

# PRODUCTIVITY

## IN THE HIGHER EDUCATION SECTOR: WHAT DOES IT MEAN?

### PRODUCING PRODUCTIVITY IN HIGHER EDUCATION

*Some of the Commonwealth's pronouncements on higher education efficiency remind me of the old joke about a time and motion study of a performance of Schubert's Unfinished Symphony.*



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1. For a considerable period, the oboe players had nothing to do. Their number should be reduced and their work spread over the whole orchestra, avoiding peaks of inactivity.
2. All 12 violins were playing identical notes. This seems to be unneeded duplication, and the staff of this section should be cut. If a volume of sound is really required, this could be accomplished with the use of an amplifier.
3. Much effort was involved in playing the 16th notes. This appear to be an excessive refinement, and it is recommended that all notes be rounded up to the nearest 8th note. If this were done, it would be possible to use para-professionals instead of experienced musicians.
4. No useful purpose is served by repeating with horns the passage that has already been handled by strings. If all such redundant passages were eliminated then the concert could be reduced from two hours to twenty minutes.
5. The symphony had two movements. If Mr Schubert didn't achieve his musical goals by the end of the first movement, then he should have stopped there.

In light of the above, one can only conclude that had Mr Schubert given attention to these matters, he probably would have had time to finish the symphony.

It is hard to respond to such comments beyond observing that the critic doesn't understand the point of the exercise.

However, satire is unlikely to persuade the Commonwealth there is little scope for further efficiencies in Australian higher education, or that institutions are best managed by themselves rather than through prescription by a Government official or agency.

### 33 per cent increase in productivity since 1995

The first substantive point to make is that Australian higher education has increased its productivity by 33 percent since 1995. In 1995 universities employed 15 equivalent full time student units for every 1 full time equivalent academic staff member, giving a student:staff ratio of 15:1. By 2001 the student:staff ratio had blown out to 20:1 and there is every indication that the trend has continued to deteriorate in 2002.

Student:staff ratios have increased so much largely because institutions have funded salary increases at about the general rate in the economy (certainly no higher) by cutting staff, since the Commonwealth has failed to supplement grants adequately. Class sizes have increased, students have less access to staff, workloads have increased greatly and the sector's staffing structure has hollowed out. As table A12 of the minister's paper for the higher education review *Higher education at the crossroads: an overview paper* shows, since 1991 the proportion of academic staff above the middle grade of senior lecturer has grown by 29 percent and the proportion of staff at lowest lecturer A level has grown by 21 percent, but the proportion of lecturer level B staff has fallen by 11 percent.

### Changed work practices

The second substantive point to make is that Australian higher education work practices have changed substantially over the last half decade. In 1995 there were 46,187 international students in our universities. By 2001 international student enrolments had increased to 112,342, a truly extraordinary growth of 140 percent in just over 5 years. Almost one third of international students – 32 percent – are studying off shore.

Such a major growth in the number of international student enrolments and substantial off shore teaching could not have been achieved without a steady revolution in work practices. These include intensive summer semesters and other flexible teaching arrangements on shore, and twinning arrangements, block mode, and shared teaching off shore.

Further major changes in work practices are being made with the introduction of on-line learning.

### Year-round teaching or 2/3 staffing appointments

One is tempted to respond to the Commonwealth's claim in *Crossroads*, and repeated in subsequent issues papers that 'most universities are fully operational for only 150 days a year' (paragraph 130), that this is like observing the Australian Parliament is 'fully operational' for only 70 days a year. Parliamentary breaks often leave Parliament House idle, weekend

use of Parliamentary facilities is minimal and shared use by community organisations or other providers in Parliamentary downtimes appears to be rare.

But again this doesn't really meet the point. There is a pervasive perception in the community that universities have an extended break from December to February each year, as I am reminded every time a taxi driver expresses surprise that anyone would want to be taken to a university campus when it is on 'holidays'.

An eloquent refutation of this perception would be to introduce year-round teaching. Most if not all universities teach over a summer semester, of course, but this is rarely more than 5 percent to 10 percent of a university's total student load. Summer semester load would have to be from 20 percent to 30 percent of a university's total student load to convince a sceptical Commonwealth that university campuses are fully engaged year-round. There are numerous difficulties with this, of course, not the least of which is persuading financially strapped students to relinquish full time vacation jobs for a continuation of their mix of part time work and full time study throughout the year.

If year-round teaching is not feasible, the Commonwealth suggests relinquishing year-round employment for academic staff. Thus in its issue paper *Meeting the challenges: the governance and management of universities*, the Commonwealth suggests that 'Other employment that would be considered include the engagement of academic staff for the full time academic year (that is, for around nine months), a practice common in the United States (US). US academics employed on this basis are able to conduct research, teach for an additional summer semester, take annual leave or undertake consultancy work for the remaining months of the year' (paragraph 208).

This is an intriguing suggestion. Assuming staff could adequately prepare, teach and assess two standard teaching semesters in 9 months and took annual leave in another month, 2 months could be released for other activities. One week's salary is almost 2 percent of a full time staff member's total salary. So by releasing staff from duties for 1 to 2 weeks per annum universities would increase the effective remuneration of staff by 2 percent to 4 percent per annum. Since 2 months would be available for release under the Commonwealth's suggestion, universities would have scope for 4 to 8 years' remuneration increases without significantly increased cash payments.

But such a scheme would incur some cash costs. New subject materials have to be prepared and existing materials renewed, students selected, supplementary assessment set and assessed. The myriad other housekeeping tasks normally done over summer would have to be paid for, presumably by contracting out the work to the staff who would previously have done it as part of their normal duties. The scheme sounds bizarre, but it may appear less so in comparison with the conditions the Commonwealth may attach to any salary supplementation funds it offers following the *Crossroads* review.

### US employment conditions

By raising US academics' employment conditions the Commonwealth invites the obvious comparison of salary levels, which show that Australian academic salaries are low compared to those in the US. Ninety percent of teaching staff in US doctoral-granting universities are employed as professors – assistant, associate and full professors. In 2000-2001 average annual salaries ranged from US\$52,671 for assistant professors to \$89,848 for full professors, with an average annual salary of US\$68,553. There is very considerable variation in US academic salaries. Almost 44 percent of full professors earned more than the average salary for full professors, 30 percent earned more than US\$100,000 pa and almost 5 percent earned US\$150,000 pa or higher (Bell, 2001).

Current Australian academic salaries range from about Aus\$37,100 pa for lecturer level A to about Aus\$100,600 pa for level E, professors. The median Australian academic salary is about Aus\$68,800 pa. Australian academic salaries are therefore about one third less than those of the United States taking into account purchasing power parity.

From 21 percent to 31 percent in academic staff of US research intensive and doctoral granting universities are employed part-time. But they teach only 18 percent of student load, so at least a significant proportion of part time academic staff in comparable US universities have relatively light teaching loads. They are most likely to be doctoral students supplementing their scholarship with part time teaching, although occasionally one reads horror stories of people trying to make a living from multiple part time teaching jobs. From 66 percent to 70 percent of full time academic staff in comparable US universities either have tenure or are on a tenure track (Berger *et al* 2001).

The same proportion – 68 percent – of Australian academic staff either have tenure or are on a tenure track (DEST, 2002a). So Australian academic staff are no less flexible than US academic staff in comparable universities. Furthermore, for their considerably lower salaries Australian academics are employed for the full year, while US academics receive much higher salaries for working only during the main teaching semesters.

The Commonwealth's misapprehension of academic staffing conditions in the US probably derives from its misunderstanding of US higher education. In the US 'higher education' includes not only research intensive and doctoral granting universities like Australian universities, but also what the US calls 'comprehensive' institutions and 2-year colleges. Comprehensive institutions offer liberal arts degrees and professional programs up to masters. There is no current analogy in Australia: the former colleges of advanced education are the closest recent comparators. Two-year institutions or community colleges offer vocational certificates and associate degrees of 2 years' duration, but not baccalaureates. Their closest analogue in Australia are vocational education and training institutions or TAFE colleges.

US comprehensive institutions and 2-year colleges have much higher proportions of part time teaching staff, a much lower proportion of their full time academic staff are full professors and their academic pay rates are much lower than doctoral granting and research intensive universities. Together they enrol 64 percent of all US higher education institutions, so their lower academic staff conditions lower considerably the averages for all US higher education.

### Small class sizes

In its issues paper on *Diversity*, the Commonwealth argues that there are too many units with small enrolments and suggests that this reflects inefficiency or at least a sub optimal allocation of resources. It goes on to float a number of ideas for reducing the number of subjects with low enrolments. However, the Commonwealth fails to examine the causes of the problem it perceives and hence does not identify a mechanism that would achieve the outcome it seeks. As Griffith University argues in its response to *Crossroads*, there are probably 3 causes of units with small enrolments:

- 1 supply factors such as maintenance of high priority but low demand areas such as physics honours, academics wishing to teach units in their area of specialisation, maintenance of workloads for otherwise under-employed staff, and maximisation of student load by academic organisations; units;

*"... fails to examine the causes of the problem it perceives and hence does not identify a mechanism that would achieve the outcome it seeks."*

- 2 demand factors such as students wanting a broad range of units available locally, students being attracted to courses with multiple options, employers and professional associations wanting specialist areas covered in programs; and
- 3 artefacts of enrolment systems such as students repeating units that are otherwise discontinued, units with multiple codes for different programs, and students taking individual study programs such as doctoral research programs that nonetheless need unique unit codes to conform to system requirements.

A comprehensive study is therefore needed to identify problems with the way data is recorded and reported to the Commonwealth. Griffith undertook such a study in 1999 on 1998 data and found that removing multiple unit codings reduced the apparent number of units offered by 32 percent. Multiple unit codings were much higher for postgraduate courses where units may be taken towards nested awards (graduate certificate, graduate diploma and coursework masters). Removing multiple codings for postgraduate units reduced the apparent number of units by 48 percent.

Without such a detailed analysis it is not possible to say, with any confidence, the causes of small class sizes in other institutions and in the sector overall. However, supply and demand factors alone are unlikely to explain large numbers of small class sizes in a sector with an average student: staff ratio of 20:1.

## Goals and incentives

Largely because the Commonwealth has failed to supplement institutions' operating grants for reasonable salary increases, universities are suffering cumulative cuts in funding per Government-supported student which have now reached about 10 percent of total budget. Universities have made savings in ways which protect their intrinsic goals and reflect funding incentives. Universities will continue to respond in this way – even to further funding cuts – while the Commonwealth retains its present policy and financing framework.

In *Governance* the Commonwealth also identifies several desired outcomes for the sector (para 187): better workforce planning –

- the need for senior university managers to have strong management skills (para 189);
- 'careful consideration' of the sector's age profile (para 190);

more flexible employment terms –

- more flexibility in the ratios of continuing, fixed term contract and casual employment types (para 197);
- dissolving the distinction between academic and general staff (paras 201, 204);
- teaching-only positions (para 205);
- US-style teaching semester-only contracts (paras 208, 210);

more streamlined organisational change and redundancy processes (para 213);

improved performance management –

- streamlined unsatisfactory performance procedures (para 221);
- more discretionary pay for top performance (para 223); and

faculty level bargaining –

- remuneration tied to revenue targets (para 225).

In addition the sector should aim to increase the proportion of women employed at lecturer level D and above and to increase the number of Indigenous Australians employed in continuing positions.

These accountabilities are so numerous and detailed that the Commonwealth would need an army of university management auditors to check compliance. They would add to governments' monitoring of inputs and processes rather than evaluation of outcomes. Griffith therefore argues in its response to *Crossroads* that the Commonwealth would achieve its goals more effectively by offering financial incentives for institutions to improve their outcomes, leaving it to universities to determine the most effective measures to achieve those outcomes. An institutional effectiveness fund could be awarded to institutions that achieved, say, 3 out of 5 targets set for the sector.

## The Griffith model

An institutional effectiveness fund should be set within a financing and policy framework that supports the core goals that the community has for higher education and encourages other outcomes that the Commonwealth seeks – diversity amongst institutions and increased funding from business and other private sources. The *Griffith model* therefore has 4 parts.

- 1 A strong but streamlined role for the Commonwealth in planning public investment in higher education through HECS places.
- 2 Encouragement of institutions to develop new institutional types by establishing 3 contestable institutional performance funds –
  - a) an institutional teaching performance fund of \$271 m;
  - b) an institutional community service and equity performance fund of \$271 m;
  - c) an institutional research performance fund of \$271 m (replacing the institutional grants scheme).

Institutions would be allowed to compete for 2 but not 3 performance funds, for two reasons. It would ensure that different types of institution had a reasonable opportunity of attracting additional funds if their performance were sufficiently strong. This would be in contrast to the process conducted by the committee for quality assurance in higher education from 1993 to 1995, in which all institutions competed in all categories and which concentrated additional funding in a few institutions.

Second, allowing institutions to compete in all 3 funds would result in their maintaining effort in all roles and thus not developing substantive diversity but merely different levels of performance in all roles. Allowing institutions to compete for only 2 funds would require them to choose one of 3 options to maximise their institutional performance:

- research and teaching;
- research and community service;
- teaching and community service.

All institutions would be tempted to continue competing for the institutional research performance fund because of the considerable prestige attached to research. However, the institutional rankings are well known, and if the differential for top performance were high enough many institutions would concentrate on the other areas in which they are better suited to performing strongly. This would encourage greater diversity in the sector, but it would be driven by institutions choosing their own areas of concentration informed by an external assessment of their relative strengths.

3 Financial incentives for institutions to improve their management outcomes, leaving it to universities to determine the most effective measures to achieve those outcomes.

4 A greater role in higher education financing for business and other sources of private funding through changes to the taxation and regulatory regimes.

## Conclusion

Productivity is a slippery concept in higher education, as it is in health, policing, government and other sophisticated human activities. But even by the crudest measures of dollars per student and student:staff ratios, Australian universities have achieved very considerable productivity increases in the last half decade. Even in the more complicated area of work practices, the extraordinary increase in the number of international students studying in Australian universities, and the large numbers of students studying at our campuses off shore and through twinning and other flexible arrangements, are evidence of very considerable changes. So Australian academic staff seem as productive as their US counterparts, who the Commonwealth used as a model in two issues paper for its *Crossroads* review of higher education.

Attempting to prescribe more detailed efficiencies through governance accountabilities would have the opposite of the effect intended by the Commonwealth, consuming vast amounts of time in accountability reporting and compliance monitoring. The better approach is for the Commonwealth to provide financial incentives for the productivity improvements it seeks, leaving it to institutions to devise the best means for achieving them. But such incentives should be located within a framework which balances instrumental productivity goals with institutions' longer term and core goals. The *Griffith model* of financing therefore has 4 parts which support the multiple goals the community and the Commonwealth has for the sector. ■

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# PRODUCTIVITY IN THE HIGHER EDUCATION SECTOR

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*In the objective of being an information society and a clever country with high productivity growth, higher education is one of the keys. Broadband Internet connectivity to citizens at school, work and home is another. Businesses that uniformly 'know' and emulate world best practice is a third. High expenditure on R&D by businesses, government and universities is a fourth. And an entrepreneurial environment for innovation and risk taking would cap-off the top five mechanisms.*

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**I**f higher education is to lead the way, then this industry should perhaps be the leading industry (of the nation's 465 industries) in terms of productivity growth. It is a basic test of cleverness and innovation. It is not enough, though valid and laudable, to prove higher education pays. A number of studies, including the recent Melbourne Institute research paper<sup>1</sup> have established this fact: there is a significant net benefit to individuals and society at large over the long term.

So, does the higher education industry have the nation's highest productivity? No, but it is not disgraced. As the following exhibit reveals it ranks above the national average, although the same cannot be said for the education industry at large. It should be noted that "higher education" in this exhibit is not a whole industry division, but one of the nation's 465 industry classes. The overall education industry division had virtually no productivity growth over the past 11 years (0.1% p.a.). (Refer Chart 1, below left)

Productivity is measured as output per hour worked; and determining output of higher education is difficult compared with most other industries. Is the quantum and quality of higher education per student increasing? This being too difficult to judge, output for higher education is best measured by student-years/per employee, both in FTE terms. (Refer Chart 2, Page 7)

The good ranking for higher education is mainly due to outstanding productivity growth in 2000 and 2001. Virtually all the productivity growth for higher education occurred in the five years after 1996. Indeed, productivity growth over the five years to 2001 was an astonishing 5.6% p.a. (c.f. 2.4% p.a. for all industries). Is this due to necessity being the mother-of-invention as a result of Federal Government funding restraint? The average student/employee ratio has certainly edged up.

Where does higher education fit within the overall education industry? There is an hierarchy of levels in education: pre-school, primary, secondary and tertiary. Around 12% of the students in educational institutions are in higher education, but account for around 31% of the educational spending. In 2001, there were over 726,000 enrolled students, representing around 36% of the 18-24 year age cohort after allowing for mature age students. This is a far cry from the 18% participation of 1980, let alone the 5% of 1960 and just 1.4% of 1920. At the beginning of the 20th Century, participation was almost invisible at around 0.4% participation. (Refer Chart 3, Page 8)

However, over the past several decades, there has been an informal quaternary level added. This quaternary level is occupied by university research and advanced

degrees; but increasingly it is being occupied by the corporate sector and its focus on intellectual property, especially by the world's giant international firms and smaller but very innovative new age enterprises. Of course, much of the "education" from those firms is osmotic rather than formal, but effective and valuable all the same.

Can universities be now viewed in the same light as yesteryears, dating back to the 1st Millennium? Most certainly they cannot, for three reasons. Firstly, the current participation rate of the population in higher education suggests it is becoming the norm in the 21st Century rather than the elitist exception; just as high school became the norm rather than the exception in the 20th Century. Secondly, the emergence of a quaternary level of "education" is nudging universities into the penultimate rather than ultimate level of education. Thirdly, in the Information and IC&T industry of today, education at large is experiencing a progressive dilution of its share of this growing sector of the economy which, in 2002, is estimated to represent around 13% of the nation's GDP.

## The Knowledge Industry

### % Share of GDP in Australia

Year	Information Industry	IC&T Industry	Total
1900	2.8	0.2	3.0%
1950	3.6	1.9	5.5%
2000 (E)	8.5	4.0	12.5%
2010 (F)	10.0	4.8	14.8%

With higher education increasing its share of the education dollar, its share of the knowledge market is subject to less dilution. However, with a 7% share of the overall Information and IC&T industry, it has plenty of competition from media, the Internet (including on-line information) and the growing intellectual property of the corporate sector which is often years ahead of the knowledge in higher education institutions. As will be raised again later, universities are adopting media and the Internet as new weapons in their armoury. Knowledge itself is hierarchical, of course, which leads to the concept of the knowledge pyramid. (Refer Chart 4, Page 9)

In the Knowledge Pyramid, higher education is surely aiming for the upper reaches, at least to the expert opinion level if not some of the knowledge and getting of wisdom level, which is higher still. Indeed, through research activities, universities certainly reach into the unique intellectual property level.

Given this new arena and competition for higher education, what is its role in the 21st Century? An elitist role, let alone a monopoly role is gone forever.

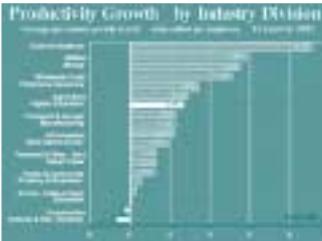


Chart 1

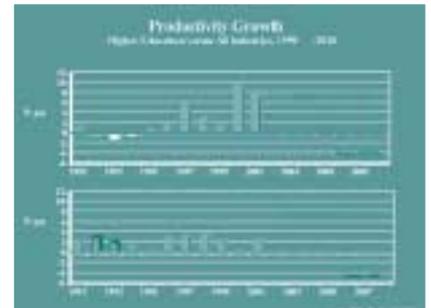


Chart 2

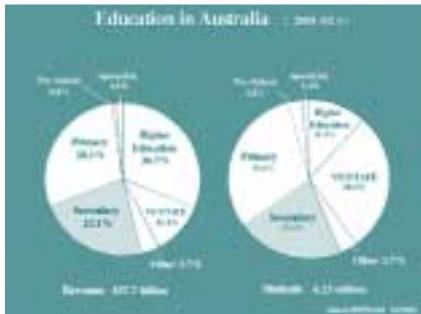


Chart 3

Academic excellence and inter-institutional competition may not be enough to counter the cheque-book power of large corporates, increasingly specializing in narrower fields of industry and human endeavour, including what might traditionally be called the “classics”.

How does a higher education institution face this challenge, and lead the nation in productivity growth? Productivity growth is, of course, achieved by working smarter and more innovatively, not by longer hours, worry, frustration and nervous breakdowns. Too often the latter route is used first!

It might begin by reviewing the four core elements or roles of educational activity: custodial, tutoring, informing and researching. The first of these applies only up to the secondary level (adults being defined as 18+ years of age). Research applies only to the tertiary level (higher education). Common to all are tutoring and informing.

Arguably, the two most important elements of higher education are tutoring and research, given that information is increasingly more mass-producible, cheaper, more accessible and more up to date from other sources, including the Internet. Tutoring and research are, of course, expensive. But the overall cost of higher education per student can be lowered in real terms by reviewing the products, assets, methodology and delivery mechanisms via the three core elements mentioned earlier.

Firstly, the product range. Have we reached an unsustainable if not absurd point where thousands upon thousands of subjects are offered, militating against any economy-of-scale considerations? If the range must continue to expand in the light of the world's explosion of knowledge and human endeavours, should 80% of these subjects (probably applying to just 20% of the students) be delivered virtually rather than in expensive classrooms and expensive campuses. And the rationalisation of courses and subjects across the nation's universities is also now timely.

Campuses today are one of the nation's most wasteful and low-productivity assets in the economy, as the table below suggests.

**Use of Assets<sup>1</sup>**

Revenue/Assets	Ratio
Finance & Insurance <sup>2</sup>	0.15
Govt., Admin & Defence	0.23
Agriculture	0.25
Utilities	0.30
Construction	0.34
<b>Education (higher education only)</b>	<b>0.38</b>
Cultural & Recreational Services	0.52
Mining	0.56
Communication	0.62
Property & Business Services	0.67
Accom., Cafes & Restaurants	0.73
Transport & Storage	0.74
<b>All Industries (excl. Finance &amp; Ins)</b>	<b>0.80</b>
Health & Community Services	1.02
Manufacturing	1.09
Personal & Other Services	1.16
Wholesaling	3.00
Retail	3.51

Note 1: Source: IBISWorld Top 1000 Enterprises (2000-01)

<sup>2</sup> This industry is incomparable to all others, as its assets are mostly financial rather than physical

The Higher Education ratio should be far better than the nation's average. It is frightening to know that this industry has around \$30 billion in assets to generate only \$12 billion in revenue in 2002. It should be the other way around, freeing up (via lease-back or via virtual campuses) around \$18 billion in capital that could be used for fast growth, high productivity and lower course costs. Universities, above all industries, should have most of their assets in *intellectual property* rather than *real* (physical) assets, but they don't. Traditions – however comfortable, warm and fuzzy – are habits with use-by dates. Perhaps it is time to review this millennium old habit of hallowed halls. This is not to suggest no campuses; but that they not be owned by the institution, be smaller relative to student numbers, and be used at least twice as much in each year's available 8760 hours. That won't be easy: if home ownership became a motherhood issue in just one century, what about campus ownership over a millennium.

Methodologies used by Higher Education institutions should always be in constant change, if this industry is to spearhead a clever nation. To some extent they are. But more than ever, the roles of *informing* and *tutoring*, and their method of delivery need radical re-thinking.

The information explosion and distribution revolution (the Net) suggests that the role of *informing* is slowly slipping away from teachers. The virtual supply of information is becoming the new order.

But *tutoring* isn't, yet. Learning to learn, learning to question and learning to value-add information to knowledge, opinion and intellectual property levels is a vital skill; perhaps the holy grail of universities. While a lot of this role too can be done via media, the Internet and video-conferencing, a lot of it cannot. This is particularly true in areas of tactile skills such as medicine, science and engineering. Such disciplines are, however, now the minority of courses in higher education. *And research?* It is not a delete option for institutions wanting to be clever or in the vanguard of knowledge

and intellectual property. Increasingly, however, it may need to be separately accounted, with separate rules for cost-and-benefit analysis whilst still being accessible by students through both researchers and lecturers.

In the issue of pricing and who pays for higher education, the debate is fierce. In the market economy (rather than producer economy) of today, pricing must be flexible, and value/quality driven. Who pays? One option is higher taxes (or displacing government spending on other areas such as aged and health benefits). Another is to treat higher education as an investment (capital expenditure) by the individual who benefits most anyway. A third option, involves a varying ratio of tax funded and individual funded sources; the option most likely to prevail.

In summary, capping the supply of funds to Higher Education over recent times may prove to have been the catalyst for wholesale re-thinking about the productivity issue. But more than that, the definition and modus operandi of universities has been open to intense debate and soul-searching.

It was long long overdue.

Productivity is now rising. Traditions are being questioned. And the role of this sector in the new fast-growing information & communications industry is being addressed.

There appears good reasons and new means by which productivity in Higher Education could be doubled if not trebled before the end of the first quarter of the 21st Century. That would really prove that this sector is clever and helping create a clever country. ■

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Chart 4



# PRODUCTIVITY – WHAT DOES IT MEAN?

*In addressing the question of productivity I wish to do so in the context of the Dr Nelson's review of Australia's higher education system – the first such review in fifteen years.*

The review provides the opportunity to address the fundamentals of university financing such that the real productivity of the sector can seriously be improved.

The sector is under the fiscal microscope. But more than that, the higher education sector is being challenged to look closely at its own performance in terms of outputs. Is it providing the graduates required by Australia's rapidly diversifying industry sector?

Are the pressure points of industry demand being identified soon enough by the higher education sector? A diverse range of views has already been expressed as part of the review process – as they ought be.

Importantly industry is looking closely at the nexus between business and higher education.

As part of the review, the Business Council of Australia commissioned the Allen Consulting Group to investigate a new data framework as well as undertake international comparisons of the sector.

The Allen Group argues that there is a need for better performance indicators. The report claims that there is insufficient evidence to support the sectors' call for an increase in the funding base to improve university outcomes.

The report argues that the sector plays a significant role in Australia's development as a nation, both domestically and internationally – but still argues the case against increased government funding. Its key focus appears to be that additional, outcome focussed, data sets should be established before any reform and significantly before any additional funds are to be invested. We would argue strongly that the two go hand in hand. Fundamental reform must happen – the present situation is unsustainable but to make that change occur – there must be investment – a commitment to long term and specific transitional funding from the government to remove the existing one size fits all model of policy and funding.

Also as part of the Commonwealth's Review, the Productivity Commission is undertaking a study to benchmark the resourcing of Australian universities against their overseas counterparts. Its draft report will be released late in September, allowing it to contribute



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to the final stages of Dr Nelson's review. The Commission will collect information for Australia and other countries on university income; assets and liabilities; management of resources; constraints on use of resources; and accountability mechanisms. But whatever the Commission's findings, it is important that it considers university productivity not against short term output measures but against the long-term impact of university teaching and research.

Universities have made significant productivity gains in the past decade.

They are graduating greater numbers of domestic and international students, have increased substantially the number of postgraduate degrees, and expanded research student numbers. They are undertaking much more externally funded research and for a greater range of funders – both public and private. Thus the outputs have risen substantially.

This increase has been associated with growing income from all sources to cover the substantial additional costs. But the growth in outputs has far exceeded the increase in income. The improved efficiency has been particularly evident for publicly funded teaching and research.

But there are potential downsides to this efficiency that raise significant issues about productivity and its meaning for universities.

The Minister has made a number of comments this year regarding the number of units with small enrolments offered by Australian universities. As is often the case the statistics do not tell the whole story: there are a number of common university practices which, while essential, also lead to some ambiguity in enrolment numbers. Out of necessity, universities may have several different codes for what is in fact the same unit. For example, some units are offered only in alternate years, and since they are not available all the time these units may be taken by students at different stages of their studies, so that in the one classroom there may be, for example, some second year students and some third years – hearing the same lectures, reading the same books but enrolled in different units.

Nevertheless the focus of Government is on removing units with small enrolments. Would this make us more

productive by using the resources freed up elsewhere? Maybe. Or it could point to a rather simplistic view of productivity, one that focuses simply on collective outputs and not enough on the quality of the product – quality assessed both at the individual level (is that student well equipped for a particular profession) and at the collective level (do we have a desirable mix of students from across the professions and disciplines to meet Australia's future needs?)

Staff-student ratios in Australian universities have increased from 12.9 students per university teacher in 1990 to 19.4 students per teacher in 2001. As a result, students now have less contact with staff and conversely it can be said that each staff member is more productive. What these figures do not begin to include is the increased reporting burden that means staff have less time to attend to individual student needs, and less time to devote to their research – which in turn can have negative effects on the quality of their teaching.

*“... a substantial part of university budgets is trapped in an efficiency cycle that does not allow a balanced assessment of what productivity should be or how to improve it.”*

Under the present funding mechanisms a substantial part of university budgets is trapped in an efficiency cycle that does not allow a balanced assessment of what productivity should be or how to improve it.

Government funding is largely fixed, forcing a focus on efficiency. Even if a university enrolls more students the additional funding is far below what is sensibly required – additional income is raised but the quality of product comes under further pressure. Universities can win additional research funding but it is only partly funding of the true costs – so again the remaining cost has to be found within existing resources.

This is not so true of universities' private services. In these cases, they can negotiate the necessary fees for the service provided. But much of universities' wider range of activity partly depends on their core teaching and research capacity. International students and fee-paying students are taught alongside domestic Government funded students. It is not realistic for the former substantially to cross-subsidise the latter. The result is further focus on efficiency not quality.

These issues point to why universities, students, employers and parents should support more flexible and diverse funding arrangements for universities. How can we achieve this through the review?

The review comes in the wake of wide-ranging public comments by the Minister about a variety of issues concerning the nation's universities. Along with the new Departmental Secretary, Dr Peter Shergold, the Minister has frequently taken advantage of opportunities to meet representatives of the higher education sector. Both he and the Secretary have appeared genuinely interested in hearing what

university academics and administrators have to say on the various challenges facing the higher education sector. There is widespread consensus – within the higher education system, in Government, and in the broader community – that the current funding and regulatory framework for universities is unsustainable; that it is inhibiting institutional growth and diversification, and is beginning to have deleterious effects on the quality of education universities are able to offer. The 'one-size-fits-all' funding model presupposes that all universities will undertake essentially the same mix of teaching, research, and community engagement. This is manifestly not the case.

The review issues papers present a range of views or options on the various issues covered, sometimes implying but never clearly presenting particular policy directions. In relation to universities' productivity the papers have raised various ways in which universities could provide better services – whether through ensuring staff are supported in how to teach, offering students courses in third semesters, opening campuses 24 hours a day, or better using information technology.

Each of these has its place. The AVCC has made clear in *Quality through Diversity* that it supports creating the environment to support a diverse set of approaches. The challenge is to create that environment rather than set out to mandate from on high how each university should approach meeting its mission.

But the papers have not really explored in depth what productivity in the sector means.

The higher education review is also being conducted alongside consultations on National Research Priorities.

The priorities raise another interesting challenge about productivity – is it more productive to produce research directed at nationally set priorities than to produce research driven by researchers views of what are the areas most deserving pursuit? In both cases the outputs are fairly clear: we can see publications; there are patents and spin off companies.

The final test comes down to which set, or more fully, what balances each will in ten, twenty or fifty years' time have produced the greatest impact.

I therefore believe that we must consider productivity for universities at the highest level: what universities achieve for Australia and how that is – or is not – improving?

In *Positioning Australia's Universities* for 2020 the AVCC's vision for the nation's universities sets out the 'product' we want universities to be measured by:

1. accessibility: all Australians will have access to post school education or training, with more than 60% completing higher education.
2. research excellence: focussing on key priority areas, extending basic knowledge, and innovative research and development.
3. internationalisation: Australian educational exports will give the nation a pre-eminent place in the global educational revolution.
4. firm foundations: effective national investment in higher education will underpin the international quality of Australia's universities.

*Positioning Australia's Universities* also proposes a 'framework of choice' that will encourage universities' diversity and adaptability, and better position them to meet the needs of students, families, industry and business. Through this framework the productivity of the sector will be supported:

1. A shift from a rigid target for student places to a range, funded at appropriate per student rates. The present targets are essentially historical, and should be replaced with a range in which universities receive public funds based on the numbers of Australian, non-fee paying, HECS liable students.
2. Appropriate funding for quality of learning, teaching and scholarship. Base funding per student must be increased, so that all universities have increased ability to provide the facilities students need.
3. Support for enrolled students from under-represented groups. There must be substantial additional funding for universities to support each student they enrol and graduate from groups under-represented in our universities. This applies to remote and rural students, those from low socio-economic groups, indigenous students, and students with disabilities.
4. Further investment in research and infrastructure. Increased funding is needed in basic research and teaching infrastructure. Commonwealth funding for university research activity should be based on measures of university research performance and international OECD indicators
5. Capacity for universities to access additional income. Universities should have the option of greater flexibility with student HECS payments. This would involve any additional cost being covered by income contingent loans, repaid when, and only if, a student reaches a certain income level. Not all universities want to use this option. The AVCC does not support a deregulated fee system.
6. Greater participation in the international educational market.

There is a need for a reduction in the barriers faced by international students in entering the Australian student market. These include rules concerning visas and work permits. Support for education exports by Government agencies is needed at a greater level than currently.

*"Positioning Australian's Universities also proposes a 'framework of choice' that will encourage universities' diversity and adaptability, and better position them to meet the needs of students, families, industry and business."*

7. Support for universities' engagement with their communities, with a wide range of funding options. Universities must be properly funded for their regional activities. All universities have regional involvement but clearly there are some that devote more resources to such issues. Regional and rural Australia has much to gain from this element.

8. National priorities to be developed through inclusive consultations. Government can benefit through collaboration with the Higher Education sector when identifying national priorities such as particular fields of study.

The 'framework of choice' addresses the tension between calls for higher public investment in higher education, and the belief that a greater private contribution is needed. The eight elements of the AVCC's framework operate as a whole, not as a series of discrete options, although each element will be of differing importance to each university, its staff and students.

If universities had a financing system based on these elements then they would be able to address seriously the question raised by this B-HERT news: what is the real measure of university productivity and how do we work to improve it further. Without significant change universities will remain trapped in an efficiency-seeking model. This would seriously undermine the long-term real productivity of Australia's universities. ■

## PRODUCTIVITY IN HIGHER EDUCATION SECTOR: A CONSULTING ENGINEER'S VIEWPOINT

### Opening and explanation

This paper has been unapologetically prepared from an engineering viewpoint, and is heavily biased toward this profession. Many of the opinions can, however, apply to other professions. It is written against a background of observation of a number of tertiary institutions both from the educational viewpoint as an employer of graduates and postgraduate engineers, but also from interaction with a number of institutions in research and development specific to industry needs.

While many of the opinions are of general nature, and may not apply to all tertiary institutions, there are influences today, not the least of which is diminution of public funding, that make improvements in productivity vital for the continuation of our tertiary institutions.

### Education.

This refers to the effectiveness of creating the desire to learn and research within the student body. This is not necessarily the same as good teaching, but must be measured against the understanding achieved and the satisfaction gained by the student compared with the time and monetary effort required to produce this result. The understanding without the satisfaction could result in exactly the reverse of what is desired, in that the student will become disillusioned and leave the area of study. It is a measure of academic efficiency that this air of excitement is continuously nourished.

Being an engineer requires that at least one equation appears in this paper. A colleague who is in fact an academic has suggested the equation

$$P = \frac{U \cdot S}{t}$$

where  $P$  = productivity,  $U$  is a measure of students' understanding,  $S$  is a measure of satisfaction gained, and  $t$  is the time taken to achieve this. This profound formula will be the last in this paper.

MR ROBERT SQUIRE

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Ltd



The understanding of the subject matter can be attained in a number of conventional and novel ways, which are well documented and understood. The excitement and satisfaction of finding things out is to some extent inborn, but usually needs careful fostering and nurturing to develop into a lifelong passion that must be the aim of education in its broadest sense. This can be achieved by structuring the education process to create inventiveness in the learning process, avoiding the mundane and encouraging self-help in finding things out. Is the traditional lecture the best way to achieve this? Is the tutorial structured to assist in this aim? In most cases probably not. The student of today is enormously comfortable with the electronic media, trusting information received from these more than actual experience. Computer based simulation replaces realism in everyday life, and this should be exploited in education, to provide excitement and satisfaction combined with learning. The advantages of this in educational productivity are enormous. It should be possible to replace high cost laboratories and associated staff with computer generated simulations of routine experiments. This in turn will allow flexibility in delivery both in terms of location and timing.

Along with this change in tradition, it is clear that many educational institutions are endlessly repeating core subjects with traditional delivery methods. An example from the engineering profession might be basic static analysis. This is taught to every engineering student in the world, with courses devised and delivered by countless lecturers. This is counter-productive. With the adoption of flexible education methods, the possibility of replacing this plethora with a limited number of international providers of this subject opens the way to real gains in productivity. Tertiary institutions become asset based, providing services through electronic and traditional media.

Finally on this matter is the productivity of academics. This needs to be addressed in terms of careers, retention and industry experience. The way to promotion currently could be cynically stated as writing papers. A better system might encourage high quality research, and reputation in industry, which is currently limited to the "high fliers". Sabbatical leave should include contact with industry and commerce, and more use can be made of industry in providing education services within the universities.

### Research

Research is a field of great variability in tertiary institutions. Productivity is indeed hampered by the system of research grants, the efforts needed to obtain these, and the growing class of professional grant application

writing experts who reap the rewards. Without stifling the creative quality of research, it seems possible that a layer of discipline in allocation of research areas among the universities might make for greater productivity, and less near duplication of effort. Some notable areas have been researched to death, at the expense of more deserving cases. The desire for productivity and value for money requires that freedom in following research topics must necessarily be somewhat curtailed, while still allowing creativity to flourish within defined fields. Funding for research which is relative to industry needs can be attracted by addressing pertinent industry problems, and finding the challenge in providing solutions. Again this intimate relationship with industry which has already been along the road to productivity efficiency can only benefit the universities.

There are some excellent models of industry and universities working together to achieve the dual aims of research results applicable to industry needs and the academic challenge of discovery and invention.

Many of these are commercial in confidence, as industry strives for greater competitiveness and efficiency from funded research. There are however, fields where knowledge from research is shared by whole groups of consumer industries. These could conceivably be funded by cooperative means, with a large number of interest groups contributing small amounts each. This method of funding has found some support in the smaller institutions, with some industry research projects supported by as many as 10 sponsors.

Productivity in research could also be measured against preset goals versus budget expenditure and time. No equation will be included, but modern industry standards would demand such measure of performance in any undertaking. There seems no valid reason why such indicators should not apply to research, nor why any field of research should be exempt.

#### Running a business

The final point to comment on is the efficiency of running a business. The practices have grown up in eras of public funding for tertiary institutions. This has led to adoption of work practices and procedures totally inappropriate for the conduct of a modern business. The administrative burden necessary to comply with probity regulations and conditional funding is intolerable if universities in this country are to develop into efficient educational and research institutions. The ratio of administrators to academics is far beyond what can be sustained by a self-funded business. To change this requires a new level of thinking and understanding of needs and future possibilities for our universities by Canberra, and a willingness to the forefront to embrace new procedures more in line with modern industry. Again this much needed transition can be fostered by the participation of industry. Drastic restructuring to reflect the desired outputs of education and research rather than the hidebound tradition from an earlier age needs consideration.

Outsourcing has been used successfully in industry for matters that are not core business. This could well be a model for universities, once the recognition and acceptance of the definitions of core business is agreed. Resource sharing becomes immediately attractive once outsourcing is embraced. By way of example, all experimental research could be outsourced to commercial laboratories, which would tender to price and timeliness to research groups in the universities. This removes the capital and labour intense resource from the universities, and allows private industry efficiency to be applied to experimental research. Performance against tendered criteria would be self determining in the ongoing success of this model.

Finally the whole question of tenure for all staff needs revision. Tertiary institutions can no longer afford the luxury of an industrial flavour protective of employee status and conditions. Greater flexibility can be successfully applied as evidenced by some very successful enterprise agreements in industry, with measured performance against target criteria changing the industrial scene. This must be a possible position for consideration in the benchmarks of productivity. Again, productivity in running a business must be considered a vital part of reform of tertiary institutions.

It must be recognised that every dollar spent on administration and overheads is a dollar less for the core business activities of research and education. Constant monitoring and review of these costs is a routine part of running a business. Universities need to develop the same philosophy as business in this regard.

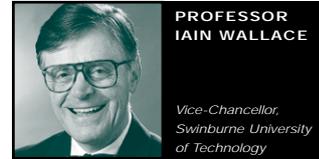
#### Finishing words and apology

Looking from a private industry viewpoint, there are many ways to improve productivity in tertiary institutions. The need to do this is obvious, if we are to continue to provide world class education and leading research. If the desire to continue to do this is agreed, then a willingness at all levels from Federal Government to the workforce at the institutions to introduce radical changes more reflective of modern business practices is required. It will be of interest to see how this is embraced and what evolves, as productivity becomes a benchmark for tertiary institutions.

It is probably impertinent for a consulting engineer working in the freedom of private industry with the associated risk to offer these comments in relation to institutions that enjoy less freedom of business actions, and enjoy greatly reduced commercial risk. With apologies to any whom resent these remarks, it is a viewpoint for consideration by government in the important consideration of this topic during the current review. ■

*“The ratio of administrators to academics is far beyond what can be sustained by a self-funded business.”*

## PRODUCTIVITY IN THE HIGHER EDUCATION SECTOR: WHAT DOES IT MEAN?



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### Introduction

The conjunction of productivity and higher education in this question to many will seem strange and inappropriate. Productivity is a measure of the ability of countries or corporations to deploy human and physical resources in the generation of economic growth. The fundamental purposes and processes of universities appear to be totally different. Rejection of the applicability of the concept of productivity to universities, although understandable as a reflex response, is simplistic in the contemporary environment.

The traditional role of universities has been the creation, preservation and transmission of knowledge while being located on the periphery of society and involving only a small proportion of its members. Nonetheless, universities have discharged fundamental functions for society at large. These include preservation and expansion of the cultural heritage and cultivation of citizenship through the formation of the characters and skills of individual students who, as graduates, have discharged community leadership roles in all areas of society.

In recent times this role has been dramatically modified as a direct result of change in government policies and consequential action. Universities have undergone 'massification', a process involving rapid expansion to permit a dramatic increase in community participation. While clearly contributing to democratisation and empowerment, the principal objective of the change was improvement in economic performance. In a policy environment dominated by economic rationalism a highly educated workforce accords competitive advantage in global competition. For the universities this has entailed an emphasis on producing a flood of graduates well prepared to play specific roles in the economy. This provides a strong attraction to international corporates contemplating significant capital investments.

Universities have also, been encouraged to contribute directly to national economic performance by recruiting international, full fee paying students. In the case of Australia this activity is currently vying for fifth place in the export earnings ranking and is well ahead of wool. More recently, emphasis has switched to the potential contribution to economic performance of effective and

comprehensive exploitation of intellectual property arising from research, a new perspective on the traditional role of creating, preserving and transmitting knowledge. Governmental encouragement to focus on these activities has taken the form of a steady decline in public funding support.

The current situation finds universities firmly integrated in the economic scenario. This is accompanied by continuing tension between discharging their traditional social and contemporary economic roles. As a result, productivity is relevant and appropriate in assessment of university performance but must be applied in a fashion consistent with the complexity and unique characteristics of universities. This is, to say the least, a challenging undertaking.

### Defining Productivity in Universities

Let us begin with three comments from the extended definition of 'productivity' provided by the Productivity Commission.

- Productivity can have connotations of minimising the use of inputs – for example, reflecting efficient production processes that minimise waste. Equally, productivity can have connotations of maximising output – reflecting the use of resources in the production of goods and services that add the most value.
- Productivity is a 'supply-side' measure, capturing technical production relationships between inputs and outputs. But, implicitly, it is also about the production of goods and services that are desired, valued and in demand.
- Evidence of productivity growth usually means that better ways have been found to create more output from given inputs. For example, the introduction of new technologies means that inputs can be used in ways that generate a greater quantity of outputs or new, higher-value products.

The first step in mapping this definition onto the activities of universities is a clarification of their inputs, outputs and the relationship between them. As will be illustrated, all aspects of this process reveal a quantifiable core and a qualitative penumbra. The degrees of precision and clarity attainable diminish with movement from the quantitative to qualitative zone and from the centre to the periphery in each zone.

Since goals and purposes establish the appropriateness of inputs we will first consider them and their associated outputs. As already indicated, the social goals of universities involve the preservation and enhancement of cultural heritage and fostering citizenship by graduating individuals capable of discharging leadership roles in society. In addition, universities are uniquely equipped to contribute to policy formation by researching societal problems. Economic goals comprise the provision of a stream of highly skilled and employable graduates, generation of commercially valuable intellectual property

and a significant economic contribution to their local community. The last includes access to a range of specialist advice, direct employment of community members, an economic boost from locally located, spin-off companies and a capital contribution through enhancement of real estate value in the vicinity.

There are, also, goals and associated outputs that bridge the social/economic divide. An example is the encouragement of social entrepreneurship. Entrepreneurship is being increasingly adopted as a quality to be encouraged in graduates and exhibited in university activities. It is not viewed as a purely economic and commercial process but, as Dees (1998) points out, "The ideas — can be as easily applied in the social sector as the business sector. They describe a mind-set and a kind of behaviour that can be manifest anywhere."

At the meta-level, social and economic goals and outputs require the same range of university activities, namely learning and teaching, research and community outreach. Similarly, when the focus shifts from goals and outputs to inputs there are many that are common to both the social and economic zones. Human resources, students and staff, are a prime example although the specific characteristics required vary with a social or economic emphasis. Capital infrastructure is relatively goal neutral. Buildings, equipment, (including information resources and communication), administrative systems and processes and utilities, such as energy use, are essential in the generation of all types of output. Finance is the fundamental input underpinning all others.

The relative importance of government and alternative sources of funds varies significantly with a social or economic focus. In contrast, much of the social capital entrusted to universities by society has little applicability to economic goals and outputs.

#### Measuring Productivity

The ultimate challenge is bringing this complex range of university inputs and outputs together in the context of productivity measurement. Let us, once again, enter the thicket by way of definitions provided by the Productivity Commission.

*Labour productivity (LP)* is the ratio of (the real value of) output to the input of labour. Where possible, hours worked, rather than the numbers of employees, is used as the measure of labour input. With an increase in part-time employment, hours worked provides the more accurate measure of labour input. The wide range of quantitative and qualitative outputs already described poses difficulties in applying this index of productivity to universities. The relationship between inputs and outputs is, also, problematic since students are both inputs and outputs and, in the case of postgraduates often contribute to the intervening teaching process. As indicated in a current DEST discussion paper, "There are major difficulties in measuring university outputs and outcomes. More students can graduate from a university within a given level of

resources but this does not necessarily mean that the university has become more productive. It is conceivable that the quality of the education these graduates received may have declined. Decreases in cost per student and increases in indicators such as completion rates and student/staff ratios are frequently interpreted as meaning either that quality must be declining or that productivity must be increasing. The reality is that crude quantitative indicators such as these cannot be interpreted as meaning either of those things without considerably more information". Variations in students' attainment level on entry add further complexity since interinstitutional comparisons are most equitably made on the basis of value added by the university experience. Relative performance data published by DEST include results of a pioneering attempt at coping with the value added dimension.

Research output measurement poses similar problems. Once again quantitative indices such as number of papers and/or citations produced as a result of the input of a specific amount of academic effort cannot be accepted as valid measures without highly sophisticated assessments of quality. A combination of quantitative and qualitative data is, also, required in measurement of productivity in commercialisation of research results. In addition to numbers of patents and spin-out companies, measures of the economic impact of discoveries are required. This involves a highly protracted time scale and a daunting challenge in data gathering. Assessment of social output presents a similar picture of complexity. It is only in relation to some aspects of university infrastructure, which are shared with any organisation, that the output measurement involved in LP calculation can be straightforwardly carried out.

On the input side of LP, data on hours of work of university general staff can be compiled. Traditionally, academic staff have largely determined the quantum of hours worked on an individual basis. In recent years maximum numbers of hours spent in formal teaching have been defined by mutual agreement in many academic departments. Formalization of such an arrangement is currently being pursued by NTEU in the industrial arena. Success in this endeavour is unlikely to increase productivity.

A frequently preferred measure of productivity is multiplier or total productivity (MFP). This is the ratio of (real value of) output to the combined input of labour and capital. It is, in principle, a better indicator of efficiency since it measures how efficiently and effectively the main factors of production — labour and capital — combine to generate output. As the Productivity Commission point out, in some circumstances, robust measures of capital input can be hard to find. This is certainly the case in universities. A few years ago, the New Zealand government considered introducing an ROI to extract a financial return on the public capital investment in universities. An essential preliminary was the valuation of the campus buildings

of each university to provide a baseline fair and acceptable to the university system. This task defied their best efforts due to variations in developmental history, community constraints and campus topography. Adoption of MFP rather than LP as an approach to productivity assessment in universities yields complexity compounded.

Further challenges in productivity measurement arise from the changing nature of the global economy. As Drucker (1993) states "the basic economic resource or means of production, is no longer capital, nor natural resources, nor labour. It is and will be knowledge". This is clearly consistent with the increasing economic significance of universities. It, also, foreshadows generalisation of the fundamental problems posed by productivity measurement in universities to society at large. A methodological paradigm shift will be required.

#### Enhancing Productivity

If most of universities' operations are so ill suited to application of economic concepts of productivity, how can we respond to legitimate requirements of governments and the community that productive application of their very considerable investment in universities be demonstrated? A very recent study emanating from the Productivity Commission, (Parham, 2002), may offer an approach to a solution. Its focus is an analysis of the determinants of a surge in Australia's productivity in the 1990's. Although a complex, technical study the broad conclusions reached are both interesting and potentially relevant to our challenge.

LP and MFP growth have both accelerated by at least one percentage point since the early 1990's. Candidate explanations include: a response to policy reforms aimed at improving Australia's productivity performance, increases in workforce skills and the use of more advanced information and communication technologies (ICTs). There was no acceleration in the demand for skills in the 1990's to directly match the productivity acceleration. It appears that 0.2 or at most 0.3 of a percentage point of MFP acceleration is attributed to use of ICTs. This leaves 0.8 of a percentage point of Australia's productivity acceleration attributed to policy reforms.

At the highest level the effect of the policy reforms has been to encourage competition, openness and flexibility. At the micro level this has resulted in a mixture of industry measures, sectoral measures and general measures. As a consequence, it is difficult to devise a measure of the impact of reform at the aggregate level. The time lag between implementing reform and the productivity response, also, presents problems. Evidence for the positive effect of reforms on productivity growth is most readily derived from empirical, case studies in industry and business.

Parham (2002) indicates that "Three mechanisms have been most important in linking policy reforms and productivity performance:

- Sharpening incentives to be more productive, chiefly by strengthening domestic and overseas competition;
- Opening the economy to trade, investment and technologies developed overseas; and
- Providing greater flexibility (for example, less regulatory restriction, more flexible labour markets) to adjust

production processes and firm organisation to improve productivity."

Since these mechanisms are at work throughout the context in which universities operate it may be enlightening to consider the problem of enhancing their productivity from this perspective.

Universities have, during the last decade, been stimulated to increase productivity by governmental strategies aimed at encouraging competition. Nationally, an increasing percentage of government funding to universities has been distributed on a competitive basis. Internationally, the necessity of generating revenue by recruiting full fee paying students has exposed Australia's universities to fierce competition from their North American, European and, most recently, Asian peers.

On the openness dimension, governments are still dedicated to exercising control over the operations of universities interstate and internationally. Information technological development is making this objective more and more difficult to achieve while the next GATS round including educational services will place this policy under international strain. Access to technologies developed overseas is not subject to government regulation but is restricted by cost and unfavourable exchange rates. Australia's public universities are badly in need of capital investment and the ability to access it from normal, commercial investment sources nationally and internationally. Government policies and attitudes indicate that this is viewed as an inappropriate objective and that they have not yet come to terms with the full implications of the economic and business roles of universities.

Introduction of a more flexible labour market via the Industrial Relations Act has largely in the case of universities been counterproductive. Prior to being formally declared an industry, universities represented a highly flexible workplace. Successive enterprise bargaining rounds have enabled a strong union to steadily diminish flexibility. University management are viewed by government as pusillanimous and incompetent negotiators. Union willingness to adopt sanctions against students and the desire to preserve some vestiges of collegiality among their staff place university negotiators in a totally invidious position.

#### *"There are major difficulties in measuring university outputs and outcomes."*

Legislation to prevent the use of students as pawns in industrial dispute is badly needed.

Any meaningful attempt to measure the impact of reform on productivity growth in universities lies in the future. There is indirect evidence in Parham's (2002) study that the overall effect is likely to have been positive and significant. Analysis of the sources of the 1990's productivity growth spurt in Australia on an industry by industry basis reveals that it was largely attributable to the performance of the service industries. In spite of numerous distinguishing characteristics, university

economic and business operations clearly constitute a service industry.

Productivity growth in service industries has been achieved through adjustment in the internal processes and organisation of firms. The last decade has seen significant change in the internal arrangements of every Australian university and in the nature and conduct of their relationships with external business organisations. It is comparatively straightforward to identify further process changes that, prima facie, appear likely to contribute to productivity growth. 'Unpacking' of the traditional teaching process to isolate the features which are critical for student learning has begun but offers further improvements in efficiency and effectiveness. At the systemic level, review and reorganization of the relationship between universities and other tertiary institutions, particularly the vocational education sector, are likely to yield major productivity gains. In all of these endeavours continuing adoption of leading edge developments in ICT will facilitate change.

#### Conclusion

If something of an act of faith at present, acceptance of government policy as the major source of acceleration in productivity growth in Australia offers a means of dealing with the present problems of applying productivity concepts to universities. A possible way forward involves government continuing the current strategy of encouraging competition, openness and flexibility but fine tuning and modifying their delivery to take account of the specific needs and difficulties arising from the special characteristics of universities.

Measurement of productivity growth in universities will continue to be a challenge. Pending methodological advances, efforts to set targets and assess outcomes should continue although the level of success will vary widely across the range of university activities. This process will, however, indicate very clearly to universities the expectations and wishes of society. In conjunction with government policy, societal expectation will establish a framework within which the wealth of talent and ability in the universities may be safely left to cope with the unique situations encountered in pursuit of productivity in each university. ■

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# PRODUCTIVITY IN HIGHER EDUCATION

## Introduction

The 21st century is a watershed in Australia's tertiary education system. The system is currently undergoing difficult and unprecedented changes. In the past, universities were supported by public moneys and were mainly concerned with providing a high standard of tertiary education and being respected places of research and learning. However, limits are being placed on public funding, leading to greater pressure on universities to fend for themselves financially. This is occurring when increasing numbers of people are seeking to enrol at universities and when they are expected to keep up with rapid technological advancement, increased internationalisation and maintain quality at a high level. At the same time there are calls for universities to improve accountability.

**Two main strategies** are held out as possible solutions, one is to raise more revenue; the other is to improve productivity. The sector has experienced rapid growth over recent years and revenues from various sources, have increased, but in spite of this and perhaps because of it, calls for improved productivity have not abated. Interest in productivity in higher education follows a trend of applying private sector strategies to the public and not-for-profit sector. Hence higher education has followed the private sector in restructuring, in seeking ways to achieve "more with the same" or even "doing more with less". Improving productivity has been a fundamental driver for many of the recent initiatives in higher education.

**Maximising productivity** is seen as important not only for the higher education sector itself but also for improving the productivity of the whole economy. This is because education and knowledge generation are recognised as major factors in promoting sustainable economic growth and improving the living standards of all Australians. However higher education is complex and multi-faceted. No consistent definition of productivity has been employed in relation to higher education. As a result the concept is poorly understood and is sometimes viewed with outright hostility within the sector.

This note seeks to illustrate how productivity has improved in higher education over recent years but does so with strong caveats that any such assessment must be made relative to the underlying goals and objectives of the system. And these are not always clearly articulated at the various levels about which productivity assessments are sought. The illustration uses a quantitative rather than qualitative approach to productivity having reference to selected published data, over the period 1995 to 2000. On the basis of a small number of selected measures, it is possible to conclude that the productivity of higher education has increased significantly over this period.

## Defining and clarifying productivity

Simply put, productivity is a **ratio** of the volume of goods and services (outputs) produced relative to the volume of inputs – including land, labour and capital – employed in producing those goods and services. In algebraic terms:

$$P = \frac{O}{N} \quad \text{Where } P \text{ is productivity,}$$

*O* is the level of outputs and  
*N* represents the inputs.

**Higher productivity** means accomplishing more with the same amount of resources, or the same for fewer resources. From the public (taxpayers) point of view, productivity in higher education is how much society gets from the higher education sector, given the amount of resources they invested in the sector. For example an increasing number of graduates and research publications at a constant or improving level of quality and at the same or reduced cost could constitute an improvement in productivity.

**However** productivity also embodies the concepts of **efficiency and effectiveness**. Theoretically, efficiency is achieved when outputs are provided with the lowest possible level of inputs. But this will not have much value if the outputs are not consistent with agreed objectives. In the case of higher education, output is valued by the ABS using predominantly weighted enrolments and research criteria however the estimates for higher education are not separated from education as a whole. For example it would be possible to increase efficiency by taking only the best students and excluding students with less chance of success. However this would also reduce opportunity for a significant number of prospective students. Consequently effectiveness, the extent to which the outputs achieve specified objectives, is also considered to be important. The current call is that in order to be productive, our higher education needs to be both efficient and effective. It needs to achieve specified objectives and outputs as economically as possible.

In order to illustrate some aspects of productivity in higher education the following parameters have been specified:

- perspective** to be used is that of a member of the general public seeking the maximum value from resources contributed either through taxes, fees or other forms of contribution including philanthropy.
- level of analysis** is the system level (ie looking at all the universities together). Other levels of analysis, which could be adopted, include the institution, organisational unit or individual level.

- focus is on outputs** rather than inputs
- alternatives for referents** including judgements of improvement against past performance, comparisons against higher education systems in other countries, comparative judgements against other industries in our economy and judgements against an ideal standard. This paper focuses on past performance.
- time frame** adopted in this study is 1995 to 2000 inclusive. The reason for choosing 2000 as the last year is that completions and research publications data are currently available until 2000 only. The commencing year of 1995 has been selected because the Commonwealth's method for measuring weighted research publications changed between 1994 and 1995.

The emphasis is on **objective rather than subjective** data. The Department of Employment Science and Training (DEST) data is the major source for pragmatic reasons as it can be easily obtained and verified. However the illustration also uses the outcomes of the Graduate Careers Council of Australia's Course Experience Questionnaire which contains subjective judgements as to the quality of higher education.

Within the confines of a brief note, it is necessary to select a small number of **measures** to construct productivity ratios and to be aware of the limitations of those measures chosen. Some brief notes on the reasoning behind the inclusion or non-inclusion of measures is given below together with a list of the resulting ratios.

## Outputs

### Award Course Completions:

A key short-term measure of teaching output is award course completions at a certain level of quality. For the sake of simplicity the raw number of completions is used. This may understate productivity because the proportion of higher degree (ie higher value added) completions within the total is increasing. A key longer-term indicator, which is not included, is the value of human capital conferred by university teaching. Again this is beyond the scope of this illustration.

### Course Experience Questionnaire (CEQ) Overall Satisfaction:

The Graduate Careers Council's CEQ is a key measure of the quality of teaching. The measure of "overall satisfaction" gives the proportion of responses 3, 4 and 5 on a 5-point satisfaction scale.

### Weighted Research Publications:

This is a key short-term measure of research output. This measure is subject to quality control in that the publications included and the weightings attributed are subject to independent audit. Other indicators, which could be used, include research funding and higher degree by research completions. Research funding is not included because it has a roughly similar growth rate to publications. Higher degree by research completions is not included because it is already included in the completions score under "award course completions" above. An important longer-term measure not included, is the impact of research and knowledge generation on the entire economy and society. This is difficult to calculate and beyond our scope.

**Inputs**

**Staff Full Time Equivalent (FTE):**

In the wider economy it is normal to calculate the productivity of labour, land, capital and other resources, eg the number of cars produced per employee or the number of tonnes of wheat per hectare. In this case it has been decided to use total staff (teaching and other staff) as the input for calculation of labour productivity because all staff contribute to the outputs albeit that some contribute indirectly.

**Operating Expenditure:**

It is total factor productivity not just labour that we really should be considering. The cost of labour comprises about 60% of the expenditure of higher education but ideally we should also include equipment, buildings and land. However since DEST does not publish capital values over time, it has been decided to use total operating expenditure as a measure of total factor inputs. Operating expenditure has been converted to year 2000 prices using the March quarter CPI.

**Productivity**

Application of the formula in Section 2 to the above measures gives the following productivity ratios:

- Completions / Staff FTE
- Publications / Staff FTE
- Completions / Operating Expenses
- Publications / Operating Expenses

The measures and resulting productivity ratios are set out in Table 1. Trends in productivity are shown in Figure 1 (overleaf) in which the ratios have been converted to indices with a base of:

1996 = 1.000.

**Measuring Productivity**

Measuring productivity is itself an improvement strategy. Productivity measurement provides a way of assessing the efficiency in which resources are converted into outputs. The analysis might reveal that one production method, institution or organisational unit is more productive than another over time.

A major difficulty therefore with measuring the productivity of higher education is that higher education has **multiple goals** (eg excellence in teaching and research, equity and diversity) that are pursued at the same time. The various stakeholders (government, parents, students, institutions or individual staff members) have different views as to these goals. The diversity of institutions adds another complexity. For example, some Universities emphasise undergraduate teaching while others emphasise research. Consequently we should not try to measure productivity starting from the assumption that all universities have common missions and goals.

A further difficulty is that higher education is a service industry with **multiple outputs**, some of which are difficult to measure. This is in contrast to the product sector of the economy where the outputs are easier to measure – for example in an industry producing goods such as motorcars it is relatively easy to obtain output figures. Outputs of higher education which can be

measured directly include the number of awards conferred or the number of research publications. Outputs that cannot be measured directly include the value added to students in terms of knowledge and competencies conferred through university teaching and other externalities such as the contribution of university research to society.

A major response to the difficulty in measuring the output of higher education has been to use a range of **performance indicators** to track performance over a period of time. However although there has been a great deal of discussion as to an appropriate set of indicators for higher education there has been no real consensus reached.

*One of the most contentious factors in measuring productivity or implementing productivity improvement strategies is whether quality is being sacrificed. An increase in productivity is achieved only if it is consistent with quality objectives which could be an increase or no change in quality. As quoted in one of the recent DEST Crossroads issues papers, 'Quality in the context of higher education can be defined as judgement about the level of goal achievement and the value and worth of that achievement. It is also a judgement about the degree to which activities or outputs have desirable characteristics, according to some norm or against particular specified criteria or objectives.'<sup>12</sup> Of course, there is no scientific formula for measuring quality – each situation must be subject to scrutiny and assessment by the stakeholders concerned. It is a subjective and qualitative measure, so it often raises debate. Nevertheless quality is a key factor in measuring productivity. An increase in productivity is achieved only if it is accompanied by an increase or no change in quality. Hence a key indicator of improving productivity is an increasing ratio of output to input at constant or improved quality<sup>13</sup>.*

Because of the massive increase in student numbers and the public funding restraints on tertiary education, there has consequently been great concern about quality and an emphasis on quality assurance. The Commonwealth and State Governments are currently strengthening the protection of the title of 'university', and the Commonwealth has established an Australian Universities Quality Agency. These protective measures are becoming increasingly important (particularly in the establishment of bogus universities in Australia).

**Table 1:**

**Productivity of Higher Education - Selected Measures**

	Outputs			Inputs		Productivity			
	Award Course Satisfaction	CIQ % Broad Publications	Weighted Research	Staff FTE	Operating Expenses	Completions / Staff FTE	Completions / Operating Expenses	Publications / Staff FTE	Publications / Operating Expenses
1995	140,918	88%	15,191	80,754	7,755	1.745	18.170	0.188	1.959
1996	145,228	89%	16,222	82,888	7,985	1.752	18.187	0.196	2.031
1997	155,275	90%	22,689	81,404	7,977	1.907	19.464	0.279	2.844
1998	161,556	89%	26,090	80,285	8,379	2.012	19.281	0.325	3.114
1999	184,423	90%	26,932	80,832	8,974	2.034	18.523	0.333	3.001
2000	171,089	90%	26,822	82,233	9,006	2.081	18.997	0.326	2.978
Total Increase	21%	2%	77%	2%	16%	19%	5%	73%	52%
Annualised Increase	4.0%	0.5%	12%	0.4%	3.0%	3.6%	0.9%	11.6%	8.7%

(a) DEST Total University Operating Expenditure adjusted by March quarter CPI.

and they will be part of the changes sought by the current debate, however the difficulties of measuring productivity accurately and the statistics relating to it should be interpreted with care as there is still considerable debate and anxiety about measurement. As can be seen from the foregoing, measuring the productivity of higher education is not straightforward and an appropriate assessment ideally includes informed judgements having reference to a range of performance data and knowledge of the trends and issues.

**Productivity of Higher Education - Some Statistics**

On many indicators the productivity of our higher education system increased between 1995 and 2000. Some statistics follow:

**Teaching and Learning**

- i) Student enrolments rose 15% from 604,176 to 695,485;
- ii) Student load increased by 19% from 467,748 to 557,763;
- iii) Award course completions rose 21% from 140,918 to 171,089;
- iv) Overseas student enrolments rose 84% from 51,944 to 95,607;
- v) The "overall satisfaction" of students with their educational experience, as indicated by the Graduate Careers Council of Australia's Course Experience Questionnaire, increased by 2 percentage points from 88% to 90%;
- vi) The Student: Staff Ratio (ratio of student load or EFTSU to Teaching Only and Teaching and Research Academic Staff FTE) rose by 26% from 14.9 to 18.8;

**Research**

- vii) Higher degree research load or EFTSU increased by 16% from 25,138 to 29,205;
- viii) Higher degree research completions rose by 62% from 2,327 to 3,781;
- ix) Research grant earnings increased by 40% from \$694 million to \$972 million (in year 2000 dollars);
- x) International research grant funding increased by 182% from \$32.1 million to \$90.6 million (in year 2000 dollars);
- xi) Weighted research publications increased by 77% from 15,191 to 26,822

**Resources and Finance**

- xii) The staff FTE resources (academic and general staff) going into producing the above outcomes rose by only 2% from 80,754 to 82,233;
- xiii) The expenditure of the higher education system rose 27% from \$7.1 billion to \$9.0 billion (in actual dollars spent);
- xiv) The real increase in expenditure by the system measured in year 2000 dollars was 16% up from \$7.8 billion in 1995 to \$9.0 billion in 2000

**Productivity per unit of labour resources invested**

- xv) The productivity of labour resources, in terms of student load per staff member (academic and other) increased by 17% or 3.3% per annum;
- xvi) Completions per staff FTE increased by 19% or 3.6% per annum;
- xvii) Research earnings per staff FTE increased by 37% or 6.6% per annum;
- xviii) Weighted Publications per Staff FTE increased by 73% or 11.6% per annum

**Productivity per unit of financial resources invested**

- xix) Student load per million of expenditure increased by 3% or 0.5% per annum;
- xx) Completions per million of expenditure increased by 5% or 0.9% per annum;
- xxi) Research earnings per million of expenditure increased by 21% or 3.8% per annum; and
- xxii) Weighted publications per million of expenditure rose by 52% or 8.7% per annum.

At this stage I feel that I should re-emphasise the warning I have stated earlier namely, that the above are only partial measures of productivity.

They do not for example capture the substantial increase in the "human capital" of students added through university teaching and the substantial effects that this has on the productivity of other sectors of the economy.

Nor do they capture the spillover effects on industry from research or the substantial multiplier effect of higher education expenditure on the national economy, which have been observed by others.

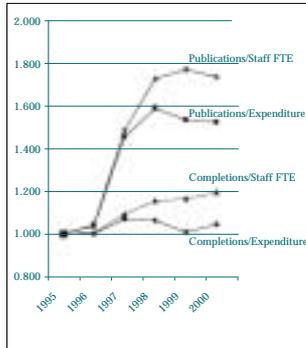
**Conclusion**

Over recent decades, successive Australian governments have sought to improve the productivity of higher education through reforms including restructuring, encouraging the diversification of income, industrial reform and quality assurance arrangements. In seeking ways to achieve 'more with the same' or even 'doing more with less' improving productivity has been a fundamental driver for many of the recent initiatives in higher education. Some might even conclude that part of the Crossroads reform agenda is to improve productivity. The business community also believes that higher education needs to be relevant to the community and provided in an effective and efficient manner.

As stated earlier, productivity embodies both concepts of efficiency and effectiveness. Effectiveness is determined by the extent to which the outputs achieve specified objectives but to fulfil the requirements of the community these objectives need to be achieved as economically as possible.

As John Ralston Saul observes "Effectiveness is about content and policy delivery. Risk, thought, research and development, long-term investment, commitment to concrete places are incapable of efficiency."<sup>vi</sup> To quote Saul once more 'the simple and central role of universities is to teach thought .... the problem is not to teach skills in a galloping technology, but to teach students to think and to give them the tools of thought so that they can react to the myriad changes, including technological, that will inevitably face them over the next decades'<sup>vii</sup>. Productivity in higher education may have increased but the substantial effect that research and knowledge generation (the output of university education) has on the productivity of other sectors of the economy is the most rewarding measure. ■

Figure 1: Productivity of Higher Education: Selected Measures



#### Sources:

- i ABS Cat. No 5206.0 Australian National Accounts: National Income, Expenditure and Productivity March Quarter 2002
- ii Harman and Meek, 2002, p.vi in 'Future Challenges and Way Forward', Cross Roads Issues Paper 'Striving for Quality' DEST, June 2002, pg 15
- iii Prokopenko, J 1987 'Productivity Management. A Practical Handbook', I.L.O. Geneva pg 5
- iv Cabatu, H., Kenyon, P. and Kosby, P. 'Valuing the Economic Contribution of Universities to the Australian Economy', Institute for Research into International Competitiveness.
- v Borland, J, Dawkins, P, Johnson, D and Williams, R. 'Returns to Investment in Higher Education', Melbourne Institute of Applied Economic and Social Research.
- vi Saul, JR 1997 'The Unconscious Civilization', Penguin, pg 127
- vii *ibid*, pg 69

## UNIVERSITY RESOURCING: AUSTRALIA IN AN INTERNATIONAL CONTEXT

*The Productivity Commission released a Draft Report on 1st October with international comparisons of the resourcing of higher education institutions and the management of those resources in Australia and other countries. The purpose is to provide information for the review of higher education currently being carried out by the Australian Government.*

Comparisons of the tertiary education sector and government involvement are reported on a country-wide basis. Financial resourcing comparisons were made at the individual university level for a selection of 11 Australian universities and 23 universities from 9 other countries (see box). Governance arrangements are compared on a case study basis for a more restricted number of universities.

The report acknowledges that there are many factors that make the higher education sector in each country unique, and distinguish individual universities within each country. That said, the Commission says it is possible to make some general observations about the resourcing of different universities.

#### Graduation rates

- Graduation rates for Australian bachelor and masters degree courses in 1999 were in the middle of the range

among the OECD countries examined. Graduation rates for advanced degrees, such as PhD's, were similar to those in the United States of America (US) and the United Kingdom (UK) and higher than those in many other countries.

#### Universities included in the report

<b>Australia</b>	ANU Bond Charles Sturt Flinders Melbourne Murdoch UNSW RMIT Southern Queensland Tasmania Western Sydney
<b>Canada</b>	Queens Simon Fraser Waterloo
<b>Hong Kong</b>	Hong Kong
<b>Ireland</b>	Limerick Trinity College Dublin
<b>Netherlands</b>	Amsterdam Utrecht
<b>New Zealand</b>	Auckland Massey Otago
<b>Singapore</b>	Nanyang Technological NUS
<b>Sweden</b>	Stockholm
<b>United Kingdom</b>	Bath Manchester Nottingham Warwick
<b>United States</b>	Georgetown Oklahoma State Pennsylvania Stanford Yale

#### Teaching staff

- The ratio of students to teaching staff was higher in Australia in 1999 than in Canada and the US, the only other countries for which there were comparable data. Student-teacher ratios increased somewhat in Australia over the late 1990s, while the ratios in North America remained largely unchanged over the same period.

#### Academic salaries

- Salaries for Australian academics in 2001 – measured on a Purchasing Power Parity basis – were comparable to those in a number of other countries, although lower than in Singapore and the US.

#### Overall financial resources

- There have been substantial changes to the funding of tertiary education (including TAFE) in a number of countries, including Australia, over recent years. The total expenditure (public and private) on tertiary education in Australia was equivalent to 1.4 percent

of Gross Domestic Product in 2000. This was lower than in the US, New Zealand, Sweden and Canada, but higher than in the UK and some other European countries.

- There were significant financial resource differences among the universities studied. Universities generally fell into two broad categories when ranked by their total revenues in 2001, namely:
  - Australian universities and most of the overseas universities, with revenue ranging, for example, between \$57.4 million and \$847.4 million in Australia; and
  - three resource-rich US universities, each with revenue of over US\$2.6 billion (Yale, Stanford and Pennsylvania).
- Some of the universities in the first category had up to three times the revenue per student of others:
  - this largely reflects the different costs of delivering courses, such as between medicine and the arts, different emphases between teaching and research and the ability to derive revenue from sources other than government and students.
- The universities in the second category, which are private and unregulated, have massive resources by comparison, even after revenues from hospitals and health care services are netted out. They receive a large proportion of their income as private gifts and donations and have accumulated very large asset bases, which produce significant investment income.

#### Sources of revenue

- Australian universities generally received the largest share of their revenue, either directly or indirectly, from government. For about half of the overseas universities, revenue from other sources – including gifts, donations, investments and commercial activities – accounted for a greater proportion of revenue than from either government or students.
- It is difficult to compare the share of revenue received from domestic students, as the domestic-international split is not generally available for overseas universities. While Australian universities typically received a greater share of their revenue from students than did universities in other countries (recognising Higher Education Contribution Scheme (HECS) payments as student payments), full-fee paying international students accounted for up to 50 percent of total student revenue for Australian public universities.
- Support for research is provided, in part, on a competitive basis in Australia and other countries. The relative size of research funding is an important source of the difference in the level of available resources, both between Australian and other universities and within the Australian group.
- Differences in returns from assets, including financial assets, did not account for a large proportion of the variation in the revenues of Australian universities. These returns represented a small portion of total revenue.

#### Assets and liabilities

- The value of university assets cannot be readily compared across the institutions because of the differences in valuation methodology.

- The resource-rich US universities had massive assets in comparison to the other universities included in the study.
  - Moreover, the observed difference is likely to understate the actual difference because of the conservative historical cost valuation methodology used by these universities.
- Australian universities generally had low levels of cash and investments compared to the value of their physical assets and relative to the invested funds of overseas universities. The level of Australian university debt was lower than that of most overseas universities included in the study.

#### Commercial activities

- Universities are involved in a diverse range of commercial activities. The revenues from such activities were relatively small for Australian universities (up to 20 percent). However, the surpluses generated from commercial activities were generally significant in relation to overall university surpluses.
- In 2001, some US universities derived substantial revenue and operating surpluses from their commercial activities, whereas others incurred losses. For example, Stanford University's hospitals and health care services generated revenue of US\$920 million (a third of total revenue) and had an operating deficit of US\$13.4 million.

#### University expenses

- For all the universities studied, staff salaries and related costs were the major expense.
  - as a proportion of total expenses, staff costs ranged from 48 percent to 60 percent.
- The next most significant expenses generally were depreciation and maintenance of buildings and grounds.

#### Financial position - operating surplus and net cash flows

- Some of the Australian universities studied had relatively strong operating margins (ratio of total revenue less total expense to total revenue).
- On average, there does not appear to be any systematic difference between the operating margins of the Australian universities and those from the other countries.
  - However, a one year snapshot may include extraordinary items and is not a reliable indicator of longer term financial position.
- The cash flows of Australian universities are mixed, with some reporting net inflows and others small net outflows.

#### Government programs

- There are significant differences across countries in government programs supporting higher education. In Australia, direct financial support for higher education (as block grants) comes mainly from the Commonwealth. In the US and Canada, the federal government's role is primarily in support of students and research. In the US, many private universities receive substantial gifts and donations from their alumni and other sources.

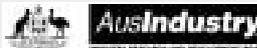
- In Australia and a number of other countries, universities receive block grants that cover both teaching and academic research:
  - In Australia, this funding is mainly based on numbers of student places;
  - in the UK, a broader range of other demand and university-related factors are taken into account.
- Recently, a number of governments in countries have attempted to separate their teaching and research funding. There has also been a move away from block funding for research to competitive or performance based funding.
- University tuition fees in public universities are regulated in all countries except New Zealand, although the degree of regulation varies between States and Provinces in the US and Canada:
  - however, public university students in Sweden do not pay tuition fees, and first-time undergraduates do not pay tuition fees in Ireland.
- Demand (through places) is regulated in all countries except New Zealand and some States of the US.
- The ability of universities to respond to student demand can have important implications for the management of their resources. Governments can influence this flexibility through the way they deliver support and the conditions they attach to it. Government restrictions on the number of places that attract funding also influence the supply of courses provided, thereby indirectly affecting demand responsiveness.
- Government funding arrangements also have the potential to affect university governance, depending on the conditions attached to funding.

#### University governance and external controls

- Detailed governance comparisons were limited to four case studies, and only cover financial and physical asset management and quality assurance.
- Australian arrangements appear similar to those in other countries:
  - there is a high degree of commonality of auditing and monitoring processes, although the extent of monitoring and reporting mandated by Australian governments is less than in England. That said, the Commission is not in a position to judge the efficacy of the arrangements in practice; and
  - Universities appear to be moving towards arrangements that are more closely modelled on the reporting practices of the corporate sector. ■

## 2002 Awards for Outstanding Achievement in Collaborative R&D

Major Sponsor



The Awards will be presented by the Hon Dr Brendan Nelson MP, Minister for Education, Science and Training, at a gala dinner in Melbourne on 20 November 2002.

In the next issue of B-HERT NEWS (March 2003) there will be a full report of the winners.

## 2002 Award for the Best Entrepreneurial Educator of The Year

MAJOR SPONSORS



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

This Award will be presented by the Hon Dr Brendan Nelson MP, Minister for Education, Science and Training, at a gala dinner in Melbourne on 20 November 2002, and the winner will be featured in the next issue of B-HERT NEWS (March 2003).

### B-HERT MEETING DATES FOR 2002

Please note the following date for the remaining

**B-HERT meeting for 2002:**

**Wednesday, 20 November 2002 – Melbourne**

2.30pm-5pm (inclusive of Annual General Meeting), followed by

Awards dinner at which the Hon Dr Brendan Nelson MP,

Minister for Education, Science and Training, will deliver

the after-dinner address and present the Awards for

Outstanding Achievement in Collaborative R&D and

the Best Entrepreneurial Educator of the Year.

## THREE SCHOLARS FROM WATER-RELATED CRC'S SCOOP THE B-HERT SCHOLARSHIPS POOL!

*B-HERT has provided scholarship support to three outstanding young scientists, Gavin Begg, Sam Brooke, and Regina Counihan, to attend the sixth annual Leadership and Career Development Course, held at Melbourne Business School, University of Melbourne, October 8-11. The course, attended by 27 PhD students and Postdoctoral Fellows from fifteen Cooperative Research Centres across Australia was voted a great success. Course Directors, Professor Leon Mann and Robert Marshall, spoke highly of the three B-HERT scholars and their leadership potential.*

### **Gavin Begg**

Gavin, a PhD graduate from the University of Queensland, is a senior research fellow and project leader for the CRC Reef Research Centre Fishing and Fisheries Project in Townsville. The CRC Reef focuses on the sustainable utilisation of fisheries resources in the Great Barrier Reef World Heritage Area. Gavin's field of research is marine resource assessment, in which he is examining the stock structure, population dynamics and effects of fishing on reef and pelagic finfish in northern Australian waters, and of groundfish species in the northern Atlantic Ocean.



*Left to right:  
Sam Brooke, Professor Leon Mann,  
Gavin Begg and Regina Counihan.*

### **Sam Brooke**

Sam is a third year PhD student at Flinders University. He is conducting his research in the CRC for Water Quality and Treatment, located in Salisbury, South Australia. His research deals with optimum conditions for oxidation of toxic microcystins in supplies of drinking water. The results of his research will provide advice to water treatment operators on the removal of toxins present in water supplies.

### **Regina Counihan**

Regina Counihan is a project leader in the CRC for Coastal Zone, Estuary and Waterway Management, based in Indooroopilly, Queensland. She is a recent PhD graduate from the University of Queensland. Her research explores the utility of automated monitoring technologies to evaluate and predict marine ecosystem processes and health.

# Recent B-HERT Publications

As a unique group of leaders in Australian business, 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.

## **Position Paper No. 10 (September 2002) – The Importance of The Social Sciences To Government**

The social sciences cover a wide array of complex issues and disciplines. Government activities are now 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 and indicates the importance and persuasiveness of social policies.

## **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. Examples of the incorporation of generic skills into higher education structures and courses are also described.

Finally the paper makes some recommendations to enhance the 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.

## **Position Paper No. 7 (January 2002) – Greater Involvement and Interaction between Industry and Higher Education**

This paper looks at the need for a more enhanced partnership between the business community and higher education.

## **Position Paper No. 6 (August 2001) – Sharing Administrative Functions at Lower Costs**

This paper highlights an innovative approach to achieving savings in administrative activities.

## **Position Paper No. 5 (June 2001) – What is Needed to Make Australia a Knowledge-Driven and Learning-Driven Society?**

This paper aims to identify major public policy challenges that stem from a proper understanding of the nature of knowledge and learning.

## **Position Paper No. 4 (February 2001) – The Critical Importance of Lifelong Learning**

This paper aims to establish the significance of lifelong learning in the Australian context. Drawing on analyses of lifelong learning policies and practices in Australia and other OECD countries the paper seeks to identify a number of policy priorities for government, particularly in the areas of lifelong learning, business and higher education.

## **Position Paper No. 3 (April 1999) – The Case for Additional Investment in Basic Research in Australia**

Australia needs to ensure that additional funding is provided within a broader policy framework. Such a framework should ensure maximum returns from this investment through diffusion of knowledge to industry and community, improving the skills level of the workforce, encouraging organisational culture change and collaboration, and promoting competition.

## **Discussion Papers:**

- How Should Diversity In The Higher Education System Be Encouraged?
- The Role of Universities In The Regions (Refer B-HERT website: [www.bhert.com](http://www.bhert.com))

# Recent B-HERT PAPERS

## **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. Copies are available at \$19.95 (GST incl.)

## **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.

# AVAILABLE NOW!

*A compendium of statistics on higher education.*

*Any constructive debate about the future of higher education in Australia needs to start from an agreed basis of FACTS.*

*Unfortunately, much of the debate is absorbed by the proponents disputing one another's facts.*

*The purpose of this paper is to present some key relevant statistics, trends and comparative data, collected from a variety of authoritative sources which hopefully will provide some valuable insight into higher education in Australia on both an historical and international comparative basis.*

## **THE FACTS**

*An order form is included on the back page of this issue. ORDER NOW!*



# USQ WIN SIFE AUSTRALIA NATIONAL CHAMPIONSHIP AND SHINE IN AMSTERDAM

On Saturday 13 July, at a gala Awards Ceremony dinner at the Hilton Sydney attended by more than 200 students, academic mentors and business leaders, the Fraser Coast SIFE team from the Wide Bay Campus of USQ was named the Qantas SIFE Australia National Champion for 2002.

SIFE's mission 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, practising and teaching the principles of free enterprise so as to empower others in their communities and enhance their economic prospects.

USQ's Fraser Coast SIFE team are highly motivated students from a campus with an enrolment of only 750, mentored by Associate Lecturer Ms Penny Richards and encouraged by the DVC Academic, Professor Susan Bambrick OBE. The other competitors comprised ANU, Bond, CQU, Edith Cowan, Flinders, Griffith, Macquarie, Melbourne, Murdoch, RMIT, Tasmania, UniSA, UNSW, UQ and UWS. UNSW were runners-up, followed by RMIT and Flinders.

CQU's Professor Glenice Hancock was named Most Supportive Vice-Chancellor, UMelbourne's Dr Joanna Tapper was named Most Supportive Dean, Arnett's SA Regional Manager Mr David Watts was named Most Supportive Business Advisory Board Member and the Woolworths Leadership prize of \$2,000 for Most Outstanding Mentor was awarded to CQU's Ms Beth Tennent.

The USQ team won a travel award provided by Qantas, \$5,000 cash from Arnett's and the right to represent Australia at the SIFE World Cup which was held in Amsterdam from 22 to 24 September and in only its second year attracted entries from 23 of the 31 countries with active SIFE programs.

For a 'rookie' team formed in only March of this year, USQ's performance was outstanding, as they came a close second in their Opening Round League to a long-established team from Togliatti Academy of

Management in Russia, which has the second oldest and largest SIFE program after the USA, with more than 60 active university SIFE teams and 11 years of development behind it.

The four finalists, in addition to Togliatti, were the University of the Free State, Bloemfontein, South Africa, La Sierra University, Riverside, California, USA and the University of Ghana, Accra, Ghana. La Sierra was named the winner with Ghana as the runner-up.

In addition to the competition, students had the opportunity to interact in a 'best practice' session, to take part in a panel discussion on business ethics led by the CEOs of four multinational companies and to mix with 60 other senior executives from more than 30 other multinationals.

The international partners of KPMG have committed to assisting in expanding the SIFE program to as many of the 160 countries in which they are represented as possible over the next five years. This will provide many opportunities for 'global' engagement by Australian SIFE students.

SIFE Australia's aim, in turn, is to encourage the establishment of a SIFE team in every Australian university and the development of 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.



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*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.*

*It is a forum where leaders of Australia's business, research, professional and academic communities can address important issues of common interest, to improve the interaction between Australian business and higher education institutions, and to guide the future directions of higher education.*

## Mission Statement

*In pursuing this mission B-HERT aims to influence public opinion and government policy on selected issues of importance.*

*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.*

*The membership of B-HERT comprises, by invitation, the chief executives of leading Australian businesses, professional firms and associations, public research organisations and the vice-chancellors of Australian universities.*

*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.*

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