Factors Predicting Completions in Vocational Education and Training in Australia

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Factors affecting subject completion rates in Australia's diverse, multicultural TVET system

1 Introduction

The context for this paper is the Australian technical and vocational education and training system (TVET). On the one hand, the paper is about some specific aspects of system management and performance monitoring. On the other hand, it is about assessment outcomes in TVET in a multicultural society. What the material presented in this paper shows, most importantly, is the need to take the diversity of the student population into account in system management and performance monitoring.

Australia is a relatively young country with a genuinely multicultural society. Non-indigenous settlement began in 1788. The indigenous Aboriginal and Torres Strait Islander peoples are now an important minority group, comprising about 2% of the total population. Many of the programmes conducted by TVET providers in Australia are designed specifically for indigenous Australians.

The non-indigenous inhabitants of Australia are drawn from countries all around the world. Although English-speaking migrants from the United Kingdom and Ireland have historically comprised the largest single group, very large numbers of Australians have been drawn from other countries and ethnic groups. This has been particularly so in the period since 1945. In the 1950s and 1960s large numbers of Europeans migrated to Australia, and since the early 1970s immigrants from the Asia-Pacific region have increased in importance. In recent years the emphasis of Australia’s immigration programme has been on ameliorating identified skills shortages in the Australian workforce, and the annual migrant intake has been reduced.

None-the-less, at the 1996 census, approximately 23% of Australians were born outside Australia, and approximately half of this group were born in a country where English is not the major language. Also, as a result of earlier immigration, a similarly large number of Australians have parents who were born outside Australia.

The publicly-funded TVET system in Australia makes an important contribution to skills development in the Australian workforce. Many of the programmes offered are designed specifically for indigenous Australians, migrants and Australians whose first language is not English.

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1 Paper prepared for the 2000 annual conference of the International Association for Educational Assessment, Jerusalem, Israel, 15 to 19 May 2000. Author: Brian Knight, Manager Data Reporting and Analysis, National Centre for Educational Research Ltd, 252 Kensington Rd, Leabrook SA 5068, Australia (e-mail bknight@ncyer.edu.au, fax +61 (0)8 8331 9211). The views expressed are those of the author and may differ from the views of agencies mentioned in this paper. The author wishes to acknowledge the Western Australian Department of Training and Employment for permission to base this paper on work undertaken for the Department.

2 The term 'vocational education and training' (VET) is generally used within Australia. However, for the purposes of this paper, the synonymous international term 'technical and vocational education and training' (TVET) will be used.

3 Source: Australian Bureau of Statistics, CDATA96.

4 TVET in Australia includes all programmes intended to develop work-related skills or to prepare students for such programmes, but excluding all higher education programmes and general education programmes provided in secondary schools. In terms of the levels specified in the Australian Qualifications Framework (AQF), TVET spans the range AQF certificate I, II, III and IV and AQF diploma and advanced diploma. The majority of TVET programmes are at AQF certificate III and IV levels.
Participation in TVET in Australia is high. In 1997 and 1998 almost 12% of the working age population of 15 to 64 year olds undertook TVET programmes with providers in receipt of public funds. A large but unknown number of Australians undertake TVET outside the publicly-funded system. The participation rate for indigenous Australians is above the national rate, with the proportion of TVET students who identify as indigenous Australians above their proportion in the total population.

It is true to say that the Australian TVET system is characterised by enormous diversity and flexibility. A very wide range of programmes are offered at a variety of levels, and these are undertaken by learners of all ages. Moreover, there are many different modes of participation (for example, full-time, part-time, apprenticeship, traineeship and undertaking TVET while still attending secondary school) and different modes of programme delivery (for example, traditional lock-step learning in a classroom, self-paced learning, learning in the workplace and distance learning). Most of the training and assessment in TVET in Australia is competency-based. Assessment is undertaken by providers against defined competency standards, and is generally unmoderated and ungraded.

Publicly-owned TVET colleges (mostly known as institutes of technical and further education, or TAFE) are usually independently managed but receive funding from a State or Territory (state) training authority to deliver TVET programmes. In most states, colleges are bound by annual performance agreements which specify the amount and type of training to be provided each year.

During the last decade there have been moves to introduce performance measures at the national, state and college levels into the Australian TVET system. At college level these have generally involved basing part of a college's funding on meeting agreed performance criteria, such as subject completion rates or measures of student satisfaction. It should be noted that at the present time only a minority of states include subject completion rates in their college funding formula, although virtually all states require colleges to meet agreed delivery targets.

Although successful subject completion rates in the Australian TVET system are high, typically 70% or more, only a minority of students complete a full course which leads to a recognised qualification. It would appear that the majority of students elect to obtain specific skills by completing selected subjects rather than completing a full qualification. Consequently, the truest indication of system outputs at the present time is provided by subject rather than course completions. A course-based funding model, such as that used by the Further Education Funding Council in the United Kingdom, would not be appropriate in the Australian TVET system.

The present paper is based on a multivariate analysis of the factors predicting subject completion rates in the state of Western Australia. This study was undertaken by the National Centre for Vocational Education Research Ltd (NCVER) on behalf of the Western Australian Department of Training and Employment (WADTE), one of the eight state training authorities in Australia.

For a fuller discussion of competency-based training and assessment in Australia, see Dickson and Bloch.

For a more detailed overview of the Australian TVET system see Alto et al, appendix on Australia. Issues relating to course and qualification completions are currently being addressed through a number of national projects being undertaken by the Australian National Training Authority (ANTA).

Report entitled ‘Multivariate Analysis of WA Department of Training Module Load Completion Rates’, National Centre for Vocational Education Research Ltd, Adelaide, 1999 (unpublished). The term ‘subject’ has been used throughout the present paper, although the term ‘module is more usual in the Australian vocational education and training system.

The NCVER is Australia’s primary research and development organisation in the field of technical and vocational education and training. NCVER undertakes and manages research programmes and monitors the performance of Australia’s training system. The NCVER provides a wide range of information aimed at improving the quality of training at all levels.
The study was one of a number commissioned by the WADTE to provide background information to assist in the development of arrangements to include subject completion rates in the funding formula for the colleges within the Department's jurisdiction. The WADTE envisaged that approximately 10% of each college's funding would be based on maintaining or improving subject completion rates. This initiative has since been implemented.

The main purpose of the study was to identify the factors which predict subject completion rates in Western Australia, and to use multivariate analysis to determine which of these factors are of greater importance. However, preliminary analysis of the data identified some specific student groups who needed to be excluded from the data before a meaningful analysis could be undertaken. The study also revealed some significant implications for colleges and the WADTE. The extent to which the conclusions of the study apply in other states of Australia has not been investigated.

2 Methodology

The factors for which information is available in college databases and might predict completion rates can be broadly identified as falling into three groups:

- Student variables, such as sex, age and full-time/part-time.
- Study programme variables, such as WADTE course level and group.
- College variables, either individual campuses or college classifications such as metropolitan/non-metropolitan or large/medium/small.

Details of all the variables used in the analysis are provided in the appendix.

Significantly missing from the list of available student variables is an explicit measure of 'student ability'. Although a highest education level is available for most students and does provide a surrogate indicator of student ability, in the discussion which follows there will be situations in which differences in outcome are due to differences in student ability.

The report presented to the WADTE explores the relative strength of the three groups of variables as predictors of subject completion rate measures. The two measures considered in the report are:

- Subject load completion rate (SLCR), the proportion of 'annual hours' undertaken which are successfully completed.\(^9\)
- Subject completion rate (SCR), the proportion of subjects undertaken which are successfully completed.

SLCR is the measure most commonly used, as it is weighted to take account of differences in annual hours among subjects. In practice, there is very little difference between SLCR and SCR at high levels of aggregation.

The nature of SLCR, as an aggregate intended for broad planning purposes, places logical limits upon what can be learned about the predictor variables. For example, since SLCR includes within itself the length of a subject measured in terms of standard curriculum hours, subject length will automatically be a partial predictor of SLCR, but as a result of definition as much as any other cause. However, this analytical difficulty can be overcome by focusing on the subject completion rate (SCR) rather than the subject load completion rate (SLCR). Because of this, and for other technical reasons, some of the analyses in the study are undertaken for SCR rather than SLCR. The conclusions, however, apply equally to both.

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\(^9\) Annual hours are the standard curriculum hours for each subject when undertaken in normal, supervised classroom delivery mode, although some students undertake subjects in self-paced learning or flexible delivery modes.
In the report to the WADTE, preliminary investigations are based upon the use of standard descriptive and presentation techniques. At the next stage the joint effects of two predictor variables (factors) are explored. Finally, an analysis which ranks the predictor variables in order of their importance in distinguishing better SLCR values from worse ones was used, for a limited data set, to identify those factors which most strongly predict subject completions.

The use of a limited dataset for the study is warranted by the subject completion patterns for indigenous students and students undertaking adult literacy and English as a second language programmes, which are very different from those of other students (section 5).

3 Measurement of subject completion rates

The WADTE uses the following formula for the annual SLCR for each college:

\[ \frac{\text{Total hours for successfully completed subject enrolments}}{\text{Total hours for result-due subject enrolments}} \]

Only training activity which is funded by the WADTE is included. This means that enrolments funded from other sources (overseas full-fee paying students, for example) and training activity associated with college commercial operations (for example, fee-for-service activity) are excluded.

The WADTE formula for SLCR has a number of important advantages over other approaches:

- It ensures that all subject enrolments which lead to a recognised output, including subject assessments conducted for the purposes of recognition of prior learning, are included as successful completions.
- It ensures that all result-due enrolments are included in the delivery base, but excludes enrolments where an outcome could not reasonably be expected at the cut-off date. This includes correspondence enrolments in their first year and enrolments in flexible delivery and self-paced learning modes where the student enrols late in the year.
- Since any unreported successful outcomes are included in the denominator but not in the numerator, they reduce and cannot increase the calculated SLCR. This means that colleges can only gain from ensuring that all enrolments are resulted and reported by the due date.

Internally, the WADTE colleges use a common set of subject outcome codes which, for the purposes of national reporting, are mapped to national codes as specified in the Australian Vocational Education and Training Management Information and Statistical Standard (AVETMISS). Through its involvement in national quality assurance and auditing activities, the NCVER has noted that the use of a common set of internal outcome codes promotes a higher level of consistency in reporting at state level than is achievable in systems where providers use locally developed outcome codes.

The use of a common set of outcome codes with common definitions across the WADTE colleges lends an important, and necessary, degree of consistency and standardisation to the available subject outcomes data. Without this, it would be difficult for the WADTE to implement and maintain a system of college funding and performance measurement which includes components for subject completions.

Valid and reliable subject outcomes information will be needed if college funding criteria or performance measures are to include the subject load completion rate. The report to the WADTE emphasised that in order to promote validity and reliability it is important to preserve the use of a common set of outcome codes and definitions within the Western Australian TVET system.
4 Materiality

A fundamental issue for the study is what constitutes a material difference. For example, is a state SLCR of say 73.2°lo for males materially different from a SLCR of say 73.5°lo for females, a difference of 0.3 percentage points? In the study, three somewhat different approaches have been used to address this question:

Setting a threshold difference for materiality: in the report a difference of 5% or more of the observed value is regarded as material, on the grounds that at least one student in 20 is likely to be affected. On this basis, for example, SLCR of 73.8% is regarded as materially higher than 70.0% (since 5% of 70.0 is 3.5), while 72.0% is not.

Estimating the 'net effect': In this approach a factor which affects SLCR by more than, say, ±1 percentage point when the associated subject outcomes are removed from the calculation of SLCR has been regarded as material. It is acknowledged that the choice of the threshold value in this approach is arbitrary.

Using inherent data relationships to identify significant factors: a much more advanced approach to the analytical problems faced here is to use classification and regression tree analysis (CART) to identify hierarchies and sequences of factors in the data in which the observed relationship between subject completions and potential predictors could not reasonably be attributed to chance. The order in which the predictors are identified by this procedure determines their importance, with the most important predictors identified first.

5 Results - single factors and pairs of factors

At the simplest level, very low values of SLCR are apparently explained by:

- Indigenous students, for whom SLCR is 50.4%, which is materially lower than the overall rate of 68.8%. Indigenous students account for 5.5% of the annual hours and 4.9% of the subject enrolments within the scope of the WADTE subject load completion rate formula in 1998.10

- Students undertaking adult literacy and English as a second language courses. SLCR for these students, who account for 6.1% of annual hours and 2.9% of subject enrolments, is just 32.5%. Many of these students are born overseas or speak a language other than English as their main language at home.

Both groups have teaching and learning facilitation needs which are generally greater and more varied than for other students.

The effects on SLCR are so great that these two student groups, and the two colleges in Western Australia which have a majority of indigenous students, are excluded from the main analysis. Retaining these students in the full multivariate analysis would have meant working with a dataset with considerable non-homogeneity. The effect of this reduction in scope is to reduce the total annual hours by 20.2% and to increase SLCR from 68.8% to 73.3%. The reduced scope covers 73,298 students and 565,224 subject enrolments in 1998.

With the reduced scope, moderately but materially lower values of SLCR are observed in the 1998 data for:

- Students born in a non-English speaking country or whose main language spoken at home is not English. However, country of birth and main language spoken at home are not collected by colleges for over half the students. As a result of this high proportion of missing data, further consideration could not be given to these factors in the analysis.

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10 For a detailed discussion of indigenous students in TVET in Australia, see Robinson and Hughes.
Students whose highest education level is year 9 or lower, or is unknown (SLCR of 66.6% and 70.1%, respectively). The 'unknown' category accounts for 26.9% of the hours in the reduced scope.

Students from lower socio-economic backgrounds, a factor which is found to correlate with highest education level, the latter emerging as the most important predictor from the study.

Students whose age is unknown (SLCR of 66.6%, accounting for 2.5% of hours in the reduced scope). This finding should not be treated as a trivial one, as it is found that students for whom data are missing generally have below average SLCR (see, for example, age and highest education level in table 2).

Students undertaking TVET for the first time in 1998, who account for 53.4% of reduced-scope hours and for whom SLCR is 70.6%, over six percentage points below the rate for other students.

It should be noted that overall differences in completion rates by sex and age are not material and these factors are not considered in detail in the report, although it is acknowledged that cross-tabulating by sex or age will in some instances reveal situations where these factors are material.

Much more pronounced in their effect, but difficult to take into account in a full multivariate analysis, are students who completed less than 50% of the subject hours in which they enrolled. These students, who effectively have no subject completions for the year, comprised almost 20% of the total in the study for 1998.

Further investigation revealed some significant interactions and joint effects between factors. There were significant interactions between factors such as college, highest education level, mode of participation (apprentice, trainee, full-time, part-time), delivery mode (teacher directed, self-paced, correspondence and other), WADTE course level, WADTE course segment and year started in TVET (1998, 1996 or 1997, before 1996 or unknown), but the patterns of interaction are complex.

A study of the proportion of the hours undertaken by each student which were successfully completed was also made. This showed that although State SLCR is just over 73% for the enrolments in the study scope, very few students have individual SLCR in the vicinity of this value (about 9% in the range 65 to 84%). In fact the State rate of 73.3% is an artifact of averaging, with over half the students completing more than 95% of the hours undertaken and a smaller, though still large proportion (19.7%) completing less than 5% of the subject hours undertaken (figure 1).

**Figure 1: Distribution of student SLCR for study-scope students, 1998**
Consequently, in order to understand fully the factors which predict SLCR it is important to investigate the characteristics of the students with very low individual SLCR (table 2). For the students who successfully completed less than 5% of the hours undertaken in 1998, it is found that:

- They are much more likely to be studying part-time, with 83.3% in the part-time student category, in contrast to 53.4% for students completing 5% or more of their annual hours, and they are much less likely to be apprentices (3.0% for apprentices, in contrast to 13.1% for other students).

- They are much more likely to be undertaking a course at certificate III or IV level (50.1%, in contrast to 40.4% for other students), slightly more likely to be undertaking a course at certificate I or II level (21.8%, compared with 19.8%), and very unlikely to be undertaking a WADTE level I (i.e. apprentice-level) course (3.0%, in contrast to 15.4%).

- They are more likely to have unknown highest education level (41.7%, in contrast to 35.6% for other students) and to be of unknown age (5.1%, in contrast to 3.9%).

- They are more likely to be in the 25 to 39 year age group (34.7%, in contrast to 29.4% for other students) and much less likely to be in the 15 to 19 year age group (20.1%, in contrast to 29.4% for other students).

- They are more likely to be undertaking TVET for the first time in 1998 (61.5%, in contrast to 53.8% for all students).

- They are slightly more likely to be female (53.1%, compared with 46.9% for male students).

As will be seen below, with the exception of sex and age, the factors identified for low completion rate students are also the major predictors of overall SCR and SLCR.

6 Results of classification and regression tree (CART) analyses

At this point it is not possible to say which factors are the most important because of complex interrelationships the various predictors. Consequently, a much more sophisticated series of investigations was carried out to attempt to discover more complete patterns of explanation and to rank factors in order of importance. These investigations were undertaken using classification and regression tree (CART) analysis as implemented in the SAS statistical package.¹¹

These investigations showed that:

- Highest education level (ranging from year 9 or lower to degree or higher, with a material unknown category) or mode of participation (apprentice, trainee, full-time and part-time) are the most important factors.

- These client factors to some extent overlap in importance with programme factors such as WADTE course level and segment, which are generally of medium importance as predictors (it should be noted that WADTE course level and segment are correlated, but by virtue of their definition rather than any other cause).

- Other factors (delivery mode, subject length, year started in TVET and college size/location) were identified as predictors in some analyses but generally at medium or low levels of importance.

The findings from the CART analysis are summarised in table 1. The overall conclusion is that student factors are slightly more important than programme or delivery factors, with:

- Apprentices and those undertaking apprentice courses having a material and positive effect on State SLCR.

¹¹ The CHAID and related analysis tools as implemented in the SPSS AnswerTree module could also be used appropriately for this type of investigation.
• Part-time students and those with highest education level of year 9 or lower or unknown (particularly the latter) having a material, negative effect on State SLCR.

There is also some evidence to suggest that the number of students enrolled in each subject at each college campus has a moderate effect on SLCR, with large campus subject candidatures tending to pull down SLCR. However, the effect is a complex one, with the State pattern influenced very strongly by just one college, namely Central College. The factor was investigated in a follow-up study of that college.

CART analyses for 11 WADTE colleges showed broadly similar patterns to the State pattern after allowance is made for the differing programme and client profiles of some colleges. A notable exception is West Coast College, where delivery mode was identified as the most important predictor and materially reduces the completion rate for this college.

The various findings would be consistent with a more general hypothesis, namely, that a structured training programme with direction either from a teacher or an employer, and prior experience or achievement in education or TVET, are the major factors underlying successful achievement in the WA TVET system.

Table 1: Hierarchy of factors predicting subject completion, 1998

<table>
<thead>
<tr>
<th>Most important</th>
<th>Less important</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highest education level (%) of total study-scope enrolments, and SCR</strong></td>
<td><strong>2nd most important predictor for this group</strong></td>
</tr>
<tr>
<td>Year 9 and lower or unknown (30.9%, SCR 70%) (a)</td>
<td>WADTE course level (SCR 81% for apprentice and trainee courses, 69% for cert I-IV courses, 67% for diploma or higher)</td>
</tr>
<tr>
<td>Year 10 or year 11 (18.8%, SCR 74%)</td>
<td>WADTE course level (SCR 87% for apprentice and trainee courses, 70% for other courses)</td>
</tr>
<tr>
<td>Trade or technician certificate (7.2%, SCR 74%)</td>
<td>Delivery mode (SCR 57% for self-paced, 77% for teacher directed and correspondence)</td>
</tr>
<tr>
<td>Year 12 (25.2%, SCR 75%)</td>
<td>WADTE course level (SCR 89% for app and trainee courses, 78% for cert I-II, 75% for cert III-IV, 72% for diploma or above)</td>
</tr>
<tr>
<td>Unspecified certificate or prior education (14.5%, SCR 77%)</td>
<td>Mode of participation (SCR 87% for apprentices, 79% for full-time, 68% for part-time and trainees)</td>
</tr>
<tr>
<td>Degree or diploma or higher (4.2%, SCR 78%)</td>
<td>Delivery mode (SCR 66% for self-paced, 79% for teacher directed and correspondence)</td>
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</tbody>
</table>

Note (a): The great majority of enrolments in this branch are for students whose highest education level is unknown.
7 Policy implications

The implications for the WADTE and colleges of these various findings are considerable.

Need for complete reporting of subject outcomes: if colleges wish to undertake monitoring or benchmarking using SLCR it is important that the great majority of subject enrolments be resulted by the reporting date agreed with the WADT. Because of the construction of the agreed SLCR formula, unnecessary outcomes of '05 Continuing studies' and '90 Not reported or not available' have the effect of reducing college SLCR.

'At risk' student groups: it is important that colleges monitor the progress of students with below-average completion rates and provide appropriate teaching and learning facilitation to ensure that they have fair and reasonable opportunities for completion. The groups include:

- Students with low prior education levels and students for whom this and related demographic information is unknown.
- Students from disadvantaged and lower socio-economic backgrounds, including indigenous students.
- Students born overseas and students whose first language at home is not English. Data limitations in this area, particularly, need to be addressed for effective monitoring.
- Students undertaking adult literacy and ESL courses, and access and equity programme courses generally.
- Students who appear to be on track not to complete any of the subjects in which they enrolled.
- Students undertaking TVET for the first time.
- Trainees and students undertaking traineeship courses (traineeships are similar to traditional apprenticeships, but shorter, and generally in non-trade occupations).

Students studying part-time or in self-paced delivery mode: one of the national priorities for the Australian TVET system is greater flexibility and the expansion of alternative modes of access to TVET programs. However, the results of the WA study suggest that there is a danger that these goals may be realised at the expense of completion rates, since it is clear that these students have lower completion rates than other groups. In order to offset this effect, colleges need to develop strategies to increase completion rates for students studying part-time and in non-standard delivery modes.

Generalisations made at the State level do not always apply at the level of individual colleges, courses or subjects. Because of this the full report to the WADTE included, in the appendices, some more detailed analysis of the factors affecting completion rates at individual colleges and for a selection of large enrolment courses and subjects. This information is important for colleges or teaching departments seeking to understand and address subject load completion rate issues, and it indicates a methodology which could be applied to campuses, courses or subjects not considered in the report to the WADTE.
Conclusions

The study shows that a complex set of factors predict subject completion rates in a diverse, multicultural TVET system. It shows that the background of students needs to be taken into account if subject completion rates are included in the set of targets and performance indicators which are used to determine college funding, since the profile of the student population at each college is likely to affect whether the completion rate is above or below the State average. Students from indigenous and non-English speaking backgrounds, particularly, are likely to have a negative impact on subject completion rates.

Programme and delivery factors also need to be taken into account, as indicated by the above-average completion rates for apprentices and apprentice courses, and the below-average completion rates for students undertaking subjects in flexible delivery or self-paced learning modes.

In fact, each college is likely to have a specific set of factors which predict subject completion rates, and these may differ from the factors at state level. This implies that any benchmarks or targets for improvement need to be specified in terms of recent patterns for each college, assuming the student and programme profile remains largely unchanged, rather than in terms of state patterns.

This is demonstrated by the findings from a follow-up study which was undertaken by the NCVER for one of the larger WADTE colleges. Here, it is found that sex of student is of moderate importance as a predictor of college SLCR, whereas for the State as whole it is not considered material. It is also found that a relatively small number of large candidature courses have a material, negative effect. Therefore, a practical strategy for improving SLCR at this college would be to focus on these courses.
Table 2: Detailed completion rate statistics for various factors, 1998

<table>
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<tr>
<th>Student SLCR</th>
<th>Completion rates</th>
<th>State SCR (%)</th>
<th>State SLCR (%)</th>
<th>Net effect on SLCR (%)</th>
<th>% of total SLCR</th>
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<td>0-4%</td>
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<td>74.4</td>
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<td>73.3</td>
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<tr>
<td>5-100%</td>
<td></td>
<td></td>
<td></td>
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<td>sub-total</td>
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<td>14.1</td>
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<td>19.4</td>
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<td>Other</td>
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<td>20.5</td>
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<th>Year started in TVET (a)</th>
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<td>1998</td>
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<td>51.9</td>
<td>50.3</td>
<td>50.9</td>
<td>53.0</td>
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<tr>
<td>1996 or 1997</td>
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<td>30.8</td>
<td>31.4</td>
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<tr>
<td>Other</td>
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<td>15.8</td>
<td>18.9</td>
<td>17.7</td>
<td>17.5</td>
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<td>100.0</td>
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<td>4.3</td>
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<tr>
<td>Diploma</td>
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<td>3.0</td>
<td>2.8</td>
<td>2.8</td>
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<tr>
<td>Trade, tech'n</td>
<td>8.2</td>
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<td>7.4</td>
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<td>7.7</td>
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<tr>
<td>Other cert.</td>
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<td>14.9</td>
<td>14.7</td>
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<td>14.4</td>
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<tr>
<td>Year 12</td>
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<td>22.7</td>
<td>16.1</td>
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<td>17.9</td>
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<tr>
<td>Year 10 or 11</td>
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<th>WADTE level of major course</th>
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<td>1 Apprentice</td>
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<td>19.6</td>
<td>17.3</td>
<td>14.7</td>
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<tr>
<td>3 Cert I-II</td>
<td>21.8</td>
<td>18.8</td>
<td>20.6</td>
<td>19.9</td>
<td>20.2</td>
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<tr>
<td>4 Cert III-IV</td>
<td>50.1</td>
<td>38.9</td>
<td>40.4</td>
<td>39.8</td>
<td>41.8</td>
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<tr>
<td>5 Diploma +</td>
<td>23.7</td>
<td>28.7</td>
<td>19.4</td>
<td>23.1</td>
<td>23.2</td>
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<tr>
<td>All levels</td>
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<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

| No. students | 14,229           | 22,866        | 35,303         | 58,169                 | 72,398          |
| % of total   | 19.7             | 31.6          | 48.8           | 80.3                   | 100.0           |

Note (a): Indicative only, because of limitations in the identification methodology used.
Note (b): Scope is 1998 college SLCR enrolments, excluding indigenous students, Kimberley Regional and Hedland Colleges, and students with adult literacy/ESL as their major course (WADTE group 19B).
Appendix - factors considered in the analysis

A range of predictor variables (factors) at the client, course and subject levels have been used in the analyses. As the methodology has been applied within institutes as well as to the whole delivery base, institute-level effects other than size and location have not been considered at this stage but could be explored further if required.

The client variables considered are:

- Sex (Female, Male and missing, the latter very small for WADTE colleges).
- Region of residence based on residential postcode, with values capital city, other metropolitan (not really relevant to WA), rural, remote and unknown.
- Born in a main English speaking country, with values Australia, other main English speaking country, non-English speaking country, and unknown.
- Main language spoken at home is English (yes, no or unknown).
- Identifies as Aboriginal or Torres Strait Islander (yes, no and unknown).
- Mode of participation (apprentice, trainee, full-time, part-time), based on WADT definitions.
- Highest education level, a composite variable derived from highest school level completed and prior education, with values:
  1. Degree and higher
  2. Diploma
  3. Technician and trades
  4. Other prior education
  5. Year 12
  6. Year 10 or Year 11
  7. Year 9 or lower
School status, a composite variable derived from year highest school level completed and the ‘at school’ flag, with values:

- **A** At school
- **S** School leaver (year highest school level completed is 1997 or 1998)
- **L** Left school
- **U** Unknown

Year started in VET, an indicative variable only because of limitations in the method of derivation, but none-the-less still useful for the purposes of the study. More refined methods for matching students across years would yield a more reliable indicator. The values used are derived by inspecting the TAFE college student number for the first year of enrolment, with values:

- **Y** Yes - year of first enrolment is 1998
- **R** Recent - year of first enrolment is 1996 or 1997
- **N** No - year of first enrolment before 1996 or unknown.

Index of socioeconomic advantage for residential address postcode as supplied by the Australian Bureau of Statistics from 1996 census data, grouped into quartiles (1 lowest to 4 highest, not available for missing or invalid postcodes).

Student SLCR: the subject load completion rate for each student, calculated using the same scope and formula as for WADTE colleges.

Major course: the course which accounts for all or a majority of the subjects undertaken in 1998. Where a student has undertaken more than one course and there is a tie the most recent or highest level course is taken.

The course variables considered are:

- **WADT** course level (1 = apprenticeship and traineeship, 3 = certificate I and II, 4 = certificate III and IV, 5 = diploma and above).

Course segment, a variable created to simplify the large number of WADT course group categories. It is derived from WADT course group using a mapping supplied by the WADT project coordinator. As a consequence of definition rather than any other cause, it is correlated with WADT course level. Values are:

- **A** Apprentice
- **FTV** Full-time vocational
- **PTV** Part-time vocational
- **PTNV** Part-time non-vocational
- **UC** Unclassified.

The subject variables considered are:

Subject completed, defined as:

- **Completed**
  - 01 Student assessed – pass, 04 Student not assessed – satisfactory completion of class hours, and 06 Status or credit through recognition of prior learning
  - 02 Student assessed – fail, 03 Student assessed – result withheld, 05 Student assessed – continuing studies (some exclusions), 10 Withdrawn – no fail, 11 Withdrawn – fail, 90 Not known or not reported (some exclusions).

- **Not completed**
  - 09 Status or credit through credit transfer, and 12 Withdrawn - transferred.
Subject length, as indicated by subject curriculum hours (short 0-20 hours, medium 21-51 hours, long more than 51 hours). Each category accounts for about one-third of annual hours in 1998.

State and national funding source, used only when selecting subject enrolments in the agreed scope for analysis.

The college variables used in the analyses are:

College size, based on the annual hours for each college in 1998. This variable also functions as a metropolitan, metro/rural and rural/remote indicator:
- Large: The WADT colleges located in Perth (metropolitan)
- Medium: South West Regional College only (mixed metro/rural)
- Small: Other WADT TAFE colleges (rural/remote)

Delivery mode, derived from the AVETMISS delivery strategy identifier, as follows:
- Local: AVETMISS codes 01 and 03
- External: AVETMISS codes 02 and 05 (includes correspondence)
- Workplace: AVETMISS code 06
- Other: Other delivery strategies, including mixed.