Building Better Pathways to Higher Education

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1. Introduction

Australia, like many other countries around the world, needs to seriously consider how its tertiary (Higher Education and Vocational Education) system will effectively meet changing societal needs. As modern nations progressively become knowledge economies, the proportion of our population which progresses from secondary school to tertiary education will increase. Our universities and TAFE Institutes have, however, evolved from systems where only a small proportion of the population progressed to tertiary education. It is questionable whether simply scaling-up the existing structures is the logical way to meet such an expanded demand.

2. The Australian Tertiary Education System

Before looking at possible alternatives to the present system it is opportune to reflect on the present tertiary education system in Australia. Broadly speaking, the present system consists of Higher Education (universities) and Vocational Education (TAFE Institutes). The differences between the two are often characterised in terms of the qualifications they deliver (eg. Higher Education – Bachelor, Masters degrees etc., TAFE – Certificates, Diplomas etc.). This distinction is, however, superficial and increasingly blurred. For instance, some universities now offer diplomas and some TAFE Institutes degrees. Rather, it is more instructive to look at the policy drivers informing the two sectors and the educational goals of each.

In the case of Higher Education, the critical policy drivers are education and innovation. All universities in Australia argue the critically important place of research in their institutions as both a driver of innovation and an informer of the educational philosophy. A key attribute of a degree graduate should be the ability to independently research a new topic and to critically evaluate material. What better way to develop these attributes then being taught by an active researcher?

In the case of TAFE, the policy drivers are again education but with the addition of industry and social policy. The TAFE education is heavily influenced by the immediate needs of industry and the requirement to develop workers with the specific skills needed by employers. This process is put into action by the many training packages which exist within the TAFE/VET system. The social policy element of TAFE is also critical in meeting many requirements around remedial education and access to education. The TAFE system is built around open access to education which contrasts with the competitive system of university entry.

The systems are fundamentally different and should not be considered in a hierarchical manner. As such, the blurring of mission (universities offering diplomas and TAFEs offering degrees) devalues the important, but distinct, roles of each sector.

Understanding of these distinctions is important in the concepts outlined below.

Progressively, problems in the present structures are becoming obvious. In the short term, these problems are manifested in terms of inadequate funding of tertiary education, and Higher Education in particular. As the system has expanded rapidly, government, representing the taxpayer, has not been prepared to fund this

expansion. As such, greater burden has fallen on students through loans (HECS) and full fees. Although there is still no evidence that students are opting out of Higher Education in significant numbers, Australia has reached a point where student contributions are high by international standards.

The challenges facing Australian Higher Education are not unique. Other countries have also struggled to cope with the massive expansion of Higher Education. Britain is a clear example and, in fact, has looked to Australia for ideas. A more striking example is Germany, where the once generously state-funded system is now staggering under swelling numbers of students and under-funding. One of the aims of the much-discussed Bologna process is to get students through the Higher Education system in reasonable time, rather than the 5 or 6 years typical of the European system.

Australia's challenges are not significantly different. Our universities are on a funding treadmill. Institutions have regularly competed for newly funded Commonwealth places whilst at the same time complaining that the funding rate per student is inadequate. Put simply, the universities are hoping that they can extract a small margin from each student to enhance the net income from provision.

The negatives associated with such unsustainable growth are significant. Quality is obviously challenged and ultimately the ability to meet the expanding education and training needs of the nation will be impacted. Had it not been for the spectacularly successful full-fee paying international student market, Australian Higher Education would be in a diabolical position.

The basic model of higher education delivery in Australia has not fundamentally changed since its establishment. A system designed for an elite few in society is now being applied to a mass market. The result is an expensive and unsustainable system which is not ideally suited to the educational needs of many students. Institutions have commenced the process of investigating alternative models for Higher Education. The "Melbourne Model" has received much publicity. Although this model may have educational advantages, in fact, it is an even more elite system than the one we have at present, increasing the average educational period from 3 to 5 years. The resulting 70% increase in the cost of education hardly represents a solution to the present situation. Other models have focussed on greater vocational and industry based skills (eg. Swinburne University of Technology, Victoria University). These approaches are aimed at making education more relevant, engaging students more and enhancing employability. All are laudable educational goals, but again, if anything they represent a move to further increase the average costs.

This paper reviews the present situation and develops an argument based on both educational and economic grounds that Australia should move to a system similar to that in the United States, where potentially very capable, but less academically prepared students study Associate Degree programs within a TAFE equivalent, before articulating to university. Such a system should enhance the success rates of these students, thus providing educational advantages. In addition, the reduced average cost of delivery will result in significant savings which could be used to support a system of smaller but better funded universities. Ultimately it will provide for a more sustainable system, capable of educating a broad cross-section of the community and meeting Australia's growing tertiary education needs.

3. The Changing Australian Tertiary Education System

Modern societies increasingly require large numbers of well educated and highly skilled employees. As such, there is an increasing demand for a higher percentage of our population to obtain tertiary qualifications [both higher education (university) and vocational education (VET/TAFE)]. This trend is clearly seen, by examining the percentage of 20 year olds engaged in tertiary education, as shown in Figure 1.

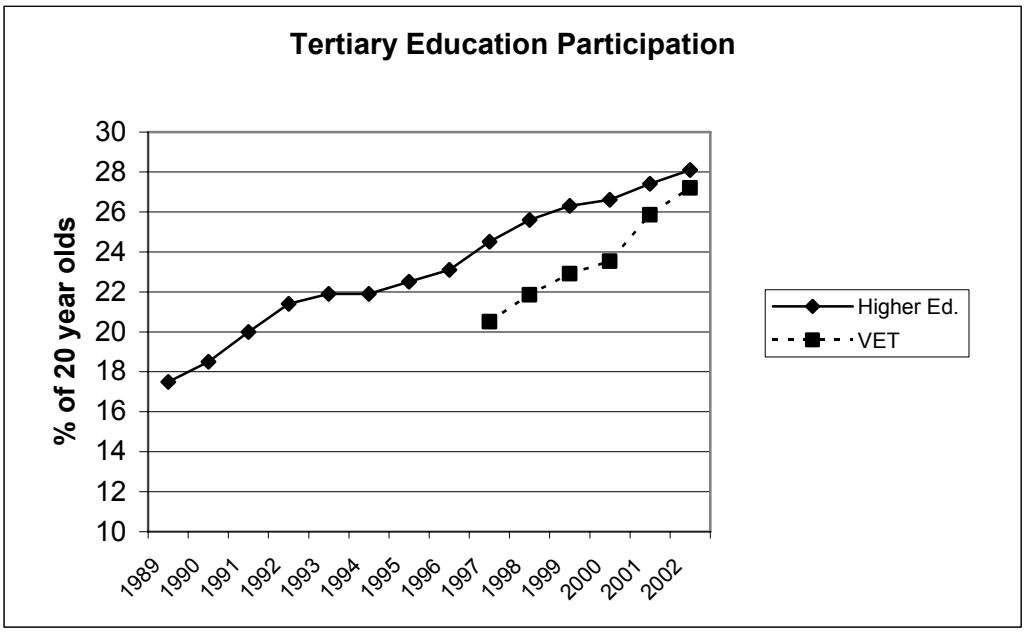

Figure 1: Percentage of 20 year olds enrolled in either Higher Education or VET. [Source: DEST Higher Education and VET participation rates].

Over a period of approximately 10 years, the percentage of school-leavers (approximated by 20 year-olds in Figure 1) entering Higher Education has increased by 10% (from 17% to 28%). Today, more than 50% of school leavers enter tertiary education (university or TAFE). The challenges for institutions, and government, to fund such an expansion are obvious. The rapid increase shown in Figure 1 shows no signs of slowing.

In addition, Australia, like most Western countries has an ageing population. This is clearly seen in Figure 2, which shows OECD predictions of population age distribution for Australia in 2015, compared to 2005. The number of 15-19 year olds will decline by 4% between 2005 and 2015. As a result, an even greater percentage of school leavers will need to progress to tertiary education in order to meet industry needs for highly educated workers. Hence, it can be expected that the percentage of school leavers seeking to enter tertiary education will continue to increase and that a larger percentage will be less well prepared for such education. It naturally follows that as the percentage of school-leaver participants increases, the system become less academically elite and must be able to cope with a much wider range of academic preparation.

A change in nature of the academic skills of commencing university students is already apparent in the data. Figure 3 shows the distribution of Tertiary Entry Ranks (TER or ENTER in Victoria) for Victoria. It is reasonable to assume that similar trends exist in other states. As the percentage of school leavers entering university increases, the TER distribution flattens. As a very high percentage of the most highly

achieving students already attend university, the expansion is largely supported by less well prepared students with lower TER.

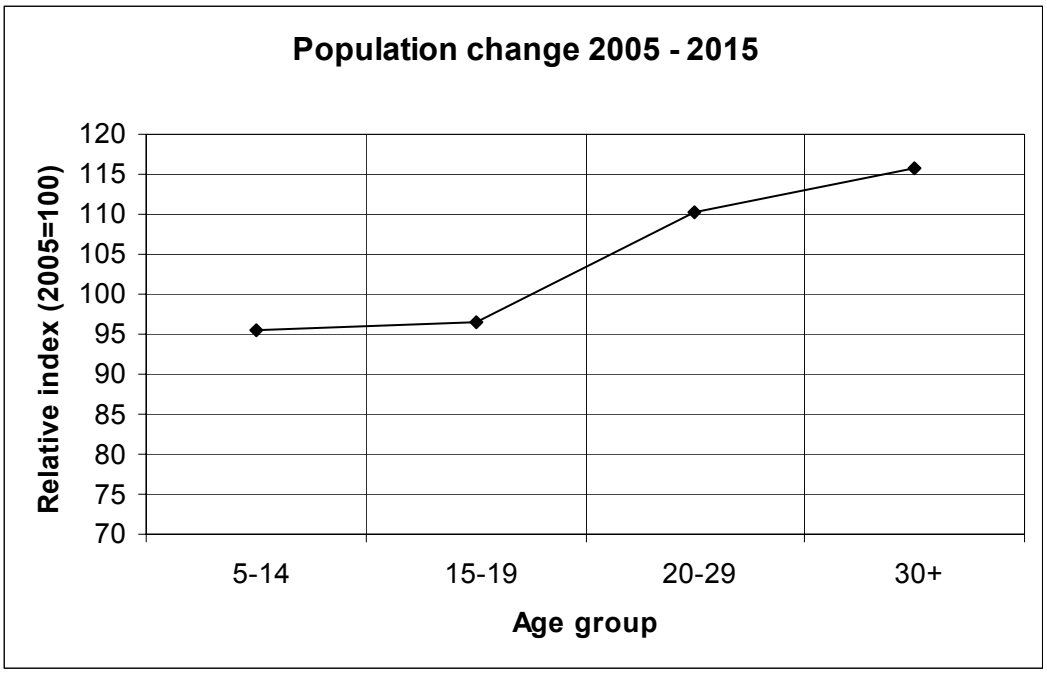

Figure 2: Demographic changes in the Australian population. The predicted age distribution of the Australian population in 2015 is shown compared to 2005. A value of 100 corresponds to no change between 2005 and 2015. [Source: OECD Education at a Glance 2006, Table A11.1].

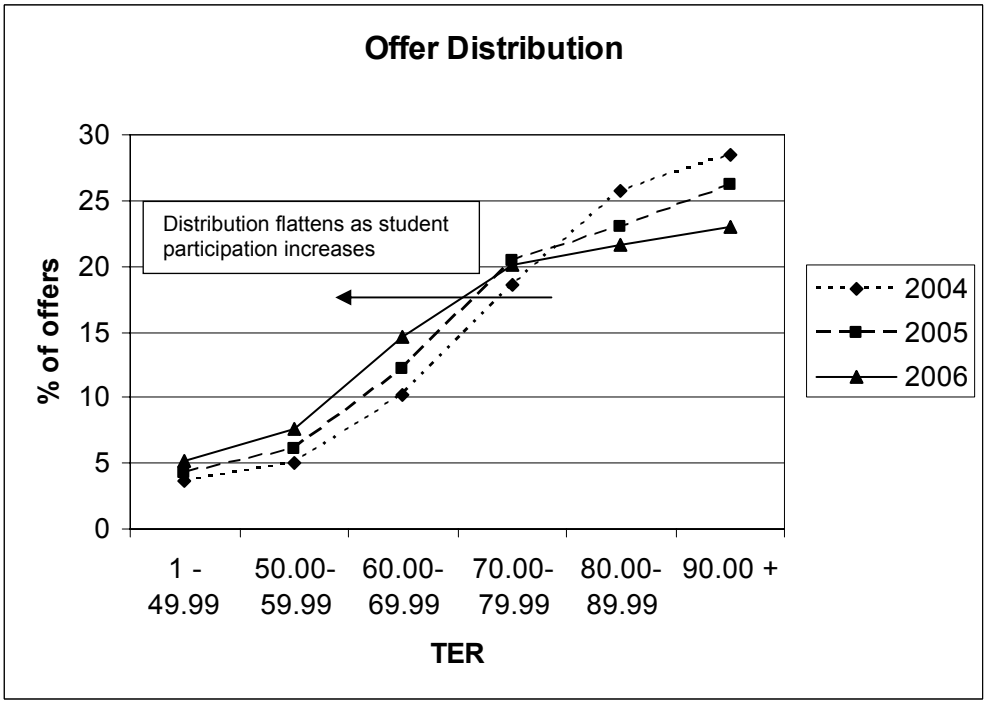

Figure 3: The changing distribution of Tertiary Entry Rank (TER) of offers made for Victorian university places for 2004, 2005 and 2006. [Source: Victorian Tertiary Admission Centre, VTAC data].

This change in academic preparation raises many questions for universities. Is TER an accurate measure of likely university success? Are we "dumbing down" the system? Should students with relatively low TER aspire to university study? Might there be better alternative for low-TER students? These are all interesting questions and as the system is expanded they must be addressed.

Figure 4 plots data for Swinburne University of Technology showing progress rates as a function of TER for school-leaver students (i.e. students who complete Year 12 and directly enter university). Clearly, there is a strong relationship between TER and the academic success of students. It should be noted that progress rate is not an ideal measure of student success. Students who elect to transfer between courses or to another university or make a decision to take a leave of absence are all counted as not having progressed. Despite these short-comings, the result in Figure 4 is clear. The data raises a number of questions. Is such a result inevitable - weaker students will naturally have higher failure rates? Can less well prepared students be assisted to improve their results?

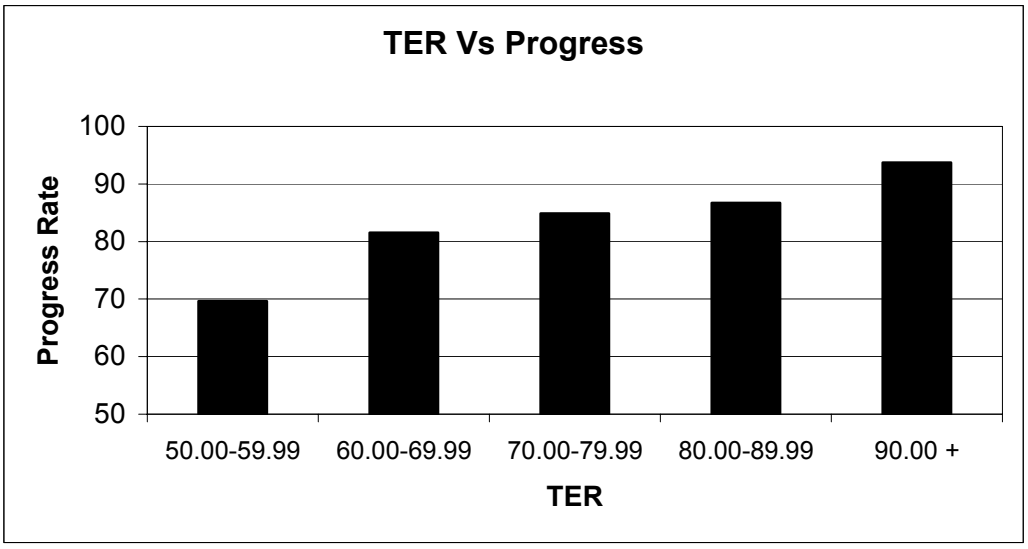

Figure 4: Progress rate of first students who entered university from Year 12 as a function of their Tertiary Entrance Rank (TER). [Source: internal Swinburne University of Technology data].

Interpretation of data such as that in Figure 4 requires an understanding of just what TER actually represents. This measure is widely used for entry to university. Is TER a measure of academic ability or is it a measure of academic preparation? Importantly, can students with relatively low TER succeed at rates higher than those shown in Figure 4?

That TER is influenced by factors other than academic ability is well known. Teese and Polesel (2003)[1] have shown that TER and socio-economic status are well correlated, as shown in Figure 5. This figure shows the mean entry TER for each of the universities in Victoria as a function of the mean socio-economic status (SES). A value of SES=1000 represents the population mean. Two striking features are clear in this figure. Firstly, students from wealthy backgrounds attend the best schools, have a more academically supportive environment at home, achieve high TER and

[1] Teese, R. and Polesel, J., 2003, "Undemocratic schooling: Equity and quality in mass secondary education in Australia", Melb. Univ. Press, 272pp, ISBN: 0-522-85048-0.

attend the most prestigious universities. As shown in Figure 4, these same students will, in turn, perform best at university. The second feature is that mean values of SES for all institutions are above the population mean of 1000.

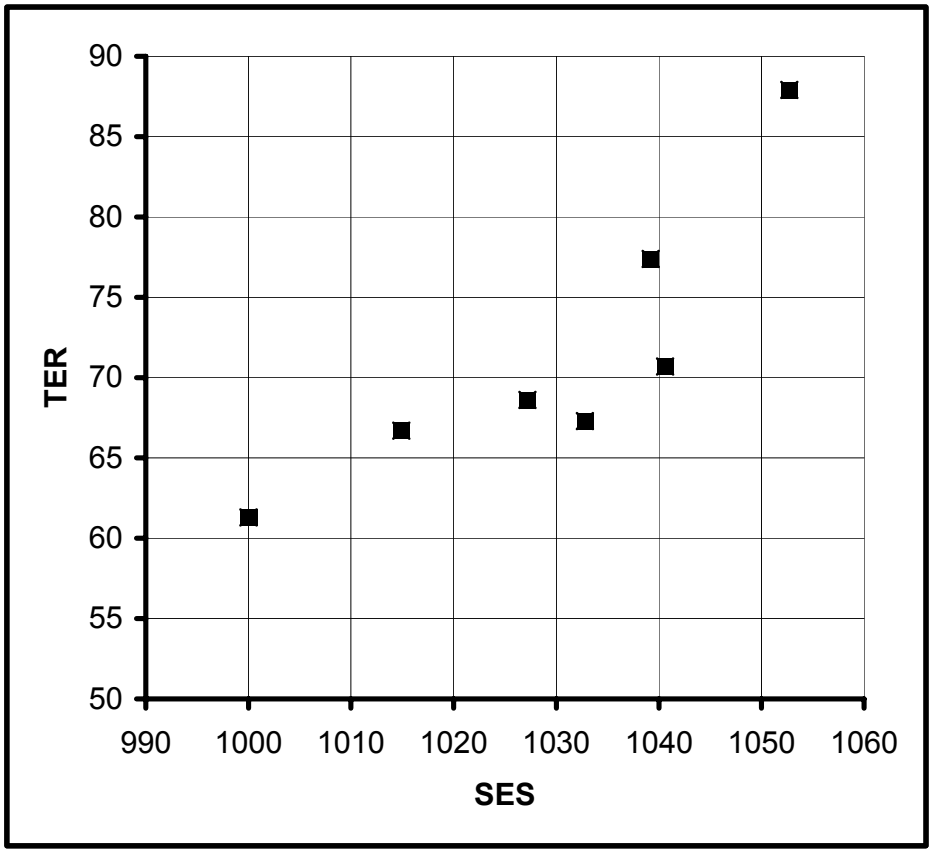

Figure 5: Mean tertiary entrance rank (TER) verses mean socio-economic status for each of Victoria's universities. [Source: Teese and Polesel (2003)[1]].

It is clear from the results in Figure 5 that TER is a measure of academic preparation rather than academic potential or ability. Hence, if in the future an increasingly large percentage of school leavers, with inevitably lower mean TER, are to progress to higher education, alternative means will be necessary to ensure this group of students are not excessively disadvantaged by their backgrounds. In addition, enhancing the success rate of this group of students will be essential to ensure this human resource is not wasted and that the increasing need for a more highly educated work force can be achieved.

4. Changing pathways to Higher Education

There is a regular debate in Australia about unmet demand. This debate tends to be superficial and does not account for the changing pathways to higher education. The unmet demand debate tends to suggest that students who fail to obtain their desired place in a university have lost all hope of such an education. In reality, there is a significant and growing pathway to higher education through TAFE and other VET pathways. These pathways typically take the form of students undertaking a diploma or advanced diploma in TAFE and then articulating into a university degree with advanced standing as a result of their prior TAFE study.

The number of students who elect this pathway and ultimately enrol in a university degree is difficult to determine. University data reporting systems are presently not

designed to accurately record this information. DEST has recently introduced changes to address these deficiencies. Unofficial data collected at Swinburne University of Technology indicates that, nation-wide, perhaps 10% of higher education students utilize this pathway. A number of institutions have actively developed this pathway (eg. Swinburne, Western Sydney, Deakin) and have numbers far higher than this national average. In 2006, approximately 28% of commencing students at Swinburne articulated from TAFE.

Although the average TER of students who adopt this pathway is unknown, it is reasonable to assume that their average TER is low, most probably between 50 and 60. As noted in Figure 4, students with values of TER in this interval are likely to have low progression rates if they enrol directly in Higher Education. Data on the progression rates of students at Swinburne has been kept since 2000. Table 1 shows the average progression rates of the different cohorts of students in 2006.

Basis of Admission	**Average Progression rate**
Year 12	83.4
TAFE/VET	84.5
Other	79.6

Table 1: Average progression rates for different cohorts of students at Swinburne University of Technology in 2006.

The results shown in Table 1 are typical of those achieved in each year for which data has been collected (6 years). Within the statistical variability of the data sample, it can be concluded that students articulating from TAFE achieve at approximately the same level as students who entered from Year 12. As shown in Figure 4, a progression rate of 84.5% (Table 1) is typical of students with a TER in the band 80 – 90. This is a remarkable result since, as noted above, this cohort of students probably have TER values between 50 and 60. Opting to take the pathway through TAFE has resulted in achievement levels equal to students with TER values 30 point higher than this cohort.

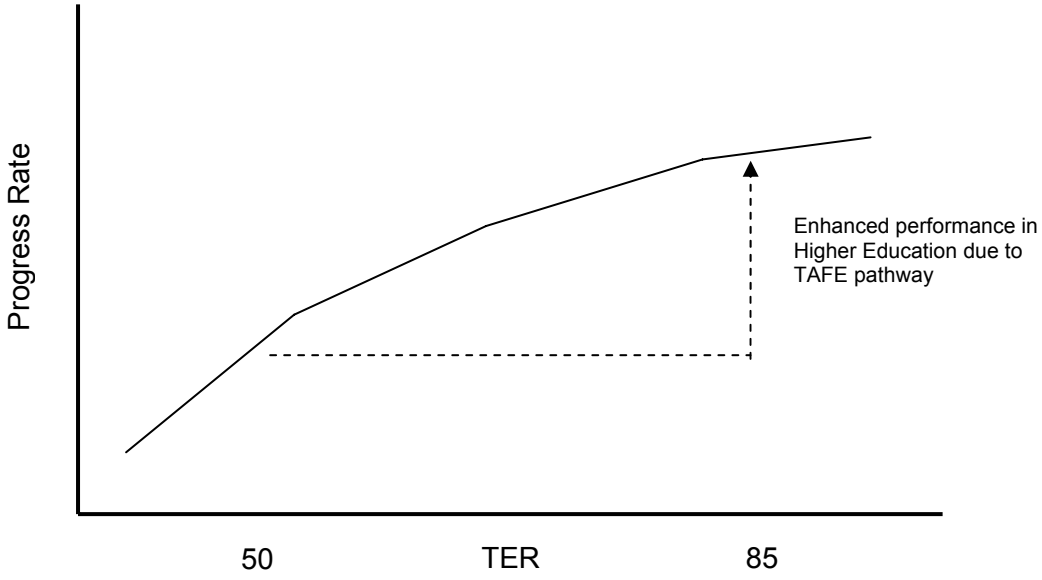

Figure 6: Diagrammatic representation of enhanced student performance brought about by the provision of a preparation pathway.

It is believed that there are a number of reasons why there is such a dramatic increase in performance for low-TER students who utilize the VET-articulation pathway. These include:

- TER is largely a measure of educational preparation, not educational ability. As such, greater preparation enhances performance.
- University, by its nature, is aimed at building independent research and learning in students. Therefore, poorly prepared students, who are not ready for such independent development, struggle.
- TAFE/VET provides greater assisted study techniques. The educational pedagogy is a natural bridge – more independent than school, but more supportive than university.
- The articulation pathway allows the students to mature. Typically, students receive a maximum of 1.5 years Higher Education credit for 2 years study in TAFE. This enables the student to mature and not to be accelerated into university study too rapidly. Although there is always pressure to provide a greater level of credit for TAFE study, anecdotal evidence suggests that such a move would disadvantage students and decrease success in university study.

5. The International Perspective

Pathway development, such as described above is a key element of the US Higher Education system. Community colleges within the US form an important part of the system, educating many students in 2-year programs who then articulate to 4-year colleges and Universities. Compared to Australia, there is a much greater level of collaboration between community colleges and universities. For instance, the American College on Education (ACE) represents the Presidents of all institutions, whether they are 2-year or 4-year in nature. ACE acts as a supportive resource and a powerful political lobby group.

The community college pathway is viewed by many US students as a desirable path to a degree. It is both less expensive and provides a better educational preparation than progressing directly to university.

Other international experiences have been less positive. The Foundation Degree introduced in the UK has not been particularly popular with students. This may simply be a transition issue, but it is also probably because it is offered by universities, alongside traditional degrees. In this setting, the Foundation Degree naturally appears as a “second best” option.

6. A Pathway Model for Australia

The data presented above provides a compelling case, based on educational outcomes, that poorly educationally prepared (low TER) students should proceed to university through a pathway, rather than enrol directly in degree programs at university. This section will present a model to achieve this outcome. The following section will provide an economic analysis to show that such a structure also has economic advantages to Australia.

It is proposed that Australia move to a system where all students with a TER (or other selection criteria) below a certain value enter a pathway program offered through TAFE rather than enrol directly in university. The details of how this would work are outlined below:

a. A minimum TER is set for university entry (either nation-wide or university specific). Students below this limit could not enter university directly, but would proceed through a TAFE pathway.

b. The TAFE pathway would be an Associate Degree rather than a Diploma. The Associate Degree is better equipped to act as a pathway as it is curriculum based and hence consistent with the requirements of the Degree.

c. The Australian Qualifications Framework (AQF) indicates that the Associate Degree offers both an exit point and a fully articulated pathway into the Bachelor Degree. This is a direct translation from the US experience where the 2-year qualification articulates into the 4-year degree. It is difficult to believe that it will be possible to take students who are poorly educationally prepared, provide them an exit qualification at two years (something a degree does not do), bring them up to the same standard as better prepared school leavers and allow them to mature. After this, they would need to transfer, become adjusted to university study and complete their final year. Although this may be possible in a 4-year US degree, it seems a demanding requirement in the already compressed 3-year Australian degree. Therefore, until proven otherwise, it is believed that the Associate Degree should articulate with 1 1/2 years credit, as is presently the case with the Diploma and Advanced Diploma.

d. The cost structures within TAFE are less than within universities (see next section). Therefore there are significant cost advantages in such a proposal.

e. The scheme would be funded by transferring a proportion of the present government funding for each student from the university sector to TAFE. A proportion of the funding would remain with the university sector, thus resulting in a smaller but better funded university sector.

f. The proportion of the funding transferred to TAFE would be at least equal to the present funding rates within TAFE. In addition, HECS would be extended to these Associate Degree programs in TAFE. The rate of HECS would be less than in corresponding degree programs. As a result, TAFE Institutes will also become better funded and students will have both educational and financial incentives to proceed through the pathway.

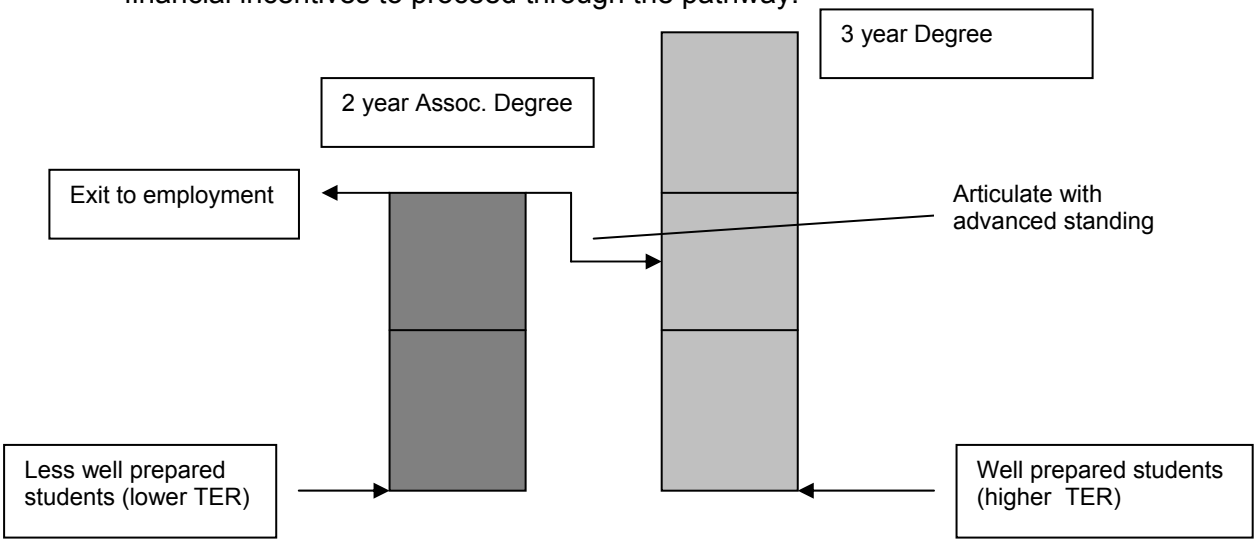

Figure 7: Diagrammatic representation of degree and employment pathways.

7. Financial Analysis

The analysis below makes a number of assumptions and is intended as an illustration of how the system might work, rather than a detailed proposal.

TAFE and Higher Education are funded for domestic students in quite distinct ways. These can be summarised as follows:

Higher Education Funding

The funding for each year of the course consists of a component provided from the Commonwealth (the Commonwealth Grant Scheme, CGS) and a component funded by the student (the Higher Education Contribution Scheme, HECS). The rates of both CGS and HECS vary by discipline. This funding must cover both instruction to the student and infrastructure.

TAFE Funding (based on Victoria)

Each hour of instruction (Student Contact Hour, SCH) is funded. This component does not include any allowance for infrastructure, which is funded separately. The SCH funding rates vary by discipline.

7.1 Indicative Cost Structures

The cost structures within TAFE are lower than in Higher Education since the levels of academic qualifications of staff are generally lower and the expectations to carry out research do not exist within TAFE. As explained earlier, such an approach is appropriate for sub-degree programs, however, a research environment is considered important for a university Degree.

Below, calculations are carried out for typical costs associated with teaching a student for one year in (a) Business and (b) Engineering. These choices give typical extremes of low and high cost disciplines.

Higher Education		**TAFE**	
Business		***Business***	
CGS	$2,515	700SCH x ($7.54+$1.15)[2]	
HECS	$7,118		
Total:	**$9,633**	**Total:**	**$6,083**
Engineering		***Engineering***	
CGS	$12,476	700SCH x ($11.3+$1.15)	
HECS	$7,118		
Total:	**$19,594**	**Total:**	**$8,715**

Table 2: Cost of teaching in TAFE and Higher Education

As can be seen above, the cost of teaching Engineering is significantly higher than Business. In both cases, the cost advantage of TAFE is clear. Note that in the above, it is assumed that the Associate Degree (TAFE program) has 700SCH. This would equate to more than 26 hours per week over two 13 week semesters. This is significantly higher than in a Higher Education degree, but is a critical part of the

[2] $7.54 per SCH for instruction plus $1.15 per SCH for infrastructure. The infrastructure figure is based on expenditure in Victoria in 2005.

more assisted mode of learning in TAFE, essential for developing the academic abilities of less well-prepared students.

As an example of the revenue sharing proposal core to the proposed model, it is assumed that:

a. The present CGS component is shared between the two sectors in the ratio 35% Higher Education, 65% TAFE.
b. That the student is charged a HECS rate in TAFE which is 75% that in Higher Education. The reduced rate takes into account that the student will complete 2 years of study in TAFE and receive 1.5 years of credit in Higher Education. Thus the reduced HECS rate ensures that the total HECS payable on the degree qualification is not changed compared to the present situation.

Higher Education		**TAFE**	
Business		***Business***	
CGS	$880	CGS	$1,635
		HECS	$5,339
Total:	**$880**	**Total:**	**$6,973**
Engineering		***Engineering***	
CGS	$4,367	CGS	$8,109
		HECS	$5,339
Total:	**$4,367**	**Total:**	**$13,448**

Table 3: A possible investment sharing arrangement for typical articulating students, allowing an enhanced public investment in both sectors.

By comparing Tables 2 and 3, it can be seen that there is a net funding increase of $880 (Business) and $4,367 (Engineering) per student to Higher Education. In addition, the funding to TAFE is more generous than present levels by $850 (Business) and $4733 (Engineering). Financially, both TAFE and Higher Education would benefit from the proposal.

Under such a scheme, it would be necessary to determine the threshold below which students should progress through the pathway Associate Degree. For illustrative purposes, a figure of 65 (TER) has been selected. Based on Figure 3, it can be estimated that approximately 19% of all offers to university in Victoria in 2006 did so with a TER below 65. If it were assumed that 19% of all admissions were also with a TER less than 65, then this would equate to approximately 80,000[3] EFTSL of student load within Higher Education. As such, students would spend half of their total educational duration in TAFE, at any one time 40,000 EFTSL would be involved. Based on a mid-point figure of approximately $3000 (between the Business and Engineering figures shown in Table 3), this would represent a net gain to both sectors of approximately $120M. This effective “additional investment” would increase as the percentage of school leavers seeking university study increases.

[3] Based on DEST data and a total of 400,000EFTSL of student load

8. Conclusions

It is clear that the future economic development of Australia will require an increasingly large proportion of the school-lever population to progress to tertiary education and, in particular, higher education. It is also desirable that the graduates of degree programs not simply have technical knowledge but have independent research skills and the ability to critically analyse and evaluate a range of options. The development of such skills requires an educational system which fosters and enhances independent development. These attributes are presently core to degrees offered by our universities. The development of such attributes does, however, require students to be educationally well prepared. The lack of such preparation will mean that students will ultimately struggle in an “independent learner” environment.

This paper clearly demonstrates that as the number of school-leavers seeking degree-level education increases, an increasing proportion of such students will be educationally poorly prepared. As a result, a high percentage of these students will struggle in their degree studies. In order to meet the needs of Australian society, alternative means need to be found to educate many students in such an expanded Higher Education system.

The data clearly shows that less well prepared students can significantly enhance their performance by progressing to university study through a pathway such as an Associate Degree. In addition, this pathway has financial advantages, thus freeing up resources which can be invested in further developing the quality of both university and TAFE systems. The Associate Degree pathways proposed in the paper will:

- Meet the nation’s needs for an increasing percentage of degree-level graduates
- Enhance the graduation rates of all students
- Provides a cost-effective process to expand tertiary education
- Enables government to further invest in the quality of post-secondary education.