
FIELD OF STUDY AND EMPLOYMENT OUTCOMES: AN ANALYSIS OF TAFE GRADUATES

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An important aim of the vocational educational and training system is to improve the employability and employment outcomes of students. The TAFE Student Outcomes Survey allows an investigation of the factors associated with employability of different individuals. Significantly for policy makers, it provides data on the course of study undertaken and institute attended. This paper models the probability that a TAFE student is employed as opposed to unemployed in the following year after graduation. It is found that non-English speaking background and disabled students have significantly lower employment outcomes than other students. One field of study, science—which includes mostly information technology courses—was associated with lower employment prospects than others. A tentative conclusion is drawn that higher-level qualifications result in better employment outcomes.

More than other forms of tertiary education, vocational education and training (VET) is intended to provide students with a pathway into employment. The data on labour force outcomes of TAFE graduates is not encouraging from this perspective. For example, of students who were studying at TAFE for the purpose of entering the labour market, only 66% reported they had achieved

that aim six months after graduating. Of those whose main reason was changing careers or re-skilling, only 61% had achieved their goal (NCVER, 2002). Furthermore, labour force data typically show that university graduates have lower unemployment rates than TAFE graduates, even though TAFE is intended to be more vocationally oriented than university. Australian Bureau of Statistics (ABS) 2001

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census data for Queensland shows that in 2001 persons with a bachelors degree had an unemployment rate of 3.6% compared with a rate of 6.1% and 10.2% for persons with Certificate III or IV, or Certificate I or II respectively.

The type of empirical analysis conducted in this article is valuable, as identifying factors associated with employability can help improve the VET system. The annual Student Outcomes Survey (SOS) conducted by the National Centre for Vocational Education Research (NCVER) provides rich and valuable data for policy analysis. The survey follows up on TAFE graduates and module completers from the previous year. It gathers data on basic demographic variables such as sex, age, ethnicity, course of study, institute attended, qualification obtained, labour force status prior to and during the course, and post-course labour force status and training. Relative to the quality of the dataset, however, only a limited number of studies have made use of the data so far (Afrassa, 2001; Dumbrell, de Montfort & Finnegan, 2001; Misko, 1999; Ryan, 2000).

The aim of this paper is to contribute to the literature with an analysis of factors affecting the employment outcomes of Queensland TAFE graduates in 2000, 2001 and 2002. One of the key problems facing educational institutions internationally is to offer training for occupations for which there is sufficient demand to absorb the supply of graduates. Maglen (2001) has expressed concern that VET may be concentrating on preparing people for occupations vulnerable to global economic developments. Although the fields of study offered by

TAFE institutes are to some extent historically determined, it is incumbent upon TAFE professionals to ensure that courses offered by TAFE will lead to long-term careers that are robust to long-term trends brought about by increasing globalisation. An analysis of employment outcomes by field of study can help identify a lack of demand or an insufficiency of supply.

Labour force status by field of study is presented in Table 1. This table shows that six months after graduation (on average) the unemployment rate for TAFE graduates is 13.8%, but this disguises considerable variation in unemployment rates across different fields of study. For example, graduates from arts, humanities and social sciences have an unemployment rate of 36.4% compared with a rate of 3.5% for veterinary science and animal care; although this does not take into account the fact that some fields of study are more likely to attract already employed persons than others.

In the analysis of TAFE student data, one must be aware of the issue of market segmentation. Different students undertake TAFE study for different reasons. Some undertake it because they are looking for a career; some to get their first job; some to improve their promotion prospects; and some for personal interest. There are also apprentices and trainees who are studying at TAFE as a condition of their employment contract. The employment outcomes of these students are not expected to be the same.

Figures 1 and 2 show basic transition data for Australian TAFE 2000 graduates, based upon data in NCVER (2002). This data shows that—for labour market entrants especially—TAFE is associated more

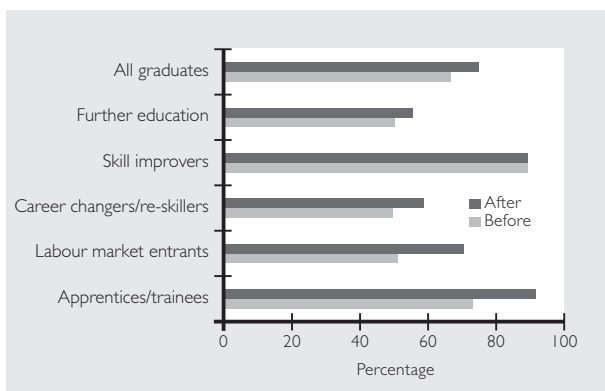


FIGURE 1: EMPLOYMENT-POPULATION RATIO FOR TAFE GRADUATES, BEFORE AND AFTER

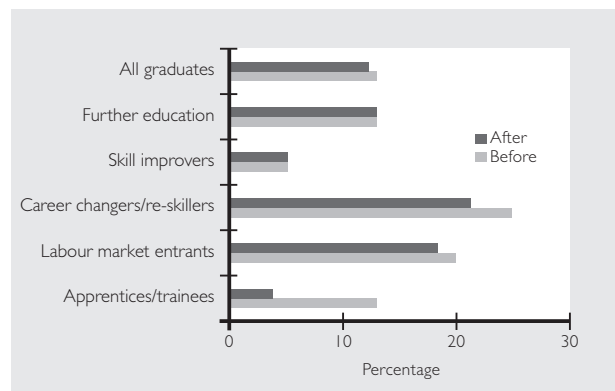


FIGURE 2: UNEMPLOYMENT-POPULATION RATIO FOR TAFE GRADUATES, BEFORE AND AFTER

TABLE 1: LABOUR FORCE OUTCOMES OF TAFE GRADUATES, QUEENSLAND, MAY 2001

Field of study	Persons	Participation rate %	Employment/ population ratio %	Unemployment rate %	Employed Full-time %
Land and Marine Resources, Animal Husbandry	774	85.7	64.6	24.6	69.6
Architecture, Building	836	95.2	89.5	6.0	93.6
Art, Humanities and Social Sciences	1,381	63.1	40.1	36.4	33.6
Business, Administration, Economics	3,692	85.4	70.8	17.1	60.2
Education	1,165	86.1	75.7	12.1	42.7
Engineering, Surveying	2,327	95.1	88.4	7.0	93.4
Health, Community Services	10,250	88.3	80.5	8.8	58.0
Law, Legal Studies	266	89.1	82.0	8.0	45.0
Science	1,500	79.7	56.9	28.6	55.9
Veterinary Science, Animal Care	157	91.7	88.5	3.5	52.5
Services, Hospitality, Transportation	2,766	88.7	72.9	17.8	51.8
VET Multi-Field Education	380	62.4	41.1	34.2	24.4
Total	25,494	86.4	74.5	13.8	61.2

Source: SOS, 2001, NCVER

with increasing employment than with reducing unemployment. This suggests that TAFE may aid the transition of young people into the workforce, but may be less successful in helping the unemployed into employment. The classification used in these figures was developed by the Western Australian Department of Training. It is implemented by combining SOS data on the main reason for undertaking the course with data on sources of income while studying and the student's age. If a student states that they received income from an apprenticeship or traineeship, they are classified as an apprentice/trainee. For all other students they are classified on the basis of their main reason for study combined with age. For example, labour market entrants are graduates under the age of 25, who undertook training 'to get a job or own business'; or under the age of 19, stating they did their TAFE course 'to try for a different career'.

However, what is misleading in Figures 1 and 2 is that graduates with differing times since completion are aggregated together. Graduating from TAFE is not expected to have an instantaneous impact on a person's labour force status. Rather, it is expected to improve an individual's employment prospects, but it will take different individuals varying amounts of time to find jobs. Because the process of job search takes time and graduates are not immediately matched to a job they would like, it takes time for graduates to find work and thus the more time passes the more likely it is that someone will be employed rather than unemployed. The analysis in this article attempts to control for the effect of time since completion, as well as the observable characteristics of TAFE graduates. TAFE graduates differ in many ways including demographic characteristics and their pre-course educational qualifications. For some students, a TAFE qualification may provide them

with just enough of an edge to get a job, and there is anecdotal evidence to suggest that some university graduates are later completing TAFE to get vocational qualifications.

LITERATURE REVIEW

There are several studies that examine the labour market outcomes of VET students, including some that compare these outcomes to those of university students. These studies are reviewed in Dumbrell (2000). However, there is not a significant econometric literature examining the labour force implications of VET that attempts to control for the differing characteristics of students. The most substantial and rigorous study utilising the SOS was undertaken by Ryan (2000), who examined employment outcomes of TAFE graduates along with wage outcomes and compared TAFE graduates with university graduates using Graduate Destination Survey data.

Ryan (2000) found that particular fields of study at TAFE were associated with a higher probability of full-time employment (relative to business administration and economics); namely, architecture and building; engineering; health; and community services. Those from arts, humanities and social science tended to have lower probabilities of full-time employment. Of course, these data do not allow determination of the extent to which these disciplines themselves provide inferior employment outcomes, regardless of the quality of the training. However, Ryan found that arts, humanities and social sciences graduates were subject to lower employment probabilities in the university sector as well.

Ryan explored the impact of past qualification levels on employability, and found that previous qualifications did not improve graduates' employment outcomes, and for females may have had an adverse effect. He speculated that this could possibly be because employers were viewing under-utilised qualifications as a signal of what previous employers thought about their ability. However, Ryan's result is possibly the result of a mis-specified equation. Labour market entrants for the most part can be expected to have no previous qualifications, but this is not necessarily the case for career changers. The inferences that employers draw about previous qualifications will differ between market segments.

A logical extension of Ryan's work is to test for differences between market segments; for example, between apprentices and trainees, and labour market entrants. It is logical to do so because employment is not the goal for several of the market segments—they are already employed and are interested in a career change or obtaining a promotion. For these market segments, the variable indicating whether a person achieved their goal or not may be a more appropriate candidate for a dependent variable. The analysis in this paper is restricted to labour market entrants and apprentices and trainees, for which the outcome variable—getting a job or not—is well-defined. For the other market segments, there is a variable capturing whether they have achieved their objective in undertaking the course, but there is significant ambiguity in the response which can be given, including the options, 'Yes', 'Partly', 'Don't know yet' and 'No.'

Ryan also examined the effect of labour market status during the course on employability and found that employment during the course significantly enhanced later employability. This article is distinct from the Ryan (2000) study, in that it excludes those persons who remain in the same job. After all, it is the new job matches that are interesting and an important goal of the VET system. Thus, employment status during the course is not used as an explanatory variable.

Ryan (2002) conducted another significant study of labour market outcomes of VET students, using 1993 and 1997 data from the ABS's *Survey of Training and Education Experience* and *Survey of Education and Training*. Ryan estimated the effects of various factors on the probability that a graduate would obtain employment. The study shows that completion of a TAFE qualification resulted in improved full-time employment outcomes. Ryan found that demographic factors and field of study also had a significant influence on employment outcomes. Compared with business administration and economics, Ryan did not find significantly better employment outcomes for any other course of study, but did find significantly worse employment outcomes for health; society and culture; natural and physical sciences; architecture and building; and miscellaneous fields for males; and society and culture; and miscellaneous fields for females.

METHODOLOGY

A pooled dataset was constructed by combining data on Queensland TAFE graduates from the 2000, 2001 and 2002 SOS unit record files. Over these three years there was sufficient consistency in the questions asked to enable this pooling to be undertaken. The pooled dataset contained observations on 26,323 TAFE graduates in Queensland over 2000–02.

The dependent variable ‘employed’ is a binary or *dummy* variable taking on the value 1 if a person is employed, and 0 if the person is unemployed. The paper does not focus exclusively on full-time employment, because to some extent hours of work are a matter of choice and many persons may be satisfied working part-time. Persons who had the same employer after the course as during the course were excluded from the sample.

This paper uses a probit model to predict the probability of a person being employed rather than unemployed, based on their characteristics. Because the probit model is non-linear, the parameter estimates do not have the interpretation of slope coefficients that they have in the standard linear regression model. Instead, the derivative of the probability with respect to a specific variable must be worked out. This derivative is called the *marginal effect*, and shows the change in the probability of the outcome associated with a unit change in the right-hand side variable. The modelling strategy employed was to estimate the most general model possible and then to drop variables or groups of variables on the basis of *t*-tests of individual significance and Wald’s tests for the significance of groups of variables. This general-to-specific approach avoids the problem of omitted variable bias, which arises when a specific model is estimated excluding a significant variable.

The SOS dataset provides a substantial number of candidates for independent variables. The variable ‘finish’ measures the time (in months) that has elapsed since the course was completed. Demographic variables include ‘sex’, variables representing different age groups, (e.g. ‘AGE15_19’ for 15 to 19 year olds), ‘ATSI’ (Aboriginal and Torres Strait Islander), ‘NESB’ (coming from a non-English speaking country), ‘language’ (speaking a language other than English at home), and ‘disability’ (persons with a disability). Thus, there are two variables (‘NESB’ and

‘language’) that account for NESB persons. Several studies have found that employment outcomes were not as favourable for NESB as for non-NESB persons (Fan & Antoine, 1999; Tiggemann & Winefield, 1989). Harris (1996) and Le and Miller (1999) found that disability had a negative effect on the probability of employment.

The next set of independent variables captures the prior educational qualifications of TAFE graduates. These variables are equal to 1 if the person had previously obtained the particular qualification. ‘Highsec’ stands for the highest level of secondary school. Owing to limited numbers of apprentices and trainees, and labour market entrants with prior post-school qualifications, a single dummy variable ‘prequal’ was used to stand for whether or not a person had any post-school qualifications.

Two variables are included to capture when a person enrolled in TAFE relative to when they finished secondary school. ‘Stillsec’ equals 1 for those persons who enrolled in TAFE while still at secondary school and ‘WI12M’ equals 1 for those persons who enrolled within 12 months of finishing secondary school. These variables are potentially significant. As McKenzie (2000) showed in an analysis of the Longitudinal Survey of Australian Youth, longer-term labour force outcomes were superior for young persons who either continued studying or obtained full-time employment in the year after leaving school. Less successful transitions were made by young persons who in their first year out of school were either unemployed, not in the labour force, or only working part-time.

Three sets of variables relate to the course of study:

- There are variables for the actual qualification obtained (‘diploma’: advanced diploma and diploma; ‘cert4’, ‘cert3’: certificates IV and III; and ‘basicvoc’: certificates II and I).
- Each TAFE institute has a dummy variable, with the labels running from ‘institut1’ to ‘institut14’.
- There are dummy variables for the different fields of study.

The field of study variables are defined as follows: ‘land’ (land and marine resources, animal husbandry); ‘arch’ (architecture, building); ‘art’ (arts, humanities and social sciences); ‘busadmin’ (business administration, economics); ‘educ’ (education); ‘eng’

(engineering, surveying); 'law' (law, legal studies); 'science' (science); 'vetsci' (veterinary science, animal care); 'serv' (services, hospitality, transportation); and 'multi' (VET multi-field education). It is expected that employment outcomes will differ significantly by field of study.

The unemployment rate pertaining to the labour force regions corresponding to postcode of usual address was included as the control variable 'urate', as in Ryan (2000), with annual average rates for 2000, 2001 and 2002 taken from the ABS Labour Force Survey (ABS, 2003). Other variables include 'bef_un' for an unemployed person before the course; 'bef_nilf' for not in the labour force before the course; 'fulltime' for whether a person studies full-time or not; and 'jobfinal' as a dummy for whether the person had a job in their final semester or not. Finally, there is a constant term, 'cons', included in the model.

RESULTS

Parameter estimates for the final probit models are presented in Table 2 for labour market entrants and in Table 3 for apprentices and trainees. These models were chosen after several iterations of a general-to-specific modelling procedure, as discussed above.

Labour market entrants

The sample used for estimation consisted of observations on 1685 Queensland TAFE graduates. The overall model was significant, with a chi-squared value of 259.3 for 27 degrees of freedom. The pseudo-R-squared was 0.1445, which means that the model explains about 14 per cent of the observed variation in the dataset. So the overall model is statistically significant, but its ability to predict whether or not a particular person is employed or unemployed is limited. This may be so, but significant parameter estimates will still show whether or not particular factors have a positive or negative impact on employability. Also, it should be noted that pseudo-R-squared measures are not necessarily meaningful in non-linear models, and the recorded R-squared is of a magnitude typically recorded for these models.

As expected, the 'finish' variable is statistically significant. The marginal effect estimate indicates that for every additional month since finishing a course, a person's probability of being employed increases by 1.7 per cent. These estimates are reported in the

marginal effects coefficient column of Table 2.

Groups of variables that proved insignificant were the variables capturing previous educational qualifications of the graduates, which was a somewhat surprising result, although it accords with Ryan's (2000) findings. Perhaps people who have come to study at TAFE have done so because their previous qualification has not got them where they would like to be, and by going to TAFE it is as if they are starting again, although this is merely speculative.

The basic demographic variables showed some interesting results. The sex and age variables were not significant. Nor was 'disability' or 'ATSI', although it should be borne in mind that because the dataset contains small numbers of ATSI and disabled persons it is less likely that a significant relationship would be found. However, 'language' was found to be significantly negative, with a person who does not speak English at home having an 11.1 per cent lower probability of finding employment after the course. It may be in the interests of employment equity to allocate extra resources to TAFE in order to help the transition into employment of NESB graduates.

Although qualifications obtained prior to the course do not significantly affect employment outcomes, labour force status before the course is a significant determinant ('bef_un' and 'bef_nilf'). Those persons who were not in the labour force before the course had an 8.2 per cent lower probability of being employed after the course, and those who were unemployed had a 15.6 per cent lower probability of being employed. Experience gained in employment before a course of study will certainly enhance a person's employability.

One TAFE institute was found to have significantly worse employment outcomes than the others. This should not be taken immediately as evidence that a particular institute is underperforming, given that the unemployment rate variable will only be imprecisely controlling for the labour market conditions facing graduates in different regions. In order to assess the effectiveness of particular institutes, a more detailed analysis would be required, possibly involving Data Envelopment Analysis as in Abbott and Doucouliagos (2002).

In accordance with what was expected, the level of qualification has a significant impact on the probability of employment, with persons gaining a

TABLE 2: PARAMETER ESTIMATES FOR PROBIT MODEL—LABOUR MARKET ENTRANTS

Variable	Coeff.	Robust s.e.	z	P-value	Marginal effects			
					Coeff.	Robust s.e.		
FINISH	0.0544	**	0.0128	4.2604	0.0000	0.0174	**	0.0041
LANGUAGE	-0.3223	**	0.1208	-2.6675	0.0080	-0.1112	**	0.0443
BEF_UN	-0.4648	**	0.0853	-5.4500	0.0000	-0.1562	**	0.0297
BEF_NILF	-0.2454	**	0.0966	-2.5402	0.0110	-0.0819	**	0.0334
STILLSEC	0.2774	**	0.1319	2.1033	0.0350	0.0818	**	0.0354
W112M	0.3236	**	0.0784	4.1286	0.0000	0.1048	**	0.0256
DIPLOMA	0.2551	**	0.0925	2.7582	0.0060	0.0786	**	0.0273
ENG	0.3851	**	0.1199	3.2118	0.0010	0.1106	**	0.0303
SCIENCE	-0.6302	**	0.1163	-5.4200	0.0000	-0.2279	**	0.0451
HEALTH	0.2297	*	0.1192	1.9273	0.0540	0.0690	*	0.0334
INSTIT1	0.0739		0.2097	0.3522	0.7250	0.0231		0.0639
INSTIT2	0.0492		0.1865	0.2637	0.7920	0.0155		0.0578
INSTIT3	0.0515		0.1827	0.2821	0.7780	0.0162		0.0566
INSTIT4	0.1296		0.1676	0.7733	0.4390	0.0399		0.0495
INSTIT5	0.1507		0.1747	0.8630	0.3880	0.0461		0.0509
INSTIT6	-0.0516		0.1639	-0.3146	0.7530	-0.0167		0.0538
INSTIT7	0.2126		0.2099	1.0129	0.3110	0.0633		0.0577
INSTIT8	-0.0525		0.1591	-0.3297	0.7420	-0.0170		0.0523
INSTIT9	0.0752		0.3826	0.1965	0.8440	0.0234		0.1161
INSTIT10	-0.1653		0.1570	-1.0532	0.2920	-0.0551		0.0543
INSTIT11	-0.3344	**	0.1666	-2.0073	0.0450	-0.1160	**	0.0617
INSTIT12	-0.0379		0.2045	-0.1854	0.8530	-0.0123		0.0669
INSTIT13	0.1810		0.2023	0.8946	0.3710	0.0549		0.0578
INSTIT14	0.2880		0.1889	1.5244	0.1270	0.0838		0.0494
FULLTIME	0.2033	**	0.0729	2.7888	0.0050	0.0656	**	0.0237
JOBFINAL	0.6023	**	0.0864	6.9738	0.0000	0.1794	**	0.0235
URATE	-0.0601	*	0.0306	-1.9626	0.0500	-0.0192	*	0.0098
CONS	0.2752		0.2890	0.9522	0.3410	0.0000		0.0000
Observations			1685					
Observed			0.7134					
Predicted			0.7472					
Log likelihood			-863.7					
Chi-square (27 d.o.f.)			259.3					
Pseudo-R-squared			0.1445					

Note: * Significant at the 10 per cent level

** Significant at the 5 per cent level

diploma having a greater chance of employment than someone who gains only lower level qualifications. In contrast, Ryan (2000) did not find the level of qualification significant.

From a policy perspective, an interesting result is the significant increase in the probability of employment that results from enrolling in a TAFE course within 12 months of leaving secondary school,

as Ryan (2000) also found. Students who do not interrupt their education and training are probably better off than those who do, and will experience a smoother transition. This is in line with the findings in McKenzie (2000).

Engineering and surveying was the only field of study found to have better employment outcomes than the others. At the 10 per cent level of significance, health was positively associated with employability. However, being only at the 10 per cent level of significance it would be unwise to make any recommendations based on this finding. Science was the only field of study found to perform worse, and was significantly negative at the 5 per cent level of significance. The great majority of TAFE science graduates, about 90 per cent, studied computer science and information systems.

A likelihood ratio test was conducted to determine if the same model applied to males and females—as Ryan (2000) did and concluded that separate models

were needed. However, here the null hypothesis that the same model applied could not be rejected at the 5 per cent level of significance, so separate models for male and female labour market entrants were not estimated.

Apprentices and trainees

Similar factors were found to influence employment outcomes of apprentices and trainees as for labour market entrants. Apprentices and trainees on average had better employment outcomes than labour market entrants, but time since finishing was not as strong a determinant as for labour market entrants—with each month since graduation increasing the probability by only 0.8 per cent. Also, as for labour market entrants, the previous labour force status variables and the variables indicating how close a person enrolled was to finishing school were significant.

Age was a significant predictor for apprentice and trainee outcomes. An apprentice or trainee aged 25–34

TABLE 3: PARAMETER ESTIMATES FOR PROBIT MODEL - APPRENTICES AND TRAINEES

Variable	Coeff.	Robust s.e.	z	P-value	Marginal effects			
					Coeff.	Robust s.e.		
FINISH	0.0327	**	0.0120	2.7342	0.0060	0.0079	**	0.0029
AGE25_34	0.3257	**	0.1382	2.3566	0.0180	0.0697	**	0.0258
ATSI	-0.2715		0.1690	-1.6066	0.1080	-0.0737		0.0506
COUNTRY	-0.5740	**	0.1616	-3.5531	0.0000	-0.1728	**	0.0569
DISABILITY	-0.4771	**	0.1974	-2.4177	0.0160	-0.1406	**	0.0675
BEF_UN	-0.6183	**	0.1033	-5.9845	0.0000	-0.1789	**	0.0339
BEF_NILF	-0.3984	**	0.1376	-2.8945	0.0040	-0.1114	**	0.0430
STILL_SEC	0.3909	**	0.1476	2.6481	0.0080	0.0819	**	0.0262
W112M	0.3345	**	0.1044	3.2028	0.0010	0.0775	**	0.0230
BASICVOC	-0.1815	*	0.0930	-1.9507	0.0510	-0.0449	*	0.0234
ARCH	0.4855	**	0.1855	2.6174	0.0090	0.0955	**	0.0281
CONS	0.7394	**	0.1353	5.4646	0.0000	0.0000	**	0.0000
Observations			1297					
Observed			0.8196					
Predicted			0.8404					
Log likelihood			-555.0					
Chi-square (11 d.o.f.)			111.0					
Pseudo-R-squared			0.0935					

Note: * Significant at the 10 per cent level

** Significant at the 5 per cent level

had better employment outcomes than trainees or apprentices of other ages.

For apprentices and trainees, the 'NESB' variable was significantly negative, confirming that NESB persons remain disadvantaged. The 'ATSI' variable was insignificant, but was very close to being significant at the 10 per cent level. 'Sex' was not significant.

The qualifications variables show that those apprentices and trainees who only complete a basic vocational qualification have a 4.5 per cent lower employment probability than those who complete a Certificate III—providing additional evidence that there are employment benefits in having higher qualifications. As for labour market entrants, the pre-course qualification dummy variable was not significant at conventional levels, and so was dropped from the model. The 'fulltime' variable and the institute variables were found not to be significant for apprentices and trainees.

SUMMARY

This paper has focused on identifying factors that are associated with an increased probability of employment of TAFE graduates. The results indicate that, after controlling for qualifications, NESB and disabled persons are still disadvantaged in obtaining employment. There is no evidence of disadvantage amongst ATSI jobseekers or mature-aged apprentices and trainees.

The analysis shows that one field of study—science (mostly computer science and information systems)—achieves poor employment outcomes for TAFE graduates. This analysis was conducted at a very broad level and a more detailed analysis would be required before any firm conclusions should be drawn, although it may suggest that employers value university qualifications in this field more highly than TAFE qualifications. However, it should be noted that Ryan (2000) found that it was the arts, humanities and social sciences field of study that was associated with poorer employment prospects. This difference in findings between the two studies may reflect the fact that this study controls for market segmentation. Labour market entrants will be careful to choose courses that provide employable skills, and a low proportion of humanities students in the labour

market entrant strata may make it difficult to discern any effect on employability.

The methodology in this paper is valuable in that it can identify subject areas and, possibly, particular TAFE institutes that may be performing better or worse than average (controlling for regional unemployment rate differences). This may confirm other evidence of superior performance and may allow further investigation into factors associated with better employment outcomes. However, this is not to deny that there are other broader social objectives associated with VET that are not reflected in a focus on employability, but merely affirms that employability of graduates remains a significant goal of VET and indeed is one of the main selling points of VET to students.

Apart from focusing solely on graduates and excluding module completers, the most significant limitation of this study, and any study using SOS data, is that it examines short-term outcomes only. As Dumbrell (2000, p. 31) noted:

No ongoing process exists for assessing whether any longer-term outcomes are achieved, despite the strong feeling of many VET providers that longer-term changes are of greater educational significance.

The recently commenced longitudinal Household, Income and Labour Dynamics Australia (HILDA) survey will be helpful in addressing this deficiency (Wooden & Watson, 2002).

This article has utilised pooled data from several years of the SOS survey, but for the state of Queensland only. It must be acknowledged that the results may not necessarily apply in other states, although the findings in this article tend to mostly confirm Ryan's (2000) findings based on a national dataset, but which did not allow for market segmentation.

The development of a national pooled dataset based on the SOS will allow longer-run trends in VET student outcomes to be discerned. This of course will require a continued commitment of NCVET to the survey and consistency in the survey questions. Provided this occurs, the existence of such a rich dataset over a number of years augurs well for VET research in Australia.

Acknowledgement

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REFERENCES

- Abbott, M., & Doucouliagos, C. (2002). A data envelopment analysis of the efficiency of Victorian TAFE institutes. *Australian Economic Review*, 35(1), 55–69.
- Afrassa, T. M. (2001, March, 28–30). *Student level factors that influence the employability of TAFE graduates over time: A partial least squares analysis*. Paper presented at the 4th National Conference of the Australian Vocational Education and Training Research Association, Adelaide, Australia. Retrieved May 4, 2004, from www.avetra.org.au/abstracts_and_papers_2001/afrassa_full.pdf
- Australian Bureau of Statistics. (2001). *Census of population and housing, usual residents profile* (Cat. No. 2004.0). Unpublished data.
- Australian Bureau of Statistics. (2003). *Labour Force Australia* (Cat. No. 6203.0). Unpublished data.
- Dumbrell, T. (2000). *Review of research: Measuring the outcomes of vocational education and training*. Adelaide, SA: National Council of Vocational Education Research.
- Dumbrell, T., de Montfort, R., & Finnegan, W. (2001). *Outcomes for vocational education and training diploma and associate diploma students*. Adelaide, SA: National Council of Vocational Education Research.
- Fan, C., & Antoine, E. (1999). Predictors of employment destinations for university graduates. *Australian Journal of Career Development*, 8(2), 17–24.
- Harris, M. (1996). Modelling the probability of youth unemployment in Australia. *Economic Record*, 72(217), 118–29.
- Le, A., & Miller, P. (1999). *A risk index approach to unemployment: An application using the survey of employment and unemployment patterns*, Occasional Paper. Canberra, Australia: Australian Bureau of Statistics.
- Maglen, L. (2001). *Australians Working in a Global Economy and What This Means for Education and Training*, Working Paper No. 39. Melbourne: CEET.
- McKenzie, P. (2000). *Pathways for Youth in Australia*, Working Paper No. 31. Melbourne: CEET.
- Misko, J. (1999). Different modes of delivery – Student outcomes and students' perspectives. 2nd National Conference of the Australian Vocational Education and Training Research Association, conference proceedings.
- NCVER (National Centre for Vocational Education Research) (2002). *TAFE Graduates: Do They Get What They Want From Training?* Adelaide, SA: Author.
- Ryan, C. (2000). *Where to Next? Graduate Outcomes From the Australian Higher Education and Vocational Education and Training Sectors*. Adelaide, SA: National Council of Vocational Education Research.
- Ryan, C. (2002). *What are the Longer-term Outcomes for Individuals Completing Vocational Education and Training Qualifications?* Adelaide, SA: National Council of Vocational Education Research.
- Tiggemann, M. & Winefield, A. (1989). Prediction of employment, unemployment, and further study among school-leavers. *Journal of Occupational Psychology*, 62, 213–221.
- Wooden, M. & Watson, N. (2002). The HILDA survey: What's in it for economists? *Australian Journal of Labour Economics*, 5, 397–417.



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THEORY AND PRACTICE

This section is designed as a brief professional review of the article. It provides relevant study questions and answers for readers to test their knowledge of the article.

Why is it important to relate the employment outcomes of TAFE students to their field of study and qualification obtained?

Answer: Taxpayers provide significant resources to TAFE institutes with the goal of improving the employability of students. If some fields of study enhance employability more than others, then resources should be reallocated to these fields. If higher qualifications are shown to enhance employability, then the attainment of higher qualifications should be encouraged.

What possible reason is there for the below average employment outcomes of TAFE information technology graduates?

Answer: TAFE information technology graduates are competing for jobs with university trained graduates. Employers may value university qualifications in information technology more than TAFE qualifications.

What could explain the finding that arts, humanities and social science graduates do not have below average employment outcomes, in contrast to a previous study?

Answer: Previous studies have included persons who are studying for personal interest and not to improve employability. If these persons are over-represented in arts, humanities and social science, then the estimate of the effect of this field of study on employability could be biased. In contrast, this study has focused on labour market entrants and apprentices and trainees.

What do the results of the paper suggest about the virtues of students having a gap year?

Answer: The results suggest that a gap year is not a good idea because students who enrol in TAFE within 12 months of leaving school have better employment outcomes than those who do not. Previous studies have also found benefits for students who do not interrupt their education.