Students' perceptions about the relative importance of specific skills and knowledge for career performance, and perceptions about the extent to which their course focuses on specific skills and knowledge

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ABSTRACT

In this article we present preliminary findings from a pilot study of students' perceptions about the importance of various graduate capabilities in relation to career performance. Each of the 613 survey participants belonged to one of five groups, each group drawn from a different stage of a course in Engineering at the University of Technology, Sydney – the course includes two 6-month industrial internships. In particular, we consider how the students' perceptions of specific skills and knowledge vary across the course. We also investigate the students' perceptions of the extent to which their current course focussed on those capabilities.

The participants responded to ten statements about specific skills and knowledge, and another ten statements about the focus of their course. Statistically significant variations between the groups were found for 4 of the 10 statements regarding perceptions of importance for their career, and 2 of the 10 statements regarding the focus of their course.

We discuss these results and their implications for course design, along with strengths and limitations of the study's methodology. Given that the results suggest that students from different stages of their courses have differing perceptions about their skills and knowledge, we propose that courses might best be designed in ways that seek to accommodate these differences in perceptions. If higher education providers are to design courses which ensure that their graduates have an appreciation of and capabilities in the areas of specific skills and knowledge, then it is important that the development of these skills is better understood, and it is necessary to develop methods for achieving these goals. We hope that this article will be of interest not only to educators, but also to researchers and professionals who have an interest in workplace learning.

INTRODUCTION

Most engineers require specific technical and professional skills and knowledge throughout their professional career. This being the case, most engineering courses emphasise the development of specific technical skills and knowledge. However, recent trends have seen engineering practitioners and course developers increasingly recognising the need to broaden engineering education courses, and placing greater emphasis on developing non-technical competencies.

The National Generic Competency Standards put forward by Engineers Australia stipulates a strong knowledge base: 'PE1.1 Knowledge of science and engineering fundamentals', 'PE1.2 In-depth technical competence in at least one engineering discipline', 'PE1.3 Techniques and

resources'. It then however goes on to define 'PE2 Engineering ability' and 'PE3 Professional attributes' (Engineers Australia, 2005). These criteria are very similar to those of the Accreditation Board for Engineering and Technology in the USA (ABET, 2002), and are indicative of a worldwide trend that has seen providers of higher education increasingly charged with the responsibility of ensuring that professional graduates have abilities such as these.

In the late 1980s, a view that universities should equip graduates with the skills necessary for the workplace led to the formation of the [Australian] Senate Standing Committee on Employment, Education and Training to identify 'priorities for reform in higher education'. The committee found that universities were producing 'trained technicians' whose education 'does not provide the basis for adequate flexibility' and who are 'undereducated in the broader sense of the term' (Aulich, 1990). The findings of the committee were, perhaps not surprisingly, remarkably similar to those of overseas counterparts. In the United Kingdom, reports urged providers of higher education to accept 'new realities' concerning the relationship between higher education and employers (Harvey, 1999; Harvey, Moon and Geall, 1997). However, employers were less concerned about deficiencies in the knowledge-base of new graduate employees than they were about deficiencies in the generic skills of those new employees. Although the technological demands on new graduates were constantly increasing, employers primarily wanted graduates to be able to learn and apply new material in the workplace (Hesketh, 2000).

In an attempt to accommodate the new demands, many educators sought to learn if and how such attributes can be understood, measured, assessed and developed. A study of University of Technology, Sydney engineering graduates who had been identified by their employers as 'highly successful' was recently undertaken as part of a quality assurance technique referred to as 'backward mapping' (Scott and Yates, 2002). In interpreting the findings it is necessary to consider whether personal attributes are developed most efficiently in the classroom, the workplace, or in other situations. John Dewey maintained that 'education, in order to accomplish its ends, both for the individual learner and for society, must be based upon experience' (1938). His thoughts influenced the development of Constructivism (commonly attributed to Piaget and Vygotsky), Rogers' Personal Thoughts on Teaching and Learning (1961), Kolb's model of Experiential Learning (1984), and Mezirow's Transformative Learning Theory (1991). An appreciation of the relationship between learning and experience has frequently taken a significant role in the formation of work-based educational programs that are designed to develop professional expertise, variously known as work placement programs, sandwich courses, cooperative education or internships. The educational and professional benefits of work-based learning are strongly recognised in the Faculty of Engineering at UTS, where the vast majority of undergraduate engineering students undertake a combined degree of Bachelor of Engineering, Diploma in Engineering Practice. Students in the program undertake two six-month internships together with six internship-related academic subjects intended to enhance the internship learning experience.

Understanding the effects of internships on learning is an important issue for professions where competence is developed through internships—professions that include architecture, dentistry, education, engineering, law, medicine, nursing, psychology and sociology. Research aimed at furthering knowledge about work-based learning suggests that learning in the workplace is an invaluable part of the learning process (Falconer and Pettigrew, 2003; Lave and Wenger 1991; Powell, Mayson, and De Lange, 2004). An interesting aspect of these studies is the proportion of learning that is attributed to sources other than the

classroom. For example, an analysis by Baker (2004) of a study by Garth and Martin (1993) indicates law graduates reported law school was the primary source of only 25% of their total learning, whereas 75% was attributed to work-based sources. Such results imply that, compared to the workplace, the classroom is not as significant a source of learning as might be expected. Even so, while it is clear that both play a role, it is not clear what aspects of learning are best facilitated through each mechanism. This can make it difficult to develop programs that include classroom activities that complement and build on abilities gained at the workplace, and, perhaps to a lesser extent, workplace activities that complement and build on classroom activities.

One approach to understanding the effects of higher education on people's abilities is to longitudinally track how people's perceptions of their abilities change with time. This type of study is relatively resource intensive, as it requires respondents to be retested at different stages of their education. Notwithstanding this, assuming that the testing instrument has an acceptable level of test-retest reliability, the approach allows changes in perceptions to be tracked. Studies employing this approach are relatively rare, partly because it is often considerably more difficult to locate the same respondents on two or more occasions than it is to administer a test to respondents on a single occasion. However, if certain methodological constraints are taken into account, an alternative approach is to administer a questionnaire to different groups of students who are at different stages of their courses. An example is a study by Duke (2002), which compares marketing students from lower divisions of their courses with graduating seniors. Duke found that seniors perceived a comparatively higher importance for speaking in groups, applying the right tools to problems, identifying the relationships between problems, integrating multiple data sources, communicating electronically, comprehending the global environment, and conducting a business meeting. Less important for seniors were skills in explaining technical concepts and managing communication flows. Duke attributes these latter findings to the seniors' greater experience with these issues.

The present study is similar to the above in that it compares students from different stages of a course. We investigate a methodology for measuring the perceived importance of various competencies for students' future careers, as well as the extent to which the students believe their current program focuses on those competencies. One of the things we are interested in is the impact on students' perceptions of two 6-month industry internships.

In a previous paper (Moulton and Lowe, 2005) we discussed competencies related to personal abilities, such as willingness to face and learn from errors, understanding personal strengths and limitations, the ability to remain calm under pressure, and a desire to produce as good a job as possible. The results suggested that students from different stages of the course have statistically significant differences in their perceptions about some personal abilities.

We are particularly interested in understanding more about students' perceptions about specific skills for several reasons. There has been increasing demand for engineering graduates to demonstrate high levels of specific technical skills as well as broader professional skills. If educators are to demonstrate that they are meeting these demands, methods for measuring such attributes are required. If students from different stages of their courses have differing perceptions about these skills and knowledge, it could be argued that courses might best be designed in ways that seek to accommodate these differences in perceptions.

For this study we use a methodology that is adapted from the instrument developed in the backward mapping study of Scott and Yates (2002), which itself was based on a framework of professional capability (Scott, Yates and Wilson 2001) founded on research into professional competence and expertise which includes that of Gardiner (1995), Goleman (1998), Gonczi, Hager and Oliver (1990), Harvey (1999), Morgan (1988), Schön (1983), Scott (1999) and Tennant (1991). The study conducted by Scott and Yates (2002) investigates five areas of professional engineering ability: emotional intelligence—personal, emotional intelligence—interpersonal, intellectual capability, profession-specific skills and knowledge, and generic skills and knowledge. Their survey has also been adapted for other purposes including studies of nurses (Scott, 2003a) and school principals (Scott, 2003b). Given this background and prior research, the objective of the present study was to trial the instrument's suitability for measuring changes in students' perceptions, over the duration of their course, of the importance of different personal abilities.

METHOD

In May and June 2004 approximately 700 UTS engineering students were given surveys to complete during class sessions. Each survey had 6 sections: personal abilities, interpersonal abilities, intellectual abilities, specific skills and knowledge, keeping university learning relevant, and a summary section. The part of the survey that was concerned with specific skills and knowledge included the following written instructions:

> *The following items seek your views on how important you believe a range of job-specific and generic skills will be in accounting for your successful performance in your early career as an Engineer. Then you are asked to rate the extent to which your current course is focusing on them. For each item please mark the box which best describes your rating for importance and focus. There is space below for you to comment on your ratings and add any other information you think would be helpful.*

Ten statements followed. For each statement, survey participants were asked to provide two ratings, both on a scale of 1 to 5 (1 = low, 3 = medium, 5 = high). The first rating corresponded to 'importance of this for successful performance in my early career as an engineer', and the second corresponded to 'extent to which my current university course is focusing on this ability'. The ten statements were:

1. Having a high level of current technical expertise to my work area
2. Being able to use I.T. effectively to communicate and perform key work functions
3. Being able to manage my own ongoing professional learning and development
4. An ability to chair and participate constructively in meetings
5. Being able to make effective presentations to clients
6. Understanding the role of risk management and litigation in current professional work
7. Knowing how to manage projects into successful implementation
8. An ability to help others learn in the workplace
9. Understanding how organisations like my current one operate
10. Being able to organise my work and manage time effectively

While it is true that these statements are to some extent 'leading' and prone to response bias (in that respondents tend to give responses that they believe the researcher is looking for) and, as such, the responses are not suitable for providing absolute measures of, say, 'having a high level of current technical expertise to my work area', the purpose of the survey was to look at

different perceptions between groups rather than absolute perceptions. Five groups of students were surveyed, each drawn from a different stage of the UTS Bachelor of Engineering course.

RESULTS AND DISCUSSION

A total of 613 surveys were returned by members of five different groups:

EfS: 212 students enrolled in the subject *Engineering for Sustainability* – typically undertaken in the students' first stage[1] (first semester of first year).

EPP1: 142 students enrolled in the subject *Engineering Practice Preview 1* which precedes the students' first 6-month internship – typically taken after stage 2 or 3.

EPR1: 103 students enrolled in the subject *Engineering Practice Review 1* which follows the students' first 6-month internship, and is typically taken in stage 3 or 4. For many of the respondents, this is the first stage at which they have work experience, though a significant proportion of the students are mature age and, of these, many have previously spent significant time in the workplace.

EPP2: 52 students enrolled in the subject *Engineering Practice Preview 2* which precedes the students' second 6-month internship – typically taken in stages 5 to 7.

EPR2: 104 students enrolled in the subject *Engineering Practice Review 2* which follows the students' second 6-month internship – typically taken in stages 6 to 8. Students belonging to this group have completed at least 12 months of full-time work.

A summary of the responses for each item is given in Table 1, and the corresponding significance values are shown in Table 2.

Kruskal-Wallis ANOVAs were conducted to determine if the groups differed significantly on any of the items. Figure 1 shows the normalised mean rank for each group for those responses where $p<0.05$. Of the items relating to importance to career, the analyses indicated that a significant proportion of the variance is attributable to differences between the groups for four of the statements:

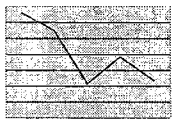
1. Having a high level of current technical expertise to my work area
5. Being able to make effective presentations to clients
6. Understanding the role of risk management and litigation in current professional work
7. Knowing how to manage projects into successful implementation

Of the items relating to focus of their course, two of the statements had statistically significant variance between the groups:

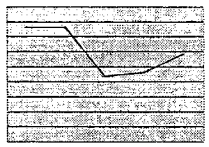
6. Understanding the role of risk management and litigation in current professional work
8. An ability to help others learn in the workplace

[1] The standard UTS BEDipEngPrac course is comprised of eight academic stages (two per year) and two six-month internships.

For *importance to their career of having a high level of current technical expertise* (response 1a), later stage students tended to rank this item lower than students in earlier stages of the course (i.e. EFS compared to EPP1), but then an even sharper drop in rankings is seen for post-internship students, i.e. between EPP1 and EPR1, and between EPP2 and EPR2. This might be because students commence the course with relatively high expectations about the role of technical expertise within an engineering career. The perceived importance technical expertise might then decrease through the early stages of the course, and subsequently much more strongly impacted by the students' experience in a workplace setting during their internships, where they are much more directly involved in industrial professional practice. It is only during the mid to later stages of the academic program, where technical expertise is developed to a greater level, where students' perceptions of the importance of technical expertise are reinforced. This result has important implications for course design insofar as it highlights a potentially significant mismatch between the messages which students' are gaining during their academic coursework and during their industry internships. The UTS Engineering students have the benefit of these internships which might act as a moderating influence - without these internships, students would presumably be less likely to understand the role of technological expertise within their professional activities until after their course was complete.



Regarding the students' perception of the *importance to their career of being able to make effective presentations to clients* (response 5a) the pattern is that the perceived importance drops during the first part of the students' course (including during the internship), and then increases during the latter stages (during both academic and internship stages). The reasons for this are not clear from the data, but one plausible explanation is that it is due to a change in focus of both the academic content and of the internships from laying foundational technical concepts to more holistically applying broader professional skills, and greater levels of interaction with non-engineers. Further investigation would be required to explore this possibility.



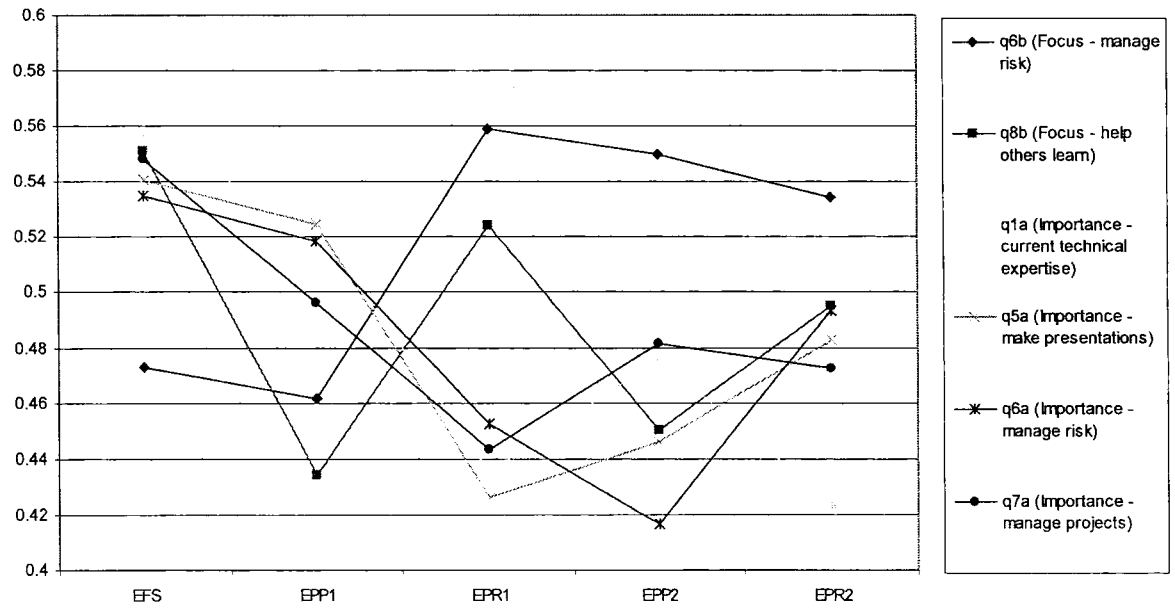


Figure 1. Normalised mean rank for each group for the items where $p<0.05$.

Table 1. Responses to survey statements

Percentages of respondents nominating each rating (1=low, 3=med, 5=high)

(a) = Importance to career, (b) = course focus on this

Statement 1: *High level of current technical expertise*

Item	(a)						(b)					
	1	*2*	*3*	*4*	*5*	*N*	*1*	*2*	*3*	*4*	*5*	*N*
EfS	3	2	21	22	51	208	5	10	39	22	22	201
EPP1	3	4	22	26	44	140	10	9	37	22	22	139
EPR1	2	13	29	23	33	95	5	10	35	28	22	92
EPP2	4	0	38	19	38	52	2	8	52	25	13	52
EPR2	1	5	37	33	24	95	5	14	37	26	18	94

Statement 2: *Able to use I.T. effectively*

Item	(a)						(b)					
	1	*2*	*3*	*4*	*5*	*N*	*1*	*2*	*3*	*4*	*5*	*N*
EfS	2	5	19	29	45	208	6	13	30	28	23	205
EPP1	0	6	23	22	50	141	6	12	33	25	25	141
EPR1	1	3	19	33	44	94	2	8	33	33	25	92
EPP2	0	2	17	35	46	52	2	12	29	37	21	52
EPR2	0	0	17	42	42	96	5	10	33	31	21	94

Statement 3: *Able to manage own professional development*

Item	(a)						(b)					
	1	*2*	*3*	*4*	*5*	*N*	*1*	*2*	*3*	*4*	*5*	*N*
EfS	2	5	18	25	50	207	4	10	32	28	27	200
EPP1	1	1	21	27	50	141	4	9	38	26	23	141
EPR1	0	1	21	34	44	95	3	8	38	27	24	92
EPP2	0	4	17	35	44	52	0	4	31	29	35	51
EPR2	2	3	16	28	51	96	3	12	29	21	35	92

Statement 4: *Able to participate constructively in meetings*

Item	(a)						(b)					
	1	*2*	*3*	*4*	*5*	*N*	*1*	*2*	*3*	*4*	*5*	*N*
EfS	1	5	24	29	41	207	10	15	35	20	22	200
EPP1	1	5	20	36	38	141	9	21	40	17	14	139
EPR1	2	1	33	32	32	94	9	18	37	25	11	92
EPP2	2	8	17	44	29	52	12	23	40	19	6	52
EPR2	1	6	20	35	38	95	11	11	38	26	15	93

Statement 5: *Able to make effective presentations to clients*

Item	(a)						(b)					
	1	*2*	*3*	*4*	*5*	*N*	*1*	*2*	*3*	*4*	*5*	*N*
EfS	2	3	17	21	57	207	7	11	34	24	23	201
EPP1	0	4	15	31	50	141	8	14	28	33	17	141
EPR1	0	5	29	33	33	94	3	9	48	19	20	93
EPP2	2	8	19	35	37	52	4	12	42	33	10	52
EPR2	1	7	18	29	44	95	2	9	33	22	33	90

Statement 6: *Understanding the role of risk management*

Item	(a)						(b)					
	1	*2*	*3*	*4*	*5*	*N*	*1*	*2*	*3*	*4*	*5*	*N*
EfS	0	4	23	26	47	207	18	13	34	19	17	200
EPP1	1	4	21	33	41	140	11	22	33	20	14	140
EPR1	2	5	25	39	29	93	2	15	39	24	20	93
EPP2	0	8	25	48	19	52	4	12	38	35	12	52
EPR2	1	6	24	29	40	96	7	13	36	29	15	95

Statement 7: *Knowing how to manage projects*

Item	(a)						(b)					
	1	*2*	*3*	*4*	*5*	*N*	*1*	*2*	*3*	*4*	*5*	*N*
EfS	0	3	16	26	54	207	9	12	38	20	20	203
EPP1	1	4	20	30	45	141	6	16	36	29	14	140
EPR1	1	3	22	43	31	94	3	16	45	23	13	93
EPP2	0	2	31	23	44	52	0	15	42	35	8	52
EPR2	0	3	23	36	38	95	3	15	37	30	15	93

Statement 8: *Able to help others learn in the workplace*

Item	(a)						(b)					
	1	*2*	*3*	*4*	*5*	*N*	*1*	*2*	*3*	*4*	*5*	*N*
EfS	2	6	25	30	36	208	10	10	33	25	22	202
EPP1	5	2	28	24	40	139	17	16	39	18	11	137
EPR1	2	5	28	37	28	94	5	13	42	25	14	92
EPP2	0	6	27	40	27	52	8	23	37	29	4	52
EPR2	2	6	30	39	23	93	9	9	49	23	10	91

Statement 9: *Understanding how organisations operate*

Item	(a)						(b)					
	1	*2*	*3*	*4*	*5*	*N*	*1*	*2*	*3*	*4*	*5*	*N*
EfS	2	5	27	24	42	208	14	18	34	17	17	202
EPP1	1	3	26	36	33	141	11	26	36	14	13	140
EPR1	3	5	21	45	26	94	12	24	31	25	9	93
EPP2	0	6	27	40	27	52	14	31	33	20	22	51
EPR2	0	3	24	36	36	94	14	29	33	13	12	94

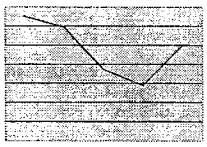
Statement 10: *Able to organise work and manage time*

Item	(a)						(b)					
	1	*2*	*3*	*4*	*5*	*N*	*1*	*2*	*3*	*4*	*5*	*N*
EfS	2	0	11	21	66	209	6	8	25	22	38	205
EPP1	1	1	12	25	61	141	7	10	28	30	25	141
EPR1	0	1	12	34	53	94	3	11	28	34	24	93
EPP2	0	0	12	29	60	52	6	11	25	34	24	95
EPR2	1	2	8	23	66	97	6	11	25	34	24	95

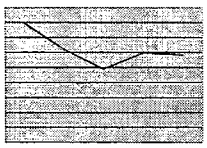
Table 2. Significance values for each item

Statement		1	2	3	4	5	6	7	8	9	10
Importance to career	*p*	0.000	0.934	0.954	0.579	0.004	0.019	0.018	0.348	0.576	0.488
Course Focus	*p*	0.860	0.689	0.227	0.069	0.116	0.019	0.911	0.002	0.203	0.159

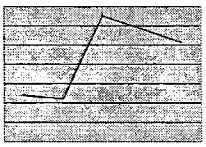
With respect to students' perceptions of the *importance to their career of understanding the role of risk management and litigation* in current professional work (response 6a) the pattern is that the perception of importance drops across the groups until the second internship, at which point there is a sharp increase. The reason for this is unclear and warrants further investigation, but may be related to the nature of the experiences which students encounter in their junior internship as compared to their senior internship. For example, an understanding of risk often requires a systems perspective, and students have limited exposure to system-level issues until later in their course, where they undertake roles which are closer to full engineering roles. If this is indeed the case, it would have important ramifications for the curricula design, especially subjects which focus on systems engineering and risk management.



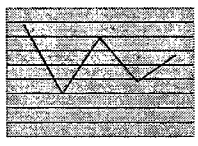
We found it quite surprising that students from earlier stages of the academic course perceived more highly the *importance to their career of knowing how to manage projects into successful implementation* (response 7a). Despite the increasing emphasis on problem-based approaches, the ability to focus on large-scale projects within an academic setting is typically limited (Hassan *et al.*, 2004), and we had thought that students would gain a greater exposure to the full life-cycle of complex projects during their internships, hence a greater appreciation of the importance of project management. This does not, however, appear to been borne out by the findings of this study – we have thus identified it as an aspect requiring further consideration.



Students from pre-first-internship stages of the course appear to differ significantly from later-stage students in their perceptions of the *focus of their course on uunderstanding the role of risk management and litigation* in current professional work (response 6b) - it appears that the students' first internship has a significant effect on how they perceive the focus of their course. This is particularly interesting when contrasted to response 6a, which considered the perception of the *importance to their career* of understanding the role of risk management and litigation, rather than the focus of their course. While the first internship appears to have resulted in a perception of an *increased* focus, it also appears to have resulted in a perception of a *decreased* importance. It is unclear at this stage whether there is a connection here.



Finally, regarding the students' perception of the *focus of their course on an ability to help others learn in the workplace* (item 8b), post internship-students appear to rate this more highly than pre-internship students. It would appear that during the periods of academic study, students' perceptions of the focus of their course on an ability to help others learn are lower, but for students during their internships periods the reverse holds. This finding is consistent with the view that the internships play a major role in informing the students' understanding of workplace learning.



Response bias may be a factor in these results, especially if (a) later stage students are less prone to response bias, and (b) the above statements elicit greater levels of response bias than the remaining statements. On the question of whether later stage students are less prone to response bias, it could be argued that later stage students are more familiar with being surveyed, have spent more time in classes, and know each other better, hence are less likely to be influenced by 'experimenter demand'. A second argument could be put that older students have self-reporting characteristics that are different from younger students. Evidence

exists that may support this second argument. Scores on self reporting instruments such as the ASI, the Approaches to Studying Inventory developed by Ramsden and Entwistle (1981), vary with age; older respondents tend to score more highly on items that relate to deep learning, whereas younger respondents tend to score more highly on items that relate to surface learning (Richardson, 1994). It is possible that the present findings could reflect an interaction between the response characteristics of the statements and age (or some other incidental variable) of the respondents. The questionable validity of self reporting has been shown to be a significant factor in other higher education research; for example, Ross and Conway (1986) describe a study where subjects reported that a course that they had attended was beneficial to them, even after it was demonstrated in a debriefing that their academic performance was no better than students who had not taken the course.

A further limitation of the study is that the Stage 1 students have different population characteristics from those of the other four Stages. All of the respondents of Stages 2 to 5 were studying the Bachelor of Engineering, Diploma of Engineering Practice – we surveyed them in the subjects associated with the Diploma of Engineering Practice, which encompasses the industry internships – whereas some of the Stage 1 students were not taking the Diploma. It is also worth noting that the proportion of international students is likely to be slightly higher at Stage 1, because a greater proportion of international students study for the Bachelor of Engineering without the Diploma than do local students. Given that Stage 1 probably had a greater proportion of international students than the subsequent four Stages, it is possible that the Stage 1 students are less (or more) prone to response bias than the other groups. However, prior research suggests that this is not likely to be a significant factor – for example, Grim and Church (1999) indicate that response bias is stable across cultures. A related issue concerns whether the participants interpreted the statements as intended – conducting interviews might help to shed light on this.

One of the goals of the present study was to gauge the suitability of the measuring instrument for measuring changes in perception, even though the instrument's reliability and validity is yet to be established. Despite the limitations of the approach, it is possible that the findings indicate the existence of real trends in perceptions of the type that are suggested. This being the case, we are interested in further developing this line of research in an attempt to shed light on the many questions that arise. For example, can we meaningfully compare one item to another, given the different demand characteristics of each item? Are these findings of practical importance? Are these findings potentially helpful as an input for a review of the course? Should differences in the focus of at different stages of the course be explicitly acknowledged in the course design and communicated to students? Can we use this type of study to 'verify' that certain graduate attributes are being attained? Further time and research is required if we are to adequately answer these questions.

CONCLUSION

In this paper we report the results of a study of students' perceptions about specific skills and knowledge. This area of research is becoming increasingly relevant because of greater levels of demand for engineering graduates that have broader professional skills, as well as highly developed technical skills. If educators are to demonstrate that they are meeting these demands, new methods for measuring student and graduate attributes are required.

While the primary objective of the present study was to trial an instrument's suitability for measuring variations in people's perceptions of their abilities, a second objective was to attempt to provide some insight into differences in students' perceptions about their technical skills and knowledge. The findings suggest that engineering internship students at different stages of their courses have different perceptions about their abilities and the focus of their courses. Although the results of this preliminary study are consistent with those that might be expected if the measuring instrument is adequate for the purpose of tracking changes in perceptions, further research is required if the validity and reliability of the method is to be established.

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