Introduction

The approaches to higher education by both sides of politics in recent years have had a significant impact on the university sector in Australia. Australian universities have been compelled to cope with the amalgamation of tertiary institutions, huge increases in student numbers and dramatic reductions in funding levels, which have all combined to radically alter university culture. The rationalization of university institutions has left a legacy of multiple campuses, which has required some staff to travel extensively in both Australia and offshore to deliver classes. This stretching of resources across campuses has problematised the delivery of higher education, as accountability pressures for the maintenance of quality standards have increased from professional bodies, government agencies and students organisations. The most significant change to higher education has been the burgeoning participation rates, which have seen student numbers trebled and, in some cases, quadrupled over the last decade in Australian universities. At the same time as student numbers have risen dramatically, governments have not responded with comparable increases in funding and support. As a result, many universities have been compelled to seek to expand their revenue base into private sources, both domestically and overseas.

Many of these changes have been the result of the 1996 ‘West report’ by the Howard Government, which was the most recent significant inquiry into higher education. The report prompted the slashing of the education budget by $600 million, which resulted in thousands of academic retrenchments and accompanying increases in class sizes. The report also called for a reassessment in the way education was delivered, with an increasing emphasis on the use of technology, digital media and the Internet. Whilst the issue of class size was not directly addressed, the report did suggest that future policy and funding arrangements should promote low-cost ‘virtual’ forms of course delivery. At a superficial level this focus appeared to efface the issue of class size, but increased class size was the inevitable corollary of redirecting resources from personnel to technology. The West Report’s vision of the tertiary education evolution into a virtual sector has been challenged, most notably in a review of the report’s findings by Flew (1998). At the same time, other visions of the West Report have received more widespread support. Australia’s transformation into an information society, with a hierarchical and market-driven higher education system and with education spending and policy driven by economic imperatives, appears inevitable.
With these and other recent changes, universities and academics have had to adapt to their changing roles and find cost-effective solutions to the task of teaching more students, without undermining the quality of the education provided. This problem involves ascertaining current and future trends in higher education (both in Australia and internationally), examining the increasing reliance on information and communication technologies and accommodating government and institutional policies that have direct and indirect effects on class size.

**Current and future trends**

The evolution of higher education from an elite system to a mass education system has resulted in universities having to accommodate vastly increased student numbers and a diversified student population. The absence of a corresponding increase in government funding has resulted in increased pressure being placed upon the diminishing numbers of academic staff, as they suffer the inevitable corollaries of larger classes – increased marking loads and contact time with students, as well as a greater administrative burden. The increased size and diversity of classes also necessitate greater preparedness on a number of other levels. Academics are required to possess a wider repertoire of teaching techniques and resources, greater sensitivity to cultural differences and language conventions, and have the capacity to adjust teaching and learning structures to allow communication with larger groups.

One of the major problems with the higher education as it exists today is the inability or unwillingness of many academics to adapt to these changing circumstances. As demonstrated by Nunan, George and McCausland (2000), many academics obstinately continue to employ the teaching methods they were utilising when universities were elite institutions. Although it is true for the most part that student support and re-mediation services remain institutional responsibilities, the reality is that teaching approaches and curricula need to be adapted also. Higher education needs to alter its focus to ensure that it serves the needs of the professions, industry and the wider community and does not merely continue to perpetuate its traditional role of producing more researchers and academics. As pointed out by Nunan et al., the key for academics is to capitalise on the available technologies and diversified means of delivery to provide inclusive and flexible teaching methodologies and curricula without compromising on educational standards.

The increased use of technology in teaching, particularly the trends towards online, off-campus and flexible teaching, raises the question about the relevance or need to improve ‘large class’ teaching. Logically it would appear that large classes and the issues that are associated with them cease to be a concern when teaching is undertaken online and/or off-campus. But Avenell (2001) maintains that although the introduction of flexible and technologically based delivery modes diminishes short-term demand for class contact on campus, increasing class sizes remains a long-term problem. He argues that
the prevailing trend of low or negative growth in the demand for campus education and the concomitant demand for on-line delivery is primarily due to a very low base line and will inevitably reverse. Avenell forecasts that increasing revenue combined with the falling cost of providing education on-line will result in a resurgence in the demand for campus education and an inevitable plateau of the demand for on-line delivery.

If the assertion that there will be a resurgence in demand for class contact in the future proves to be correct, the need to identify best practice for teaching large classes remains imperative. The West Report’s notion of the ‘virtual university’ has increasingly been challenged and rival visions of Australia’s tertiary education sector have gained more widespread acceptance. Nunan et al. (2000) have raised the prospect of the evolution of ‘multi-versities’ focusing on the provision of a large diversity of programs, and ‘flexi-versities’ featuring market specialisation and staff and student flexibility. Nunan et al. (2000, p. 2) describe this change in the function of universities as representing a move “from being scholarly ivory towers to information corporations”.

**Information and communication technologies (ICTs)**

In this changing education environment, universities will need to continue to utilise the latest and most innovative information and communication technologies (ICTs) in order to be able to meet student demand for personalized and flexible learning experiences, especially with the entrenched reality of large class sizes. Thompson (2000) maintains that increasing reliance on ICTs has transformed the university sector primarily at three levels. These are:

- University structures and the interrelations between universities and the private sector.
- Academic productivity and the relations between ‘change managers’ and academic staff.
- Teaching and learning, and the social relations between academic staff and students in the teacher/learner/artefact interface.

At the level of teaching and learning, the utilisation of ICTs involves combining the use of computers, the Internet, educational software, and software tools for design and production of HTML pages with revised methodologies to serve educational principles. According to Thompson (2000) there is a danger to both universities and academics in viewing ICTs as simply new mediums for the dissemination of information to students. The failure of academics to realize this would downgrade their value to universities as teachers, the competitiveness of their skill base and their relevance as a profession. Thompson warns that there would be long term consequences to the academic profession and the higher education industry as a whole in being seduced by the minimal drain on
resources and low-cost of information provision through ICTs. He warns that the processes of teaching and learning, especially in higher education, have always been much more than simply information delivery and consumption. Therefore, it is imperative that academics and universities maintain quality education by ensuring the continued investment of resources in the labour intensive task of facilitating the turning of information into knowledge, and knowledge into wisdom. Therefore, the most appropriate use of ICTs as a scholarly tool would be as interactive devices assisting the collection of relevant information from the world-wide-web and access to scholarly debate on discussion forums, listservs and bulletin boards.

The increasing importance of ICTs to higher education and the recognition that they must complement rather than be a substitute for the 'human factor', has compelled most universities to develop new support services and approaches for existing services. These include the development of flexible learning committees or centres, Information Technology Services (ITS) and new service portfolios for registries and libraries. The purpose of these services is to enhance the administration of courses, promote access to resources, facilitate interactions within the delivery of courses (via email, virtual tutorial guides and broadcasts) and improve access to student support services (learning support, discussion groups, etc.). In this fashion, ICTs have developed as an important aid in servicing the needs of students in large classes. The clear benefits for students in large classes in using ICTs is that they have greater flexibility in choosing the information and the timing of its access to serve their particular learning needs (Nunan et al., 2000). Flexibility of access to resources has been an increasingly important aspect of university education as burgeoning student numbers have had the effect of dramatically increasing competition for resources. The improvement in communication avenues provided by ICTs, has also been crucial to combat the increasing time pressures on both academics and students in today’s university environment, especially with large classes. Communication has improved through the facilitation of mass communication and asynchronous interaction, especially in the use of virtual groups and communities of students and academics. Enabling devices such as wizards, templates, online course information and study guides and subject home pages are needed to make the online learning environment effective.

The importance of ICTs in teaching and managing large cohorts of students spawns a new set of problems of a corollary nature. As pointed out by Nunan et al. (2000), university institutions must respond by ensuring the provision of efficient and seamless operational links in their just-in-time online systems. Also, with the increasing use of ICTs, computer and information literacy are no longer advantages for students, they have become requirements for student participation in higher education. Institutional approaches to this problem would promote greater efficiency but, nevertheless, many courses have had to address student deficiencies in this area without institutional support, using
web-based systems (such as WebCT) and flexible teaching tools (Housego and Freeman, 2000).\textsuperscript{1}

\textit{Institutional policies}

As it is a relatively recent phenomenon, there has been only limited research into higher education policies addressing class size. Since 1995, Washington’s higher education policy has included class-size reduction (CSR) initiatives (McRobbie, Finn & Harman, 1998), but as yet these initiatives have only been implemented in certain US states. There is no conclusive evidence to suggest that the reduction of class sizes, by itself, has any significant positive effects on student performance.\textsuperscript{2} Maxwell and Lopus (1995) conducted the most notable study into the cost-effectiveness of different configurations of large university courses. Maxwell & Lopus measured student performances from 12 economics courses at Californian State University over a period of time, as class sizes were increased. Their study revealed that increasing class sizes resulted in substantial monetary savings without loss of learning, as measured by multiple-choice post-tests. At the same time, the study revealed that students in large classes experienced greater dissatisfaction with the learning experience and had a 38\% increased probability of transferring to other degree majors. Maxwell and Lopus concluded that large class sizes could provide quality education at a reduced cost, but would probably translate into declines in future enrolments and, in turn, cause internal relocation of resources between departments.

In Australia continued pressure on the government’s education budget has entrenched large class sizes and placed the onus on universities to adapt to their roles as mass education institutions. In this respect, Nunan et al. (2000) argue that universities need to clearly articulate policies that recognise and accommodate the paradigm shift of higher education from a culture of ‘production’ to one of ‘consumption’. The paradigm shift has had such a profound and pervasive influence on the way higher education functions that university policies need to be freshly formulated, rather than a revision of existing policies. Such policies and initiatives could include, and have included:

1. A statement of the generic qualities of a graduate (sometimes called graduate attributes) to govern curriculum design, as well as teaching, learning and assessment procedures.

2. Internationalising activities through collaboration and strategic partnerships.

3. Integrating an international and inter-cultural dimension into teaching and research.

\textsuperscript{1} For more detailed discussions about best practice in online learning and ICTs with respect to both small and large classes, visit the ‘Flexible Futures in Teaching’ page at http://wwwtlc1.murdoch.edu.au/confs/tlf/tlf2000/contents.html.

\textsuperscript{2} Refer to Student performance in large classes.
4. Developing and providing a client service culture.

5. Conducting strategic planning for computer mediated teaching and learning.

6. Providing induction training for new and casual academic staff.

7. Providing services and course delivery that emphasise flexibility.

The last four of these policy areas are most likely to be relevant to the teaching of large classes. Nunan et al. (2000) advocate promoting policies such as these by adopting key indicators directly linked to performance-based funding for academic divisions, and indirectly to the funding of services such as information technology, library, staff and student support and professional and organisational development.

Conclusions about Higher Education in Australia

At the heart of the revolution in the function of higher education has been the refashioning by the Federal Government of its role in the process. It has moved from being a ‘patron’ and guide of the system to being the ‘contractor’ and purchaser of tertiary education on behalf of the taxpayer. In its new role the government’s primary functions have been to ascertain the appropriate base level of subsidy and to ensure accountability and quality assurance (Nunan et al., 2000). University administrations have also had to adapt to this new approach to higher education and overcome the ambiguities inherent in the transformation of their own roles. The emphasis on providing alternative modes of delivery has been a major source of ambiguity, as it fundamentally diminishes the demarcation between academic and administrative staff, as well as merges the cultures found in universities and industry. This emphasis has also required academics (especially those teaching large groups) to rely on professional and technical help and expertise to deliver their product to a greater extent than ever before. Accordingly, professional administrators are becoming more influential in university affairs, reshaping academic work by virtue of their increasingly pivotal role in areas such as course management and delivery (McInnis, 1998).

The blurring of roles within the university system necessitates greater cooperation among academics, as well as between academic and nonacademic staff. Therefore, it is imperative that university cultures foster collaborative environments and that management policies are designed for the benefit of both academic and administrative staff (McInnis, 1998). Nunan et al. (2000) argue that these changes should be managed at a framework level through a continuous improvement of processes and skills, rather than through specific procedures. McInnis and Nunan et al. agree that enterprise and flexibility are the key values needed for universities to succeed in the rapidly changing culture of Australia’s higher education system.