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Australia's tertiary education sector

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Australia's tertiary education sector comprises higher (university) education and vocational education and training (VET). The purpose of this paper is to contrast the two sectors in terms of the way they are defined, their size and recent growth, the characteristics of their student bodies, and access and equity within the two sectors. The paper also considers the links between the two sectors.

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Australia's tertiary education sector comprises higher (university) education and vocational education and training (VET).

Definition

Two aspects define the sectors. These are the awards offered by each, and the nature of the institutions comprising each sector. While people generally consider the two sectors to be distinct, a closer look suggests a considerably more complex situation. Table 1 shows the extent of provision of awards, based on the Australian Qualifications Framework (AQF) classification.

Table 1: Level of education of current study, by type of institution attending ('000)

AQF qualifications		Type of institution		
Higher education awards	VET awards	Higher education	TAFE	Other** institution
Post-graduate degree		104.0	1.0*	5.0*
Graduate diploma or certificate		52.6	11.5	13.5
Bachelor degree		574.7	9.6	14.9
Advanced diploma or diploma	Advanced diploma or diploma	52.3	118.8	41.8
	Certificate III or II	11.1	172.0	26.7
	Certificate I or II	4.1*	36.6	11.3
	Certificate not further defined	8.8	92.9	41.5

Notes: *Estimate has a relative standard error of being 25% and 50% and should be used with caution.
**Includes institutions or establishments that offer educational courses, such as industry skills centres, professional or industry associations and instances where insufficient information was available to determine type of educational institution.

Source: Australian Bureau of Statistics (2001)

The numbers in the table should be taken as indicative only because they reflect the survey methodology (the interview was conducted with any responsible adult on behalf of the whole household) and a specific point in time.[1] However, the point of the table is that it shows clearly that there is no definite distinction between the sectors in terms of providers. Numerous higher education institutions (22 according to the Australian Quality Training Framework) run VET programs while a small number of technical and further education (TAFE) institutes currently offer degrees. Thus the level of the award defines the sectors rather than the provider.[2] As an aside, they are certainly not defined by vocational content—medicine is as vocational as plumbing and the VET sector provides considerable general education.

Size of sectors

Comparing the size of the two sectors is far from straightforward. This is for two reasons. First, the statistical collections for both sectors are not comprehensive. The second reason is that the nature of delivery is very different, with the VET sector offering many more short courses. However, a cursory examination of the higher education sector shows that:

- In 2001 there were 726 000 students, including around 110 000 overseas students.
- The base operating grant for teaching provided by the Department of Education, Science and Training was $4.5b.
- The total Department of Education, Science and Training funding was $5.9b.

[1] Conventionally, VET activity is measured over a year, thus giving more prominence to the large numbers of students doing short courses.

[2] But even here things are not straightforward because of the dual sector diploma and advanced diploma awards. A dual sector award is one with the same title but different descriptors and accreditation arrangements within each sector.

- The total operating revenue for the universities was $10.2b.

By contrast, in the public VET sector in 2001:

- There were 1.7m students.
- The revenue from both the federal government and state governments was $3.2b.
- The total revenue was $4.1b.

Clearly, the VET sector is much larger in terms of students. If those VET students not counted in the public sector figures are included, we are likely to be talking about a sector with three times the number of students than the higher education sector.[3] However, because of the very different nature of provision in the two sectors, using the number of students as a measure of size is not particularly satisfactory. A better comparison is a measure of teaching activity. In the higher education sector the measure used is 'equivalent full-time student units' (EFTSU), while in the VET sector it is teaching hours. Without getting into a debate about the usefulness or otherwise of a standard measure of activity applicable to both sectors, a 'courageous' estimate of equivalent full-time student units is 480 000 for the public VET sector.[4]

Table 2: Estimated EFTSU for students in higher education and VET in 2001

Sector	EFTSU ('000)	Total students ('000)	Student/EFTSU (%)
Higher education	588.2	726.4	1.2
VET	478.7*	1751.4*	3.7

Note: *Excludes credit transfer students.
Source: Unpublished 2001 data from NCVER; Department of Employment, Science & Training (2002)

The conclusion from this is that the public VET sector is of a size roughly equivalent to 80% of the teaching part of higher education. However, the intensity is completely different. In higher education, around 1.2 students make an equivalent full-time student unit. In the VET sector, however, this figure is around 3.7 students. This 'low intensity' attribute of the VET sector is emphasised by a Lorenz curve (figure 1) which plots the cumulative share of hours and students.

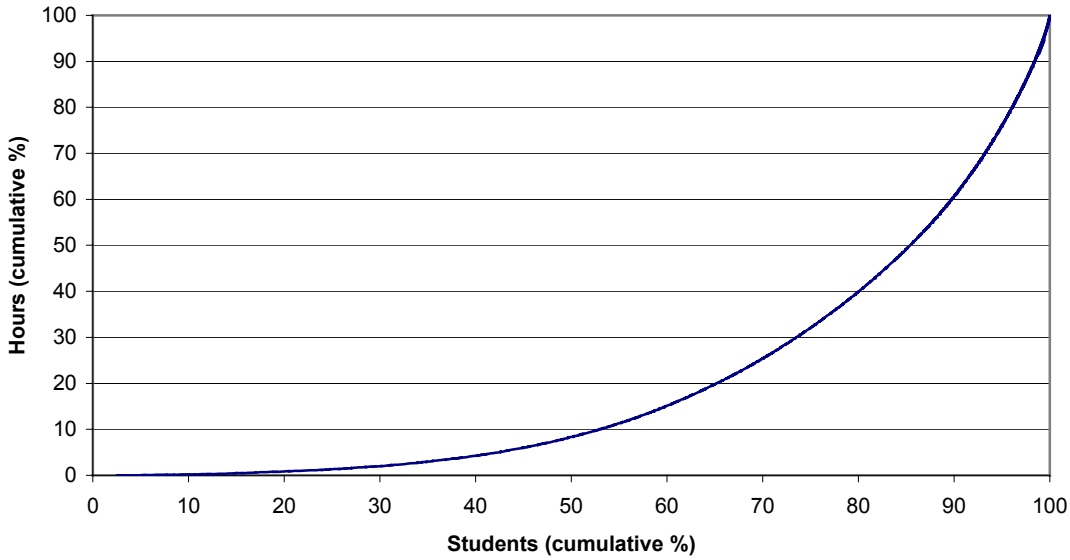
Growth

Both sectors grew substantially in the 1990s, with the higher education sector growing by just under 20% and the VET sector by around 60%, as can be seen from figure 2.

[3] See Karmel (2003) for a discussion of the likely size of the private component of the VET sector.

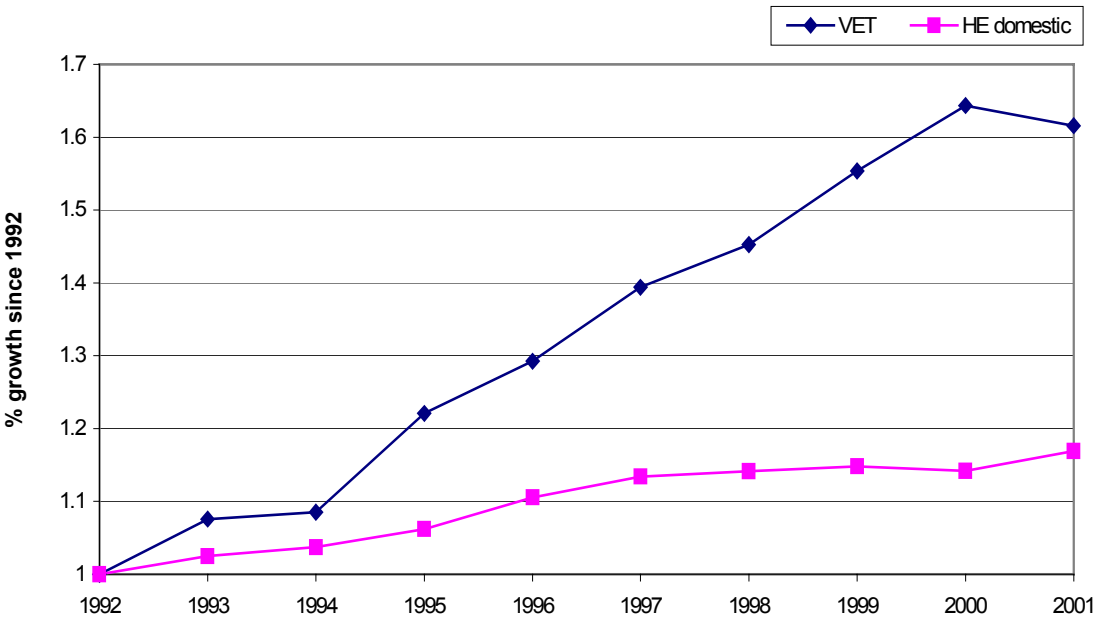
[4] The estimate was obtained by taking nominal hours per student for a year, truncating at 720 hours (considered to be a full-time load) and then dividing by 720. This number should be treated with caution because the nominal teaching hours data have a number of problems. In fact, one of the challenges for VET statistics is to establish a robust measure of activity.

Figure 1: Lorenz curve of students by hours



Source: Unpublished 2001 data from NCVER

Figure 2: Growth in students



The growth in the education sector over a long period has translated into much higher average skill levels in the population. Table 3 makes use of data from the Australian Bureau of Statistics Survey of Education and Training which obtains extensive data about the types and numbers of qualifications possessed rather than highest qualification, the information most usually requested. It is worth noting that the number of qualifications per person has also increased, indicating that the growth in educational participation has resulted in both skill deepening and skill widening.

Table 3: Growth in qualifications, 1993 and 2001

	Qualified people ('000)		Qualifications per person	
	1993	2001	1993	2001
Higher education	993.9	2169.3	1.59	1.74
VET	2903.6	4712.5	1.29	1.45

Source: Australian Bureau of Statistics Confidentialised Unit Record Files (1994, 2002)

Characteristics of students

Not surprisingly, the composition of the two sectors is different. A quick scrutiny of the demographics indicates that:

- The higher education sector is female-dominated while the gender split is more even in VET.[5]
- The VET sector has a much higher representation of older students.
- The VET sector has very few overseas students by comparison with higher education.

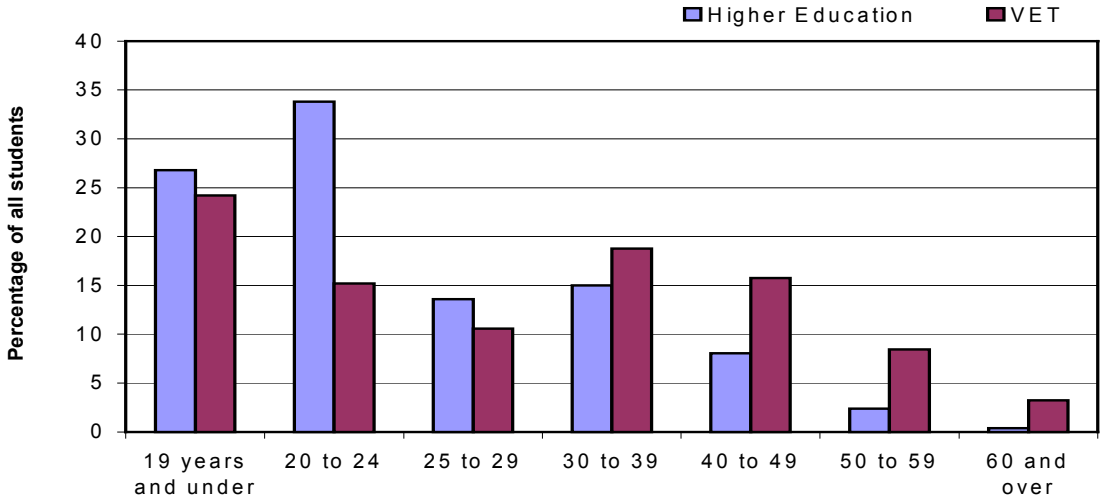
Table 4: Sectors by gender, 2001, percentage

Gender	Higher education (%)	VET* (%)
Male	45.0	51.1
Female	55.0	48.9
Total	**100.0**	**100.0**

Note: *Unknowns distributed on a prorated basis.

Source: Unpublished data from NCVER (2003); Department of Education, Science & Training (2002)

Figure 3: Sectors by age group (%)



Source: NCVER (2002); Department of Employment, Science & Training (2002)

[5] The characteristics are taken from NCVER's public VET collection and the Department of Employment, Science & Training's higher education statistics.

Table 5: Sectors by citizenship, 2001, percentage

Citizenship	Higher education (%)	VET* (%)
Non-overseas	84.5	99.2
Overseas	15.5	0.8
Total	**100.0**	**100.0**

Note: *Unknowns distributed on a prorated basis

Source: NCVER (2002); Department of Employment, Science & Training (2002)

As would be expected, the distribution of courses across fields is quite distinctive in the two sectors (table 6). A number of fields are well represented in both sectors and these are management and commerce, the creative arts and information technology. Nevertheless, each sector also displays specific areas of dominance. For example, in higher education, the relatively strong fields are science, health, education, society and culture, while in VET, they are engineering, architecture and building, agriculture and the environment, food and hospitality and 'mixed field'. 'Mixed field' refers to more general education courses where students take a range of courses.

Table 6: Load by field of education, percentages

	VET hours, 2002	Higher education EFTSU, 2001
Natural and physical sciences	0.6	11.1
Information technology	7.4	9.0
Engineering and related technologies	16.5	6.1
Architecture and building	5.4	2.4
Agriculture, environmental and related studies	5.3	1.4
Health	2.7	9.4
Education	2.0	9.8
Management and commerce	21.4	18.4
Society and culture	14.1	26.4
Creative arts	5.2	7.0
Food, hospitality and personal services	6.7	0.0
Mixed field	11.0	0.1
Subject only	1.6	
Total	**100.0**	**100.0**

Source: Unpublished data from the NCVER data collection; Department of Employment, Science & Training (2002)

Equity

The VET sector has the reputation of being the sector which has more successfully addressed educational disadvantage. Table 5 suggests that, on the whole, this image is justified, although some of the definitions used in the sectors, most notably that applied to non-English speaking background students, make it difficult to draw unequivocal conclusions.[6]

[6] One would have to be very careful in making comparisons in the non-English speaking category. The higher education definition restricts the category to people arriving in Australia in the last 10 years and it is well known that some migrant groups have very high educational aspirations. On the other hand, many recent migrants attend VET to improve English language skills and also to obtain qualifications to ease their transition into the workforce (and indeed these people tend to have higher rates of completing qualifications that the student body as a whole).

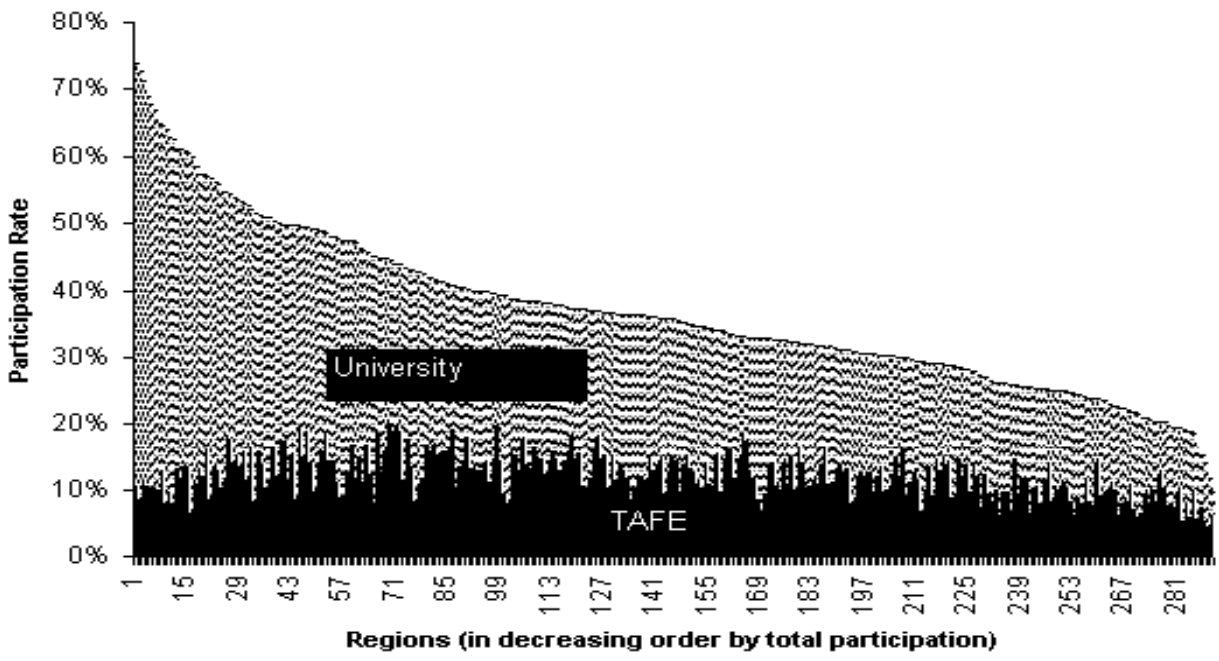
Table 7: Comparison of two sectors in terms of equity groups, 2001

Equity groups	Number of students (%)	
	Higher education	VET
Aboriginal/Torres Strait Islanders	1.3	3.3
Non-English speaking	3.8	19.7
With disability	3.3	3.9
Rural	18.6	30.0
Remote	0.2	3.7
Low economic status	15.3*	25.0*

Note *Comparisons made for the socio-economic status category based on 1999 figures from ANTA (2000).
Source: Unpublished 2001 data from NCVER; Department of Education, Science & Training (2002)

Of particular interest are the large differences in the composition of the student bodies in relation to rural location and socio-economic status. Figure 4[7] (showing participation of the entry-level cohort) and figure 5 indicate that overall participation in VET is remarkably even across regions and across socio-economic groupings. These figures suggest that VET is much more a sector for the whole community rather than one which necessarily focuses on the more disadvantaged groups. That said, the very high Indigenous participation in VET does indicate that it does have a substantial commitment to some disadvantaged groups.

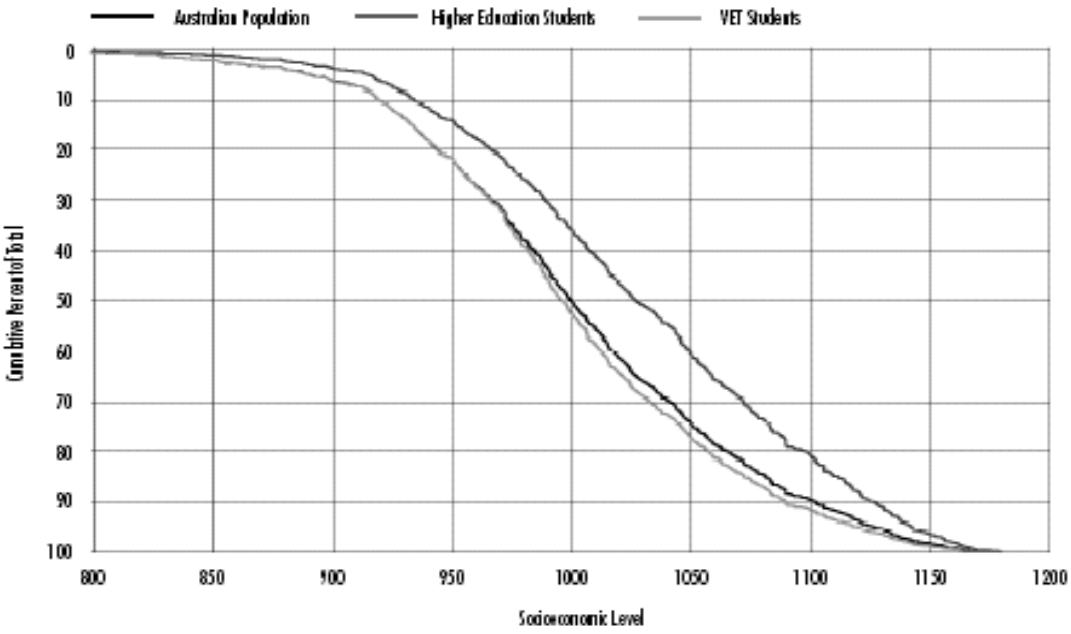
Figure 4: Regional participation in sectors



Source: Stevenson, Maclachlan and Karmel (1999)

[7] This figure is based on participation of 19- and 21-year-olds, as measured by the 1996 census, with region defined as place of residence 5 years earlier. The point-in-time measure gives a relatively low participation for VET.

Figure 5: Higher education, Australian and VET population by socio-economic status, 1999

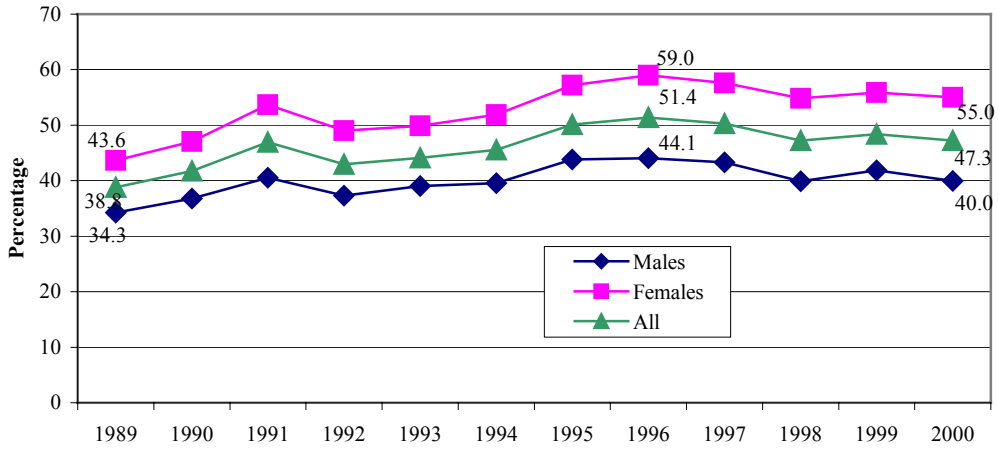


Source: ANTA (2000)

Access

Equity usually focuses on the composition of the student body. Access on the other hand, is concerned with opportunity. One way of looking at this is to calculate the probability of an individual accessing an educational sector at some stage in their lifetime. Because questions relating to prior educational experience are included on the enrolment form of institutions, reasonably good data are available for the higher education sector. Figure 6 indicates that, in fact, access has been declining in the last few years after having reached a peak in 1996.

Figure 6: Lifetime probability of attending higher education, 1989 to 2000

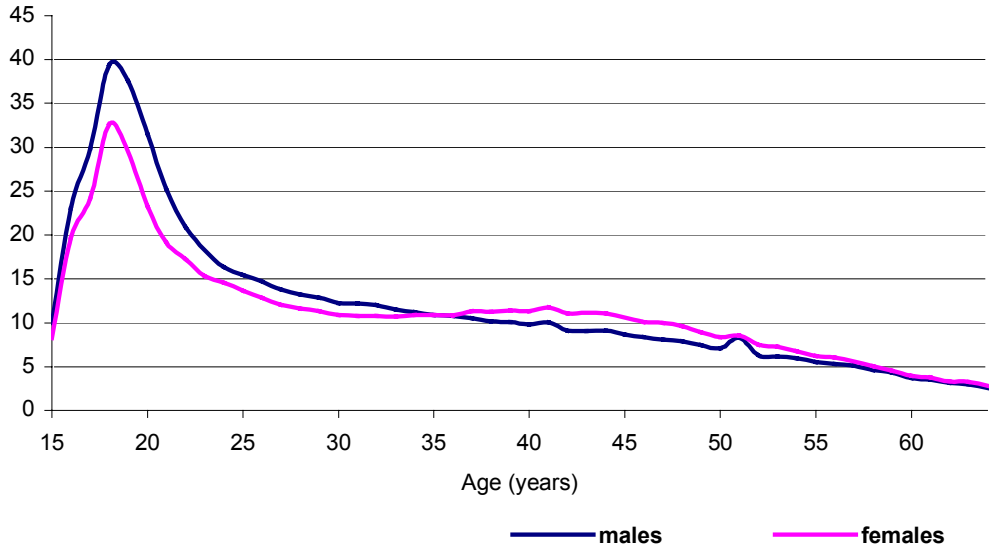


Source: Martin and Karmel (2003)

For the year 2000 at least (the latest year for which calculations have been done), the calculations suggest that lifetime access to higher education for females is 55% and 40% for males.

In the context of the VET sector, simple participation rates indicate that participation is very high, but it is difficult to get a 'lifetime' figure, since the data do not clearly separate commencements. In addition, prior educational experience data are incomplete. However, simple participation rates indicate that access must be high, given that 39% of male 18-year-olds attend VET, as do 33% of that age group for females.

Figure 8: Student participation (%) by age, VET students 2001



Source: Unpublished 2001 data from NCVER

However some calculations based on the participation rates can be usefully undertaken. The estimated number of years a person on average will attend VET is six years. This is equivalent to 1.7 'full-time' years. By contrast, in the higher education sector, the average consumption of higher education is 1.9 years for females and is 1.4 for males. Given that the distribution of courses in VET is heavily skewed toward shorter courses, it would appear that access to VET is substantially higher than access to higher education.

Another way of approaching the issue is to focus on qualifications. By looking at the proportion of persons at different ages we can estimate the rate at which people acquire qualifications, and hence we can derive the likelihood of a person obtaining a qualification over their lifetime. This provides an underestimate of 'lifetime' participation because not everyone who participates completes a qualification. The 1993 and 2001 Australian Bureau of Statistics Surveys of Education and Training provide the data. Unfortunately, published data are in 10-year-age blocks, although the surveys were conducted eight years apart. If it is assumed that eight Australian Bureau of Statistics years are equivalent to 10 real years, some calculations can be undertaken based on a made-up cohort—assuming that the 1993–2001 transitions operate over an individual's lifetime. By way of example, table 8 gives the population with VET qualifications (excluding diplomas). It can be seen that the 15 to 24-year-old cohort had a qualification rate of 11% in 1993, and (by assumption), a 26% rate when the cohort had moved into the 25 to 34-year-old group in 2001.

Table 8: Population with VET qualifications, percentage

Age group	1993	2001
15–24	11	15
25–34	21	26
35–44	18	26
45–54	16	24
55–64	10	23

Source: Derived from Australian Bureau of Statistics Confidentialised Unit Record Files (1994, 2002)

By applying transition probabilities to the 15 to 24-year-old cohort of 2001 it is possible to determine a lifetime probability of obtaining a VET qualification (see the appendix for details). The same process can be applied to corresponding data for diplomas and degrees. Table 9 gives the resulting lifetime probabilities.

Table 9: Lifetime probability of getting a qualification

Qualification	(%)
Degree	28
Diploma	14
VET	42
Diploma or VET	55

Source: Derived from Australian Bureau of Statistics Confidentialised Unit Record Files (1994, 2002)

These calculations suggest that access to VET is considerably higher than access to higher education.

Movement between the sectors

Up to this point, this paper has concentrated on comparing the two sectors. However, it also needs to be acknowledged that there is considerable movement between the sectors—from both VET to higher education and higher education to VET. In terms of the former, in 2001 around 7% (15 000) commencing undergraduate students were admitted to university on the basis of VET study. Of commencing undergraduate students, 11.5% had a TAFE award and 8.8% had other awards. While no reliable data on VET commencing students are available, the numbers going from higher education to VET are large. In 2002, 88 500 VET students had a bachelor or higher degree. A further 24 700 had an advanced diploma or associate degree. (It should be noted that these may be underestimates because of the 40 000 or so 'unknowns'.)

An alternative view of the flow between sectors is provided by, again, the Survey of Education and Training. Table 10 gives the figures of persons with qualifications from more than one sector for 1993, while table 11 gives them for 2001.

Table 10: Persons with cross-sectional qualifications, 1993, percentages

Age group	VET-qualified[8]		Degree-qualified	
	With a diploma	With a degree	With a diploma	With a VET qual.
15–24	5.5	1.0	4.6	3.0
25–34	10.4	2.4	17.0	5.1
35–44	9.7	2.7	24.5	4.7
45–54	12.6	4.6	20.0	10.8
55–64	12.5	3.1	20.2	9.9

Source: Derived from Australian Bureau of Statistics Confidentialised Unit Record Files (CURF) (1994)

[8] This table classifies qualifications into certificates (described as VET qualifications) diplomas and degrees. Diplomas are taught in both higher education and VET sectors.

Table 11: Persons with cross-sectoral qualifications, 2001, percentages

Age group	VET-qualified		Degree-qualified	
	With a diploma	With a degree	With a diploma	With a VET qual.
15–24	4.9	2.6	5.7	6.7
25–34	8.3	5.3	11.1	7.1
35–44	8.8	7.0	16.8	11.4
45–54	10.4	7.3	23.1	11.1
55–64	7.8	5.8	23.8	13.2

Source: Derived from Australian Bureau of Statistics Confidentialised Unit Records Files (CURF) (2002)

These tables demonstrate a number of things. First, the diploma qualification is a sort of 'cross-over' qualification with around 10% of people with a VET having a diploma. For some age groups with a degree, over 20% of people also have a diploma.[9] The second point is the relatively high proportion of people with a degree also having a VET qualification. This is not surprising, given the general picture of VET being such a mass education system, catering for both entry-level training and older persons who already have a high level of education and training. The final point to note, again not surprisingly, is that the proportion of people with a qualification from both sectors is growing. Particularly noticeable is the growth in the proportion of VET-qualified people who also have a degree.

Conclusion

The simple comparisons in this paper emphasise what, in one sense, we already knew—that the two sectors which comprise Australia's tertiary education sector are quite different. They differ in the following ways:

- in the number of students—but not so different in size measured by activity
- in the age profile of students
- in their field of study coverage
- in their coverage of equity groups.

VET can be characterised as being the sector for the whole community, whether by gender or in a lifelong learning sense, or in its regional coverage. It is not so clear the extent to which the VET sector addresses equity issues, although the representation of Indigenous students in VET is very high. The data have shown that, in many instances, VET participation reflects the overall population rather than being skewed toward disadvantaged groups. No doubt this is an area where further investigation would be useful, given that the VET sector covers such disparate courses. It also appears that lifetime access to both sectors is very high, although considerably higher for the VET sector. Finally, the two sectors are not clearly distinct. Dual-sector qualifications, cross-sectoral provision, and the considerable number of people who have attended both sectors, all mean that in many ways it is better to think of Australia's tertiary education sector as a single entity.

[9] It is worth noting the diploma qualification is declining in importance in the higher education sector.

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Appendix: Estimating the lifetime probability of obtaining a qualification

We first estimate transition probabilities, π_i for each of the cohorts. These refer to the probability of obtaining a qualification between 1993 and 2001, assuming that the person did not have a qualification in 1993.

So $\pi_{25-34} = \dfrac{p^{2001}_{25-34} - p^{1993}_{15-24}}{1 - p^{1993}_{15-24}}$

Denote by * the steady state probability based on the 15 to 24-year-old cohort in 2001 and using the 1993–2001 transition probabilities. That is:

$$p^{*}_{25-34} = p^{*}_{15-24} + (1 - p^{*}_{15-24})\pi_{25-34}$$

Similarly

$$p^{*}_{35-44} = p^{*}_{25-34} + (1 - p^{*}_{25-34})\pi_{35-44}$$
$$p^{*}_{45-54} = p^{*}_{35-44} + (1 - p^{*}_{35-44})\pi_{45-54}$$
$$p^{*}_{55-64} = p^{*}_{55-64} + (1 - p^{*}_{55-64})\pi_{55-64}$$

The final probability gives us the 'lifetime' probability of obtaining a qualification.

The transitions are calculated from the following table.

Proportions of population with qualifications

Age	University		Diploma		Other VET		Diploma + VET	
	2001	1993	2001	1993	2001	1993	2001	1993
15–24	0.06	0.04	0.04	0.03	0.15	0.11	0.19	0.14
25–35	0.15	0.08	0.11	0.09	0.26	0.21	0.36	0.30
35–44	0.13	0.07	0.11	0.10	0.26	0.18	0.37	0.28
45–54	0.13	0.05	0.12	0.08	0.24	0.16	0.36	0.25
55–64	0.08	0.02	0.09	0.05	0.23	0.10	0.32	0.15

Source: Derived from Australian Bureau of Statistics Confidentialised Unit Record Files (CURF) (1994, 2002)