Analysis of Students outcomes using Module Load Completion Rate
Introduction:

To measure performance and gauge improvement the Western Australian Department of Employment and Training (WADTE) has identified a number of key performance measures relating to efficiency, effectiveness and quality. In relation to the effectiveness of the training system, one key performance measure, module load completion rate (MLCR), describes the extent to which clients complete the training in which they enrol.

MLCR is the proportion of module load completed out of the total commenced, modules being the components from which courses are constructed. Each year TAFE colleges and other training providers report the modules in which students enrol and the result of that enrolment (pass, fail, withdrawal etc). This information is also reported along with a range of other information about the student, the module or course and forms part of the national reporting system under the Australian Vocational Education and Training Management Information Statistical Standard (AVETMISS).

MLCR is a business compliance key performance indicator under Central TAFE’s resource agreement with the Western Australian Department of Training and Employment. The Western Australian Department of Employment and Training uses the aggregated measurement of MLCR as an effectiveness measure across the VET system.

The Research Questions

What are the factors affecting the module load completion rate (MLCR) and the related outcome measure, the module completion rate (MCR), at Central College, which of these factors are of greater importance? How can Central TAFE increase its retention rates of students and who are most at risk and what areas should we target for improvements?

Background and Methodology

To better understand the factors which effect MLCR, the Research Unit at Central TAFE subcontracted the statistical expertise at the National Centre for Vocational Education Research to assist us in identifying “at risk” students. The outcome of this research was to examine existing data to better target strategies to improve student outcomes.

An executive summary of the results of this analysis are presented in this paper.

The factors which might predict completion rates can be broadly identified as falling into three groups:

- Student variables (such as sex, age, and full-time/part-time),
- Program variables (such as WADTE course level and group) and
- College variables (such as individual campuses).

Significantly missing from the list of student variables is an explicit measure of ‘student ability’, highest education level does provide an approximate, surrogate indicator of student ability and has been used in this case.
This research explores the relative strength of these three groups of variables as predictors of MLCR.

Results - single factors and pairs of factors

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

- Indigenous students
- Students undertaking adult literacy and ESL courses

As in a similar study of all WADTE colleges the effects are very great for these two student groups, and in the analysis for the whole State, colleges which have a majority of indigenous students (Hedland and Kimberley Regional Colleges), have overall poor MLCR.

Moderately but materially lower values of MLCR are observed for:

- Younger students and males. Gender and age have a joint effect
- Students whose highest education level is year 11 or lower, or is unknown
- Students studying part-time or as trainees
- Students with missing demographic information, a finding which should not be treated as a trivial one. Missing data precluded a consideration of the effects of main language spoken at home and country of birth for Central College
- School leavers, students still at school and students undertaking VET for the first time
- Students undertaking modules in self-paced or correspondence delivery modes
- Students undertaking longer courses with many modules and modules with a large number of enrolments at the campus (these effects are weaker but still observable)

Much more pronounced in their effect, but difficult to take account of in a multi-variate analysis, are students who completed less than 5% of the module hours in which they enrolled. These students comprised about 21% of the total in the study group.

Further investigation revealed some significant interactions and joint effects between factors. There were significant interactions between factors such as 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 (derived from WADTE course group) and year stated in VET (1998, 1997 or 1996, and before 1996 or unknown), but the patterns of interaction are complex.

A study of the proportion of the hours undertaken which were successfully completed by each student was also made. This showed that although College MCR is 72% for the enrolments in the study scope, very few students (about 11%) have individual MCR in the vicinity of this value. In fact the College rate of 72% is an artefact of averaging, with just over 40% of the students completing more than 95% of the hours undertaken and a smaller, though still large proportion (21%) completing less than 5% of the modules undertaken.

Consequently, in order to understand fully the factors that predict MLCR it is important to investigate the characteristics of the students with very low individual MLCR.
For the students who successfully completed less than 5% of the hours undertaken in the study group the following characteristics were noted:

- They are more likely to be starting VET for the first time (58.6% in this category, in contrast to 48.8% for all Central College study-cope students)
- They are more likely to be studying part-time or as trainees
- They are more likely to have unknown demographic data (eg. 34.4% in contrast to 25.0% for all student on highest education level, 42.9% in contrast to 33.8% for all students on school status).

At Central College student gender is a prominent factor, with female students generally having higher completion rates than males.

Results of classification and regression tree (CART) analyses

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. The investigation showed that:

- Highest education level (ranging from year 9 or lower to degree or higher) is the most important factor, followed by mode of participation (apprentice, trainee, full-time and part-time).
- These client factors to some extent overlap in importance with program factors such as WADTE course level and segment, which are generally of medium importance as predictors.
- Other factors (gender, delivery mode, module length, year stated in VET) were also identified as predictors for low module completion.

The overall conclusion is that student factors are slightly more important than program or delivery factors, with:

- Full-time students and apprentices (the latter a very small group at Central College) have a positive effect on MLCR.
- Part-time students and those with highest education level of year 9 or lower or unknown (particularly the latter) have negative effect on MLCR.

The various findings would be consistent with a more general hypothesis, namely, that direction either from a teacher or an employer, and prior experience or achievement in education or VET, are the major factors underlying successful achievement at Central College.
### Table 1.1: Hierarchy of factors predicting module completion at Central College, 1998

<table>
<thead>
<tr>
<th>Highest prior education level</th>
<th>% of total</th>
<th>MCR (%)</th>
<th>Other factors for this group (in approximate order of importance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree or higher</td>
<td>4.4</td>
<td>79.5</td>
<td>Mode of participation (82% for full-time students and 76% for part-time students and trainees); Year started in VET lowest for first-time students;</td>
</tr>
<tr>
<td>Diploma, trade/technician certificate or other certificate</td>
<td>33.9</td>
<td>76.8</td>
<td>Mode of participation (80% for full-time students and apprentices, 69% for part-time students and 35% for trainees). WADTE segments or year started in VET (lowest for first-time students) are next in importance.</td>
</tr>
<tr>
<td>Year 12</td>
<td>33.3</td>
<td>71.7</td>
<td>WADTE course segment: 82% for full-time vocational and part-time non-vocational courses, with mode of participation, module length, sex, WADTE course level and year started in VET medium importance. 69% for apprentice and part-time vocational courses, with sex, mode of participation, module length and year started in VET of medium importance. WADTE course level is important for males undertaking medium-length or long modules.</td>
</tr>
<tr>
<td>Year 10 or 11</td>
<td>8.7</td>
<td>67.1</td>
<td>Gender of student: 72% for females, followed by mode of participation, module length, year started in VET and WADTE course segment. 61% for males, followed by WADTE course level (low for certificate III and IV courses), year started in VET or WADTE course segment, and mode participation</td>
</tr>
<tr>
<td>Year 9 or lower</td>
<td>0.6</td>
<td>55.1</td>
<td>No further factors because of small number of module enrolments in this branch</td>
</tr>
<tr>
<td>Unknown</td>
<td>19.1</td>
<td>66.1</td>
<td>Mode of participation: 82% for apprentices (note small numbers) 72% for full-time students, followed variously by WADTE course segment, sex, module length, WADTE course level, delivery mode and year started in VET. 57% for trainees and part-time students, delivery mode (lower for local mode), then WADTE level, sex and WADTE course segment.</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>72.2</td>
<td>Based on 148,510 module enrolments in study scope</td>
</tr>
</tbody>
</table>

### Effect of specific, large candidature courses
A separate analysis also shows that there is some evidence to suggest that the number of students enrolled in each module has a moderate effect on MLCR, with large campus module candidature’s tending to pull down the overall College MLCR. Although appearing to have an effect on MLCR in its own right, campus module candidature is more likely to be an artefact of the effects of program factors.

Previous research conducted at Central TAFE on student attrition also found a correlation between class size and attrition rates of students, once class sizes reached approximately 23 in the School of Management and Business the rate of student withdrawal increased dramatically.

At Central TAFE there are 271 courses within the scope of the present study, and none contributes more than 4.3% to total SCH, so that the net effect of even the largest course on College MLCR is numerically small unless MLCR for the course is abnormally low.

In fact, the effects of specific courses at Central College are found to be comparatively weak. 19 courses have been identified as having a net effect outside the range –0.1 to +0.1 percentage point.

Key points to note are:

- The net effect of 12 of these 19 courses is negative, although the overall impact on College MLCR is offset to a large extent by the seven courses with a large positive net effect.
- The courses with a negative net effect all have MLCR well below the College rate, for example, 38.0% for the Certificate I of Electrical/Electronic Engineering (Preparatory) and 40.1% for the Certificate in Printing Machining.
- The course with the most negative impact (-0.51 percentage points) is the Diploma of Building Design and Drafting, which has MLCR of 59.2% and contributes almost 4% of the hours in the scope of the study.
- The 19 courses with more prominent net effects cover a wide range of WADT level and groups.

Although the course net effects discussed here are comparatively weak, the negative effects do cumulate and reduce MLCR by a greater amount than is observed for any one course. Consequently, one strategy for improving MLCR at Central College would be to focus efforts at improvements on the course with the most negative net effects, taking into account other identified factors predictors of low MLCR.
Policy implications

The implications of these various finding for Central College are considerable.

1. Need for complete reporting of module outcomes: if the College wishes to undertake monitoring or benchmarking using MLCR it is important that the great majority of module enrolments be resulted by the reporting date agreed with the WADTE. Because of the construction of the agreed MLCR formula, unnecessary outcomes of Continuing studies and not reported or not available have the effect of reducing college MLCR. Although the proportions in these categories are lower than in other WADTE colleges there appears to be scope for some improvement.

2. ‘At risk’ student groups: it is important that College monitors 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.
   - Young students (ie those under 25 years of age) and male students, particularly young males.
   - Students undertaking adult literacy and ESL courses, and access and equity program courses generally.
   - Students who appear to be on track not to complete any of the modules in which they enrolled.
   - Students undertaking VET for the first time, including school leavers and students still at school
   - Trainees and students undertaking traineeship courses.
   - Students undertaking multi-year courses, longer modules and large candidature modules

3. Students studying part-time or in self-paced delivery mode: one of the national priorities for the Australian VET system is greater flexibility and the expansion of alternative modes of access to VET programs. However, the results of this 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, the College needs to develop strategies to increase completion rates for students studying part-time and in non-standard delivery modes.

4. The issues of gender having a material effect on MLCR is also of significance to the College. The results of the 1999 Graduate Outcome Survey indicated that Central TAFE has dropped 3% points in graduate satisfaction for achieving their main reason for studying. Analysis of the data shows that some of the characteristics of our graduates are associated with poorer achievement and destination outcomes.
Central TAFE’s graduates are more likely than all WA graduates to be female, older, born overseas in a non-main English speaking country. The research also indicated a significant decline in the number of young male graduates. Males are more likely females to achieve their main reason for studying and are more likely to be employed in full time work upon graduation. This in turn will have a positive affect on the overall graduate outcome measure for the College. Whilst initiatives are being developed to support our Graduates to ensure they do achieve their outcomes for study, increasing the number of male graduates will need to be address earlier.

Further Action

• Review the results and enrolment processes to ensure that module enrolments are both resulted on time and also to ensure that all demographic data and results are completed.

• Further specific research on the needs of at risk students is required. This will be achieved by targeting ‘at risk students’ who have been identified in this study. A research brief formulated which will use a combination of, focus groups, student exit surveys and phone interviews to examine ways in which the college can maximise successful student completion for these groups.

• The research identified 19 courses which have the greatest impact on overall MLCR, 12 of these courses in a negative sense. Using the outcomes of the previous dot point develop strategies to assist program areas to increase the number of successful student outcomes and pilot these strategies with these courses and evaluate the effectiveness of such strategies.

• Use the outcomes of the analysis to negotiate with the Department of Employment and Training for more realistic outcome measures for MLCR.

• Benchmark with other TAFE colleges (both locally and interstate) on research findings.

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