**The Changing Education Needs of the Professions**

**The Changing Education Needs of the Engineering Profession**

A recent edition of the Business Review Weekly ran an editorial on the rapid changes occurring in engineering consultancies. Firms are expanding, either by acquisitions or internal growth. Opportunities are increasing locally with infrastructure work and the resources boom, while overseas increased access to the Chinese and Middle Eastern markets is driving demand for engineering services.

Firms are moving from straight consultancies to taking equity in projects, working in alliances with other firms – often multinationals – and increasing the risk profile of projects to earn higher margins, while sending their more functional tasks offshore to take advantage of lower labour costs.

Opportunities are increasing locally with infrastructure work and the resources boom, while overseas increased access to the Chinese and Middle Eastern markets is driving demand for engineering services.

Today it is not only industrial and mining companies that outsource their engineering departments. Governments, particularly at a State level, have also outsourced their technical expertise creating an ongoing problem as to whether they have retained the in-house ability to be an informed buyer of engineering services.

Understandably this outsourcing movement has had a significant impact on the professional development and training of engineers in Australia. In the past, a significant percentage of engineers were trained in the public sector. However, as government agencies and utilities have been privatised or have outsourced, there has been a fundamental shift in the employment of engineers, who are now, on the whole, private sector employees. Never before has the private sector had to take the major responsibility for the provision of training engineering graduates.

Continuing education and training post graduation is particularly important for engineering graduates. An engineer is not fully “formed” and thereby regarded as competent to practice independently until they have gained several years of “mentored” engineering experience. This requirement is driven by issues of public health and safety, and is essential to ensure high quality engineering work.

Additionally, it is recognised that in view of today’s rapid pace of change in technology, and the increasingly
accountable and literate environment in which engineers operate, it is essential that engineers adopt a program of lifelong learning through Professional Development. In this new environment, graduate and experienced engineers, industry, private training companies and universities have recognised the need to work together to support these changes in the employment, education and training environment of engineers.

EDUCATION

Engineers Australia has undertaken an accreditation program for undergraduate programs since 1965. Accreditation involves an evaluation of undergraduate engineering award programs offered by universities and other educational providers and a judgement against designated criteria set down in accordance with the accreditation policy. Consideration of engineering programs for the request of the specific educational institution and is not obligatory.

An accredited engineering education program is judged as providing satisfactory preparation for graduates to enter the profession at the appropriate career category and to gain admission to Engineers Australia in the grade of graduate Professional Engineer, Graduate Engineering Technologist or Graduate Engineering Associate as appropriate.

By providing an internationally benchmarked standard for judgement of undergraduate engineering education programs, accreditation publicly assures the competence of graduates from all accredited degrees in Australia and provides a guarantee of standard of education for the employer.

This benchmarked reference is particularly important to employers.

Over 1995 and 1996 Engineers Australia, in association with the Academy of Technological Sciences and Engineering and the Australian Council of Engineering Deans, undertook a major review of engineering education in Australia: Changing the Culture: Engineering Education into the Future. One significant direction to emerge from this review was the call from employers for engineering education to cover wider professional skills such as leadership, social awareness, and communications.

In the wake of the review, Engineers Australia has used its accreditation role to help ensure that Graduates from engineering courses throughout Australia are meeting employers’ expectations.

PROFESSIONAL DEVELOPMENT

As the private sector now has to take the major responsibility in training engineering graduates, Engineers Australia has responded to this challenge through its Professional Development (PDP) and Continuing Professional Development (CPD) programs. The Professional Development Program (PDP), focused on the professional career of full-time engineering graduates, is a formally recognised agreement between Engineers Australia, the enterprise/employer and the individual/graduate engineer. The PDP is a structured program delivered in the workplace with external assessment and support from Engineers Australia. Participation in a PDP is open to engineering practitioners employed in all fields, types and sizes of enterprise.

As at 2004, there are over 2,000 graduates in 70 organisations involved in the program. These organisations include mining, utilities, consulting, aerospace, information technology, telecommunications, processing, manufacturing, construction and public authorities at all three levels of government. Professional Engineer, Engineering Technologist and Engineering Associate.

Under the Continuing Professional Development (CPD) program, professional engineers, on an individual level, undertake activities in order to maintain and extend their knowledge, skills and judgment.

For an activity to qualify as CPD it must be related to the engineer's professional career. For many engineers CPD activities will include both technical and non-technical topics. Non-technical topics include management, accounting, law, ethics and foreign languages. The six major types of CPD are Formal Education and Training Activities, Informal Learning Activities, Conferences and Meetings, Presentations and Papers, Service Activities and Industry involvement (per academia). Engineers must undertake CPD to maintain Chartered Status with Engineers Australia.

One third of CPD is obtained from within Engineers Australia; from our conferences, workshops, seminars and from our published journals.

CENTRE FOR ENGINEERING LEADERSHIP AND MANAGEMENT

After graduation many engineers find that after a period of practice they move into careers in management and business. Until recently, some engineers who move into management ceased thinking of themselves as engineers.

In order to assist professional engineers to move into management and leadership positions in business and government, the Council of Engineers Australia has established the Centre for Engineering Leadership and Management (CELM).

The establishment of CELM recognises that the Colleges of Engineers Australia are focused to give support to engineers working in their professional technical fields, for example civil or electrical engineering. The concept of a ‘Centre’ allows interaction with all Colleges and welcomes the participation of other professional organisations. CELM operates to enhance the career opportunities of engineers in leadership and management positions.

Engineers Australia has recognised that rapid changes in knowledge make it difficult for professionals to remain abreast of their field. Learning must be provided with the opportunity for continued learning.

With this in mind Engineers Australia is pro-actively working to ensure that engineers develop the skills, knowledge and competencies they require to be successful members of the engineering team.

Engineers Australia’s involvement in the assessment of university courses, the design of continuing professional development programs and the development of CELM will ensure that professional engineers are able to meet the challenges of the future.

CONCLUSION

Engineers have changed from a profession that supplied employers and clients with competent and economical technological advice to a professional occupation that seeks to serve the community, a socially and environmentally responsible manner. This is the future challenge for engineering education.

To meet these challenges, the professional education of engineers must be broadened and strengthened.

In the next section, we consider whether there are any professional education programs that are sufficiently broad and comprehensive to meet this challenge.
Globalisation is driving the need for change, which means that universities are increasingly looking at ways to adapt and remain internationally competitive. The shift of educational resources online is opening up the tertiary education sector to true globalisation, creating a requirement for constant review and redevelopment not only of course materials, but also of the knowledge and skills of the academics and business workers. They also provide a level of education that complements what is offered by the universities and the TAFE system, and in our rapidly changing environment, a broad range of education options is essential to meet the different needs of working professionals.

Educational content provided by professional societies is usually brief and highly focused, representing the leading edge of a particular topic rather than the broader theoretical foundation provided by the universities.

For example, a workshop might present an overview of software design, teaching the various approaches of software design, teaching the various approaches. The ACS might complement their other offerings by engaging a renowned expert in Internet technology to explain the elements of the profession, such as academics and business workers.

Professional associations such as the ACS (Australian Computer Society) play an important role in bringing professionals together to exchange ideas and encourage cross-fertilisation between different elements of the profession, such as academics and business workers.

Ten years ago, conferences were seen as a necessary part of working life, affording a valuable opportunity for education and networking. But cost constraints and the demands on organisations to be lean and mean and expect more out of their staff, has meant that many fewer workers have the time or budget to attend events during the week, and weekend events have suffered equally as people strive for balance in their lives.

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Conversations with (accounting) practitioners have a recurrent theme. They are looking for educational offerings that know something about the broader political, social and economic contexts within which business takes place. It is recognised that communication, analytical and problem solving skills are best developed through a broad-based education.

To enable students greater choice in their undergraduate degrees, CPA Australia has recently changed the requirements for admission to its CPA Program. By allowing students to defer studies in Taxation and/or Auditing to the postgraduate professional education CPA Program which will increase the options for these students in their undergraduate degree.

While candidates must still have an accounting major, they will have the option of studying other areas of interest, such as finance, information technology and marketing, while still studying tax and/or auditing before qualifying as CPAs.

The CPA Program's entry requirements have also been modified to better accommodate Masters graduates in certain specialist disciplines and some will be eligible to be exempted from two CPA Program electives.

For example, a 2004 candidate with an approved Masters degree in Tax from a recognised Australian university and a relevant undergraduate degree would only have to complete four segments (including the three compulsory ones) in the CPA Program.

Historically, no exemptions have been given for higher degree qualifications.

CPA Program graduates wanting to acquire a Masters degree or an MBA at certain universities can already gain exemptions for part of their Masters requirements as a result of the six segments they have studied through the CPA Program.

This change, in addition to the change in Tax and Auditing requirements, is to encourage candidates with broader and more advanced business backgrounds into the profession. The changes in admission requirements have better linked professional education with undergraduate and postgraduate tertiary study.

The CPA Program has changed with the times because more than 300 CPAs and 12000 students are completing higher degrees. If we consider the implication of professional life-long learning, the CPA Program is now uniquely located in a continuum of education, as well as meshing (through the Mentor Program) with professional practical experience.

Over the last 10 years there has been a proliferation of professional coursework masters' degrees across a broad spectrum of business-related disciplines. It reflects the growing complexity of the profession, and is also evidence of the recognised need on the part of business professionals to engage in continuous and ongoing learning and development.

The CPA Program, CPA Australia's professional education program consists of six (6) postgraduate level full semester subjects (segments), 3 compulsory and 3 elective segments. The first compulsory segment, Reporting and Professional Practice, forms the foundation of the CPA Program.

This segment focuses on the business environment and the role and responsibilities of the professional accountant with particular emphasis on ethical and reporting issues.

Corporate Governance and Accountability is the second compulsory segment, demanding students to confront issues surrounding governance and accountability by directors and management of organisations.

The CPA Program offers flexibility but choice, given that candidates have nine electives from which to choose 3, as depicted in the course structure diagram. From 2004 new candidates have to complete a new compulsory capstone segment, Professional Practice and Corporate Governance and Accountability.

Candidates studying the capstone segment will have had a very comprehensive technical, ethical and regulatory education, all of which have been surmounted by the major financial reporting and legal compliance dimensions of the CPA Program within the framework of Corporate Governance and Accountability.

More employers want their CPAs to be leaders in business, accounting and finance, and the new CPA Program will provide candidates with more business and leadership skills than ever before, as the major financial reporting and legal compliance dimensions of the CPA Program within the framework of Corporate Governance and Accountability.

The Business Strategy and Leadership segment links strategic planning to the leadership role, teaching candidates how they can add value to their organisations by taking the leadership role in projects.

All compulsory segments in the new CPA Program will have increased written assessment. Business Strategy and
In a nutshell, CPA Australia’s new education strategy will consolidate its position as the pre-eminent provider of professional education for leaders in finance, accounting, and business advice. To ensure that the CPA Program maintains its contemporary relevance, a Professional Education Board was established in 2003 to oversee the strategic development and quality assurance of the CPA Program.

Leadership will be assessed by 100 per cent case-based written examination under examination conditions. This extra assessment will not only increase the educational value of the course of study by requiring thoughtful analysis of information and reporting, it will also meet the International Education Standards set by the International Federation of Accountants Committee (IFAC).

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THE IMPACT OF THE INFORMATION EXPLOSION ON MEDICAL EDUCATION

The most obvious examples of the challenges of information overload are the expansion of available investigations and treatments to better manage health and illness. In 1960, one of the authors’ fathers, a graduating medical student, condensed his final examination notes on medications used to treat patients onto two sides of a single page of paper. Today, books listing the available medications rival metropolitan phone books. Similar changes have occurred in laboratory and body imaging investigations. The growing number of necessary diagnostic and treatment decisions that are part of the modern “standard of care” reflect both the success and educational dilemmas of modern scientific medicine. The result is that while universities once memorized human anatomy in detail, they cannot master the knowledge associated with current medical practice; nor can the modern curriculum allow time for them to learn the detail of anatomy. Instead, the keys to modern medical competency, and thus to the future of medical education, lie in teaching problem-solving skills that emphasize information acquisition via databases, and then focuses learners on assessing evidence, interpreting it for patients, and making shared decisions. This analytical problem solving is a far flung reality from the paternalistic approach taken to patient care in an era, not so far distant, when doctors could do little more than either accept the lack of solutions or apply unproven remedies, reassuring those likely to improve regardless or supporting and empathizing with patients and families in dire circumstances.

Most medical schools are moving from a traditional, lecture-based curriculum to a new “problem-based...
learning” (PBL) curriculum that uses small group, case-based, learner-centred approaches designed to stimulate lifelong learning. The issue for educators, is that no matter how creatively their priorities are resourced, in many respects they are still taking on the problem of providing medical education that is as effective as possible. In addition, the quality of medical education depends on the goodwill of medical graduates – doctors who will care for all of us. They are in training. If we do not choose to fund training and education is ongoing and public hospitals will be unable to do so. This makes precise budgetary allocation all but impossible. 

The demands for teachers at the rural clinical schools has meant that an increasing number of scarce rural GPs and specialists (many of whom commute for sessions in the country) are being asked to teach without adequate resources of time and money. Workforce shortages and distribution are an increasingly important issue. A global healthcare provider shortage means that doctors are less likely to have time to be involved in patient care. The difficulty of quantifying this and post-graduate trainees reduces the efficiency of patient care. The greater requirement for a clinical teaching environment of metropolitan Melbourne is more than twice that of rural settings in Victoria (~1:500) [5]. To many learners, specialist practice, with its appealing combination of increased pay, increased respect, the latest technology, and the ability to focus on more defined patient problems, is hard to resist when they choose their ultimate pathway as a doctor [7]. There is no doubt that many are at risk of overspecialisation, as the exciting and interesting world of technologically sophisticated subspecialty medicine in the traditional healthcare provider shortage and demand for medical education. The demands for learning more about the exciting and interesting world of technologically sophisticated subspecialty medicine in the traditional healthcare provider shortage and demand for medical education. The demands for learning more about the exciting and interesting world of technologically sophisticated subspecialty medicine in the traditional healthcare provider shortage and demand for medical education. The demands for learning more about the exciting and interesting world of technologically sophisticated subspecialty medicine in the traditional healthcare provider shortage and demand for medical education. 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SUMMARY

Recognition of the interdependence, and inseparability, of the healthcare and education systems in clinical education is the first step in addressing the resource and workforce issues identified above. Importantly, merely fixing the funding will not solve all problems in medical education. Medicine as a profession is also struggling with social issues including impact of excess work hours, perceived appropriateness of remuneration and an increasing desire of doctors, like others, to want balanced lifestyles that allow for family and other interests. Unsatisfied, these concerns can contribute to the erosion of professionalism of our clinical workforce with specific concerns about their teaching obligations.

There is now evidence to support what medical educators have always known: doctors who teach have increased career satisfaction and better knowledge and skills retention. These personal benefits provide a rational basis for medical educators to re-dedicate themselves to their most important role of training the rational basis for medical educators to re-dedicate increased career satisfaction and better knowledge and educators have always known: doctors who teach have for the best possible clinical workforce for the future.

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THE PRIMARY ROLE OF THE ACTUARY IS TO CONSIDER THE FUTURE AND MAKE SENSE OF IT...

CAROLYN MACULICH
Director, Professional Education, Institute of Actuaries of Australia

WHAT DO ACTUARIES DO?

Actuaries manage risk. They provide commercial, financial and prudential advice on the management and interrelationships of assets and liabilities in a wide range of practical business contexts. Actuaries are skilled in statistics, economics and finance, and use these skills in a range of business environments. While actuaries work in the traditional spheres of life insurance, general insurance and superannuation, where there are legislated statutory roles for actuaries, they are expanding into new fields such as sustainability and climate change, genetics, health financing, investments and banking. While the areas in which actuaries can add value are very varied, there is a common theme to their role: managing risk and making financial sense of the future.

THE INSTITUTE OF ACTUARIES OF AUSTRALIA

To be recognised as an actuary in Australia, an individual must achieve the designation of Fellow of the Institute of Actuaries of Australia (FIAA). The Institute is the peak professional body representing the actuarial profession by creating, expanding and maintaining an environment where the skills of actuaries are widely used and valued.

The Institute:

- establishes and maintains professional standards for the protection of the public
- provides pre-qualification and continuing professional education
- creates forums for discussion about contemporary and relevant issues
- promotes research and the development of actuarial science, and
- contributes to and informs the debate on public issues

Currently there are 2 770 members of the Institute, of which 1 277 are Fellows, 565 Associates, and 854 students. Over 17% of members are outside Australia, the majority of these in Asia. The Institute also has a number of bilateral agreements for mutual recognition of Fellows with the Faculty and Institute of Actuaries (UK), the Society of Actuaries (US), the Canadian Institute of Actuaries, the Society of Actuaries of Ireland, and the Actuarial Society of India and at the level of Affiliate with the Institute of Actuaries of Japan. These agreements enable actuaries to practise professionally in other territories subject to meeting the requirements of the local actuarial association, such as a period of professional practice and residency. Each agreement is predicated on equivalent educational and professional conduct standards. The Australian actuarial education program is very highly regarded internationally.

AUSTRALIAN ACTUARIAL EDUCATION

Becoming a Fellow is a highly specialised career path requiring several years of study before qualification as an actuary. The Australian actuarial education program involves a combination of university programs and courses conducted by practising actuaries through the Institute. It includes five parts and requires anywhere from five to eight years to complete. To ensure the appropriateness of the education process for the actuarial profession, the Institute has responsibility for the continuous review of the education program and the improvement of the syllabus and delivery approaches of the courses. The Institute has a rigorous process for accrediting universities to teach Part I and Part II of the actuarial education program, leading to the professional qualification of Associate of the Institute of Actuaries of Australia (AIAA). Currently four Australian universities are accredited to teach Part I and Part II. The first such program in the English-speaking world commenced at Macquarie University in 1968, and has been followed by others at the University of Melbourne, the Australian National University, and the University of NSW. The university programs are reviewed by the Institute on a four-year cycle, with a mid-term review conducted every two years. An important partnership exists between the Institute and the university appointments. The Institute provides financial support to departments which meet established Institute criteria for Centres of Excellence (CoE), which includes a requirement for an education program.

Part I of the actuarial education program consists of nine core technical subjects which are taught as part of a Bachelor's degree at two accredited universities. The examinations of the Faculty and Institute Actuaries (UK) which are delivered via correspondence are an alternative for Part I for students who work following their university study.

Part II of the actuarial education program is the Actuarial Control Cycle, which is an innovative means for learning how to apply actuarial skills to business situations across a wide range of practice areas. Developed by the Institute, the Actuarial Control Cycle has formed the centre-piece of the Australian actuarial education program since 1996, and now is a fundamental component of the education of actuaries around the world. The strong emphasis of the control cycle is in holistic approach, which can assist actuaries to apply a multi-disciplinary approach to a range of problems, both within and beyond the traditional areas of actuarial endeavour. This has led to the addition of control cycle principles by the UK and US professional bodies at the mid or associate level of their education programs. This course is now taught as either an Honours or Masters course at the four accredited universities in Australia. After successfully completing Parts I and II (a credit grade or more to be gained in each subject), and becoming Associates of the Institute of Actuaries of Australia (AIAA).

Part III, the specialist education program, is developed, delivered and managed by the Institute. It keeps pace with the degree of change within the profession, and to incorporate developments within the international actuarial community, the Institute conducted a major review of its Part III education program in 2003/2004. Establishing best practice for post-graduate professional education and equipping graduates with actuarial and business skills to meet the demands of the changing commercial environment were the main concerns of this review. The Institute also developed a set of Capability Statements for actuarial practice, in consultation with a wide range of members, which provide a framework for considering how actuarial education provision and work experience can best meet the expected levels of performance for an AIAA and FIAA. The resulting Institute of Actuaries of Australia (IAAA) Part III Education Program, which is conducted with one semester options and on-line components, and provides grounding in Investments, and Risk and insurance, with strong emphasis on the commercial applications and business communications.
From 2005 the Part III program consists of a compulsory Investment Management subject, a choice of one subject from either Life Insurance, General Insurance, Superannuation & Planned Savings, or Investment Management & Finance, and a compulsory six day residential course Commercial Actuarial Practice – Managing Financial Risk. Assisting actuaries to develop a business orientation is a common concern throughout the world, and is being addressed by many actuarial professional bodies internationally. The new Commercial Actuarial Practice course developed by the Institute, in conjunction with the Australian National University, will focus on contextualizing actuarial skills and approaches in the wider commercial environment, on increasing communication skills and on the applications of ethical concepts, corporate governance requirements and actuarial professional standards.

The numbers of students undertaking Part III have consistently increased, with over 480 students currently enrolled. Students are located around the world, primarily in Australia and Asia, and use the distance learning materials, web-based discussion forums, CDROMs, tutorials (which are delivered in Sydney, Melbourne, Hong Kong and Singapore), and sit the final examinations in 30 centres around the world.

The considerable contribution of Institute members in the development and delivery of the Part III subjects is remarkable. Over 250 Fellows generously give their time each year to work with the Institute’s professional education department. All exams (except double-marked), assignment markers, scrutineers, tutors, course writers and reviewers, and education committee members.

To finalise their studies, students are required to attend the Institute’s Professionalism Course and meet a one-year Practical Experience Requirement under the guidance of a nominated Mentor. The three-day residential Professionalism Course deals with the Institute’s Code of Conduct and its practical applications, ethical requirements, obligations, risks and the legal responsibilities of being a member of the actuarial profession.

After qualifying, all Fellows are required to undertake 70 hours of continuing professional development (CPD) training annually. The Institute conducts an extensive CPD program, as a means of maintaining professional standards, enhancing career opportunities and meeting the needs for life-long learning by actuaries. Typically the CPD program consists of forums, seminars, self-study programs, ‘hot topics’ sessions, residential courses, regular monthly meetings, and a major biennial Convention. Annual or biennial forums for discussion of industry issues, changes to regulations, government initiatives and developments in professional practice are also held across various practice areas.

The scope of professional roles for actuaries is rapidly expanding, which creates exciting opportunities for work in new fields, such as Health Financing and Banking.

MEETING IN THE MIDDLE – A QUANTITY SURVEYING PERSPECTIVE ON CHANGING EDUCATION NEEDS FOR THE PROFESSIONS

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INTRODUCTION

The system of tertiary education for quantity surveyors that has served us for about 40 years is coming to an end in many directions. Observed trends in tertiary education are not isolated. There is evidence that shifts in thinking have a global reach. We must ask ourselves why it is so and what is to be done.

HISTORICAL CONTEXT

The Australian historical context is that, up to about 1960, the only real quantity surveying qualification was direct entry into the IQSA, the forerunner of today’s Australian Institute of Quantity Surveyors (AIQS) or the RICS, a British institute. Study was undertaken on the job and wherever it was available, often by correspondence from England. Before a student or probationer was admitted the applicant was required to pass a two-day measurement examination. The RICS exams were much more comprehensive and extremely difficult for Australians to pass since they were based on British practice.

Around 1960, technical colleges around the country began to offer part-time quantity surveying courses where students undertook all their study after working hours. Students undertook cadasters or indentures with practicing firms during their course of study. At that time the colleges concentrated on vocational training, including construction trade courses. The professional courses quickly became sandwich courses with substantial blocks of ‘day-release’ study during the week. The colleges negotiated with the AIQS to allow graduates of these courses direct entry to the Institute without further examination. These proposals were readily accepted because it relieved the Institute of the burden of setting and marking exams. A logbook and interview after a period of practical experience (probationary period) became the single test of entry retained by the Institute. We quickly got used to the idea that universities would produce, with minimal help, ready-to-employ quantity surveyors (i.e., measurers with practical competence).

It is easy to forget that students and graduates were not, at that time, expected to be highly profitable. Their work was carefully supervised and edited as part of their on-going training and the firms’ long-standing risk management practices.

The colleges started the move away from vocational training in favour of higher academic education, first becoming Institutes of Technology and ultimately, Universities. This trend was driven by successive federal government education policies. Even then these ‘practical’ universities retained a vocational focus in many of their degree courses but the trend towards more academic bias and away from a vocational bias was set in train.

THE EVOLVING PROFESSION

When vocational courses were first developed the range of quantity surveying services typically offered was very limited. The profession offered some estimating and detailed measurement (bills of quantities). Cost planning was in its infancy and contract administration was rare. Quantity surveying core competencies were limited to a handful.

In the following 40 years, pushed by progressive firms, we have developed sophisticated documentation and contract administration techniques in response to evolving procurement and contracting environments. Our base competencies rose to around 30. 15. More recently quantity surveyors have begun to specialise in a wide range of cost related advisory areas. It is now difficult to define the ‘average’ quantity surveyor, much less define the core skills that constitute a qualified quantity surveyor. It leads me to wonder, if it is extremely difficult, if not impossible to develop a degree course that will educate a complete modern quantity surveyor.

On top of the added complexity, competition policy has had the effect of reducing prices to the extent that students and graduates are expected to be immediately profitable whilst costly supervision and editing techniques have disappeared. They have not necessarily been replaced with new risk management techniques appropriate to current technology and practice.

WHITHER THE PROFESSION?

While quality surveying practices will continue to offer a traditional range of consulting services, perhaps delivered differently, there will be an accelerating trend towards specialisation. We see this with firms and individuals specialising in tax depreciation, facilities management, due diligence and compliance, dispute resolution, estimating, contract management, project management and bid writing. The Institute will advise IT systems development and sales, IT contract management, property investment and analysis, property development and the sale of real property data. The AIQS published competencies now number 31. Services offered have grown well beyond this already. It is unreasonable to expect that quantity surveyors are...
expert in all the recognised QS competencies. Many will have a general knowledge in some areas and will specialise in other areas. QS general practitioners will not be inhibited to specialise, where they may not be experienced in particular specialist areas of practice, as is normal in other professions. Graduate quantity surveyors are being employed at an increasing rate by building firms. Many of these people will be qualified quantity surveyors with high levels of specialisation, but they may never acquire the broad range of core skills to entitle them to full membership of the AQPs in its present form.

There is no doubt today’s graduates will be doing different things differently by the end of their working life than is the case for most graduates today. The professions have been slow to adopt competence based assessment for entry into their institutions, preferring to rely on input based agreements negotiated from time to time with universities. The input based models are no longer appropriate for a number of reasons, including the move towards multiple specialisations and the reluctance of universities to offer long vocational degree courses.

Competence based approaches will better way to admit new members because it is objective, fairer, more flexible to cope with changing specialities and it has the potential to recognise many more entry paths into the profession. It is also of benefit to the world towards personal education and development. We should give recognition to this trend and make a place for it within our entry paths.

With a move towards competence based membership criteria and assessment, the way in which members are educated and how we learn will change. We will do away with the “high jump” approach to professional membership in favour of a “hurdles” method. At present applicants will have to pass all the core assessment criteria and experience for a single entry test. In future, members will, after graduation, acquire competencies in particular areas of practice over time as they need or want them, until they are able for and be granted elevation to general practice or to any of a number of specialist areas.

Such a system will require more commitment on the part of the Institute to its admission and accreditation processes, but it will enable significantly better control and management of the process. This will be important as voluntary professional registration schemes take effect. Membership of our professional organisation at an early stage will become part of the ordinary membership program once again mean much more than holding an undergraduate degree. It would be the basis of a true partnership between the educators and the profession. As a result, education, specialisation and the quantity surveying itself changes, the current “GP” model of membership is likely to become less relevant and it is the professions responsibility to ensure that it has a structure that is relevant to the needs of members now and in the future.

Under more generic regimes, the profession itself will once again be the gatekeeper of the profession. Using self-controlled schemes to establish standards that accord with community and industry expectations, guided by professional organisations such as the AQPs, this will again become the sole agency recognising and accrediting quantity surveyors in general practice and in specialist areas of expertise.

It is generally agreed that the vocational skills of today will not necessarily be the skills of tomorrow and that it is more important to educate graduates in critical and creative thinking, leaving vocational skills to be acquired in other ways, as they were before 1960.

Partnership between universities and professional associations will remain, although a university degree will not necessarily be the qualification with which graduates will acquire more generic undergraduate degrees.

It is generally agreed that the vocational skills of today will not necessarily be the skills of tomorrow and that it is more important to educate graduates in critical and creative thinking, leaving vocational skills to be acquired in other ways, as they were before 1960. This is not a new concept for universities. It has always been the practice for graduates of sciences and the arts to undergo further vocational training in their chosen field after graduation.

I believe that the move towards generic degrees is not necessarily harmful to the profession and at best has the potential to offer significant advantages, if handled carefully. The costs, and pitfalls that must be understood.

It is likely that full-time undergraduate degree courses will fall back to educating students in critical and creative thinking, with knowledge of project and construction processes, communication and management skills. It would be a specialised kind of management degree. These courses would not last longer than two to three years. Beyond this, vocational skills would be acquired by combinations of post-graduate and special courses, on-the-job experience, corporate training, personal study and life long learning.

There are practical pitfalls and problems with such an approach. Firstly many young people leaving school, and their parents, still have an expectation that after completing a course of study for a vocationally directed degree there will be a qualification for an immediate profession. This would not be the case. After qualifying they would be looking at two to three years additional study to fit them for a particular career path and after that a life-long commitment to acquiring knowledge. This prospect may well deter school-leavers from entering or continuing a course in a vocationally directed career path. At present marketing for undergraduates is shared between the profession and faculties who have a vested interest in maintaining strong single strand undergraduate courses. Both would need to carefully target undergraduate entry post-graduate marketing in order to attract good quality students into the professions. Without structured courses to fill, it is suggested the Universities could well be disinclined to market individual professions.

It is also known that students develop core professional attitudes from early exposure and study in their particular discipline. We know that these attitudes are generally knowledge and skills important and valuable to employers. Just as young architects develop an early appreciation of spatial and environmental design concepts, young quantity surveyors develop a particular style of critical thinking, based on an understanding and appreciation of the components and processes of construction that comes from measuring work. We do not know how we will replace this early skill development and subsequent attitudes if graduates are required to learn those core motivational skills on-the-job after graduation, when their attitudes have already been formed.

It is likely that universities and the professions will respond today’s education and qualification challenges in a variety of ways. The approaches are unlikely to be as homogeneous as they have been in recent history.

Some universities will retain strongly focussed degree courses with a high vocational content. These courses will attract those students who are seeking a degree with a high level of vocational content. Some universities will also attract international students who have neither the time nor the capability to seek out education options over time. It would be expected that graduates would acquire all the necessary core competencies for base professional entry through study in such a course.

Where universities do not have appropriate resources or structure to provide a focussed degree course they will develop generic project and construction management degree courses. Some generic competencies for base professional entry will be acquired in other ways.

Universities would be accredited for their educational capability, as proposed by the Universities partnering arrangements. The professional tertiary course guides published by the AQPs will nominate the accredited universities as well as the competencies that graduates will expect to acquire from a course. Courses may be rated, so that a full course may achieve a five star rating whilst a partial course would be given a lower rating. This would enable students to plan their tertiary education.

Further generic degree programs will be acquired in a number of ways. Some will be by way of post-graduate study, external study, self-study and on-the-job training. The AQPS, TAFE colleges and private employers are likely to offer courses of further study, sometimes in collaboration.

Life-long learning, including regulated continuing professional development, will be important to the profession and will be delivered in the same way and will be seamlessly integrated with the acquisition of further and specialist competencies.
based managerialism. The phrase ‘doesn’t everyone work 60–70 hours per week?’ indicates the unwillfulness of the minerals industry to regard its employees as workers and a valuable asset. ‘When will the industry move beyond technical fatigue management?’ Mining is already seen as a high-risk business, can it ever be detached from its attachment to its workers as a production factor?’

Recently the working age population (18–64) has increased by 170,000 per year. Access Economics estimates that this workforce will peak in the entire decade of the 2020’s will grow by only 125,000.1 The implications then, for the ability of the minerals sector to attract quality staff from a reduced pool of available employees in a competitive market where other industries are seeking a similar skill base, are profound. Providing effective leadership and making decisions to lead balanced lives with as much social and family time as time at work, students increasingly chose not to study engineering and the sciences, and the working population is aging and reduced. Society must go back to the drawing board if sustainability is to be conceived achievable.

A company’s ability to innovate, and its commitment to, and reputation for, being ethical are also associated to, and reputation for, being ethical are also associated with increased employee loyalty and confidence.4 To attract quality staff from a reduced pool of available employees in a competitive market where other industries are seeking a similar skill base, are profound. Providing effective leadership and making decisions to lead balanced lives with as much social and family time as time at work, students increasingly chose not to study engineering and the sciences, and the working population is aging and reduced. Society must go back to the drawing board if sustainability is to be conceived achievable.

The Minerals Tertiary Education Council (MTEC) has been actively seeking to develop innovative and flexible programs across its member institutions such as the G3 Masters program.4 The MTEC program does not include all course provider and does have its own cost and cons, but it seems that this collaborative approach may provide a sustainable outcome for the minerals sector. The VET sector is also concerned about the sustainability of higher education. Engineering courses are increasingly options based courses. In a graduating class of over 60 students from the University of Melbourne in 2002 less than 20 students took the mining engineers elective. With the increasing popularity of engineering, and mining, fewer and fewer students have opted for the minerals sector to attract to students to mine electives. This is not a simple task when many students are either not aware or not well informed of the opportunities in the minerals sector and the diversity of career paths it can offer. There are many postgraduate courses that provide the opportunity to multi-skilled, and trained in more specialised. Chemical engineers can take postgraduate courses while working fulltime to become re-branded as metallurgists and geologists have the opportunity to take postgraduate courses to become re-branded as mining engineers and geo-technical engineers. However, there still needs to be undergraduate courses to feed the need. The socio-economic need need to be made aware of these opportunities.

“Tertiary geology courses still tend to train ‘general’ or ‘academic’ geologists with the odd elective or subject thrown in to cover exploration or mineral economics. Most of those teaching our geologists have little industry experience, and even fewer have mine geology experience. There is a belief by those providing courses at universities that mine geology will be taught on the job by industry. However, increasingly the number of professionals at mine sites is reducing and there is not the luxury of having graduate positions that spend years learning the basics under close supervision and mentoring by senior professionals. …it is not unreasonable to expect that a graduate mine geologist should have a basic understanding of drilling, sampling theory, the principles of QA/QC, basic orebody modelling in one of the commonly used general mine planning systems, geostatistics and geometallurgy. It has been our experience that many graduate mine geologists commence their careers with varying levels of skills, and even worse, graduates are often not aware that these skills might be useful to them. The industry does need to work more closely with universities to ensure training is more aligned to the needs of the industry, even get involved in curriculum design and delivery.”

This experience with geology is common to many disciplines and professions. If higher education paradigms for minerals sector professionals is to be sustainable then industry, professional associations and government must to work more closely with higher education providers and that higher education providers must work together to provide flexible and collaborative courses.

CONTINUING PROFESSIONAL DEVELOPMENT

Professionals need to maintain their technical skills, but also need to ensure they develop their knowledge and understanding of current issues, changing regulations, and new techniques. Increasingly, working hours and responsibility means that many professionals, particularly the young and new professionals need to be aware of these opportunities. Employers or the time available to invest in their continuing professional development. The mining industry is working more closely with training providers across all industries with almost 50% of its workforce working more than 50 hours per week every week of the year. Many employees indicates that employers need time for professional development, it also raises issues of professional fatigue.

There is an apparent gap in the numbers of new professional entrants to the workforce. New professionals need to have time to acquire the knowledge of older professionals and integrate that in their own experience. Mentoring should be vital, especially in shifting to an ‘ageless’ workforce rather than a polished older/younger generation workforce. The fertility to this is also perceived unsustainable as the consulting workforce tends to draw its employees from the companies who are no longer training the numbers of staff they once did. Where do the employees with five to 10 years experience come from as the sector does not invest in training them retain them in the sector and give them the training and professional development to get them to that level? More regularly we are working on the same project again and again because the person that did the project has left, taking all the valuable knowledge with them. What makes this situation worse is the electronic media. Many professionals have access to training and development resources that are available within their organisation and have been deemed to be relevant to their job.

The AusIMM in May 2001 addressed issues including the access to, and availability of, professional development resources. A testing question for companies was put forward, ‘How clear are our professional staff – graduates and recruits to executive managers – about the answers to three key employee questions, What is my job?, What am I doing? and What’s my future?’. Organisations that are successful in establishing conditions for their staff to answer those questions in the affirmative maximise their chances of having motivated and effective staff.”

The Australian minerals sector will increasingly be a component of the global portfolio and not in control of its viability. Yet it has the opportunity to establish itself as the most sustainable of all the global industry. To achieve this aim industry, associations and government need to work together with higher education providers and that number of graduates be addressed but also addressed must be the issues surrounding attraction and retention of the ‘agrarian’ or younger engineers. The knowledge management and employment practices all play a role in the sustainability of the Australian mining sector. However, FASTS and Professions Australia allow greater collaboration and sharing of skills. Sustainability requires a holistic approach to the way professionals conduct their business. No longer can professionals work in isolation within specific disciplines. As mining, processing and technical problems are considered concurrently it is clear that professionals must work together to achieve the best possible outcome with respect to sustainability.

Higher Education

The minerals industry employs 75,000 people6 and the sector employs roughly twice that. The number of people working in the minerals industry with bachelor degrees and above qualifications is only 13,000.6 Employing less than 2% of the Australian labour force direct and indirectly employed, the Australian minerals industry contributed 33.8 billion dollars to the Australian GDP in 2002. In the same year, the Australian Agriculture Industry contributed 21.2 billion dollars to the Australian GDP, but only employed 404,800 people.7 It is increasing hard to maintain the viability of niche courses that professionals of the future. University chancellors and vice chancellors running their institutions as businesses do not understand the importance to Australia of the minerals sector. Courses such as RMIT’s Applied Geology and Geological Engineering undergraduate courses are the last of their kind in Australia and are being closed. No further enrolments were taken for these courses in 2003 though the students graduating from them had 100% employment within the minerals sector. The viability of the mining and minerals school at the University of Queensland was recently questioned. Investigation found that the economic viability of the school was based on undergraduate enrollments and in courses with as few as 15 students this would clearly be perceived as unviable.


6 ABS Australian Census 2001


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I am an Australian general practitioner who has worked as an academic most of my career educating medical students and doctors training in general practice – for 12 years at London University and more recently in the Northern Territory. The education of our profession has evolved greatly over this 25 year period, and has become somewhat problematic in the postgraduate area.

But first undergraduate education. The major issue at this level, as in many fields, is that the knowledge and skill base has grown at an alarming rate – to the point where no one has a grip on it. At the undergraduate level this is dealt with in a rational manner – by choosing the common and important health problems and presenting these to the students. The focus of the education is of caring for patients, an eagerness to learn and a willingness to deal with uncertainty appropriately. Not caring is always a disaster for all concerned. The eagerness to learn may wain or more usually, interests become more narrowly focused over the years, which means that patients do not always get the best care.

Dealing with uncertainty appropriately is critical as willingness to deal with uncertainty appropriately. Not caring is always a disaster for all concerned. The eagerness to learn may wain or more usually, interests become more narrowly focused over the years, which means that patients do not always get the best care. The burden of caring for patients, an eagerness to learn and a willingness to deal with uncertainty appropriately is critical as the under-provision of care, although the latter may find you in court earlier.

This brings me to a crucial problem facing our profession – the overwhelming threat of litigation. Avoiding litigation is held by all as a matter and is far more complex.

By removing the need to train ‘doctors’ as undergraduates – it is not long enough – the requirements of postgraduate education has the hurdle based proviso that few or no Australian graduates entering training, and even in the large metropolitan centres as many as 40% are overseas trained.

There is another problem facing general practice, that of an insufficient workforce. This raises many issues for education in general practice. We have seen the popularity of our special area of medicine fall since the government removed funding from our College and established a Commonwealth company to fund regionally-based private education providers. The hope remains that such an approach will solve some of the workforce issues in Australian general practice – but young doctors are not attracted by such measures, particularly when only applied to one field of medicine. My efforts, through our College, have found that for most it has been reached before I have met them. That is to say, in a field where you cannot know everything, a young doctor can flourish on the basis of caring for patients, an eagerness to learn and a willingness to deal with uncertainty appropriately.

What does this mean for postgraduate education in general practice? It means we have a bypass of the standards of our College and the Australian Medical Council (AMC) on the basis of workforce. Our coming first and good doctors second – but there has to be a standard below which a doctor should not be able to work unsupervised, and a standard below which a doctor should not be able to practice. Given these large numbers of international graduates both in training and entering the workforce directly, with private companies managing their education, – what can the profession do? We can take a different approach, changing our assessment process into a mastery of learning experience – allowing all doctors to learn from the assessment process and make explicit their learning needs. Such an assessment process should be available for all practitioners – including those who have gained the right to practice independently – providing indicators of where they need to increase their knowledge and skills. A feature of such an approach would be the ability to determine which practitioners fall beneath the level that allows supervised practice, or any practice at all. For such practitioners there should be a special pathway that will provide a means of regaining such accreditation. This process would allow quality practitioners to follow a rapid assessment process, and those who have other responsibilities, such as parenting, to take it at their own speed. The process must be independent of the requirements imposed by government to address workforce issues and be determined by the profession and other key stakeholders.

Our profession as a whole is concerned about possible introduction of re-certification, and rightly so. Imposed processes are always unpleasant. But international experience shows that it only takes a few high profile examples of incompetence to assure that it is necessary. It is possible at this moment that there are more doctors who would not meet a minimum standard practicing in this country than ever before – certainly our College or the AMC is not in a position to refute this claim. I hope that our new approach to assessment will make such concerns redundant, as well as adapting to our new and very different environment.

Avoiding litigation is held by all as a measure of good practice, and good communication skills are an important asset in this pursuit. Being sued is now, however, a reality for many doctors – some of them amongst the best in the country.

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Governments have a great interest in general practice – it is where they get the best value for money in health care. If professionalism, and by that I mean self-development, regulation and assessment, is overly constrained then interest will dwindle.

Being a general practitioner is a wonderful job as long as we can develop our own careers and participate in the development of our profession. I have been around (just) long enough to know that is only from within that a profession can grow and flourish. Governments have a great interest in general practice – it is where they get the best value for money in health care. If professionalism, and by that I mean self-development, regulation and assessment, is overly constrained then interest will dwindle. Finally, as a nation we have a duty to educate and train sufficient general practitioners for our population.
EMBRACING A NATIONAL LIFE LONG LEARNING PHILOSOPHY IN THE AUSTRALIAN NURSING COMMUNITY

CHRISTINE ASHLEY-COE

Director – Professional Services and Projects
Royal College of Nursing, Australia

There can be few professions that have undergone such significant changes in training and professional development over the last 20 years as the nursing profession. Prior to the move from service based training in the 1980s to the tertiary sector, nursing was a female dominated vocation with training developed using a medical model, and delivered in the workplace. In-service education, essential components of the job, were self-paced into the shift work on the ward and depended on the workload of the day. Student nurses were considered a vital part of the workforce in hospitals and community health settings, and their educational needs were largely limited to courses available through the schools of nursing in universities around the country, and their educational needs were largely limited to courses available through the tertiary studies for undergraduates and the opening of tertiary studies for undergraduates and the opening of Nursing, Australia. However, with the advent of professional development for undergraduate nurses, there was an shift towards the formalisation of education for nurses. Practical learning, such as access to professional settings, was considered as the key element in the career development of professional nurses. Life long learning has been defined as the key element in the career development of professional nurses. Life long learning has been defined as the key element in the career development of professional nurses. It allows consumers, nurses and their employers access to an objective evaluation when choosing the course most suitable to meet their needs. It also gives education providers guidelines of the profession’s expectations and minimises the risk of courses or programs being developed in isolation from the wider nursing profession. This does not mean that all courses or programs must be the same or that local needs cannot be met.

The accreditation process also incorporates continuous evaluation of courses and their providers. The College offers ongoing support and feedback to education providers, thus ensuring that nurses considering undertaking accredited courses are accessing quality programs. (RCNA Course Accreditation Handbook 2003)

Endorsement is similar to accreditation, except it is a shorter process used for reviewing the content of activities such as workshops, conferences and seminars. The review process may include books and other educational material such as CDs, reports and pamphlets. In the case of workshops and other activities, CNE points are allocated to the activity as part of the endorsement process. Both accreditation and endorsement represent a national standard held by the profession, which is recognised as evidence of the value of the event or product. Nurses can be assured that the processes of accreditation and endorsement are rigorous and involve a peer review, and so activities or products which have successfully gone through this process should therefore provide valuable learning experiences.

Whilst several professional groups have introduced CNEs as part of their continuing education programs, a major difference in the Royal College of Nursing, Australia 3LP program came about as a result of a survey of College membership, which sought how issues such as access to professional development due to geographic location or social circumstances needed to be taken into consideration.

program, as meeting the pre-determined criteria for quality activities. CNEs provide a guide to the amount of professional development each nurse should aim to achieve over a 12 month period, with the College recommending 30 CNEs (roughly equated to 30 hours of professional development). CNEs are awarded to Royal College of Nursing, Australia activities, and to other education providers who have submitted their activities or courses to the College for accreditation or endorsement. Royal College of Nursing, Australia has provided a national accreditation and endorsement program to the nursing profession if nursing is to successfully meet the needs of today’s health care environment, and tomorrow’s unknown challenges.

Life long learning has been identified as the key element in the career development of professional nurses. It allows consumers, nurses and their employers access to an objective evaluation when choosing the course most suitable to meet their needs. It also gives education providers guidelines of the profession’s expectations and minimises the risk of courses or programs being developed in isolation from the wider nursing profession. This does not mean that all courses or programs must be the same or that local needs cannot be met.

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memberships was founded to have difficulty accessing formal education either because of where they lived or worked, or because of family commitments and shift work. In addition, it has been widely recognised that nurses take part in a range of learning activities in the workplace. They are frequently asked to undertake research for development of policies and procedures; in the workplace, to identify best practice, develop learning packages for clients and other nurses, take part in reviews of documents, sit on specialist committees and undertake advocacy or policy work for their professional bodies.

Learning packages for clients and other nurses, take part in reviews of documents, sit on specialist committees and undertake advocacy or policy work for their professional bodies. In the past, this experiential learning has not been ‘officially’ recognised as professional development by their employers, and has largely not been included in individual resumes. Royal College of Nursing, Australia’s program provides the opportunity for nurses to take a fresh look at these activities, and to review them against specific criteria. Provided these criteria are met, they may award CNEs to the activity, and can then also identify them in their own professional portfolios.

Enrolment in the life long learning program is not compulsory for nurses in Australia, but as the only national program of its kind, thousands of nurses have already taken advantage of its benefits. In addition to a personalised portfolio, the program also offers other elements of support to nurses who enrol, such as the services of a Nurse Advisor to assist with career planning, regular mailouts of information on a range of issues relevant to nurses, and annual certificates of achievement. Future initiatives include a mentoring program of its kind, thousands of nurses have taken part in a range of learning activities in the workplace. They are frequently asked to undertake research for development of policies and procedures; in the workplace, to identify best practice, develop learning packages for clients and other nurses, take part in reviews of documents, sit on specialist committees and undertake advocacy or policy work for their professional bodies.

Introduction

Tonight I wish to question some of the prevailing orthodoxies about Australian education and the Australian economy. I should also be clear that I am speaking in my personal capacity, not on behalf of Looksmart or any of the other bodies on which I am a Board or Council member.

I will talk about the economic theory of increasing returns to scale. It will then follow that Australia must focus on exports to compete and therefore that our Universities must focus on export education rather than commercialisation of R&D. I will conclude by noting the persistent challenge of unemployment and why I believe these issues are all interlinked.

But since this is a forum that is at least partially grounded in respect for scholarship, I am hoping you will indulge me a few minutes first to explore some forgotten debates in economic theory that turn out to have profound relevance to Australian public policy.

In the 1770’s Adam Smith was the first serious thinker to explain the nature of markets and the gradual increase in human prosperity resulting from the division of labour and it’s capacity to create surplus for future investment.

In the 1820’s, David Ricardo added to this by an elegant explanation of the benefits of trade between nation states by using the “doctrine of comparative advantage”. If England is better at producing wool and Portugal at wine, then by trading, both countries benefit.

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the other country. In short, choose your friends carefully!

As Baumol and Gomory are at pains to point out “...it is never enough”, in the real world, it’s a bit more complicated. To put it in practical terms, for example, this analysis may mean that a free trade agreement with China is a far more important priority than one with the USA – even that one with the EU, if not carefully constructed, could be a net negative due to our scale disadvantages in most industries. What I have said should in no way be interpreted as support for a return to protectionism. Rather it is a passionate call for us to move forward together. To move beyond some sort of simple 1980-vintage free trade as a magic cure-all – and recognise that the interests of a small, isolated, sub-scale economy must be carefully managed and developed if we are to successfully compete in a global economy characterised by increasing returns to scale. This is a call for us to focus on scale, as well as free trade, as the central challenges for the national interest. But for us to focus on scale, we must focus on exports. For it is only in exports, and access to global markets, that we can ever acquire the scale necessary for our industries and companies to compete. Without that, our share of global production, and therefore of markets, that we can ever acquire the scale necessary for our industries and companies to compete. Without that, our share of global production, and therefore of markets, that we can ever acquire the scale necessary for our industries and companies to compete.

**Export education**

Let’s start with the good news – export education. Export education is the largest single component of the Australian economy. We are already the #3 player in the world – in one of the fastest growing new global industries. It is a great tribute to the many unsung entrepreneurs in our Universities, some of whom are here tonight, who have made this happen and continue to do so.

Export education is already larger than some of our traditional and lower value export stalwarts, like wool. It is also larger and growing faster than some of our new exciting positions in wine and niche automotives. In Victoria, in particular, the #3 makes the largest contribution – two of the top 15 employers are educational institutions.

Export education has, for decades, built powerful relationships for the nation with opinion leaders in our region – it is a major plus for both access to markets and for regional security. As a national priority, export education also has major positive externalities. Export education, if handled correctly, can help fund improvements to our educational institutions. Thus the neglect of increasing returns that would never previously have been possible – and that will be a massive benefit to domestic students as well. Export education has, for decades, built powerful relationships for the nation with opinion leaders in our region – it is a major plus for both access to markets and for regional security. But it is not all a bed of roses, indeed we are at real risk of killing the goose that is laying our golden egg. We are facing serious competition. The Canadians are increasingly moving into the market. Intra-regional competitors are already making inroads in the market. The Aussie dollar's recent appreciation is beginning to damage our pricing advantage. We have some institutions who are taking the money without any real commitment to customer service or product tailoring. We have scandals about reduced academic standards for some fee-paying students – a sure sign that some are willing to risk long-term major damage to the brand for a short-term cut in quality and cost.

I recently saw some emerging work on the pedagogical challenges and changes required to meet the needs of these students. These are difficult and complex issues. They are eminently solvable. But they are problems that demand our full attention. They are not getting set. Not by a long shot.

**Most Universities spend more management time and governance energy on commercialisation of R&D than they do on export education. I believe this is a tragic error.**

Most Universities spend more management time and governance energy on commercialisation of R&D than they do on export education. I believe this is a tragic error. It is an error largely forced upon them by Governments of both persuasions who’ve been drinking the commercialisation kool aid despite it’s some notables. Even during the incumbent Labor Government, public policy has been the province of the neo-classical economists who have written on it – Kenneth Arrow, Joseph Stiglitz and James Buchanan jur to name just three. I’d like to quote quick from a book “The Returns of Increasing Returns” which is now 10 years old, but his summary appears to be alive and well if we view the Australian IT industry. In the neo-classical Theory of Distribution ... relied on the postulate that in equilibrium constant returns to scale exist [...]the [mathematical] models are not incorporating a dynamic increasing returns to scale component into traditional general equilibrium models ... and consequently, the increasing returns to scale represented an analytical monkey wrench thrown into the whole neo-classical structure. Thus the neglect of increasing returns may have been methodologically understandable, but it was scientifically scandalous. Only in recent years has the increasing returns to scale ... returned ... through the analysis of ... growth, international trade and unemployment.

To explain, let me start at ground zero of innovation. To explain, let me start at ground zero of innovation. “Innovation” and “commercialisation of R&D” are poorly defined buzz-words that are attached to no obvious customer, market, product, brand, distribution channel or revenue stream. There are no significant barriers to entry to new start-ups or companies or industries of global scale in any area other than niche medical devices. So while we talk endlessly of “commercialisation” and the failure of Universities to achieve it, there isn’t a single company outside our resources sector that can generate even $1Bn in export sales. We are pouring money into IT research, for example, and waiting for the results to be commercialised. Waiting, as endless Australian trade delegations used to tell me when they made the call in San Francisco, to turn Melbourne/Sydney/Adelaide or wherever “into the next Silicon Valley”.

Well this may be late breaking news, but we don’t have an IT industry. We have a few wonderful mid-sized Australian companies like MinCom, Computershare and ERG, but that’s about it. The rest of the Australian IT industry, as I ruefully observed in my Allen and Company, the respected economic consultancy recently undertook a study on behalf of the Australian Institute of Commercialisation and concluded correctly that in practice, commercialisation of publicly funded R&D, total returns to Institutions is at most 5–10% of the public research expenditure.” The major economic return is expected through companies. But as we noted, there are very few of them – and those only concentrated in a single industry sector. And we won’t create those companies or industries by talking about “innovation” or “commercialisation”. To explain, let me start at ground zero of innovation. In Silicon Valley, in seven years in Silicon Valley, I never once heard the words “innovation” or “commercialisation” mentioned. Not once. Not by John Doerr of Kleiner Perkins or Mike Moritz of Sequoia or the rest of the SandHill Road Venture Capitalists. Not by Mark Andreessen of Netscape or Jerry Yang of Yahoo or Larry Page of Google, or Bill Gates or any other successful entrepreneur. Not even by the people – Mary Meeker or Henry Blodget or Frank Quattrone, may he enjoy the comfort of his prison cell, or anyone else on Wall Street.

I never once heard someone mention the “patents per head of population” ratio that so fascinates academics and policy-makers here. But there is one notable exception of the Government-mandated monopolies in the pharmaceutical industry and a few specialist medical equipment niches, a commercial irrelevance to the rest of the economy. Innovation and commercialisation are words that are used by people who don’t do them.

But let me tell you something. I heard endless talk about “flagship customers, about emerging market niches, about value propositions and business models. I also heard a lot about mass market applications, about scalable business models, about killer companies and global opportunities. In short, I heard a lot about scale. The Yanks understand scale, by crikey, and while they recognise it as essential, they don’t necessarily equate it with exports because they have the largest domestic market in the world and they can reach global scale without getting a passport. But in Australia there is no scale without exports. With a few exceptions, it’s almost impossible to reach global scale here in the Australian droughts. The Yanks.

And yet we already have an industry that is at scale in our own backyards – export education. When I recently rejoined the Council at The University of Melbourne I was truly not telling any tales out of school here – that our revenue from export education was about 30 times that of our revenues from licensing intellectual property.
WHY IS IT SO?

Businesses understand customers and markets, products and distribution channels, sales forces and brands. Businesses should be investing in R&D – the creation of new value propositions to satisfy unmet customer needs – and they should be tapping into University research to help them do it.

But Australian business is not investing in R&D – we are woeful by international standards – 19th of 29 in a recent OECD survey – behind the Czech Republic and at less than half Korea or France. Our business sector’s share of total R&D was 22nd of 29 nations surveyed. The reason for this is clear. The Australian economy, with the notable exception of our global mining industry, is not failing by want of scientific input. The benefits of global market places is that they are massive and if you win, you win big. The disadvantage is that they are ruthlessly competitive and they demand our full attention. We have a choice – we can focus the vast majority of our Universities efforts on export education or on this frolic of commercialisation. We cannot do both.

UNEMPLOYMENT

I believe there is an urgency to do the former and this stems from the wider economic storm clouds that are gathering at the end of what has been nearly 2 decades of uninterrupted growth. We are already far too pleased with ourselves and complacent about the state of our economy. Many have the temerity to call it a miracle economy. How can you call a place where 1 in 6 kids grows up in a jobless household a miracle economy? How can you call a place where many regions still have 30% youth unemployment a miracle economy? How come, despite a decade of prosperity, we have the same number of long-term unemployed as we’ve had throughout that period?

In fact, we have not beaten unemployment. The official unemployment rate of 7% is a misleading light, a fraud. If you study the data, you’ll see that our “miraculous” decline in unemployment beneficiaries is mirrored by an equally miraculous rise in “sickness beneficiaries”. As the government is keen to point out, the unemployment rate is an equally miraculous rise in “sickness beneficiaries”. As the government is keen to point out, the unemployment rate is not a measure of how many people have new jobs, it is a measure of how many people have the race ahead of us.

So as a small nation who must export to survive, we are currently the second-worst exporter in the OECD. We have the race ahead of us.

WHAT SHOULD WE DO ABOUT IT?

The answer is: we should let the Universities get back to their traditional teaching and research and allow them to make large investments – such as those in R&D that will take many years to pay off.

The small number of successful global exporters we have have an enviable record. They grow at twice the rate of domestic companies. They pay 40% higher wages than their domestic counterparts – giving the lie to the notion that it is high wages that prevents us from being globally competitive.

So as a small nation who must export to survive, we are currently the second-worst exporter in the OECD. We have the race ahead of us.

We must build at least a few industries that remain globally competitive if we are going to retain even our current level of employment.

It is for that reason that we must redouble our efforts find solutions to our economy’s challenges when the going is relatively good. We must build at least a few industries that remain globally competitive if we are going to retain even our current level of employment. Our major hope for growth in jobs and growth in prosperity is our major exporters – among them mining, tourism, wine, some automotive – and education.

Let’s give it everything we’ve got and see if we can’t become one of the long-term winners in this massive global market. The direct benefits in export income and jobs will be valuable. The capacity to rebuild our own educational infrastructure to benefit everyone and the regional trade and security benefits are an added bonus.

To recap, let me briefly summarise this evening’s discussion:

Scale drives global competitiveness.

To get ahead, Australian businesses need to export.

To win in even a few global export markets we should be focussed.

For our Universities, this should mean a focus on export education not the frolic of ill-defined “commercialisation”. Rather, our business community should also be encouraged to focus on exports – in doing so they will have to innovate and commercialise R&D as a matter of course or they will not win global customers.

And we should do all these things urgently because time may be short – our already chronic unemployment conditions could deteriorate rapidly at the onset of the next recession. We need to cut it to build our export industries while we still have the luxury of being able to afford the investment.

I began this evening with an excursion into the economics sciences – I conclude with one from the Area – indeed from the San Francisco Bay Area that is so misused in this debate. But rather than Silicon Valley, I think of the San Francisco of the Beat Generation of the 1940s and 1950s – of Keroauc and Ginsberg and Allen Ginsberg’s haunting poem Howl. With apologies to Ginsberg, I think of how he may have seen the challenges facing the current generation of academics and came up with the following:

“I saw the best minds of my generation destroyed by madness, starving hysterical roids... Dragging themselves through the Universities at dawn looking for an angry fix, or an innovative solution, Angel-headed hipsters burning for the ancient heavenly connection to the starry dynamo in the machinary of commercialisation.”
The 2004 B-HERT Awards are proudly supported by the Australian Government through its business unit, AusIndustry. AusIndustry delivers a range of programs to help Australian businesses become more innovative, investment ready and internationally competitive. It currently assists more than 10,000 businesses each year, providing $2 billion in innovation and commercialisation grants, tax and duty concessions and venture capital support. AusIndustry will be at forefront of the Australian Government’s new $5.3 billion science and innovation package, Backing Australia’s Ability – Building our Future through Science and Innovation. Announced by the Prime Minister in May, the package builds on the Government’s initial 2001 Backing Australia’s Ability package. Together, they constitute a ten year, $8.3 billion funding commitment to resourcing Australian science and innovation.

**Purpose**

A program of prestigious awards initiated in 1998 to recognise outstanding achievements in collaboration between business and higher education in the fields of Research & Development and Education & Training. The objective of the program is to highlight at a national level the benefits of such collaboration, and enhance links between industry and universities.

**Frequency**

Awards are made annually and presented at the B-HERT Awards dinner in November each year.

**Eligibility**

The award is made to a program or project involving a collaborative partnership between business and higher education. Therefore, the collaborating organisations nominated for the award must come from business and from higher education. At least one of the collaborating organisations must be a Member of B-HERT. Each submission must be signed by all participating partners.

**Number and categories of Awards**

This year’s Awards are for:

- Best R&D Collaboration
- Best E&T Collaboration
- Best Collaboration involving a CRC – R&D or E&T
- Best International Collaboration – R&D or E&T
- Best Collaboration with a Regional Focus – R&D or E&T

Applications may be submitted for an Award in one or more categories. However, no application can win more than one Award. Non successful applicants are eligible to apply for an Award in a later year.

**Criteria for Assessment**

1. **Innovation** – has the project or program produced new products or services; how innovative is it in its concept or idea, design, delivery or content; what new barriers has it surmounted; what new challenges has it identified?

2. **Strength of Relationship** – (a) what is the extent of involvement of the partners? (b) how has this grown over the life of the project or program? (c) how do the partners work together in a productive partnership? (d) are there obstacles and barriers the partners have had to overcome to make the collaboration work? (e) what other spin-offs have there been from the project or program for participating organisations?

3. **Outreach Inclusion** – has the project or program attracted new participants since its inception; has it become a model for other projects or programs?

4. **National Benefits** – these may be economic, financial, social, educational or community benefits: may include for example, growth in exports, creation of new jobs, outreach and provision of services to new community sectors and participants, and so on.

5. **Cultural Impact** – what impact has the project or program had on the cultures of the participating organisations? What changes have occurred in what is done and the way it is done in the participating organisations? What changes have there been in attitudes, behaviour or values in the participants?

6. **Process**

   1. Applications for 2004 are now being sought from all Members of B-HERT.
   2. Deadline for applications is 30 August 2004.
   4. Judging panel:
      - Professor Leon Mann, Professorial Fellow, School of Behavioural Science, University of Melbourne (Chairman)
      - Dr Annabelle Duncan, Chief of Division, Molecular Science, CSIRO
      - Dr Bob Frater AO, Vice-President for Innovation, ResMed Ltd
      - Ms Lesley Johnson, Director of Strategic Initiatives, Australian National Training Authority
      - Mr Peter Laver, Chair, Victorian Learning and Employment Skills Commission
      - Dr Jane Munro AM, Head of College & CEO, International House, University of Melbourne
      - Dr Peter Scaife, Director, Centre for Sustainable Technology, University of Newcastle
   5. Awards will be presented at the B-HERT Awards Dinner on 18 November 2004 in Sydney.
   6. There will be up to five short-listed nominees in each category. The winner in each category will be presented with an Award at the Dinner and the other short-listed candidates will be presented with framed citations.
   7. Applications to be no more than one page on each of the five criteria.
   8. Completed applications to be sent to: Business/Higher Education Round Table 1st Floor, 24 Brunswick Street, Fitzroy Vic 3065 Enquiries: Ph: 03 9419 8068 Fax: 03 9419 8276 Email: bher@bher.com
B-HERT is delighted to announce for the fourth successive year that the major sponsor of the Best Entrepreneurial Educator of the Year Award for 2004 is the Australian Technology Network

MAJOR SPONSOR

AUSTRALIAN TECHNOLOGY NETWORK

• Professor Denise Bradley AO, Vice-Chancellor, University of South Australia
• Professor Kerry Cox, Vice-Chancellor, University of Ballarat
• Professor Ruth Dunkin, Vice-Chancellor, RMIT University
• Professor Gavin Brown, Vice-Chancellor, University of Sydney
• Mr Russell Cooper, Chief Executive, SITA Environmental Solutions
• Professor Helen Garnett, Vice-Chancellor, Charles Darwin University
• Ms Janina Gawler, Chief Executive, Australian Computer Society
• Ms Linda Heron, General Manager, Learning & Development, Coles Myer Limited
• Mr David Hind, Managing Director – Process Gas Solutions, BOC Limited
• Mr Richard Hogg, Immediate Past President, Australian Computer Society
• Professor Millicent Poole, Vice-Chancellor, Edith Cowan University
• Professor Peter Sheehan AO, Vice-Chancellor, Australian Catholic University
• Dr Mark Toner, Immediate Past-President, Business/Higher Education Round Table

The Award will include a Qantas voucher to the value of $3000, valid for 12 months, which is intended to be used by the winner to visit some appropriate overseas institutions.

Purpose
To recognise the importance of education in the process of developing and nurturing entrepreneurs; and to showcase best practice in entrepreneurial education.

Eligibility
Educators of students beyond the age of compulsion from final years of schooling, vocational education, training institutions, universities, employment programs to adult education programs are eligible.

Frequency
Awards are made annually and presented at the B-HERT Awards dinner each year.

Award
The Award will include a Qantas voucher to the value of $3000, valid for 12 months, which is intended to be used by the winner to visit some appropriate overseas institutions.

Criteria for Assessment
1. Effective involvement of industry in the design, implementation and evaluation of entrepreneurial educational activities.
2. Encouragement of students in the practice of entrepreneurship.
3. Is the educator’s work a model for others?
4. Demonstrable outcomes of the educator’s work – development by students of new products, processes or services.
5. Has the educator’s work made a difference to the attitudes, self esteem, behaviour, life chances, values and employment outcomes of their students?

Process
1. Applications for 2004 are now being sought from all eligible applicants. Applications may be submitted by the nominee personally, or by a third party on their behalf (with the nominee’s consent).
2. Deadline for applications is 1 October 2004.
3. Judging panel will be chosen from the Board of Directors of the Business/Higher Education Round Table.

Application forms for all Awards can be obtained by contacting the B-HERT Secretariat or downloading from the B-HERT website on www.bhert.com

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B-HERT Paper No. 8 (July 2004) – THE FACTS (Higher Education in Australia – today compared with yesterday and the rest of the world)

An update to B-HERT Paper No. 5 (June 2002) – a compendium of statistics on higher education. ($19.95 per copy)

B-HERT Paper No. 7 (February 2004) – The Knowledge-Based Economy: Some Facts and Figures

An update to B-HERT Paper No. 4 which provides some useful and interesting comparative data on Australia’s relative global position within the context of the knowledge-based economy. ($29.95 per copy)

B-HERT Paper No. 6 (February 2003) – Research Issues for the Service Sector, particularly for Community Service Professions and Export Services

This paper defines the service sector, particularly on two important areas, the community services sector and the export industries sector. ($19.95 per copy)

Position Paper No. 9 (August 2002) – Enhancing the Learning and Employability of Graduates: The Role of Generic Skills

This paper outlines the nature and scope of generic skills before discussing the reasons why they have become a focus of policy interest. The benefits of paying attention to generic skills for learning and employability purposes are considered in relation to relevant research findings. Examples of the incorporation of generic skills into higher education structures and courses are also described.

The paper suggests a learning framework for generic skills at different levels. Finally the paper makes some recommendations in respect of further work that would be valuable in pursuit of the agenda to enhance the learning capability of employability of graduates.

Position Paper No. 8 (July 2002) – Higher Education in Australia – the Global Imperative

This paper is B-HERT’S submission to the Nelson Review of Higher Education.

B-HERT Paper No. 5 (June 2002) – THE FACTS (Higher Education in Australia – today compared with yesterday and the rest of the world)

A compendium of statistics on higher education. ($19.95 per copy)

B-HERT Paper No. 4 (February 2002) – The Knowledge-Based Economy: Some Facts and Figures

An update to B-HERT Paper No. 2 which provides some useful and interesting comparative data on Australia’s relative global position within the context of the knowledge-based economy.

Position Paper No. 10 (September 2002) – The Importance of the Social Sciences to Government

Government activities are centrally related to social policy and the boundaries between social, economic and science policy are blurred. Commonwealth Government expenditure on social security and welfare, health and education amounts to some 65% of total expenditure. The social sciences and policies are important in ensuring the maintenance and functioning of a stable society. Universities play a key role in providing social science courses which educate graduates in a philosophy, knowledge and the new developments of social science.
STUDENTS IN FREE ENTERPRISE (SIFE) CHAMPIONSHIPS SHOWCASED IN MELBOURNE

Over the weekend 10/11 July, the 2004 Arnott’s SIFE Australia National Competition will be held at the Hilton On the Park-Melbourne, 192 Wellington Parade East Melbourne. 32 teams from universities in all states and territories will challenge for the title of Qantas SIFE Australia National Champion and the right to represent Australia at the SIFE World Cup in Barcelona in September.

SIFE’s mission, as members will recall, is to challenge university students to make a difference in their own lives by developing their leadership, teamwork and communication skills. They are encouraged to do this through learning, practicing and teaching the principles of free enterprise so as to empower others in their communities and enhance their economic prospects.

At the Awards Ceremony lunch on Sunday, in addition to announcing the Champion Team, awards will be made to the Most Supportive Vice-Chancellor, Most Supportive Dean, Most Supportive Business Advisory Board Member and the $2,000 Woolworths Leadership prize will be presented to the Most Outstanding Mentor. B-HERT members may attend at a subsidized cost of $50.

The 2004 Champion Team will win a perpetual trophy sponsored by Woolworths, a travel award provided by Qantas, $5,000 cash from Campbell Arnott’s and the right to represent Australia at the SIFE World Cup which will be held in Barcelona from 22 to 24 September and will be contested by the National Champion teams from the 40 countries with active SIFE programs.

SIFE Australia’s aim is to see the eventual establishment of a SIFE team on each campus of every Australian university and to develop a cooperative network in which the corporate sponsors of SIFE are provided with a ‘first choice’ opportunity to recruit these outstanding students.

University and corporate members of B-HERT who are not already involved in SIFE are strongly encouraged to contact the CEO of SIFE Australia, John Thornton, on 0417 811877 or by email to john.thornton@sifeaustralia.org.au for more information on opportunities provided by the program.
One-Day Programme

(sparkers subject to confirmation & change without notice)

This symposium will consist of presentations, case studies and panels, and will give participants the opportunity:

To learn about IP Management and Knowledge Transfer within the innovation/commercialisation context.

To learn how to introduce and systematise processes aligned to IP Management and Knowledge Transfer as part of their organisation’s sustainable competitive advantage.

To develop a more entrepreneurial and/or innovative approach to IP Management and Knowledge Transfer as alternative value streams.

To learn how to leverage IP and organisational expertise within a strategic partnership.

To know where to go to get the right advice or assistance.

To learn how some of Australia’s leading IP managers, together with leading educationalists do it and their advice to others who WANT to do it.

PART I – SETTING THE SCENE: What do business and research institutions need from each other?

Professor Frank Larkins AM, DVC (Research), University of Melbourne

Roy Rose, General Manager, Technology & Environment, Orica

Speaker tba, UniQuest

John Puttick, Executive Chairman, Global Banking & Securities Transactions Ltd

Speaker tba, Commonwealth Dept of Industry, Tourism and Resources

PART II – STRUCTURING COLLABORATIONS: How should IP Ownership and Entitlements be allocated?

Michael Quinn, CEO, Innovation Capital

Professor Andrew Christie, Director, Intellectual Property Research Institute of Australia

Dr Peter Jonson, Chair, Australian Institute for Commercialisation

Robert Muir, Business Development Director, ANSTO

Dr Jack Steele, Chief of Staff, CSIRO Business Development & Commercialisation

Professor Peter Andrews AO, Chief Scientist, Qld

PART III – COMMERCIALISATION STRATEGIES and TECHNICALITIES: What works and why?

Dr Vivien Santer, Principal, Griffith Hack

Dr Phil Keep, Director Intellectual Property, AMRAD Corporation

Udo Buecher, Manager Intellectual Property, Steel Research Laboratories, Bluescope Steel

Owen Malone, Vice-President, Intellectual Property, Fosters Group

PART IV – BRIDGING THE GAP: Where do we go from here?

Professor Timothy Deviney, Director, Centre for Corporate Change, AGSM

Jane Niall, Deputy Secretary, Dept of Innovation, Industry & Regional Development, Victoria

Dr Peter Tucker, General Manager, Business Development & Strategy Group, IP Australia

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