

## How the product is shaped by the container: A learning ideology

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### Abstract

This paper proposes a need for change within Australian universities in order to address properly the academic requirements and concerns of new students and especially those of new international students. Through a discussion of Australian and non-Australian pedagogical, economic and social paradigms, it examines the pressures of university choice, as well as the educational and social dislocation which influences the expectations of new students. It considers the provision of a multi-structured methodology within the tertiary learning environment.

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### container

*Noun*

an object used to hold or to store things

## Introduction

A great deal of current academic discussion revolves around the need for universities to increase their relevance for the next generation of potential scholars. In Australia this need for a greater attractiveness is primarily a financial one and reflects a national policy which has moved steadily away from a socialist ideal of free education since the late 1970s (Worthington, 2002), rendering today's university less reminiscent of dreaming spires and more of the industrial hub. Because of this enforced shift, further impacted by the current global financial meltdown, institutions of higher education have developed two distinctly new faces: that of academic systems architect, responsible for designing a syllabus in line with industrial and economic rationality; and another of global education service provider, connected and online with the rest of the world. This inability on the part of the universities to show contemporary relevance is part of a larger crisis, that of an uncoupling between the fundamental purpose of a university and its ability to fulfil that purpose. To complicate matters, though it craves fiscal stability, academia cannot afford to be seen as merely another commercial interest. Universities embody iconic values of a far greater worth in the global marketplace and should they entirely abdicate their reputation as philosophical and pedagogical pioneers in favour of change agents for a 'faster buck' they risk scholastic integrity as well as individual survival. Though radical change is needed, some elements of the university, the 'container' of deliverable pedagogy, should be preserved and strengthened.

To some, the grail of a stable financial horizon is a “narrow pursuit” (Lane, 2008, p. 23), but simultaneously it would be financially irrational for any university to ignore the seemingly inevitable commercialisation of its services and product. Resistance by some sections of academia towards corporatisation distracts university administrations from tackling the other causes of financial pragmatism in higher education such as costly technological development and decreasing enrolments. While universities around the world are doing their best to value-add to their educational product through student services and some peripheral commercialisation, this is still little more than standard business competitiveness. Education in Australia has become as much an export product as iron ore (Uren, 2008) with foreign students spending \$12.5 billion in this country last year, and its problems deserve to be treated with at least the same diligence as those of the primary industries. Caught between economic survival and social expectation, universities around the world are being forced to look squarely into the future and prepare themselves for new technologies, new networks and radically new student expectations.

Universities must be observed to be at the sharp edge of thought, both as providers of an educational product and in their method of delivery. However, in the quest to ‘deliver world-class higher education’ (Department of Education, Science and Training [DEST], 2003, n.p.) while muttering mantras of economic rationalism, much (r)evolutionary academic zeal is lost, diluted or misdirected. At a recent Melbourne forum examining ways of increasing social inclusion at universities, the consensus was that something needed to be done, but the best suggestion was for a wider social catchment (Creagh, 2008). There was no formal discussion of the redevelopment of the actual educative product or delivery, and an apparent acceptance that conventional academic forms and mechanisms (essays and exams which earlier generations of students would recognise) would continue to produce a desirable result. Yet, instead of looking with fresh eyes at desirable change, academic heavyweights are still focusing on the classic parochialities of content and methodology – the “what” and the “how” of learning. Though these same people are pleased that their university incorporates information and communication technologies (ICTs) into learning methodologies, this is analogous to the cliché of deckchairs on the Titanic. Requiring an essay or a report to be submitted online instead of in hard-copy is not progress in education, but an exercise in “technomics.” It is not the method of submission that needs to be reviewed but the requirement for the essay itself. Curriculum design cannot afford to reiterate the previous century’s teaching models when its targeted customers need the 21st century version.

Thus universities need to enhance their relevance while maintaining a priceless patina of wisdom and knowledge, and simultaneously espousing new ideas, technologies and the globalisation of the industry. Dr Risa Palm, provost and vice chancellor for academic affairs at the 64-campus State University of New York, suggests that one response to the economic downturn needs to be a more serious look at course design, “Can colleges serve larger populations at lower costs?” she asks (Jaschik, 2008, n.p.). Palm argues that not only has the Socratic model had its day, but so too has the entire concept of real-time seminars and tutorials where students and professors meet in person. Such models have succeeded in the past because they offer the critical attributes of “continuous feedback, individualized and on-demand academic support, and interactive materials that appeal to the ‘millennial generation of multi-taskers’ who prefer approaches that go beyond traditional lectures and textbooks” (p. 2). Are there methods of providing the same critical features within an innovative delivery infrastructure? Palm is clearly

attempting to clarify the shape of things to come and, by definition, the contours of the changing educational container.

Why do students value a degree? Why do employers see a degree as imparting extra value to a potential employee? In 1994 a survey of trends in first-year student enrolments was undertaken by the University of Melbourne (McInnes & Hartley, 2000), followed by a second and similar review in 1999 which showed a dramatic increase in students who both worked and studied. Of the 225,225 surveyed students, 142,001 had entered a vocational program such as Business or Law (DEST, 1997). Not only had there been strong growth in the number of students in vocational study, but that number had been further expanded by the increase of international students, mainly from India and China (Australian Bureau of Statistics [ABS], 2007). By 2007 there had been a significant increase in such vocational studies as Management and Engineering, and a massive burst of growth in the Hospitality fields. Not only had the size of the international student cohort increased, but also the ratio of female to male international students had swung steadily towards the female between 1985 and 2005, echoing a global increase in the number of women in tertiary study.

**Table 1 Students, Selected Higher Education Statistics: Summary of Student numbers, 2006 and 2007 full year. Source: Department of Education, Employment & Workplace Relations [DEEWR], 2007 found in DEST, 2008**

| <b>Broad Field of Education</b>                | <b>2006</b>    | <b>2007</b>    | <b>% of total</b> | <b>% change on 2006</b> |
|--|----------------|----------------|-------------------|-------------------------|
| Natural and Physical Sciences                  | 24,943         | 25,786         | 6.3%              | 3.4%                    |
| Information Technology                         | 18,285         | 18,223         | 4.5%              | -0.3%                   |
| Engineering and Related Technologies           | 21,178         | 23,393         | 5.7%              | 10.5%                   |
| Architecture and Building                      | 7,659          | 8,378          | 2.1%              | 9.4%                    |
| Agriculture, Environmental and Related Studies | 5,487          | 5,797          | 1.4%              | 5.6%                    |
| Health   | 45,949         | 50,959         | 12.5%             | 10.9%                   |
| Education                                      | 42,280         | 42,126         | 10.3%             | -0.4%                   |
| Management and Commerce                        | 106,307        | 118,588        | 29.0%             | 11.6%                   |
| Society and Culture                            | 79,412         | 81,903         | 20.1%             | 3.1%                    |
| Creative Arts                                  | 25,058         | 27,817         | 6.8%              | 11.0%                   |
| Food, Hospitality and Personal Services        | 42             | 350            | 0.1%              | 733.3%                  |
| Mixed Field Programmes                         | 1,761          | 2,791          | 0.7%              | 58.5%                   |
| Non-award courses                              | 19,776         | 19,816         | 4.9%              | 0.2%                    |
| <b>TOTAL</b>                                   | <b>381,699</b> | <b>408,334</b> | <b>100.0%</b>     | <b>7.0%</b>             |

**Table 2 (a) Annual data (i.e. total number of arrivals in the year).(b) Includes other countries not listed and therefore components do not add to total. Source: ABS 1985 and 2005 Overseas Arrivals and Departures Collections**

| elected countries of residence | 1985(a)<br>Arrivals<br>(‘000) | Proportion<br>female<br>(%) | 2005(a)<br>Arrivals<br>(‘000) | Proportion<br>Female<br>(%) |
|--------------------------------|-------------------------------|-----------------------------|-------------------------------|-----------------------------|
| China (excludes SAR)           | 0.4                           | 24.9                        | 63.6                          | 52.9                        |
| Hong Kong (SAR of China)       | 1.5                           | 41.7                        | 22.5                          | 49.8                        |
| India                          | 0.3                           | 13.7                        | 16.7                          | 20.3                        |
| Indonesia                      | 1.7                           | 36.4                        | 18.6                          | 48.7                        |
| Japan                          | 1.0                           | 64.5                        | 25.6                          | 65.6                        |
| Korea (Republic of South)      | 0.2                           | 26.5                        | 29.9                          | 52.2                        |
| Malaysia                       | 7.7                           | 45.5                        | 24.2                          | 52.1                        |
| New Zealand                    | 2.2                           | 47.5                        | 11.3                          | 46.4                        |
| Singapore                      | 1.3                           | 42.3                        | 20.0                          | 52.9                        |
| Thailand                       | 0.7                           | 41.8                        | 15.5                          | 55.4                        |
| United States of America       | 2.2                           | 58.5                        | 29.1                          | 60.2                        |
| <b>Total(b)</b>                | <b>29.9</b>                   | <b>41.8</b>                 | <b>374.6</b>                  | <b>50.9</b>                 |

A degree is an implicit part of a professional future, whether a person be 18 or 58 at the time of study. This demands a revisiting of the entire concept of a ‘profession’, since degrees are no longer for the clever few but for the serious majority. The United Kingdom has an educational plan designed to incorporate 50% of school leavers in the national system by 2010 (Egan, 2008), while to maintain its global ranking the USA plans to put an additional 61 million degree-qualified people into the United States economy by 2020 (Jones, 2008). On top of school-leavers, the potential number of established mature students (persons in mid-career) wishing to supplement or update an existing base of skills and knowledge will undoubtedly increase as their jobs move into new technological fields. The current teaching and learning methodologies of the university system are becoming insufficient to (i) meet the changing demands, or (ii) provide the desired results. Students are already asking “Is this the most useful program of study I can do?” If the university is unable to demonstrate the functionality and “usefulness” of a program’s outcomes, that program is unlikely to survive, as can be seen in the frantic amalgamation of today’s university faculties. The change in student knowledge-needs combined with the user-pays approach leads to an essential conclusion: any university unable to link its educational products to the globalised reality will be likely to lose students to an institution that does (Reinecke, 1996).

Any thought of parochialism must be removed. In Australia, continued diversification of society through migration, economic growth and technological innovation demands a greater *weltanschauung* of educational practices, and, while an Australian ambience might be attractive, an Australia-centric outlook is not. If the Australian curricula remain “un-globalised”, they will stagnate and decline. The effects of global university rankings such as those of the Shanghai Jiao Tong University’s Graduate School of Education ([GSE-SJTU], 2007), coupled with the rising cost of education around the world, mean that all industries, including universities, are entering an intensely competitive international market. At the recent 4th Conference of International Rankings Expert Group [IREG] in Kazakhstan, the description of the ranking process reads like a race-commentary, where, weighed down by handicaps of funding and politics, universities jostle

against one another in the competitive environment of research and teaching-quality:

The University of Cambridge, which goes down the list until 28th position, continues being the first European university that appears in the ranking followed by Swiss Federal Institute of Technology (ETH) of Zurich and the University of Oxford. Nordic universities like Helsinki and Oslo universities continue to improve their positions in the ranking. And also the universities of Utrecht, Vienna or Bologna show an interesting progress. Although 5 of the Top 10 European Universities are British, there are more German (15) than UK (10) universities among the Top 50 European Universities, with French and Italian ones underrepresented. For Eastern Europe the Czech Charles University and the Russian Lomonosov Moscow State University are among the world best 200, but their Polish counterparts appear delayed. (IREG, 2009, n.p.)

While it becomes clear that the shape of many universities is changing, the form of the academic container is not the primary concern of students, especially international students. International students who first visit Australia to complete a Bachelor's degree do so because an English-based program will enhance their career, or because the fees at Australian universities are lower than those in the UK or the USA. If we were to invoke Hofstede's analysis of cultural dimensions (Itim International, 2009), it would be tempting to place weighted values on why different cultural groups come to Australia, a country which locates its mainstream culture mid-way along the axes of individualism and uncertainty avoidance. But can such a deterministic labelling of difference be usefully applied when we imagine the international student of the future? Cultural groups are already experiencing the stress of global homogenisation as the Internet exerts its sleepless influence. Potential students use the Internet to inspect, on a global level, what competing institutions have to offer and the current generation of teenagers are more than technologically competent and willing to do this.

Though sharing similarities of physical and social dislocation, language difficulties and disjunction from family networks, students from different cultures cope with these obstacles in differing ways. Those from cultural environments similar to Australia (most of Europe, North America) adjust quickly as their personal level of dislocation is comparatively mild (Thomson, Rosenthal, & Russell, 2006, p. 3). However, students for whom Australia represents a very different mindset in terms of civil and political liberties as well as personal and economic responsibilities find cultural orientation a disturbing and traumatic period. Many students arriving in Australia from India and China (the two fastest growing cohorts of students 2007-2008 [ABS, 2007]) find their first year particularly difficult as they adapt to a challenging and sometimes hostile existence (Thomson, et al., 2006). Given these external pressures, it is unsurprising that a number of first-year international students who have done well in their previous studies suddenly experience academic failure, anxiety and social distress. This situation is not alleviated by the demand of Australian universities for these international students to complete their study in a parochial and antiquated manner – a notion which domestic students have had a lifetime to comprehend but which internationals are expected to digest virtually overnight.

The differences between the experiences of domestic and international students are not restricted to social areas; differences are evident in motivation for study, technological proficiency and a resistance towards cultural adaptation. International students often arrive with an idealised image of the Western university experience. "In the movies, you always see university students on a

campus. I wanted to have that proper campus experience,” says one student from Mauritius (Tysome, 2008). Indeed, some students have been fed unrealistic expectations by recruitment agents and arrive expecting the Hollywood version. In addition to all the conventional stresses and pressures, new overseas students are also subject to problematic cultural anxieties when called upon to face fundamental issues (equality, free speech, feminism, accountability) with which they may be completely unfamiliar. While engaging with new concepts is a key element of the university experience, having to deal with cultural angst as well as everything else is a major source of new student overload. This frequently results in the student experiencing serious financial, physical or legal consequences, rendering them even more handicapped in the education stakes. Thomson, et al. (2006) state that 70.4% of international students surveyed say that loneliness affects them, and 11.3% say it affects them very much.

Yet there are a number of areas where change might be made quickly. The syllabus (course profile) can no longer afford traditional limitations. It becomes essential to embrace a multi-cellular approach or, as Sylvie Richards has been suggesting for a number of years, the syllabus must become “interactive” (Richards, 2003, n.p.). The example Richards uses in her article *The Interactive Syllabus* is a reading assignment on a Jane Austen novel. This standard task should be widened to include historical, biographical, political and literary fields, with the student expected to be able to locate the text in a set of transdisciplinary studies and in diverse media. This encourages students to “engage with great autonomy in deeper explorations” (Richards, p. 2). All disciplines need to review their purpose through this type of interactive paradigm, allowing academics to examine teaching functionality in the light of changing learning needs and the movement of future students within demographic and psychographic boundaries.

Another point of change is the digitisation of all new learning materials. New students exist surrounded by and immersed within a cocoon of technology-enhanced materials, and have already developed thinking and learning strategies based on their personal level of ‘net-savvy’. This ‘Net-generation’ or ‘N-gen’ (Barnes, Mateo, & Ferris, 2007) have developed specific skills and abilities beyond many current university requirements and frequently operate several Web sites of their own outside the formal learning environment. To expect these technologically advanced learners to regress into hard-copy texts seems to be a self-defeating principle. It is vital that all existing course materials are evaluated in the light of digitised methodologies as a standard matter of Total Quality Management (TQM). From anecdotal discussion it appears many academics feel less technologically literate than their students, and are concerned with limited teaching competence in digitised learning. Any university prepared to embrace the advantage of learning technologies should also be ready to provide its faculty staff with a full and ongoing technological familiarisation in order that the students are not required to ‘dumb-down’ to the level of the teacher. For at least the next generation of academics, we should anticipate an inevitable clash between learning styles. Given the explosion of digital facilities now available online, new students may expect to learn in a radiant as well as a linear manner, while teaching staff, lacking skills in the latest technological competencies, will remain chained to a traditional linear learning style (Hartman, Dzubian, & Brophy-Ellison, 2007).

Yet another change which might be incorporated quickly is in the area of academic integrity. As in all social mechanisms, the rules of fair play, mutual respect and trust are upheld for and by the majority although there is inevitably a minority who reason such rules do not apply to them. Given the N-gen’s common disregard for

the rules of pre-digitised sharing, there are significant implications for academic misconduct and plagiarism. Social sharing of minutia is a hallmark of the N-gen (witness the growth of social spaces such as Facebook and MySpace), so it is unsurprising if this generation share learning issues in the same casual manner as sharing music downloads from the Internet. Peer culture encourages the use of radical new technologies which further enable this blasé ideology. In 2005, a Web-based survey of US students across 67 campuses noted that 26% of business students and 20% of all undergraduate students overall admitted to plagiarism (McCabe, 2005, p. 4). Plagiarism in some form exists at all levels of education, but with the digitisation of learning materials a massive wave of academic dishonesty has appeared (Roberts, 2008). What can be done about this?

This issue can be partly addressed by anti-plagiarism software. Such programs as Turnitin and CrossCheck have been available for a number of years, although the ongoing controversy over student copyright rages on. Since most new students are so familiar and comfortable with digitised or ‘soft’ media, it will not surprise them that universities are willing to adopt equivalent mechanisms. A practical way to incorporate such softwares is via a digital drop-box which automatically filters each individual’s work through one (or more) anti-plagiarism programs. This removes some of the arduous effort currently involved in a manual identification of plagiarism, and offers students an impartial and objective perspective of their work. The increasing volume of online work necessitates a major development of screening technologies, especially since each degree is now tensioned between fee costs and career implications.

A university degree (of any description) is not an easy achievement; however, it is clear that, given the additional social and cultural burdens carried by international students, completing a program of study in Australia may be perceived as a much more difficult task for them. Given that the international cohort is an undeniable and significant source of income for Australian universities contributing \$11.7 billion to the Australian economy in 2006-07, Australian universities need to secure every financial advantage they can through innovation. It is useful to examine how the university might optionalise its study criteria while still demanding the same high academic outcomes. To begin, it would be useful to identify the failure criteria for each course or program. Until those responsible for curriculum design are able to base their work on what is acceptable, universities cannot move into the realm of innovative learning. By knowing what results to avoid educators may also define those which meet university requirements. This provision is useful in immediate terms as well as being a forward planning tool for the design and maintenance of curricula.

If Australian universities cannot accept work written in languages other than English then it becomes of paramount importance to facilitate the use of that language in their students. It is the use that then becomes vital, not the form that use might take. If universities are unwilling to accept any expression of thought that is vague or non-analytical, then a mechanism for the concise expression of ideas is required by students whether domestic or international. Once the difference between destination and journey is identified, plotting a number of possible pathways can begin. These alternative pathways could be shown in the familiar guise of mud maps or mind maps, or even in the style of an implementation schedule where students are able to select the form with which they feel most comfortable. Instead of a traditional 3000-word essay in English, an assignment could ask for a detailed concept map plus exegesis, or an ICT prototype, probably in the form of a Web site or blog (Ohler, 2009).

Similar in function to the Key Performance Indicators (KPIs) of business, universities should identify long-term goals through a mechanism of failure criteria, and place strategic learning mechanisms (linkages) along the pathway to success so that, at each potential point of failure, a student is able to access supplementary learning modules. As the largest provider of higher education to international students in Australia, CQUniversity has a Learning and Teaching management Plan 2006-2011 that is formative in the expression of desirable ‘generic’ student skills at tertiary level (CQUniversity, 2006). General learning linkages based on those desired skills might include the following:

| <b>Failure criteria:</b>  | <b>Optimum objective (KPI):</b>   | <b>Learning mechanisms &amp; additional aids:</b>   | <b>Scenario learning:</b>   |
|---|---|---|---|
| Student unable to demonstrate analytical ability                | Student able to analyse both quantitative and qualitative data, in writing and in verbal presentation   | Focus on concepts & structure of analysis: learning exercises can include online multi-choice tests; case study discussion; practical project         | Online quizzes with immediate feedback; blog diary of practical analysis exercises; digitised discussions; student choice of project material           |
| Student unable to construct formal written responses in English | Student competent to produce a series of written documents demonstrating comprehension, glossary suited to level of study, ability to manipulate correctly English expression | Focus on English vocabulary & glossary; practical learning discussions; strategic reading; identification; live talking; praxis; internship exercises | Prepared individual presentation; completion of writing portfolio; completion of job application exercises; completion of finance application exercises |
| Student unable to express ideas effectively                     | Student able to clearly identify innovative thought and demonstrate effective expression in various media   | Focus on features and benefits of different media mechanisms; explore written, verbal & visual methodologies  | Blog; student to construct teaching project; mind map design; Web page design; live presentation; debate  |

It is also necessary to design specific learning linkages. The following table of examples defines a more precise series of learning linkages based on the same generic skilling objective of accessing additional learning modules:

| <b>Failure criteria:</b>  | <b>Optimum objective (KPI):</b>   | <b>Learning mechanisms &amp; additional aids:</b>   | <b>Scenario learning:</b>   |
|---|---|---|---|
| Student unable to demonstrate understanding of postmodernist theory | Student able to identify and discuss the main elements of postmodernism together with its history, activities and most significant participants | Practical research project of postmodernism (art, architecture, artists, new media); blog construction in form; presentation; bibliographic presentation; biographic presentation | Participation in online discussion group; Web page design; publication of postmodern review; interview postmodernist figure |
| Student unable to construct financial analysis argument             | Student able to identify and discuss the significant areas of financial reporting from alpha-numeric data                                       | Practical project analysis; presentation; construction of trial report; praxis; internship exercises  | Membership of professional association; voluntary work; practical experience with financial advisor                         |

A final idea in assisting first-year university students (both domestic and foreign) is to ease the experience of transition from the regimented forms of secondary education into the autonomy of tertiary self-responsibility. The N-gen, though far more technologically-minded than were their grandparents' generation, have neglected the development of crucial social management skills. This is where the USA model of a general undergraduate degree plus specialist graduate study demonstrates its advantage. United States universities have a longer time to teach their students how to think, especially vital since that, in certain fields (law, medicine), students are not even eligible to apply for a specialist degree (termed "second entry degrees") unless they have demonstrated a high level of ability in critical thinking, research and communication skills which are instilled through a series of Humanities courses. At the University of California, Irvine, Dr Johanna Shapiro, Course Director of medical education, stresses the importance of such skills in that "Opportunities abound for physicians who can develop new ways of conveying medical information, who can touch readers and viewers with their written experiences, who can reach patients by placing the patient's own experiences into a larger framework - essentially, physicians who are excellent communicators" (Berg & Shapiro, 2008, p. 3).

In Western universities, tomorrow's students will not be further away from information than their computer or mobile phone and are unlikely to experience the frustration of seeking unobtainable data. Yet it is this frustration which instigates true intellectual engagement; without a need for effort there will be none. Universities cannot avoid the responsibility of teaching new knowledge, as well as teaching students how to think about and find such knowledge. Unless they re-define those areas which genuinely 'educate' a student, universities are not fulfilling their mandate. Commercial pragmatism demands that students clearly comprehend the value of each element of learning, not only in terms of outcomes,

but also by connecting such learning with understanding their future careers. Nor can universities afford to maintain a conventional view of “student services” as the task of defining a conventional student becomes more complex. Traditional domestic enrolments are already forming smaller cohorts in university plans as the global student makes an increasingly prominent appearance. This suggests a massive re-think of how universities envisage their function and how curriculum designers are able to translate these multifunctional demands into a deliverable educational service. The very concept of higher education is being challenged at a macro level and it becomes obvious that the shape of education, and therefore the form of organisations which produce and deliver it, must change from a rigid Mode-1 social model to a more fluid and malleable container.

To effect real change in Australian universities, the following areas are recommended for immediate review:

1. Each program should be examined to identify its primary learning objectives. How can these objectives be brought into closer alignment with global industry standards? Is there some way of index-linking learning materials to industry development?
2. Knowledge presentations (lectures, workshops, seminars) should be assessed in terms of functionality. Is there a better/quicker/more cost-effective methodology by which to connect the teacher’s knowledge to the student’s learning? Can student interactivity be improved?
3. A university requirement for the use of specific avenues of researched information should be incorporated into Bachelor studies. (This does not ban the Internet, but limits its use to specified sources of information for academic referencing.)
4. There should be an immediate overhaul of all academic integrity policies to ensure that software options available to students are mirrored by software developments available to teaching staff. This further demands of the institution a regular program of staff development.
5. Additional (possibly extra-curricular) learning opportunities should be made available to international students prior to commencing a Bachelor degree. This could take the form of a 1-term foundation program. It should contain both academic and social skill seminars.
6. Assignments which incorporate traditional written materials (essays, reports, research projects) should be reviewed in the light of recent technologies. Are there better ways for the student to practice communicating knowledge and learning at undergraduate level?
7. All assignments should be assessed to ensure work above failure criteria levels. This may mean the overall learning objective might be better achieved by installing a series of smaller, multiformatted learning goals.

Though Australian universities are already moving towards a greater interface between technology and pedagogy it must be realised that this movement cannot be a temporary or superficial trend, but a permanent and irreversible alteration of how education is perceived and how learning is received. For universities to grow in terms of ability, reputation and, above all, usefulness, they must change profoundly

the shape of the container in order that its contents attain the qualities genuinely valued by both students and industry.

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