BUSINESS/HIGHER EDUCATION ROUND TABLE

B-HERT NEWS

issue 20 • July 2004

THE CHANGING EDUCATION NEEDS OF THE PROFESSIONS

THE CHANGING EDUCATION NEEDS OF THE ENGINEERING PROFESSION

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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 litigious 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 university programs and courses 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 accreditation is at 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, the accreditation process publicly assures the competence of graduates from all accredited degrees in Australia and provides a guarantee of standing independently from the educational provider. 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 development to emerge from the review was the call from employers for engineering education to cover wider professional skills such as leadership, social awareness, and communication.

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 needs in these areas.

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 development needs of recent 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 employment categories; 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, economics, 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.

About 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 moved 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 adept at their jobs. Consequently they 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 operation of continual professional development programs and the development of CELM will ensure that professional engineers are able to meet the challenges of the future.

CONCLUSION

Engineering has 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 in a socially and environmentally responsible manner. This is the future challenge for engineering education.

'IS THE PRIMARY GOAL OF HIGHER EDUCATION TO PRODUCE JOB-READY GRADUATES... THERE ARE CERTAINLY SOME WITHIN THE ICT SECTOR WHO BELIEVE THAT MANY OF THE ICT-RELATED UNIVERSITY COURSES ARE NOT MEETING THE NEEDS OF BUSINESS...'

RICHARD G HOGG
Immediate Past-President, Australian Computer Society and a Member of the B-HERT Board

Education has always been an essential element of any profession, but there is considerable debate, particularly within the information and communications technology (ICT) sector, about what form that education should take.

Is the primary goal of higher education to produce job-ready graduates, or is it to produce technically competent graduates who then undergo a process of job-based learning to meet the broad day-to-day requirements of their work?

There are certainly some within the ICT sector who believe that many of the ICT-related university courses are not meeting the needs of business in terms of the skills and knowledge they teach students.

This highlights the need for greater consultation between business and the academic community in order to identify the changing needs of business and provide the opportunity for universities to prepare graduates to meet those needs. This was, of course, one of the key drivers behind the creation of B-HERT.

Any consultation would involve a certain degree of crystal ball gazing to try and assess which of the emerging technologies is most likely to achieve a level of acceptance that might demand its inclusion in tertiary courses.

Such an exercise would require input from both business and academia in order to ensure the highest degree of accuracy, and by business I don't just mean the ICT vendors developing the technologies, but also the users who apply technology for competitive advantage.

I recognise that it takes months and even years to develop university courses, even in the fast-moving ICT sector, so the broader the input to the consultation process, the more successful and relevant the likely outcome will be.

I believe that while the academic community is responsible for developing courseware and delivering it to students in a digestible and relevant manner, the business sector needs to drive the educational requirements of the market.

Of course, you can't ignore the important role played by the TAFE system in preparing work-ready graduates to complement the more theoretical focus taken by the universities. Since many of these shorter courses are more technology based than their university cousins, they are also more easily modified.

So is it the universities' responsibility to look at developing markets both locally and overseas to determine what needs to be incorporated into the next year's curriculum? Or is it up to business to say that this is what we want taught?

Opinions vary on this score. I believe that while the academic community is responsible for developing courseware and delivering it to students in a digestible and relevant manner, the business sector needs to drive the educational requirements of the market.

Yes, it's true that universities are more outwardly focused than ever before, many of them operating international campuses and attracting students and academics from all over the world.

However, the commercial realities and competitive pressures of globalisation are having an even greater impact on the business community, radically changing the way in which enterprises operate, communicate and take their goods and services to market.

Businesses in the global market are being exposed to new technologies at a rapid rate – often well before the universities – and this will only increase as the signing of new trade agreements open up fresh opportunities and provide access to technologies that are only now in their infancy.

These increasing commercial pressures will inevitably speed the time to market of emerging technologies. Businesses will, therefore, have to keep the academic community well abreast of their changing needs in terms of technologies and professional skills.

This will in turn place increasing pressure on the universities to react more quickly in developing new course materials. Otherwise they face being left

behind in the global race to attract students by offering the most up-to-date and relevant subjects.

Globalisation is driving the need for change, which creates a requirement for constant review and redevelopment not only of course materials, but also of the knowledge and skills of the academics developing and presenting these materials.

Learning for life has become the mantra for all professionals in the 21st century because nothing stays the same and those who don't remain current will be left behind.

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.

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 university might present an overview of software design, teaching the various approaches and methodologies as well as introducing the different tools in the market and explaining their uses. A TAFE college will offer short courses in specific tools to enable students to become competent users of one or more pieces of technology. The ACS might complement these other offerings by engaging a renowned expert in Internet technology to explain the importance of usability in creating Websites, or to demonstrate how enterprises in Europe are addressing the challenge of Spam.

Each of these offerings makes an important contribution to the knowledge base of the professional and hence the profession, helping to ensure that the local industry remains up to date and current with new developments to enable Australia to remain internationally competitive.

Unfortunately, over the past few years we've seen a significant decline in the level of funding made available by employers for professional development, with the responsibility for on-going education falling to the individual.

We need organisations to be more proactive in their budget allocations for training to ensure that their staff is not being left behind.

We also need to take advantage of organisations like B-HERT, which provides an environment where CEOs can sit around a table with vice chancellors to discuss common issues and challenges and find creative solutions.

There's also a growing recognition by universities of the value of bringing in working practitioners to present guest lectures, giving students greater awareness of real-life work issues to round out their theoretical knowledge.

A chief information officer will bring a very different perspective to the value of a particular piece of technology and open students' eyes to seeing their studies in a different light.

That working perspective was often provided in the past, and still is in many cases, by professional conferences and seminars, but increasing work pressures has seen attendance at these types of events fall significantly in recent years.

The changing demands of modern lifestyles means flexibility of delivery is becoming a key selection criterion for professionals exploring their education options.

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 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.

The changing demands of modern lifestyles means flexibility of delivery is becoming a key selection criterion for professionals exploring their education options. Since distance education and online studies allow participants to study where and when they choose and avoid the need to attend face-to-face lectures, they are certain to increase in popularity in coming years.

While distance education has been available in Australia for 30 years the virtual university concept has yet to really take off here. However, I believe it offers a practical solution for working professionals who need to update their knowledge.

The shift of educational resources online is opening up the tertiary education sector to true globalisation, with universities in the US, Africa, Asia and Europe beginning to target students on other continents.

Of course, this approach opens up a broad range of issues in relation to language, culture, availability and quality, all of which will have to be addressed by the university sector in relation to a global market.

But merely identifying these issues is just the start of an ongoing process of review and discussion. If Australian universities lag behind in offering quality online education, their international competitors will corner the market. The information age represents new challenges for both educators and professionals.

To meet these challenges and address the changing needs of professionals in the 21st century, not only universities but the whole post-secondary education sector must provide education using multiple modes of delivery to enable students to fit their studies around their other commitments.

The innovative and efficient use of technology will be key to delivering the level of flexibility needed for success.

CPA AUSTRALIA – A LEADER IN THE PROVISION OF PROFESSIONAL EDUCATION

PROFESSOR PETER WOLNIZER

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Conversations with (accounting) practitioners have a recurrent theme. They are looking for graduates who 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 entry requirements for Associate membership and CPA Program candidature. CPA Australia wants to attract bright double degree and double major students who may have reduced choice within the business/commerce component. CPA Australia is now 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 Australian 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 to CPA Australia's entry requirements have better linked professional education with undergraduate and postgraduate tertiary study.

The CPA Program has changed with the times because more and more CPAs and prospective CPAs are gaining 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 which deals with issues surrounding governance and accountability by directors and management of organisations.

The CPA Program offers not only 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, Business Strategy and Leadership, after completing the two existing compulsory segments Reporting and Professional Practice and Corporate Governance and Accountability.

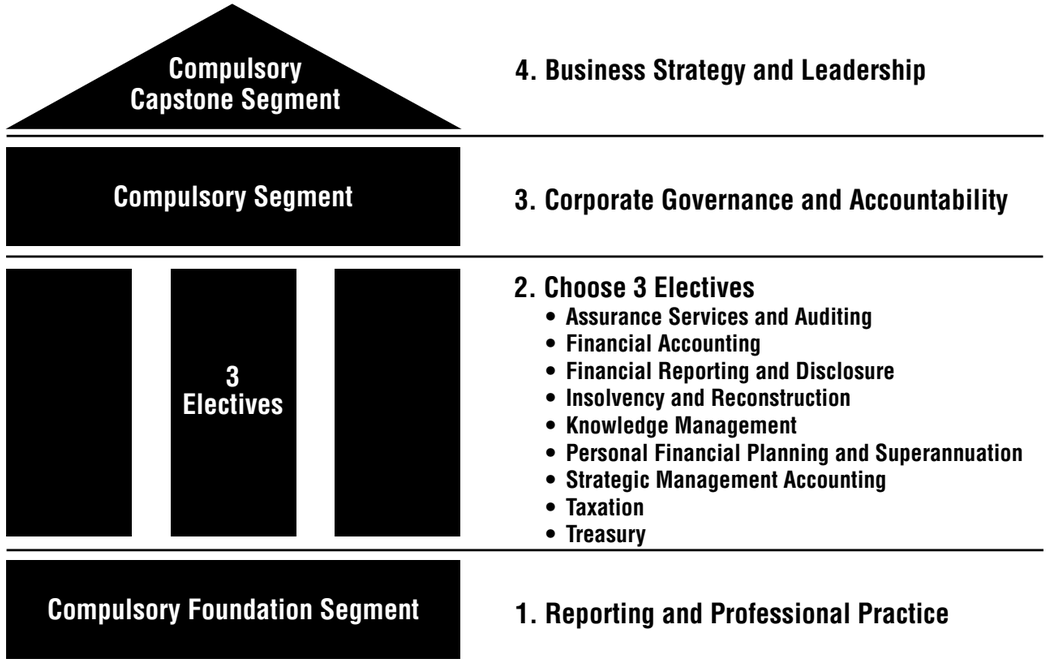
Candidates studying the capstone segment will have had a very comprehensive technical, ethical and regulatory education. They will have already located the major financial reporting and legal compliance dimensions of the CPA Program within the framework of Corporate Governance and Accountability.

More employers want their CPAs to be leaders in business, accounting and finance, and the new CPA Program will provide candidates with more background skills in that area. Employers believe a CPA needs to know how strategies are developed, implemented, tracked and monitored, and how to employ alternative courses of action when external factors cause problems.

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 lead role in projects.

All compulsory segments in the new CPA Program will have increased written assessment. Business Strategy and

CPA Program Course Structure



In a nut shell 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 assessment 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).

In a nut shell 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.

Following the establishment of a Professional Education Board of influential business and education leaders, three other key developments came into effect from 1 January 2004:

BROADENING OF ENTRY REQUIREMENTS

There is greater choice now at undergraduate level as students can attain some of the core competencies as part of their undergraduate degree or as part of the CPA Program at postgraduate level.

EXTENSION OF THE CPA PROGRAM FROM FIVE TO SIX SEGMENTS

There are now three compulsory and three elective segments with additional written assessment in the compulsory segments which will extend the opportunities for improving candidates written and analytical skills.

CREDITS OR EXEMPTIONS FOR MASTERS DEGREES

Those with a relevant specialist Masters degree and a relevant undergraduate degree will receive credits or exemptions from two elective segments.

These changes are directly related to the changing education needs of the profession. The career aspirations of current CPA Program candidates suggest that many are keen for diverse career options – which signal that a broader CPA Program will not only suit their needs but the needs of employers and industry better.

CHANGING EDUCATIONAL NEEDS IN MEDICAL EDUCATION AND THE HEALTH PROFESSIONS: HOW EDUCATION AND HEALTHCARE MUST FIT TOGETHER IN THE FUTURE.

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INTRODUCTION

". . . if the rate of change within an organization is less than the rate of change outside, the end is in sight."

Jack Welch, CEO, General Electric

The very public debates on the need for changes in health service delivery and its funding are matched by the need for major changes in medical education. For better or worse, doctoring, the long-honoured caring profession, has become a scientifically driven, high stakes business. While the increasing emphasis on efficiency and the bottom line has contained costs and stimulated the creation of systems that benefit patients, it also conflicts with doctors' abilities to "care" for patients and to create a positive learning culture for students. The need for changes in medical education is driven by a number of factors: an exponential increase in medical knowledge and technology, competition for resources between health services and education, changing medical workforce priorities and societal changes in expectations of clinicians and the community.

Medical schools have recognized that traditional teaching methods are inadequate to meet these challenges and have progressively changed their curricula and modes of teaching toward learner-centred education that emphasizes life-long learning.

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 students could once memorise human anatomy in detail, they cannot master the knowledge associated with current medical practice, nor can the modern medical 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 empathising 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 this approach is more effective in many respects [1] with improved performance of students on high stakes exams in the United States [2], but also more costly for educators since it requires a higher staff to learner ratio of 1:8, rather than lecture-based courses in which lecturers deliver their wares to hundreds of students at a time, albeit with a knowledge retention rate of ~10–30%.

Changes are also occurring in the location of learning. Medical school training consists of knowledge acquisition and application. The first, traditionally obtained in a non-patient university setting, the second via an apprenticeship model in clinical settings with gradually increasing responsibility for patient care. Since adult learning theory has clearly demonstrated that adults learn better when they need to know the information ("just in time") and then can immediately apply that information, medical knowledge and skills are better mastered if students move into a healthcare service setting earlier so that information is immediately relevant. The greater requirement for a healthcare service setting for education increases the tensions between patient care and education and may have significant implications for future workforce choices of students. Thus, the requirements for improved medical education are clear, but the implications for both medical educators and the public are enormous.

CONFLICTS BETWEEN SERVICE DELIVERY OF PATIENT CARE AND EDUCATION

The resourcing of clinical teaching lies in the nether land between the separate funding and accountabilities of health (predominately State) and university education (predominately Commonwealth). In the past, most clinical teaching occurred in public hospitals and most doctors carried out their clinical teaching either within their public hospital sessional time, substantially resourced by health funding, or in their own time. The new business approach to healthcare, increasing public demands for clinical services and the increasing financial deficits of public hospitals, coupled with decreasing funds for education, means that Hospital Boards, Chief Executive Officers, Clinicians, and University faculties seek to distinguish, and identify appropriate resources for what they see as the distinct responsibilities of patient care and education. Separating the costs of patient care and education is complicated by the knowledge that educating students and post-graduate trainees reduces the efficiency of patient care. The difficulty of quantifying this inefficiency makes precise budgetary allocation all but impossible.

Public funding of substantial components of healthcare and education is ongoing and public hospitals will continue to provide an important component of clinical training. If we do not choose to fund training appropriately, we will compromise the competency of medical graduates – doctors who will care for all of us. Clinical education is too important to be dependant on the allocation of resources of health service providers, with their competing priorities or on the goodwill of clinicians. Doctors who teach have higher career satisfaction than those who do not [3], but clinicians who teach also sacrifice income or personal time to do so. Appropriate resourcing of student education and supervision time, needs to be identified, allocated and accounted for, including managing the budgetary uncertainties between healthcare and education [4].

IMPACT OF WORKFORCE CHANGES AND RURAL CLINICAL SCHOOLS

Resourcing of clinical education is not just a matter of money. Workforce shortages and distribution are an increasingly important issue. A global healthcare provider shortage means that doctors who teach are being asked to choose between teaching and patient care as clinical skills training is extended. For example, the Workforce Agency Australia estimates that Australia will need over 1 000 additional general practitioners by 2012 [5]. There are increasing reports of patients in regional and rural Australia being unable to access a general practitioner because the practice has reached its capacity. While the Commonwealth has

Workforce shortages and distribution are an increasingly important issue. A global healthcare provider shortage means that doctors who teach are being asked to choose between teaching and patient care as clinical skills training is extended.

allocated an additional 235 medical school places per year, it takes 12–13 years in Australia to train a general practitioner from scratch. Clearly, if 235 additional students enter medical school each year beginning in 2005 and assuming about 50% of medical students become general practitioners, an additional 1 000 vocationally registered general practitioners will not be in practice until 2026. The next 13 years then, are critical for medical education providers as they struggle to provide for both patients and educate the next generation of doctors. On the bright side, properly supervised senior trainees in appropriate education/service patient care settings will provide significant amounts of patient care in the meantime, providing the government and doctors are able to provide the infrastructure needed for their training. This includes space to see patients and supervision.

Dealing with workforce issues means that medical educators must also actively research and address current student career choices. Students are drawn into careers by role models who are enthusiastic and competent. The workforce pressures for general practitioners, including meeting increased demand for health services, increased productivity to maintain income and requirements for compliance and quality (process and paperwork), have resulted in significant levels of general practitioner burnout (60% of GPs are stressed, depressed, or burned out) [6]. This problem is exacerbated by a geographical mal-distribution of doctors (the general practitioner to patient ratio in metropolitan Melbourne is more than twice that (~1: 900) of rural settings in Victoria (~1:1 900) [5].

To many learners, specialist practice, with its appealing combination of increased pay, increased respect, the lure of 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 students are at risk of overexposure to the exciting and interesting world of technologically sophisticated subspecialty medicine in the traditional educational environment of metropolitan tertiary care hospitals. To counter this excessive subspecialisation in career choice it seems desirable to move medical education to a more community hospital experience in regional urban or rural settings. The creation of the Commonwealth's Rural Clinical School Program, which aims to train 25% of medical students in regional and rural settings for 50% of their clinical skills training is one way of addressing students' career choices. The creation of the rural clinical schools was based on sound research showing that trainees are more likely to practice in rural areas if they have trained in such settings. However this effort to address workforce mal-distribution has significant implications for medical education, and indeed education of all of the health professions.

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.

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. In the short term, Australia may need to "up skill" other health practitioners (e.g. nurses to nurse practitioners) and doctors will need to carefully delegate procedures and other patient care issues to paramedical providers. The health and education payment systems need to be flexible enough to introduce codes to reimburse doctors, and other teaching clinicians, in order to sustain appropriate income for doctors, while allowing for supervision of other healthcare providers and trainees. If this critical issue is not addressed, doctors will become burned out or be tempted by higher incomes in the U.S., U.K. or Canada – countries with similar healthcare provider shortages who are keen to recruit Australian graduates.

The attempt to move clinical education to rural and regional hospitals and ambulatory care settings has also highlighted a critical lack of infrastructure. While only 1% of all patient care is now based in hospitals, the majority of clinical medical education in Australia still takes place in inpatient settings. Educators are increasingly realising that inpatient care, with decreasing lengths of stay for patients who are sicker and who spend more of their time undergoing investigations and procedures, is sub-optimal as a learning experience. However, the space and resources needed to educate learners in the ambulatory setting are insufficient for the task. Most "consultants" see patients from a single room, in contrast to best educational and efficiency standards that demonstrate that two rooms per teaching clinician are optimal for both patient care and teaching. Students need supervised independence and ideally, students should see patients in a room adjoining that of their supervisor. Without this, learners are relegated to watch from the corner of the consultant's room, when we know that passive observation results in only 10% knowledge retention, compared to active participation and application of knowledge that results in much higher knowledge retention (60–80%) [8].

An important issue is that, however well intentioned the creation of the rural clinical schools, it has produced concerns among metropolitan-based clinical teachers who seem sceptical that less specialized country doctors, both general practitioners and specialists, can provide students with the skills and expertise to practice excellent medicine. The new curriculum, developed at Melbourne and other Universities, with a focus on the need for evidence based problem-solving, competency and professionalism, supported by healthcare systems of care that provide innovative timely information systems and specialist consultation should remove any risk of less intensive subspecialty education, providing an good generalist practitioner and better informed career choices.

Finally, as an adjunct to the changes in undergraduate training, changes are also needed in post-graduate medical training. In order to sustain the effects of positive changes in undergraduate education, post-graduate training opportunities must: 1) offer opportunities for training in rural and regional settings so that graduates will establish links in rural communities and stay there; and 2) encourage experiences that emphasize the skills and multidisciplinary team approach needed in modern medicine, both in metropolitan and rural settings.

CONFLICTS BETWEEN PATIENT PRIVACY AND TRAINING

The public have become increasingly concerned with the training issues of competence of learners and privacy. While many patients in public and private health care services still willingly allow student involvement in their assessment and care, the public in general, and patients in particular, are increasingly reluctant to be the "guinea pigs" of trainees. In metropolitan public hospital settings, many patients now have "no student" signs over the bedside, reflecting trends seen in other settings. This reluctance to be seen by students has its legitimacy in terms of patient privacy and quality of care. How we reconcile these concerns with the public, and ultimately individual, benefit of well-trained clinicians is an issue for society and worthy of public discussion.

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 clinicians, 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.

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 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…'

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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 policy.

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 takes on average seven years to complete. To ensure the appropriateness of the education process for the actuarial profession, the Institute has responsibility

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 takes on average seven years to complete.

for the continuous review of the education program and the improvement of the syllabus and delivery approaches of all 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 actuarial science departments. The academics engaged in the universities are members of the Institute and have often been practicing professionals prior to taking up academic appointments. The Institute provides financial support to departments which meet established Institute criteria for Centres of Excellence (CoE), which includes a requirement for an active research program.

Part I of the actuarial education program consists of nine core technical subjects which are taught as part of a Bachelors degree at the four 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 Australia actuarial education program since 1996, and now is a fundamental component of the education of actuaries around the world. The great strength of the control cycle is its 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 program. 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), members can become Associates of the Institute of Actuaries of Australia (AIAA).

Part III, the specialist education program, is developed, delivered and managed by the Institute. To keep 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 Part III program is more flexible, with one semester options and on-line components, and provides grounding in Investments for all students, and equips students with training in 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. These 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 as examiners (all exams are 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.

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. The Institute's education program supports this expansion and anticipates the likely future needs for actuarial skills and advice in emerging fields.

For more information, please contact see www.actuaries.asn.au or contact the Institute on (02) 9233 3466.

ACTUARIAL EDUCATION AT A GLANCE

Part I	nine technical subjects taught as part of a Bachelors degree at accredited universities (or by correspondence through the UK)
Part II	one year Honours or Masters level subject taught at accredited universities: the Actuarial Control Cycle (also available as non award subject)
Successful completion of Part I and Part II leads to the qualification of Associate of the Institute of Actuaries of Australia (AIAA).	
Part III	from 2005: delivered by the Institute: a one semester course in Investments, a two semester course in either Life Insurance, General Insurance, Superannuation & Planned Savings, or Investment Management & Finance; a six day residential course in Commercial Actuarial Practice – Managing Financial Risk.
Practical Experience Requirement (PER)	a one year practical experience requirement, with guidance from a nominated Mentor
Professionalism Course	a three day residential course on professionalism ethics, legal liability issues and the Code of Conduct.
Successful completion of Part III, PER and Professionalism Course leads to the qualification of Fellow of the Institute of Actuaries of Australia (FIAA).	

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

JOHN LOWRY
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INTRODUCTION

The system of tertiary education for quantity surveyors that has served us for about 40 years is coming under scrutiny from a number of 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 cadetships 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 potential in other areas of 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 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 developed sophisticated cost planning, documentation and contract administration techniques in response to evolving procurement and contracting environments. Our base competencies rose to around 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?

Whilst quantity 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, business planning and advice, IT systems development and sales, IT contract management, property investment and analysis, property development and the sale of value-engineered cost 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 refer clients to specialists, 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 other than practicing 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 AIQS in its present form.

There is no doubt that today's graduates will be doing different things differently by the end of their working life, just as this generation has done.

In order to maintain competence in the face of change, the profession will continue to strengthen continuing professional development requirements. This trend will also be driven by legislation designed to encourage people to remain in the professions whilst ensuring that professional standards meet community expectations.

COMPETENCE-BASED ASSESSMENT

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 assessment is a better way to admit new members because it is objective, fairer, more flexible to cope with changing specialties and it has the potential to recognise many more entry paths into the profession. There is a strong move in 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 admitted and accredited will change. We will do away with the "high jump" approach to professional membership in favour of a "hurdles" method. At present applicants must acquire 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 to apply 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 membership. This will be important as voluntary professional registration schemes take effect. Membership of our professional organisation at any level above ordinary membership will 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 the nature of employment, specialisation and 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 Services legislation, the AIQS 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 synonymous with qualification.

EDUCATION TRENDS

Now, under new government funding regimes and financial pressures to run profitable courses, there is a trend towards consolidating faculties and offering 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. There are, of course, 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 that they will be qualified to work in a job or 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 such a course in favour of a more structured 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 different ways 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 (part of their tacit knowledge) are important and valuable to employers. Just as young architects develop an early appreciation of spatial and environmental 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 these 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 to today's education and qualification challenges in a variety of ways. The approaches are unlikely to be as homogenous 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 streamed outcome. They 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 student capacity for complete courses they will offer more generic project and construction management degree courses. Some core competencies for base professional entry may have to 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 AIQS 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 core and specialist competencies 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. Universities, the AIQS, TAFE colleges and private educators are likely to offer courses of further study, sometimes in collaboration.

Life-long learning, including regulated continuing professional development is likely to be delivered in the same way and will be seamlessly integrated with the acquisition of further and specialist competencies.

ACHIEVING A SUSTAINABLE FUTURE – AN AUSTRALIAN MINERALS SECTOR PERSPECTIVE

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(An extended version of this article was published in the The AusIMM Bulletin Jan/Feb 2004)

The perception of the minerals sector as being dirty, dumb and dangerous prevails to this day even though the sector has evolved to become increasingly high tech, with major achievements in the fields of occupational health and safety and environmental management. 15 years ago few had heard the term sustainable development. Today, industry leaders have embraced the concept. They have taken action, incorporating the values and principles of sustainable development into the policies and modus operandi of their companies.[1] There is a real role for Australia to position itself as the leading minerals knowledge and human resources provider to the world. If Australia nurtures and invests in its workforce, knowledge management and intellectual capital, then it has this opportunity.

Initially the path towards sustainability meant being proactive and successful in addressing mine site environmental management. While environmental catastrophes remain a critical risk factor, the key challenge identified by the Mining Minerals and Sustainable Development (MMSD) Process was managing social impacts. There are already signs that the future of minerals will not be one of simple commodity pricing but differentiated on the basis of the environmental and social factors. Social impacts may be summarised briefly as relations with affected communities, indigenous peoples and the workforce. While the Australian minerals sector has been making increasing progress in the last decade with respect to the first two of these, the third is mired in engineering-

1 Mitchell, Paul 2003 Sustainable development in the mining, minerals and metals: progress on the journey *in Abstracts of The MCA Sustainable Development Conference 2003, Brisbane, Queensland, Nov 10–14, 2003 pages 98–99*

based managerialism. The phrase 'doesn't everyone work 60–70 hours per week?" indicates the unwillingness of the minerals industry to regard its employees as partners and a valuable asset. "When will the industry move beyond technical fatigue management? Mining is already seen as a high-risk business, can it afford the escalating risk attached to treating its workers as a production factor?"[2]

Recently the working age population (18–64) has increased by 170,000 per year. Access Economics estimates the working age population for the entire decade of the 2020's will grow by only 125,000.[3] 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. Professionals increasingly make 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 with increased employee loyalty and confidence.[4] Benefits to business are greater than merely attracting and retaining high quality employees. Through effective training schemes and through incorporating the diverse opinion of employees into the business decision-making process, companies can also ensure the continued growth and development of the corporate knowledge base. Capacity building and institutional strengthening can be achieved by raising awareness, by human resource development and by strengthening government, industry, community and other stakeholders to learn how to address and resolve sustainable development issues.[5] Quality leadership at all levels is paramount. Minerals professionals must take the lead in the transition to a more sustainable minerals sector.

HIGHER EDUCATION

The minerals industry employs 75,000 people[6] and the sector employs roughly twice that. The number of people employed by the minerals industry with bachelor degrees and above qualifications is only 13,000[7]. Employing less than 2% of the Australian labour force direct and indirect employment combined, 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 employed 404,800 people.[8]

It is increasingly hard to maintain the viability of niche courses that will provide the 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 being based on undergraduate enrolments and in courses with as few as 15 students this would clearly be perceived as unviable.

The Minerals Tertiary Education Council (MTEC) has been actively seeking to establish collaborative and flexible programs across its member institutions such as the G3 Masters program.[9] The MTEC program does not include all course providers and does have its pros 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 110 students from The University of Melbourne in 2002 less than 20 students took the minerals engineering elective. With the increasing popularity of options based courses it is necessary for the minerals sector to attract students to take minerals 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-skill, and/or become more specialised. Chemical engineers can take postgraduate courses while working fulltime to become re-branded as metallurgists and geologists and civil engineers can take postgraduate courses to become re-branded as mining engineers and geo-technical engineers. However, there still needs to be the undergraduate courses to feed into these courses and professionals 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, same basic statistics and geostatistics,…….It has been our experience that many graduate mine geologists commence their careers with virtually none of these 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 their expectations, and even get involved in curriculum design and delivery."[10]

This experience with geology is common to many disciplines and professions. If higher education for minerals sector professions 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 management and soft skills practices. Increasing working hours and responsibility means that many professionals, particularly the young and new professionals, do not have the support of their employers or the time available to invest in their continuing professional development. The mining industry has the highest proportion of working hours across all industries with almost 50% of its workforce working more than 50 hours per week every week of the year. While this means that employees have less time for professional development, it also raises issues of professional fatigue.

There is an apparent gap in the numbers of new professionals and the older generation of the workforce. New professionals need to have time to acquire the knowledge of older professionals and incorporate that into their own experience. Mentoring should be vital, especially in shifting to an 'ageless' workforce rather than a polarised older/younger generational workforce. The tendency to outsource 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 if the sector does not invest in graduates to 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. Most of the project correspondence and results are within my email system, which is deleted along with my profile when I resign, requiring the next project leader to begin from the start. Or the project was saved on floppy disk which I can no longer read with my CD drive. The paper copy would have gone along with the librarian in one of the cost cutting exercises."[11]

Companies are often unaware of the value-add a long-standing, high-calibre and nurtured professional can add. One example of value-add and corporate memory is the discovery of a new resource at a mine thought to have exhausted its resources. A production foreman, previously a geologist with the same company, suggested the plans be checked again. This suggestion resulted an extension of the mine life by another 12 years.[12] "Rising to the Challenge- Building Professional Staff Capability in the Australian minerals industry" conducted by World Competitive Practices Pty Ltd for The AusIMM in May 2001 addressed issues including that of retention and meeting the needs of high calibre staff. A testing question for companies was put forward; 'How clear are our professional staff – from graduate recruits to executive managers – about the answers to three key employee questions, 'What is my job?', 'How am I doing?' and 'What's my future?'. "Organisations that put effort into establishing conditions for their staff to answer those questions in the affirmative maximise their chances of having motivated and effective staff."[13]

CONCLUSIONS

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 leading provider of professionals to the global industry. To achieve this aim industry, associations and government need to work together with higher education providers. Not only must the quality and number of graduates be addressed but also addressed must be the issues surrounding attraction and retention of high calibre employees. Professional development, knowledge management and employment practices all play a role in the sustainability of the Australian minerals sector and its professions. Forums such as FASTS and Professions Australia allow greater collaborated effort and sharing of skills. Sustainability requires a holistic approach to the way professions conduct their business. No longer can professionals work in isolation within specific disciplines. As mining, processing and total product life are all considered concurrently it is clear that professionals must work together to achieve the best possible outcome with respect to sustainability.

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‘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.’

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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 faced by individuals and populations in our society and presenting these to the students. The focus of the education may be the knowledge of the foundations or (increasingly commonly) the management of these problems. The latter approach presents realistic unfolding stories to the students, who are supported by a learned tutor who may not have specific knowledge in the area. The students are asked to consider how to approach the problem – what tests to do – and what might be going on in various aspects of the patient’s life. Anyone who has tutored students in a ‘problem-based’ curriculum will be astonished at the rate of learning. They do not, however, become proficient in the treatment of even the limited exemplary problems they are required to address – this is thought to be a postgraduate objective.

Although the approaches in undergraduate education vary a great deal, I suggest none have been shown to provide sustained or even particular short-term benefit to students or patients. We might conclude that the learner is the key resource and with committed support they will get there in the end. The student is ‘socialised’ in this process in a manner that is of concern to many, though less so to doctors. Paradoxically, little attention is paid to the human requirements of a young doctor in our society, in particular how to balance their needs and the expectations of others. I suspect that research would demonstrate some detachment is a necessity for taking on such a role without undue personal consequences. Postgraduate education is a different matter and is far more complex.

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.

By removing the need to train ‘doctors’ as undergraduates – *it is not long enough* – the requirements of postgraduate education have become burdensome. This trend is likely to grow. For generalists in their field the point of competence is quite difficult to ascertain – but as an educator I 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. 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 over-investigation and treatment is as problematic as under-provision of care, although the later 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 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. When avoiding litigation becomes the primary motive in practice, it is unsatisfying for all concerned. Quite contrary to the wish of our patients, the choices available to them are now to a considerable extent determined by insurance companies. Take the once quite popular choice of home-birth here in Darwin – midwives cannot get insurance and no doctor can afford to take it up despite a great safety record locally and internationally. The problem is the 20-year liability in these situations. Obstetrics as a specialty is finding recruitment exceedingly difficult. My efforts, through our College, to place requirements on educators to take particular care in the health problems most likely to lead to litigation have been met with concerns that it will cause medico-legal vulnerability. Perhaps this is the problem – we need to bring the issue into the open, research the actual risks and harm, and begin to formulate a reasonable approach, understood by patients, doctors, the legal profession and politicians.

Many of the rurally based providers have 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. Many of the rurally based providers have few or no Australian graduates entering training, and even in the large metropolitan centres as many as 40% are overseas trained. Not only this, but the workforce shortage which is now escalating, has been met by removal of barriers for doctors emigrating to Australia, many rushing from countries with far less resources than ourselves. And not always from afar – I understand that Fiji is now in a critical situation. This is somewhat hypocritical for a country that won’t allow refugees onshore and is of highly questionable ethics for an industrialised country.

What does this mean for postgraduate education in general practice? It means we have a bypass of the standards of our College and even the Australian Medical Council (AMC) on the basis of workforce. Our community wants doctors first and good doctors second – but there has to be a standard below which a doctor should not be able to work unsupervised, and another 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 unsupervised 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 a community 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.

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 it 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 THEAUSTRALIAN NURSING COMMUNITY

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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, specialist courses and 'on the job' learning were fitted 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 related to the nature of their ward specialty. Whilst most nurses enjoyed grasping opportunities to learn and expand their working knowledge, this education was delivered in an ad hoc manner, and based on the needs of the organisation. Postgraduate studies were largely limited to courses available through professional organisations such as the Royal College of Nursing, Australia. However, with the advent of tertiary studies for undergraduates and the opening of schools of nursing in universities around the country, nurses were quick to embrace the opportunities provided for them to progress their careers and enhance their clinical skills by undertaking further studies.

In line with overseas developments, the 1990s saw nursing, like other professions, focussing on the importance of continuing education in order to keep pace with the changing work environment and professional requirements – such as meeting competency standards, personal accountability, and increased emphasis on evidence based practice. Royal College of Nursing, Australia and other groups actively encouraged and participated in a national debate on the issues of mandatory education, accreditation and endorsement of education activities, and credentialling advanced nursing practice. These debates were one of the triggers that led to the recognition by regulatory authorities that in order to meet their purpose of protecting the public, there had to be formalised systems in place to monitor the competency of registered and enrolled nurses. All state and territory nurses boards except in New South Wales have now introduced requirements for nurses to annually declare their competency to practice, and in four jurisdictions, there are auditing systems in place to monitor these declarations.

Nurses are still learning about the concept of life long learning, and discovering how it can assist them in their career paths as well as in their day to day practice.

A flow on effect from these developments has undoubtedly been a recognition by many nurses that in order to be competent and accountable, they must take personal responsibility for their individual learning needs, and must take part in life long learning. This is a major shift from the past where there was an expectation that employers would take responsibility for provision of all their employees learning needs. Nurses are still learning about the concept of life long learning, and discovering how it can assist them in their career paths as well as in their day to day practice.

Various researchers have attempted to define life long learning and to identify key characteristics of life long learners. Ralph (2002) described life long learning as a 'cradle to grave' process enabling the learner to acquire and apply all the knowledge, values, skills and understanding required in a life time. This view is supported by Oliver (1999) who states that it is 'likely to incorporate all types of learning under a variety of different situations'. Comments recorded in the research about life long learners include quotes such as 'I am open to new experiences, ideas, information and insights', 'I have learned enormously from certain important experiences which do not usually rate as subjects' and 'I often learn a great deal in ways other than taking courses' (adapted from Gross 1977: 15–16).

Life long learning has been identified as the key element in the career development of professional workers (Duyff 1999). It is genuinely a 'cradle to grave' concept, and must be considered an important component for the profession if nursing is to successfully meet the needs of today's health care environment, and tomorrow's unknown challenges.

In 2002 the landmark National Review of Nursing Education report *Our Duty of Care (Commonwealth 2002)* made many recommendations relating to the educational needs of nurses, and of note was Recommendation 17 which identified that all nurses should undertake life long learning, and that in doing so this should be a shared responsibility between the individual, employers and the profession as a whole. Mindful of these changes, Royal College of Nursing, Australia, the peak professional organisation for nurses, developed a program which adopted the concept of life long learning, by encouraging nurses to include the broadest range of learning opportunities in their professional development goals, and to record these in a professional portfolio (Ashley-Coe 2003, Averis 2003). The program, called 3LP, encourages nurses to view life long learning as an active and self-directed process, focussing on knowledge, values, skills and understanding, and looking beyond acquiring these learning outcomes for their own sake. An important component of 3LP is the introduction of continuing nursing education points (CNE), which are awarded to specific activities, or may be allocated to activities identified by individual nurses participating in the

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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 for many years, but with the launch of 3LP in 2003, this program has gained increased attention from a broad range of education providers, publishers and other organisations providing professional development to nurses.

Royal College of Nursing, Australia accreditation is a process designed to enable the nursing profession to assess, and give recognition to postgraduate nursing courses and other educational activities which demonstrate a standard considered necessary to facilitate the further education of nurses into advanced areas of practice (RCNA 2003). It offers a service to organizations conducting nursing courses, enabling them to submit their curricula and other specific information to the College for review by a panel of experts using pre-determined criteria provided by RCNA. Examples of courses submitted to undergo this process include womens health and pap smear provider credentialing courses, trauma management and wound management. The process can take several months, especially if the review panel requires revisions to the curricula. Once a course has been successfully accredited, the provider is entitled to use the RCNA logo in all its course advertising and promotional material, and participants in the course are assured that the course meets professionally recognised standards. Accreditation is normally awarded for a three year period, after which the course must be updated and re-submitted for accreditation.

As it is a national process, accreditation allows for greater interstate mobility for nurses with postgraduate qualifications and also promotes national standards of advanced practice. It allows consumers, nurses and their employers access to an objective evaluation when choosing the course most likely 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 also include books and other educational material such as CDs, reports and pamphlets. In the case of workshops and other activities, CNE points will be allocated to the activity as part of the endorsement process.

Both accreditation and endorsement represent a national standard set 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 involve rigorous 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 showed how issues such as access to professional development due to geographic location or social circumstances needed to be taken into consideration.

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 showed how issues such as access to professional development due to geographic location or social circumstances needed to be taken into consideration. Almost 30% of the

membership was found 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. 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.

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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 service and on-line enrolment and record keeping.

Nurses have been required to undergo enormous professional and cultural shifts in the last two decades. Consumers now expect them to be well educated, competent and highly professional.

Nurses have been required to undergo enormous professional and cultural shifts in the last two decades. Consumers now expect them to be well educated, competent and highly professional. Regulatory authorities and professional bodies such as Royal College of Nursing, Australia are supporting nurses in their efforts to undertake life long learning to ensure that they are appropriately educated to meet the needs of the rapidly changing health care sector.

More information about the RCNA Life Long Learning Program (3LP) can be obtained from the College website at www.rcna.org.au

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DISTINGUISHED SPEAKER SERIES

The following are extracts from an address entitled "Export Education, R&D and Unemployment", by Evan Thornley, Founder and Chairman of LookSmart International, given at the Distinguished Speaker Dinner on Tuesday, 18 May 2004 at the Sheraton Towers Southgate, Melbourne

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.

Ricardo and Smith saw that the benefits of freer markets and competition would ultimately be greater than the perceived benefits of self-interested protectionist arguments. There is no doubt we owe them both an enormous debt of gratitude for that.

But the foundations of Ricardo-ian economics have been increasingly challenged by economic theory and empirical reality. Curiously, these challenges flow from an observation made initially by Smith, some 40 years earlier – that the wealth of a nation depends on the division of labour and the division of labour depends on the size of the market.

And so enters economies of scale to mess with an otherwise simple picture.

You see Ricardo's doctrine of comparative advantage came from observing agriculture – an industry where historically there were decreasing returns to scale. That is, you got worse as you got bigger. Why? Because you farmed the best land first. If you had to expand, you farmed the second-best land next and so on.

But in the last 30 years, this approach has been overtaken by another idea – increasing returns to scale. Put simply, the larger your company and your industry, the more powerful you are versus competitors and the more your fixed costs can be offset by larger volumes, leaving you with spare change to out-research, out-develop, out-distribute and out-brand the competition.

Take a simple example – biscuit-making. If you're Arnotts with 80% market share, you can afford to spend 20% of revenue advertising your brand and still make a tidy profit. If you're Westons trying to compete, you'd have to spend 80% of revenue to make the same investment in brand. You can't do it.

So much more so in cars, computers or pharmaceuticals where the same economics apply not just to branding costs (though they certainly apply there as well) but to all the areas of major capital investment.

So in a simple free trading world the big will get bigger, the wealthy wealthier and the meek will not inherit the earth.

This is not an idea that anyone I've ever met in business has a lot of trouble getting their head around. But it is an idea that steadfastly refuses to lodge in the hallowed halls that are advising Australian public policy – or even in the commentariat that is meant to be critically reporting it.

While we may generally benefit from freer trade – free trade alone is not enough – we must find ways of building scale.

As a small, isolated domestic market, this is a particular challenge for Australia – probably a greater challenge for us, given our size and location, than for any other developed country in the world.

To illustrate further, two senior American economists – Ralph Gomory and William Baumol (respectively the former Chief Scientist at IBM and former President of the American Economic Association) recently published a book entitled "Global Trade and Conflicting National Interests". It concluded that free trade between nations with per capita incomes at least 50% different to each would almost always be mutually beneficial. The increase in wealth and buying power of the less developed nation creating more wealth from the bigger market for the products of the more developed nation than it took by letting the less-developed country enter the developed market with lower priced goods.

But for countries with similar income levels there were winners and losers. Pure free trade typically *advantaged* the country with larger scale industries and/or faster productivity growth *and disadvantaged*

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

As Baumol and Gomory are at pains to point out "…there is some danger that this book will be misunderstood as a protectionist argument, which it emphatically *is not*…. Our message, rather, is that under modern free trade conditions, there is no longer one, but rather many possible free-trade outcomes, and a country is better off with some than with others."

So while most trade is good most of the time, not all free trade is good all the time. While the ideologues may believe, to misquote Roy and HG that "too much free trade … 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 USA, 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 *further forward*. To move beyond some sort of simple 1980-vintage free traderism 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** and 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 jobs and wealth, will inevitably continue to decline.

To date these considerations have been marginal or non-existent in framing public policy.

While virtually unsighted in Australia, the debate on increasing returns to scale has been raging in economic theory in other parts of the world for several decades. There's a phalanx of Nobel Prize-winning market economists who have written on it – Kenneth Arrow, Joseph Stiglitz and James Buchanan Jnr to name just three.

I'd like to quote from Buchanan's book "The Return of Increasing Returns" which is now 10 years old, but his summary appears to be alive and well if we view the Australian policy landscape:

'The neo-classical Theory of Distribution … relied on the postulate that in equilibrium constant returns to scale exist …[he speaks at some length about the mathematical modelling difficulties of incorporating a dynamic increasing returns to scale component into traditional general equilibrium models … and concludes] … The possibility of 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 analysis of … growth, international trade and unemployment.'

That ends my brief intellectual excursion for the evening, but I hope you agree that the prosecution has established an intellectual "case to answer" about our need to focus on scale and therefore exports to drive the Australian economy.

And so to higher education and it's possible relationship to the world of business through either the powerhouse of export education or the twin false prophets of "innovation" and "commercialisation".

EXPORT EDUCATION

Let's start with the good news – export education.

Export education is the largely unsung hero 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, it makes our marked 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 infrastructure 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 or 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 moving into the low-end of 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 learning 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 it. 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 palpable lack of results.

COMMERCIALISATION

And so to Commercialisation of R&D.

Again, let me first pay tribute to the people who've built some of Australia's great new export companies out of research that started in our Universities. Without University research there would be no Cochlear or Resmed, no Memtech or Radiata. It is equally true that these great companies would not have been built without the business leadership of the Paul Trainor's, Catherine Livingstone's, Peter Farrell's and Dennis Hanley's in our midst.

But with the notable exception of medical device makers like Cochlear and ResMed, there is little evidence that we have success in creating companies in any other industry segments. This, despite a $5Bn per annum expenditure now targeted under the latest round of R&D funding to a vast array of hopefuls, maybe's and moonshots.

"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 companies or industries of global scale in any area other than niche bio-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 IT-based exporters like MinCom, Computershare and ERG, but that's about it. The rest of the Australian IT industry, as I ruefully observed in the BRW a few weeks ago, consists of smart Australians implementing US software onto US hardware for the benefit of the Australian services industry cartels. And even that will only last until such time as the role is completely outsourced to smart Indians to install US software onto US hardware at half the price.

So why are we pouring money into IT research if our primary goal is to "commercialise" it – there's no-one who's going to do that. To put it bluntly, if the $250M of public money that is currently pouring into NICTA ever generates even $100M p.a. of profitable export revenue, I promise that I will, as the old saying goes, "bare my arse in Burke Street".

Allen and Company, the respected economic consultancy recently undertook a study on behalf of the Australian Institute of Commercialisation and concluded correctly that "Even at world's best practise, 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. 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 Andreesen of Netscape or Jerry Yang of Yahoo or Larry Page of Google, or Bill Gates or any other successful entrepreneur. Not even by the money 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. Patents are, of course, with the 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 in Silicon Valley 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* technology architectures and *category* 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. A market where you 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 by serving the Australian domestic market alone.

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 astonished to see – and I trust I'm not telling any tales out of school here – that our revenue from export education was about 50 times that of our revenues from licensing intellectual property.

This is not to cast blame on those responsible – they've been asked to do the wrong job. Not only that but it is clear that export education is a generator of significant free cash flow whereas the true financial contribution of our "commercialisation" efforts was profoundly negative.

It's easy to see what the "core business" should be. And as luck would have it that core business meshes neatly with the core teaching and research missions that the Universities have always had.

WHY IS IT SO?

So who is selling us this bill of goods on commercialisation – and why? I believe we can identify the culprits – they are the non-playing coaches of the Australia economy in Canberra and their partners in crime – the managerial class of Australia's domestic services industry cartels. Let me unpack that for you a little.

Businesses understands 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.

What we have is the better minds and efforts of our nation being misdirected down a yellow brick road of "commercialisation" by a tin man Federal Government with no brain and no heart! It is strip-mining the financial benefits of export education as an excuse to reduce public investment in higher education to just 0.8% of GDP. This impacts domestic students through fee hikes, rising class sizes and failing infrastructure, but it also risks killing the goose that lays the golden egg – the quality of our education and the resulting brands that we have invested for decades to build which have driven our export success to date.

In an effort to further reduce public investment, ironically, we are now wasting large amounts of money and, more importantly, time and focus, on the muddled pursuit of "commercialisation" of R&D.

As a result, we risk losing touch with simple imperatives – to pursue great scholarship and the development of great minds. To build real businesses with real products and real customers. Great companies and great industries.

The failure of commercialisation is a failure of Australian business not a failure of Australian higher education.

Businesses understands 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 either Korea or Iceland. Our business 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 dominated by inwardly focussed domestic services industry monopolies and oligopolies. In banking, media, telecommunications, retailing, transport and financial services, for example, most focus in on how to squeeze customers, suppliers, employees and Governments. In short to generate profit growth by abusing market power domestically rather than to truly find new customers and new markets by going global.

Because going global is hard. The competition is fierce, the results less certain and less immediate and there is a requirement 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 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.

WHAT SHOULD WE DO ABOUT IT?

The answer is: we should let the Universities get back to teaching and research and allow them to fund ever greater investments in both through export education. Then we should hold business accountable to drive export growth and with that will come jobs, innovation, commercialisation and prosperity.

And given the need for scale there is a resulting need for focus. We can't be all things to all people. We can't afford to try to let a thousand flowers bloom. We must find the few things that we have already proven that we are good at and get great at them. This is not picking winners. The winners have picked themselves – they are the businesses and industries that have cut it in the global market place and are growing their global market share and building their scale to competitive levels.

Some of you may be wondering "why do we need to pit export education against commercialisation? Surely they are both good and important?"

The answer is because we have to focus. We can't be good at very many things simultaneously. Global markets are fiercely competitive and if we take our eye off the ball, even for a moment, we risk losing advantage that may be hard to regain.

If the coach and management of our swimming team took a lot of time out to try to help our struggling waterpolo or synchronised swimming teams – imperilling our Gold medal chances in Athens, we would all be appalled, and rightly so, by the lack of focus – however well meaning. And so it is with our Universities and export education.

Traditional teaching and research also suffers from this lack of focus.

In particular this bizarre view that scientific knowledge is somehow more important that that of the humanities has become pervasive, despite the obvious fact that our failures to build global markets have been largely failures of sales, marketing and distribution – culturally driven imperatives – not failure of scientific wizardry.

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 numbers are, and I don't use the word lightly, 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". Add to that increases in "sole parent beneficiaries" that for some unexplained reason is increasing at over twice the rate of family breakdown and guess what? Since 1993 we've had hardly any reduction in the level of effective unemployment at all. The combination of the three figures was about 1.6 million recipients in 1993 and higher a decade later.

We've had a reshuffling of the statistics to give a headline rate of measured unemployment that appears to be in rapid decline, but out on the ground, the people that we see through the Brotherhood of St.Laurence every day, are seeing no change at all. This, despite the prosperity of a decade of boom.

Similarly, if you look at the Roy Morgan Research survey of unemployment – a survey that unlike the ABS numbers has not had a range of convenient methodological changes over the last decade – you'll see the real level of unemployment remains stubbornly high.

So the curse of unemployment and it's devastating effects on the individuals, families and communities that it affects is still with us. Worse still, the very real possibility that if our current debt-funded boom unravels into a recession some time in the next decade, those numbers could double very very quickly – they always do in recessions.

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 while 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 to scale Australia must export.

To win in even a few global export markets we must 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 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 economic sciences – I conclude with one from the Arts – 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 '50s – of Kerouac 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 naked,

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 machinery of commercialisation."

2004 Awards

for

Outstanding Achievement in Collaboration in Research & Development and Education & Training

SUPPORTED BY

An Australian Government Initiative

AusIndustry

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.

B-HERT wishes to acknowledge the generous support of the following organisations:

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?

Process

1. Applications for 2004 are now being sought from all Members of B-HERT.

2. Deadline for applications is **30 August 2004**.

3. Judging will be completed by **25 October 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: bhert@bhert.com

2004 Award for

The Best Entrepreneurial Educator of the Year

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 OF UNIVERSITIES

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:
   - Mr Rob Stewart, President, Business/Higher Education Round Table
   - 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 National Training Authority
   - Ms Leanne Hardwicke, Director Public Policy & Representation, Engineers Australia
   - 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
4. The Award will be presented at the annual B-HERT Awards Dinner on **18 November 2004** in Sydney, along with the Awards for Outstanding Achievement in Collaboration in Research & Development and Education & Training.
5. Submission to be no more than one page of each of the five criteria.
6. Completed submissions to be sent to the Business/Higher Education Round Table at the following address:
   1st Floor, 24 Brunswick Street
   Fitzroy Vic 3065
   Ph: +61 3 9419 8068
   Fax: +61 3 9419 8276
   E-mail: bhert@bhert.com

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

Recent B-HERT Publications

As a unique group of leaders in Australian business, professional firms, higher education and research organisations, the Business/Higher Education Round Table (B-HERT) sees as part of its responsibility the need to articulate its views on matters of importance germane to its Mission. From time to time B-HERT issues Papers in this context – copies of which are available from the B-HERT Secretariat at a cost of $9.90 (GST incl.) per copy.

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.

Leading Edge – **Australian Public Sector Research (November 2003)**

This publication seeks to showcase our developing research excellence, and widen the opportunities available to many of the researchers, their universities and agencies which supported this research, and to the nation.

($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.

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.

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.

STUDENTS IN FREE ENTERPRISE (SIFE) CHAMPIONSHIPS SHOWCASED IN MELBOURNE

SIFE
STUDENTS IN FREE ENTERPRISE

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.

With the support and encouragement of B-HERT and the assistance of our Executive Director Professor Goldsworthy, who is Chairman of the Board of SIFE Australia Ltd, the number of teams in competition continues to expand towards the goal of participation by all Australian universities.

All members of B-HERT, but particularly those in Melbourne, are invited to look in on any part of the proceedings, which run from Friday evening through to Sunday afternoon. The main competition will take place between 9 am and 5 pm on Saturday, with a final round between 9 am and 12.15 pm on Sunday. Advance warning would be appreciated by calling 0417 811877.

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 through 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.

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.

CENTRE FOR R&D LEADERSHIP

a Centre within the Faculty of Medicine, Dentistry and Health Sciences

Award Programs and Short Courses

THE UNIVERSITY OF MELBOURNE

The Centre will be a resource for education, training and research in the field of R&D leadership based in the Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne.

- Short courses for Industry, Higher Education and Research Institutions offered from July 2004.
- Award programs from Certificate through to Diploma and Masters level in R&D leadership offered from 2005 onwards (subject to approval).

Short Course Details:

■ **CRC Leadership and Career Development Course** $2,793.20*

Dates: 30 August–3 September 2004 (5 day residential)

For Ph.D students and Postdocs in CRCs. To develop an understanding of the nature of leadership, how to work effectively with others in teams, and how to plan a professional career.

■ **Strategic Planning for R&D Programs**

Date: 14 September 2004 + follow up day $950*

For leaders and co-ordinators of R&D Centres, Research Programs, and research areas. To develop strategic, operational and business plans.

■ **Collaborating for Success in R&D**

Dates: 11–14 October 2004 (4 day residential) $2,000* +accommodation

For partners in collaborative ventures – CRCs, joint ventures, research alliances, research networks, and cross functional research teams. To build knowledge and skills for successful collaboration.

■ **Presentation and Report Writing Skills for Researchers**

Dates: 3–4 November 2004 $950*

For R&D staff in Universities, CRCs, and government research agencies. To develop skills in report writing to business clients.

■ **Career Development for R&D Professionals**

Dates: 25–26 November 2004 $950*

For early – mid career research staff. To assist in active career management and progression.

■ **Creativity and Performance for R&D Teams**

Dates: 1–3 December 2004 $1,900*

For leaders and members of R&D teams. To improve the capability, cohesiveness and creativity of R&D teams in Universities, CRCs, and public and private sector research organisations. The fee includes an effectiveness profile of the participant's own work team.

For enquiries about the courses and further information, please contact:

Professor Leon Mann
School of Behavioural Science, University of Melbourne
Ph: +61 3 8344 4434 E-mail: leonm@unimelb.edu.au

or

Enquiries, Postgraduate Programs
School of Medicine, University of Melbourne
Ph: +61 3 8344 5998 E-mail: medicine-info@unimelb.edu.au

*** All prices are inclusive of GST**

B-HERT MEETING DATES FOR 2004

Please note the following date for the next B-HERT meeting, in addition to University Governance Seminar

Thursday, 18 November 2004 –

Shangri-La Hotel – Sydney

8.30am – 3.00pm University Governance Seminar
3.00pm – 5.00pm B-HERT Meeting (inclusive of Annual General Meeting)

followed by Awards dinner at which the Hon Peter McGauran MP, Minister for Science, will present the Awards for Outstanding Achievement in Collaboration in Research & Development and Education & Training and Best Entrepreneurial Educator of the Year, in addition to delivering the after-dinner address.

DIARY NOTE

INTELLECTUAL PROPERTY MANAGEMENT & KNOWLEDGE TRANSFER SYMPOSIUM

Realise, Systematise, Optimise

Melbourne 29 Sept 2004, Sheraton Towers, Southbank

One-Day Programme

(speakers 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 TECNICALITIES: 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 Devinney, 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

TO REGISTER YOUR INTEREST, EMAIL YOUR CONTACT DETAILS TO bhert@bhert.com

This symposium is presented in association with the Intellectual Property Research Institute of Australia and is kindly supported by the Commonwealth Department of Industry, Tourism and Resources

The purpose of the Business/Higher Education Round Table (B-HERT) is to pursue initiatives that will advance the goals and improve the performance of both business and higher education for the benefit of Australian society.

B-HERT is the only body where leaders of Australia's business, research, professional and academic communities come together to address important issues of common concern, to improve the interaction between Australian business and higher education institutions, and to help guide the future directions of higher education.

In pursuing this mission BHERT aims to influence public opinion and government policy on selected issues of importance.

Mission Statement

B-HERT believes that a prerequisite for a more prosperous and equitable society in Australia is a more highly-educated community. In material terms it fosters economic growth and improved living standards - through improved productivity and competitiveness with other countries. In terms of equity, individual Australians should have the opportunity to realise their full social, cultural, political and economic potential.

Membership of B-HERT comprises Australian universities, corporations, professional associations, the major public research organisations (Commonwealth Scientific and Industrial Research Organisation; Australian Nuclear Science and Technology Organisation and Defence Science and Technology Organisation) and the Australian National Training Authority.

B-HERT pursues a number of activities through its Working Groups and active alliances with relevant organisations both domestically and internationally. It publishes a regular newsletter (B-HERT NEWS), reporting on its activities and current issues of concern relevant to its Mission.

BUSINESS/HIGHER EDUCATION ROUND TABLE
A.C.N. 050 207 942
1st Floor, 24 Brunswick Street Fitzroy Vic 3065
Ph: 61 3 9419 8068 Fax: 61 3 9419 8276
Email: bhert@bhert.com Website: www.bhert.com

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