

Using Successful Graduates to Improve the Quality of Curriculum & Assessment in Nurse Education

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Overview

This paper reports on the nursing component of a linked set of research studies of successful graduates in the early stages of their career across a wide range of professions. The studies are being undertaken by the University of Technology, Sydney (UTS) in partnership with professional bodies and employers. The aim of these studies is to identify the capabilities that are seen to be most important for successful practice in the first years after graduation in the unique context of each profession and to evaluate/refine the existing undergraduate curriculum in the light of what is found.

So far studies have been completed in Accounting (with Auckland University of Technology), Architecture, Engineering, Information Technology and Nursing, Midwifery & Health. Studies for Sport Management, Science, Law and Information Sciences are nearing completion or scheduled for 2003-4. An extensive parallel study of 322 effective principals in the NSW Public Education System, one of the largest in the world, has also just been completed (Scott, 2003).

The research is guided by a comprehensive professional capability framework and involves a two phase methodology – 1:1 interviews and an online survey. Successful graduates are selected by their supervisors in the UTS partner organisations who employ our graduates. In the case of the Nursing study this involved the key managers and supervisors from two large NSW Hospitals. UTS does not prespecify the criteria used by supervisors when they identify a graduate as being ‘successful’, this is left to the partner organisation. However, there is a surprising consistency in the indicators used across all the professions so far studied – typically ‘successful’ early career graduates are identified as consistently delivering allocated work on time to specification, attracting high levels of client satisfaction and high levels of colleague satisfaction. It must be emphasised that the graduates do not necessarily have to come from UTS – the key focus is that they are reported by those who employ them to be performing successfully.

The nursing study involved 18 graduates working in two hospitals. The results at this stage are, therefore, intended only to be indicative and there is considerable room to scale up the study, should the preliminary findings be of interest.

The results of the nursing study confirm something found in every profession investigated: that, while a high level of technical expertise is necessary for successful practice as a nurse in the early stages of one’s career, it is certainly not sufficient. A range of specific ‘emotional intelligence’ and cognitive capabilities are being identified by graduates and their supervisors alike as being very significant success factors. By focusing on the entire undergraduate experience, rather than just on what is taught, course designers can do much to provide learning opportunities and assessment to develop the capabilities identified as being most significant.

Why Undertake this research?

Extensive and consistent evidence is available from a wide range of national and institutional satisfaction surveys of students enrolled in or just graduated from Australia's Universities about what engages university students in productive learning¹. Explorations of these data, including a new study of over 200,000 hitherto unanalysed comments from Australia's Course Experience Questionnaire², consistently suggest that students perceive universities to be of higher quality when they provide learning content and experiences that are demonstrably relevant to subsequent professional practice.

We know also, from the ground-breaking research of Alan Tough (1979) a quarter of a century ago, that what really motivates students is having access to information about what actually makes for successful practice from those already further down the same learning path. But, until graduates have come to grips with the realities of sustained full-time work, they are not well positioned to make specific recommendations about what sorts of university assessment, curriculum and support constitute the best preparation for the complexities of current professional practice. Yet, it is hard to find studies which have followed up graduates during their first 3 – 5 years of professional work in order to investigate this issue.

Of course, universities do use a range of procedures already to 'backward map' (Elmore, 1979) from professional experience in order to improve undergraduate learning programs. Common practices include the use of Course or Faculty Advisory Committees, Professional Accreditation Committees, reference to national competency frameworks and employer surveys. However the professionals involved in this work tend to be very experienced and in senior positions. Because of this, they may no longer be familiar with the realities of the first few years of professional work, know what is most relevant for new graduates or understand the full range of contexts in which they must currently operate. Research on course processes at one Australian Technology Network University revealed that the information from peak industry representatives was not always based on comprehensive research into what counts for effective performance in the wide range of contexts in which early career graduates in their particular profession must operate.

The UTS successful graduates studies seek to address this gap in applied higher education research. We are finding that not only are the outcomes of the studies completed so far helping address the above issues but they are also having other positive spin-offs.

For example, in an increasingly competitive higher education environment, universities like UTS are seeking to position themselves in a distinctive way, particularly in the area of practice-oriented education. However, many universities are now claiming that they too are successfully using practice as a site and source for learning and engaging in productive research partnerships with the professions. In this context 'backward-mapping' from what distinguishes successful graduates in the particular environment of their early professional career and using this directly to improve the undergraduate curriculum and assessment constitutes a genuinely distinctive form of practice-oriented education.

Every university in Australia has a generic set of graduate attributes. This project will enable us to test and enhance the validity of the UTS version of these and to locate capability more in the unique professional context in which it is to be applied.

¹ The Graduate Careers Council of Australia delivers its Graduate Destination Survey and Course Experience Questionnaire to more than 100,000 graduates each year with a 65% response rate. Each Australian University runs its own internal surveys – these include surveys which tap students' satisfaction with the overall university experience, subject and teaching feedback surveys, research student surveys and a wide range of focus group studies. For details of the UTS tracking systems see www.qdu.uts.edu.au and click on tracking systems.

² This project is funded by DEST. The report Scott, G & Richardson, A (forthcoming). The project is being led by UTS and QUT in partnership with nine other Australian Universities.

The Study's Conceptual Frameworks

A conceptual framework explains either graphically or in narrative form, the main dimensions of a study – the key factors, constructs or variables – and the presumed relationships between them
(Miles & Huberman (1994) and Huberman & Miles (2001).

Professional Capability³

The conceptual framework for professional capability which has guided the present study has been developed from research and writing in a wide range of contexts, some of which has already been indicated. It draws upon:

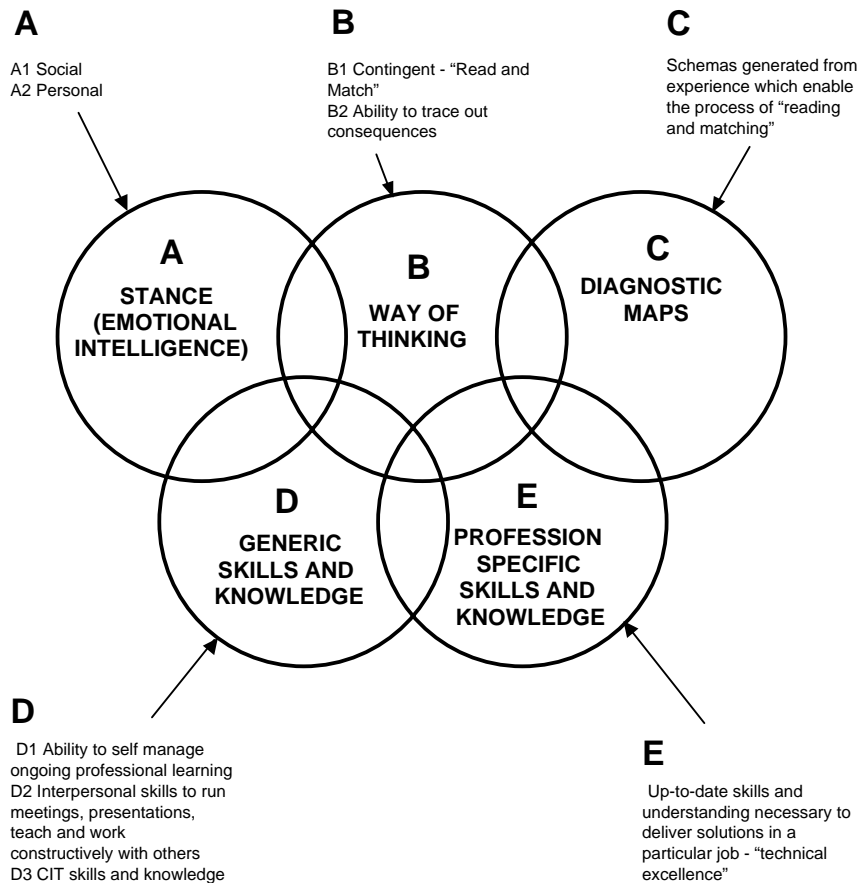
- Research on professional & vocational competence and expertise by Schön (1983), Morgan (1988), Gonczí , Hagar and Oliver (1990), Tennant (1991) and, more recently, by Binney & Williams (1995), Gardiner (1995), Scott (1996), UK Centre for Research into quality (1997), Goleman (1998, 2000, 2002) and DEST (2002);
- Research undertaken on effective leadership and change in education (Scott, 1999 Chapter 5 and Fullan, 2001a&b);
- UTS empirical research:
 - Studies of what distinguishes the most effective performers in the Skill Olympics (Scott & Saunders, 1995);
 - A study of the key capabilities required by Deans in a period of rapid change in Australian Higher Education (Kemmis & Scott, 1996);
 - A study undertaken for the NSW Secondary Principals Council which sought to evaluate and explain the effectiveness of its 'Futures Strategy' (NSW SPC, 2002)
- An analysis of the results of workplace research projects undertaken by some 500 graduate students studying leadership, professional competence and change in the MEd Subject "Managing Change in Education & Training" over the past 17 years;
- The outcomes of some thirty exploratory workshops across NSW over the past two years with more than 1200 principals, members of the school executive and experienced teachers on the topic "leadership and effective change management in state schools" in which the emerging framework has been tested and refined⁴;

The consistent findings from this broad range of research are that professional capability is comprised of the 5 interlocked domains represented in Figure 1. This Figure seeks to demonstrate that the possession of generic or job-specific skills (D and E) is necessary but not sufficient for effective professional performance.

³ In this study 'capability' is defined as that combination of attributes, qualities, skills and knowledge that enables a person to perform to a high standard in a given professional context and role.

⁴ Over the same period UTS has run a parallel series of courses and workshops with teachers within and beyond Australia on what constitutes an effective approach to teaching and learning. This work has been supplemented with extensive analysis of student survey data on effective teaching and learning in universities (Scott & Richardson, forthcoming). The parallels in the findings between the distinguishing attributes of effective teachers and effective educational leaders has led us to hypothesise that the most effective leaders see their role as primarily being one of setting up and coordinating the conditions for effective adult and organisational learning for their staff.

Figure One
FRAMEWORK
PROFESSIONAL CAPABILITY



UTS research in developing this framework has repeatedly demonstrated that it is when things go wrong, when an unexpected and troubling problem or dilemma emerges, that professional capability is most tested, not when things are running smoothly or routinely. It is at times like these that the individual must bring to bear the combination of a well developed social and emotional intelligence (A) and a sharp, contingent way of thinking to diagnose what is going on (i.e. to 'read' the situation) and, from this, to figure out (i.e. 'match') a uniquely suitable strategy for addressing it (B&C), a strategy which brings together and competently delivers that selection of generic and job-specific skills and knowledge (D&E) most appropriate to the situation.

This suggests, for example, that, if professionals cannot remain calm when things go awry or are unable to work constructively with staff then, no matter how intelligent they may be or how much they may know, they will not be able to resolve the situation productively. Equally, however, simply remaining calm and being responsive is not enough. Professionals must have the where-with-all to accurately 'read' the total human and technical components of the situation and, with the assistance of well developed professional relationships, accurately figure out what really lies behind it if a productive solution to the situation is to be identified and implemented. The study's conceptual framework for professional capability suggests, therefore, that it is the combination of brain and heart that ultimately makes the difference.

It is from this framework that the 38 items which make up the Professional Capability Scale used in the Successful Graduates Surveys has been developed. The items that make up this scale are given in Chart One.

Chart One
Professional Capability Scales

<p>Emotional Intelligence – Personal (A1)</p> <ol style="list-style-type: none"> 1. Being willing to face and learn from my errors and listen openly to feedback 2. Understanding my personal strengths & limitations 3. Being confident to take calculated risks and take on new projects 4. Being able to remain calm under pressure or when things go wrong 5. Having the ability to defer judgement and not to jump in too quickly to resolve a problem 6. A willingness to persevere when things are not working out as anticipated 7. Wanting to produce as good a job as possible 8. Being willing to take responsibility for projects, including how they turn out 9. Having an ability to make a hard decision 10. A willingness to pitch in and undertake menial tasks when needed 11. Having a sense of humour and being able to keep work in perspective <p>Emotional Intelligence – Interpersonal (A2)</p> <ol style="list-style-type: none"> 12. The ability to empathise with and work productively with people from a wide range of backgrounds 13. A willingness to listen to different points of view before coming to a decision 14. Being able to develop and use networks of colleagues to help me solve key workplace problems 15. Understanding how the different groups that make up my organisation operate and how much influence they have in different situations 16. Being able to work with senior staff without being intimidated 17. Being able to give constructive feedback to work colleagues and others without engaging in personal blame 18. Being able to motivate others to achieve great things 19. Being able to develop and contribute positively to team-based projects 	<p>Intellectual Capability (B & C)</p> <ol style="list-style-type: none"> 20. Knowing that there is never a fixed set of steps for solving workplace problems or carrying out a project 21. Being able to identify from a mass of detail the core issue in any situation 22. The ability to use previous experience to figure out what is going on when a current situation takes an unexpected turn 23. Being able to diagnose what is really causing a problem and then to test this out in action 24. An ability to trace out and assess the consequences of alternative courses of action and, from this, pick the one most suitable 25. Being able to readjust a plan of action in the light of what happens as it is implemented 26. Being able to see how apparently unconnected activities are linked and make up an overall picture 27. Being able to set and justify priorities 28. An ability to recognise patterns in a complex situation <p>Profession-specific skills & knowledge (E)</p> <ol style="list-style-type: none"> 29. Having a high level of current technical expertise relevant to my work area <p>Generic Skills & Knowledge (D)</p> <ol style="list-style-type: none"> 30. Being able to use I.T. effectively to communicate & perform key work functions 31. Being able to manage my own ongoing professional learning and development 32. An ability to chair and participate constructively in meetings 33. Being able to make effective presentations to clients 34. Understanding the role of risk management and litigation in current professional work 35. Knowing how to manage projects into successful implementation 36. An ability to help others learn in the workplace 37. Understanding how organisations like my current one operate 38. Being able to organise my work and manage time effectively
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Productive Adult Learning

The second framework used in the study brings together research on what factors most effectively engage tertiary students in productive adult learning. This framework has been generated from 20 years’ study of effective adult teaching and learning⁵. It represents an overall quality assurance framework for learning design and delivery and indicates that adults, including principals, will be more likely to engage in productive learning if their learning programs:

⁵ For a summary see Scott, (1999, 2000 & 2002), Foley (2000) and Scott and Richardson, (forthcoming).

- R** Are immediately **RELEVANT** to their particular backgrounds, abilities, needs and experiences;
- A** Provide for more **ACTIVE** than passive learning, avoid endless one-way lectures, afford frequent opportunities to make contact with people who are further down the same learning path and enable easy access to a range of quality assured data bases;
- T** Constantly link **THEORY WITH PRACTICE**, especially through the use of integrated problem-based learning projects, real-world case studies and staff with current practical experience of the area being studied;
- E** Effectively manage their **EXPECTATIONS** about what will be delivered, how assessment will work, and what sorts of access and support will be available;
- D** Ensure that learning proceeds logically in **DIGESTIBLE** 'chunks';

- C** Use a valid professional **CAPABILITY** profile, like that outlined in Figure One, to specifically generate targeted outcomes and appropriate assessment and to guide the learning necessary to achieve them;
- L** Provide opportunities to pursue flexible **LEARNING PATHWAYS** by enabling them to undertake a linked, developmental set of learning activities responsive to their particular needs, the requirements of the profession and (when it is involved) the university;
- A** Ensure that feedback on all **ASSESSMENT** and learning tasks is timely, constructive and detailed;
- S** Not only include opportunities for **SELF-MANAGED LEARNING**, but actively coach participants on how to use the systems and resources set up to support it;
- S** Provide **SUPPORT & ADMINISTRATIVE SERVICES** which are responsive to their needs and specifically optimise the total experience they have of the providing institution and the learning program;

- A** Ensure that **ACCESS** to learning times, locations and resources makes participation in the learning program as convenient and productive as possible.

It is from this scale that the 11 items which make up the education quality scale used in the successful graduates' studies has been developed. These items are given in Chart 2.

Chart 2

Educational Quality Scale

<p>39. Focus more directly on the capabilities identified as being important above in university courses and assessment</p> <p>40. Use real-life workplace problems identified by successful graduates as a key resource for learning</p> <p>41. Make work-placements which test out the capabilities identified in this study a key focus in each course</p> <p>42. Use successful graduates more consistently as a learning resource in university courses (e.g. as guest speakers)</p> <p>43. Decrease the amount of formal classroom teaching of basic technical skills and use self-instructional guides and I.T. to develop these</p> <p>44. Include learning experiences based on real-life case studies that specifically develop the interpersonal and personal skills needed in my particular profession</p>	<p>45. When relevant, use I.T. to make learning as convenient and interactive as possible</p> <p>46. Ensure that all teaching staff model the key attributes identified as being important in this study</p> <p>47. Ensure that teaching staff have current workplace experience</p> <p>48. Make assessment more real-world and problem-based and less focused on memorising factual material</p> <p>49. Use performance on the capabilities identified as being most important in earlier parts of this survey as the focus for assessment and feedback on all learning tasks.</p>
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Method

First, key professional partners of the University are invited to participate. This is done by the relevant Faculty A/Dean (Teaching & Learning) or delegate personally contacting senior staff in the range of public instrumentalities, companies or enterprises with which the Faculty already has a strong relationship. These people are briefed on what is involved by being sent details of a study already completed and published for another profession⁶. If the partners agree to proceed they organise for the identification of early career graduates who, on their key indicators, are performing effectively⁷. They also provide the names of the supervisors for these people.

Detailed 1:1 interviews are held with a sub-sample of the nominated group of graduates and supervisors, using a semi-structured interview schedule. These interviews are used to test, calibrate and ensure that the online instrument used in the second phase of the research is appropriate and contextualised. The interviews also provide valuable qualitative data in their own right;

The partner organisations then arrange for the distribution of the calibrated online survey to the full sample and, by personally contacting their nominees, help ensure that online response rates are high. This method is proving particularly effective with the achievement of online response rates of more than 90% for each project⁸. In the case of the nursing study some of the surveys had to be completed by hand as the nurses concerned did not have easy access to a computer.

The phase 2 online survey invites respondents to rate the capability items in Chart One first on their relative importance in explaining effective performance and then on the extent to which the university course they undertook addressed them using a five point Lickert Scale (1 – low, 5 – high). They are also invited to explain their ratings and provide case studies of when their capabilities were most tested. Finally they are asked to rate the items on educational quality (Chart 2) for importance and performance and to identify those aspects of their experience of university seen to be most and least productive for their first few years professional practice.

This research is undertaken with the approval from the UTS Human Research Ethics Committee.

Results

An extensive array of quantitative and qualitative data are produced. The quantitative data are presented graphically so that the relative importance and performance for different items and professions is evident. The qualitative data are analysed using recent developments in computer-assisted analysis software like *CEQuery* and *Leximancer* (www.leximancer.com). Data can also be analysed on a wide range of demographic variables.

The results are currently being analysed and written up in detail for publication by the two colleagues from the Faculty of Nursing, Midwifery and Health at UTS who organised the nursing phase of the study with the two partner hospitals. What I intend to do at this stage is just to give a preview of what has emerged and a brief outline of how the nursing results compare with the findings from the parallel studies of successful graduates in Information Technology, Engineering and Accounting. This will be followed by a brief outline of some of the ways in which the results can be used to enhance the curriculum, assessment and learning in nurse education programs.

⁶ See, for example, Scott, G & Yates, W (2002): Using successful graduates to improve the quality of undergraduate engineering programs, *European Journal of Engineering Education*, Vol 27, Number 4, December, pgs 363 –78.

⁷ As noted early across all of the professions so far studied, including nursing, the preferred indicators tend to involve looking for triangulated evidence of effective performance in at least three core areas: delivery of projects/services on time to specification; high levels of client satisfaction; high levels of workplace & supervisor satisfaction.

⁸ For example, in the parallel capability survey being undertaken for the NSW Department of Education and Training with 'effective' principals, this approach has achieved a response rate of 100% from the 322 school leaders surveyed.

Items ranked highest on importance

Of the 12 items ranked highest on importance for effective performance as an early career nurse (Table One), eight come from the Emotional Intelligence Scales (A). Specifically, four come from the Emotional Intelligence (Personal) Scale (A1); and four from the Emotional Intelligence (Interpersonal) Scale (A2). Of the remainder, three come from the Intellectual Ability Scales (Way of thinking/Diagnostic Maps – B&C) and one from the Generic Skills & Knowledge Scale (D). The items are, in rank order of importance:

Table One

Item (Scale)	Importance Rank (mean)	Focus
12 (A2)	1 (4.94)	The ability to empathise & work productively with people from a wide variety of backgrounds
1 (A1)	2 (4.88)	Being willing to face and learn from my errors and listen openly to feedback
38 (D)	3 (4.82)	Being able to organise my work & manage time effectively
13 (A2)	4 (4.76)	A willingness to listen to different points of view before coming to a decision
27 (B)	4 (4.76)	Being able to set and justify priorities
14 (A2)	6 (4.73)	Being able to develop and use networks of colleagues to help me solve key workplace problems
22 (C)	7 (4.71)	The ability to use previous experience to figure out what is going on when a current situation takes an unexpected turn. Being able to remain calm under pressure or when things go wrong
4 (A1)	8 (4.65)	Wanting to produce as good a job as possible
7 (A1)	8 (4.65)	Being able to readjust a plan of action in the light of what happens as it is implemented
25 (B)	8 (4.65)	Having a sense of humour and being able to keep work in perspective
11 (A1)	11 (4.63)	Understanding how the different groups that make up my organisation operate & how much influence they have in different situations
15 (A2)	12 (4.63)	

Respondents' emphasis on the central role which Emotional Intelligence (Personal and Social) plays in effective practice has emerged in every other professional capability study undertaken to date by both our own research teams (e.g. Scott & Yates, 2002) and others (e.g. Goleman, 1998, Goleman, Boyatzis and McKee, 2002⁹).

What becomes clear when looking at the patterns in the above table is that it is the total mix of capabilities outlined in Figure One that counts, not just strength in one component.

⁹ These authors identified 18 competencies sorted into four domains (self-awareness, self-management, social awareness, and relationship management) as being essential for emotionally intelligent professional leadership and organisational success in complex times.

Place of Job Specific skills and knowledge

Consistent with most studies completed so far, item 29 (Scale D): *Having a high level of current technical expertise relevant to my work area* received a comparatively low importance ranking (27/38)¹⁰. However, as respondents emphasise, this simply means that job-specific skills and knowledge are necessary but not sufficient for successful early career performance, an observation confirmed by the fact that this item still attracted a mean importance rating of 4.38. Respondents consistently observe that there is a profound difference between having knowledge and skills and knowing when and when not to use particular components of it appropriately.

Capability items ranked lowest on importance

The vast majority of the 38 items which make up the capability scale received mean importance ratings in excess of 4.0 (that is between ‘agree’ and ‘strongly agree’ on the five point Lickert Scale). However there were seven exceptions (Table 2). These may reflect some of the ways in which the nursing profession is different from the other professions surveyed, where such items often attract higher importance ratings. Please note that even the lowest ranking capability item 32 still attracts an importance rating well above the neutral position (3) on the five point Lickert Scale. Item 30 (*being able to use I.T. effectively*) receives lower importance rankings in professions like education but much higher ones in professions like engineering. Stage of career may also be having an influence on the level of importance attributed to particular items.

Table Two

Item (Scale)	Importance Rank (mean)	Focus
32 (D)	38 (3.47)	An ability to chair and participate constructively in meetings
30 (D)	37 (3.63)	Being able to use I.T. effectively to communicate & perform key work functions.
35 (D)	36 (3.75)	Knowing how to manage projects into successful implementation
33 (D)	35 (3.81)	Being able to make effective presentations to clients
20 (B)	34 (3.88)	Knowing there is never a fixed set of steps for solving workplace problems or carrying out a project.
3 (A1)	33 (3.88)	Being confident to take calculated risks and take on new projects
18 (A2)	32 (3.94)	Being able to motivate others to achieve great things.

Items rated high on importance but low on performance

Items with this characteristic identify potential areas for enhancement. The criterion for identifying an item as low performing (i.e. not receiving adequate focus in the university’s learning program for the area) is that its mean must fall at or below 2.9 – that is below the neutral point (3) on the five point Lickert Scale. The criterion for identifying an item as being of high importance is that it should have an importance mean which is at or above 4.5 – that is at least half way between ‘agree’ and ‘strongly’ on the five point Lickert Scale.

¹⁰ This item was ranked 29/38 on importance for Engineers and 34/38 for Information Technology professionals. However, successful early career accountants rated it much higher (8/38).

The items which meet these two criteria are presented, in rank order by performance (lowest first), in Table 3.

Table 3

Item (Scale)	Importance	Performance	Focus
4 (A1)	4.65	2.50	Being able to remain calm under pressure or when things go wrong
22 (C)	4.71	2.59	The ability to use previous experience to figure out what is going on when a current situation takes an unexpected turn
16 (A2)	4.53	2.69	Being able to work with senior staff without being intimidated Having a sense of humour and being able to keep work in perspective
11 (A1)	4.63	2.82	Being able to give constructive feedback to work colleagues and others without engaging in personal blame
17 (A2)	4.53	2.87	

It should be emphasised that, although a number of these capabilities may not be amenable to formal classroom instruction, they can be addressed during practical placements and in the broader components of the university experience, including its non-formal aspects. It is also becoming clear that, once items like number 4 are identified as being so important, people become more conscious of monitoring their own performance on them.

Additional high importance/low performance items which did not meet the above criteria but which came close include items:

- 1 (being willing to face and learn from my errors and listen openly to feedback);
- 5 (having the ability to defer judgement and not to jump in too quickly to resolve a problem);
- 21 (being able to identify from a mass of detail the core issue in any situation);
- 26 (being able to see how apparently unconnected activities are linked and make up an overall picture);
- 28 (ability to recognise patterns in a complex situation);
- 36 (an ability to help others learn in the workplace);
- 37 (understanding how organisations like my current one operate).

Items with high importance and performance

Items with this characteristic identify potential areas of good practice. The criterion for identifying an item as high performing (i.e. receiving adequate focus in the university program) is that its mean must fall at or above 3.5 - that is, at least half way between neutral (3) and agree (4) on the five point Lickert Scale. This test takes into account the fact that respondents to higher education quality surveys consistently rank performance much lower than importance. The criterion for identifying an item as having high importance is, as already noted, that it should have an importance mean which is at or above 4.5. The items which meet these two criteria are presented in rank order by performance (highest first) in Table 4.

Table 4

Item (Scale)	Importance	Performance	Focus
27 (B)	4.76	3.93	Being able to set & justify priorities
7 (A1)	4.65	3.81	Wanting to produce as good a job as possible
12 (A2)	4.94	3.63	The ability to empathise and work productively with people from a wide range of backgrounds
38 (D)	4.82	3.63	Being able to organise my work and manage time effectively
14 (A2)	4.73	3.56	Being able to develop and use networks of colleagues to help me solve key workplace problems

Other high importance/high performance items which did not meet the above criteria but which were close include item 34 (Scale C: *Understanding the role of risk management and litigation in current professional work*); and item 13 (Scale A2: *A willingness to listen to different points of view before coming to a decision*).

Comparisons with studies in other professions

Table 5 presents combined results for the 8 top ranking items on importance in the successful graduate studies completed for Information Technology, Engineering and Accountancy. The 8 top ranking items for nursing are also provided to enable comparison.

Table 5

Rank Order on Importance	Information Technology, Engineering & Accountancy combined	Nursing
1	<u>Item 1</u> : Being willing to face and learn from my errors & listen openly to feedback (A1)	Item 12: The ability to empathise with & work productively with people from a wide variety of backgrounds (A2)
2	Item 19: Being able to develop and contribute positively to team-based projects (A2)	<u>Item 1</u> : Being willing to face and learn from my errors and listen openly to feedback (A1);
3	Item 8: Being willing to take responsibility for projects & how they turn out (A1)	Item 38: Being able to organise my work & manage time effectively (D)
4	<u>Item 27</u> : Being able to set and justify priorities (B)	Item 13: A willingness to listen to different points of view before coming to a decision (A2);
5	<u>Item 4</u> : Being able to remain calm under pressure when things go wrong (A1)	<u>Item 27</u> : Being able to set and justify priorities (B)
6	Item 7: Wanting to produce as good a job as possible (A1)	<u>Item 14</u> : Being able to develop and use networks of colleagues to help me solve key workplace problems (A2)
7	<u>Item 22</u> : The ability to use previous experience to figure out what is going on when a current situation takes an unexpected	<u>Item 22</u> : The ability to use previous experience to figure out what is going on when a current situation takes an unexpected

	turn (C)	turn (C).
8	<u>Item 14</u> : Being able to develop & use networks colleagues to help me solve key workplace problems (A2)	<u>Item 4</u> : Being able to remain calm under pressure or when things go wrong (A1)

Table 5 shows that five of the top 8 items are common to all of the professions studied (items 1, 4, 14, 22 and 27); and that they cover the full range of emotional and cognitive intelligence outlined in Chart One. Of the remaining three items, the differences trigger some interesting hypotheses which could be followed up. It may be that factors like the following could be influencing these differences: different levels of responsibility and control over work; possible differences in the levels of team-work necessary; differing levels of risk; in the need for being well organised; and the need to be responsive and sensitive to diversity. Once again many of these capabilities may not be amenable to formal classroom instruction but are open to being addressed in the broader range of formal and informal learning experiences that make up current approaches to nurse education.

Using the results to enhance curriculum and assessment

The follow-up strategies being used by the UTS Faculty of Engineering to action their results are indicative of the possibilities for using the results of this preliminary nursing study to enhance curriculum and assessment in Nurse Education. All of these strategies are consistent with the RATED CLASS A framework for productive learning which has been consistently confirmed as valid in the results of the successful graduate studies, including the present one¹¹:

- First year students have completed the same survey as that filled out by the successful early career graduates and have compared results. This is seen as being a more powerful and informed approach to expectations' management and needs' assessment than simply asking new students to identify what they think is most relevant. It also makes the rationale for course content and assessment more explicit. It is anticipated that this process will be repeated at a number of stages throughout the course to track student development;
- The results are being compared with the national competency framework for accreditation of Engineering Programs by the Australian Institute for Engineers;
- The Engineering results on the framework outlined in Figure One are to be used to give students a more comprehensive and valid briefing on what to expect and look for in their work-placements and on how to evaluate and learn from what happens. In particular, it is anticipated that workplace mentors will use the framework to ensure their assessment of UTS students on placement is comprehensive, focused on what counts and that feedback is targeted and constructive;
- The orientation camp for new students is developed by senior students and used to develop the peer support networks found to be so important in this and other studies;
- Ways of using the case studies generated from the online survey to make learning and assessment more integrated and focused are being explored;
- As part of the redesign of the core program within the UTS BE degrees, the findings of the study are being used to inform the focus and sequencing of assessment, subjects and capability development;
- A trigger film which demonstrates the importance of emotional intelligence in delivering engineering projects has been successfully piloted with a group of Engineering students;
- The findings of the study confirm the importance of the BE Subject: "Integrating Project" (48430) undertaken in the final year to consolidate what has been learnt throughout the degree. In the 2002 UTS Subject Feedback Survey this subject attracted the second highest rating on relevance (4.5/5.0) out of all 66 engineering subjects surveyed .

¹¹ For example the highest ranking items on importance in the Educational Quality Scale (Chart Two) in the present study were, in rank order: Item 47 (*Ensure that staff have current workplace experience* – importance mean 4.6); Item 48 (*Make assessment more real-world and problem-based and less focused on memorising factual material* – mean 4.43); Item 40 (*Use real-life workplace problems identified as successful graduates as a key resource for learning* – mean 4.4); Item 44 (*Include learning experiences based on real-life case studies* – mean 4.4).

It will be interesting to see if any of these strategies proves to be productive and applicable in the case of Nurse Education and to see what additional ones can be identified and successfully implemented.

Conclusion

Outcomes from this study of successful nurses in the early stages of their career and parallel investigations with their counterparts in a range of other professions suggest that this UTS project has considerable potential for enhancing the quality of learning design, delivery and assessment in universities in ways which will prove to be relevant to early career professional productivity and performance.

The results in all of the studies completed so far, including the present one, demonstrate that what is central to effective practice is not simply the possession of specific skills and knowledge but something far more integrated and complex, something more emblematic of a university education than an industry training programme. For example, irrespective of the profession, it appears that it is the appropriate combination of all of the capability domains identified in Figure 1 that accounts for effective early career performance, not the possession of just one or two components. In particular, job-specific knowledge and skills are seen as being necessary but not sufficient for professional success.

The studies provide a comprehensive and profession-specific 'backward mapping' methodology with which to identify what might best be emphasised in the undergraduate learning designs and assessment in order to make university study relevant. All of the successful graduate studies to date, including the present one, confirm that the integrated capability framework used to guide this research (Figure One) can comfortably accommodate all of the data generated in ways which may sense to the respondents. This argues in favour of its use by universities when seeking to formulate their graduate profiles for the various professions they serve and suggests that it might be a useful way of shaping overall discussions about graduate attributes. The use of the profession-specific data generated using this framework can ensure that links between theory and practice and reflective learning are comprehensive and focused.

Emotional intelligence – both social and personal – emerges as being a far more significant influence on successful early career performance than previously recognised. And there are indications from both our qualitative and quantitative data that, although such attributes may not necessarily be amenable to traditional, subject-based teaching, they are learnable. In this regard it is very clear that we must look to the total university experience and at how the practicum is handled and assessed as a key resource in this regard, not just to what happens in the traditional classroom.

A range of strategies for more directly developing the capabilities important to early career performance have been identified. This has been done by referring to the Engineering component of successful graduates studies where the research was completed more than a year ago and action in applying what has been learnt is now well underway.

Respondents' reflections on the quality of learning and assessment in their undergraduate course align not only with what they say best develops professional capability but also with recent studies of what most motivates and sustains student engagement in productive learning at university. They confirm that there should be less assessment of routine skills and facts and more tracking of how well students can use their technical expertise in combination with their emotional and intellectual capabilities to effectively diagnose and resolve specific workplace problems and common dilemmas¹². How to address this finding poses universities, whose learning systems are often based on separate, disaggregated subjects and credit points, with a considerable challenge. However, if this can be successfully done, it will reposition these institutions in a period of considerable competition as being about far more than the delivery of facts online or mere technical training.

¹² In this context a dilemma is defined as 'requiring a choice (often under considerable time pressure) between two or more potentially appropriate courses of action which set up a tension that must be resolved one way or the other (Scott, G, 1999: *Change matters: making a difference in education & training*, Allen & Unwin, Sydney).

Now that a data base for the different professions is emerging, some interesting cross-profession analyses are becoming possible. A brief indication of the potential in this regard has been given in the discussion of the data in Table 5.

It should be re-emphasised that, due to the comparatively small sample of respondents used in each of these pilot studies (18 successful nursing graduates from two Australian hospitals in the present instance), its findings should be viewed as indicative until we have been able to scale up each study. In this regard the project has considerable potential in strengthening the partnerships between universities, professional organisations and employers in mutually productive ways. The approach is currently being piloted across the Australian Technology Network of Universities of which UTS is a member¹³.

The research approach successfully implemented in this and parallel pilot studies represents a key new strategy for making universities more relevant and engaging to people entering the professions. It is hoped that other tertiary institutions will follow our lead by seeking to listen more systematically and carefully to their graduates and to 'backward map' from what they learn in order to enhance the quality of their students' total experience of university life.

This task, although challenging, is critical to Australasia's future – tertiary education represents a key investment in developing a country's social, intellectual and creative potential. Without sensitive, socially conscious, open, critical, and capable graduates who can successfully generate and implement relevant and imaginative solutions to the complex problems which countries like ours now face, our social as well as economic future will be grim. The stakes are that high.

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His research and thinking on effective change management and quality development in post-secondary and higher education are outlined in Scott, G (1999): *Change Matters: making a difference in education and training*, Allen & Unwin, Sydney & London. He has masters and doctoral degrees from the University of Toronto, Canada and is a Fellow of the Australian College of Education. Contact: geoff.scott@uts.edu.au

¹³ These universities are Curtin University of Technology, Perth, the University of South Australia, Adelaide, RMIT University, Melbourne, UTS, Sydney and Queensland University of Technology, Brisbane. Between them ATN Universities cater for more than 137,000 students.

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