is clear that graduate engineers are often not prepared for the transition from the formal education context to industry. This is significant considering this research reports on feedback regarding graduates who are seen by industry to be the best-of-the-best, sometimes selected from a pool of 200, or even 6000, applicants, yet, are still seen to lack competence and preparedness for their work at the point of entry into the profession and sometimes even until two years of experience in the role.

Employers acknowledge that experience in the role and undertaking the development opportunities offered addresses these issues; however, certain areas could be addressed by education providers, considering the importance placed on them. These include giving students the opportunity to develop 'soft-skills' e.g. communication skills, as part of their degree. This does not only refer to general areas such as report writing or presenting in front of peers, but giving students the understanding of the engineering context and the role of an engineer in being able to speak to people at different levels of an organisation or how to build rapport with team members and other stakeholders. It also involves universities recognising that students' personal attributes also play a key part in this transition, especially considering industry intentions of placing graduates into non-technical roles.

There also exists the need to provide students with an awareness for the realities of the engineering profession. By considering the areas in which industry recognises graduates to be ill-prepared and the reasons for why industry operate Graduate Development Programs, it is evident that there exists a learning curve that sometimes takes up to three years to master. **University needs to address this gap, which exists between what students are taught to expect of the profession and what the 'reality' actually is.** Upon completion of an engineering degree, graduates disperse and find their careers in hundreds of different organisations and industries; yet, university offers a one-size-fits-all engineering degree. There are practicalities to this and, clearly, university education cannot be expected to address the specific future needs of all of its students. However, if universities state that their engineering graduates will be work ready, then there is an obligation to ensure that graduates are, in fact, work ready.

The current interviews suggest the following three ways of starting to address this:

(i) Give students a more holistic awareness of what the role of an engineer involves and the importance of both technical and non-technical competencies. This would not only aid to reduce the gap in expectation experienced when transitioning to work but, ideally, also lead to students better understanding the importance of taking ownership for their own learning and development right from the beginning of their degrees. They may be more willing and engaged in, for example, taking part in teamwork; they may take more initiative in finding work experience, or simply be more willing to take part in seeking opportunities to develop non-technical skills.

Steps to reduce the gap between what is taught at university and workplace 'realities':

- *Give students a holistic awareness of what the role of an engineer involves.*
- *Emphasise the practical importance of both technical and non-technical competencies.*
- *Offer and encourage practical work experience for greater insight into workplace realities.*
- *Offer and encourage networking opportunities.*

(ii) Acknowledge the importance of practical experience, by not only providing, but also encouraging students to take part in such experiences. This includes vacation programs, which can be competitive to find, but also internships, work integrated learning, voluntary work, industry based projects, community based projects, etc. These experiences are seen by employers to provide greater insight into workplace realities.

(iii) Provide all engineering students with the opportunity to network with engineering graduates and other professional engineers. It is important here to both provide this opportunity and also to encourage students to take part, highlighting the vast amount of insight to be gained from experienced engineers in industry and the emphasis industry places on networking. Mentoring is also important, whereby students can gain valuable insight into the experiences of graduates.

Limitations and Recommendations

This research focuses on the perspective of graduate development program managers and the managers of graduates and would benefit from gaining future insights from the engineering graduates themselves. This would give a more holistic view of such programs and the graduates experiences of their transition to work. It would be appropriate to speak to graduates at different stage of the graduate program, as insights would vary with experience.

Investigation into differences across industry sectors would also be beneficial. In this research, the 'consultancy' and 'industry' sectors were investigated. While the concept of 'billability' was seen in consultancy organisations, other aspects of the programs seem to be similar. It would be beneficial to investigate whether there are any significant variations to the programs offered by the government sector and the type of graduates they seek to recruit.

It is also acknowledged that not all engineering graduates have the opportunity to enter an organisation via a formal graduate development program. These graduates may not be offered the opportunities available as part of a program, yet they do undergo the same issues faced by all graduates entering industry. It would be valuable to see how these graduates experience this transition and their preparedness for it.

Conclusions

Technical competence is important and so too are personal and professional attributes, as supported by other literature and current accreditation requirements. Employers place a significant interest in seeking graduates with excellent communication skills (both written and verbal, including other aspects such as being able to build rapport), the ability to learn and research on the job and other skills such as leadership, project management, time management and teamwork. Personal attributes such as resilience and an interest and

passion for the industry are also highly sought after. These other competencies are sometimes emphasised over academic transcripts and technical knowledge, with the majority of employers also indicating that very high academic achievement may be an indicator of a lack of competence and experience in other non- academic areas.

There is a disconnection between the education that students receive at university and its practicality in the workplace and key gaps exist in in the form of graduates' knowledge of the context of engineering and of the profession and their lack of practical experience. Even across different industry sectors, Graduate Development Programs have similar structures and initiatives and exist to provide the support and structure required by graduates to transition into their careers, to develop the future leaders of the organisation from the bottom up and, to formally integrate graduates into the organisation, thus, providing confidence to graduates for their new role and assurance for employers that the new graduates will become productive members of the organisation.

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