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DISCUSSION PAPER

Performance indicators in the VET sector

*Tom Karmel
Peter Fieger
Davinia Blomberg
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*Discussion paper for the National Summit on
Data for Quality Improvement in VET
April 2013*

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EDUCATION RESEARCH
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The National Centre for Vocational Education Research (NCVER) is an independent body responsible for collecting, managing and analysing, evaluating and communicating research and statistics about vocational education and training (VET).

NCVER's inhouse research and evaluation program undertakes projects which are strategic to the VET sector. These projects are developed and conducted by NCVER's research staff and are funded by NCVER. This research aims to improve policy and practice in the VET sector.

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Introduction

Performance in the vocational education and training (VET) sector has largely been considered to date at the system level. Thus we see in the *Annual national report of the Australian vocational education and training system* (for example, DEEWR 2011) indicators covering:

- students' participation and achievement in VET and training
- student achievements
- student outcomes
- employer engagement and satisfaction with VET
- VET system efficiency.

More recently, the National Agreement for Skills and Workforce Development specified two performance targets and seven indicators:

- halve the proportion of Australians nationally aged 20–64 without qualifications at certificate III level and above between 2009 and 2020
- double the number of higher level qualification completions (diploma and advanced diploma) nationally between 2009 and 2020
- Indicator 1 – Proportion of working age population with higher level qualifications (certificate III and above)
- Indicator 2 – Proportion of employers satisfied that training meets their needs
- Indicator 3 – Proportion of working age population with adequate foundation skills (literacy level 3 or above)
- Indicator 4 – Proportion of working age population with or working towards a non-school Australian Quality Framework (AQF) qualification
- Indicator 5 – Proportion of VET graduates with improved employment status after training
- Indicator 6 – Proportion of VET graduates with improved education/training status after training
- Indicator 7 – Proportion of Indigenous 20–64 year olds with or working towards post-school qualification in AQF Certificate III or above.

In recent years, an interest in indicators at the provider – registered training organisation (RTO) – level has emerged. This interest has come on a number of fronts. First, RTO level data has been seen as a valuable tool for regulators – and NCVER has done considerable work in this area for the Australian Skills Quality Agency. Second, training markets have become of increasing importance and one of the pre-requisites for effective markets is good information. Thus we have seen the creation of the My Skills website by the Commonwealth aimed at informing student choice. The third motivation for indicators comes from governments in the administration of their programs. RTO level information is seen as critical to accountability, and also there is thought to funding by outcomes (which of course implies RTO performance indicators).

In this paper, we set out our thinking on RTO performance indicators. We set out a taxonomy and then document possible indicators (noting that our current datasets have some areas well covered, but there are considerable gaps), based on a literature review of relevant national and international practice. In the third section, we discuss the issues surrounding performance indicators: the properties indicators should have, statistical and presentation issues. We illustrate some of the statistical issues with analysis of some indicators we have already calculated.

The paper ends with some final comments, drawing attention to the current work that NCVER is undertaking for senior officials.

At the outset, we need to note the scope of this work. We have already made the point that our interest is in RTO level indicators, not sector indicators. Thus we are not covering indicators that would go to questions on how well the VET sector is meeting the needs of the labour market.

Indicators

There is no single way of categorising RTO indicators, and a review of practice elsewhere gives a variety of approaches. Some of the approaches to indicators have a stronger focus on system accountability and may not necessarily translate well to the RTO level. For example, the International Labour Organization (ILO), United Nations Educational, Scientific and Cultural Organization (UNESCO) and the European Training Foundation (ETF) (2012) have recently developed an indicator framework for TAFE-delivered vocational education and training (TVET) in Europe, with the categories being finance, access and participation, quality and innovation, and relevance to the labour market.

Another system level framework is the 3Es model – economy, efficiency and effectiveness – provided by the Report on Government Services (see Productivity Commission 2010). United Nations Development Program (UNDP) and Euromed (Homs 2007) are also concerned with system accountability and have established indicators around four key objectives of VET: participation (considered here as social partners and stakeholders participating in decision making); accountability (transparency and governance); decentralisation (autonomy in decision making and innovation of training system); and effectiveness and efficiency (system outcomes as they apply to labour market needs). The Organization for Economic Co-operation and Development (OECD) (2012), as part of its Indicators of National Education Systems (INES) program, focuses on four key education and training objectives: output of educational institutions and the impact on learners; financial and human resources investment in education and training; access, participation and progression; and the learning environment.

There are also numerous examples of frameworks which focus directly on RTO performance. We look at four of these: Phillips KPA (2006), the Skills Funding Agency (UK) in its Further Education (FE) Choices website, Office for Standards in Education, Children's Services and Skills (OFSTED) (UK) indicators for its inspection of Further Education Colleges and the Illinois State Board of Higher Education (IBHE 2003).

Phillips KPA, in a report prepared for the Victorian Qualifications Authority, suggest three standards which could play a role in an outcomes-based audit model revolving around quality training and assessment; access and equity and maximising outcomes for clients; and management systems. Possible measures include:

- an index of learner engagement
- an index of learners' and graduates' perception of quality of teaching
- learners' and graduates' satisfaction of the VET experience
- self-assessment of learning outcomes
- student employment and further learning outcomes
- staff engagement with the education and training process
- employers' satisfaction with the quality of training
- completion rates
- outcomes of review of assessment instruments and processes (this is not really an indicator).

In terms of the access and equity dimension, the suggestion is that many of the same indicators can be used but for specific groups.

OFSTED (UK) undertakes learning and inspection reports of further education colleges. They use the following broad indicators in their college assessments:

- outcomes for learners
- quality of teaching and learning and assessment
- effectiveness of leadership and management.

The Illinois State Board of Higher Education (IBHE 2003) has developed a performance framework around five key objectives:

- economic growth (employer/industry satisfaction with training, research expenditures)
- partnerships (with P-12 education)
- affordability (cost of tuition fees, income support etc.)
- access and diversity (levels of access by disability status, ethnicity and gender)
- quality (of teaching staff and course satisfaction).

The above three frameworks are from the point of view of central government agencies. By contrast the FE Choices website set up by the Skills Funding Agency (UK) presents indicators on:

- success rates (the percentage of people who achieved the qualification they started)
- learner destinations (the proportion of learners who progressed into or within further or higher education, found a job or improved their career prospects after completing their course)
- learning rate (the percentage of learners who went into higher education)
- employment rate (the percentage of learners who found work, got a better job or improved their prospects)
- learner satisfaction (how learners rated their training organisation)
- employer satisfaction (how employers rated the training for a particular training organisation).

To date we have looked at 'official indicators' recommended for or produced by government agencies. Common themes to emerge are indicators on the quality of the process, outcomes and equity. The privately produced *The Good Universities Guide* rates universities on similar dimensions but takes a relatively broad approach covering:

- characteristics: student demand, non-government earnings, research grants, research intensity
- access and equity: access by equity target groups; gender balance; Indigenous participation; entry flexibility; proportion given credit for technical and further education (TAFE) studies; proportion of school leavers
- who's there: size; student characteristics (by age, international students, external students, non-English speaking background ([NESB])
- educational experience: student–staff ratio; staff qualifications; educational experience (satisfaction with teaching, generic skills rating, overall satisfaction), with these indicators also calculated for domestic students only

- graduate outcomes: starting salary; proportion getting a job; proportion getting a job or further study.

The Good Universities Guide uses stars rather than numeric values to rate the universities.

It is interesting to note that the higher education sector has a long history with indicators, beginning with the ‘dulux chart’ (Department of Employment, Education and Training 1994). The 1998 edition (Department of Education, Training and Youth Affairs 1998) had some 360 indicators (although this includes the same indicator for multiple years) covering:

- broad context: students, equivalent full-time students, type of enrolment, post-graduate students, overseas students, non-overseas Higher Education Contributors Scheme (HECS) liable and fee-paying students; basis for admission; median age; equity groups; field of study
- staff: number of staff; staff by function, by classification, by age, by qualifications; student-staff ratio; remuneration by employee
- finance: operating revenues and expenses; research income; salaries and related costs; expenses per equivalent full-time student unit (EFTSU); and assets
- outcomes: retention rate; student progress rate; graduate full-time employment; graduate full-time study; graduate starting salaries; course satisfaction (overall, good teaching, generic skills).

These indicators are presented as numerical values, although for the outcome indicators adjustments are made for the composition of the student body.

As one can see there is a very large number of possible indicators and various ways of classifying them. The classifications typically are quite descriptive or make use of concepts such as efficiency, equity, quality and outcomes. Based on a brief examination of possible frameworks, we have come up with the following taxonomy, taking a fairly pragmatic approach:

- provider characteristics: covering student participation and characteristics; training characteristics; amenities and services; and RTO management
- efficiency
- quality of teaching and learning
- consumer satisfaction
- labour market effectiveness.

We also note that the allocation of potential indicators to category is somewhat arbitrary. For example, the proportion of delivery online granted at first sight could be treated as a contextual indicator. On the other hand, it could be argued that it is directly relevant to the teaching and learning process (and certainly, a regulator may well wish to look carefully at providers who deliver a very high proportion of line delivery). Similarly, the qualification completion rate could be treated as either a teaching and learning indicator or as a measure of efficiency.

Possible indicators for RTOs

We have made an initial attempt at compiling a list of RTO indicators. We have canvassed the various frameworks discussed earlier as well as coming up with some ourselves. It would be presumptuous to call the list exhaustive for the simple reason that there must be an infinity of possible indicators.

Nevertheless this is our starting point, and the list has been compiled without thought of data availability.

About the provider

Student characteristics

Number of students, distribution of students by age and sex, proportion of students who are Indigenous, proportion of students who have a disability, proportion of students who completed school, proportion of students who are international, proportion of students from a non-English speaking background, proportion of students who have a previous non-school qualification, proportion of students who completed Year 12.

Training characteristics

Distribution of student by field of education, distribution of students by qualification level, full-year training equivalents, number of states in which training is delivered, number of sites of delivery, number of qualifications registered to deliver, fee levels, proportion of income from fee-for-service activity.

Provider characteristics

Number of staff, number of staff by field of education, number of staff by age, length of operation.

Amenities and services

Distance to public transport, the number of car parking spaces, extent of financial assistance to students (including extent of campus employment), size of library, access to internet, level of pastoral care (student support services per student).

Registered training organisation management

Capital reserves, assets.

Efficiency

Module pass rate, qualification completion rate, proportion of recognition of prior learning (RPL) granted, time taken to complete a course, cost per publicly funded full year training equivalent (FYTE), share of cost to employers providing apprenticeships and other types of training, private spending by the student on a VET course, administrative and support costs per student or FYTE, salaries and salary related costs, turnover, operating expenses, operating revenues.

Quality of teaching and learning indicators

Student: teacher ratio, proportion of trainers with Certificate IV in Training and Assessment (TAE), proportion of trainers with degrees or diplomas in teaching/training, level of staff satisfaction and motivation levels, level of staff engagement in professional development, adequate facilities and equipment (measured by age of plant), number of complaints/black marks, innovation measure – share of information and communications technology (ICT) training activities, proportion of delivery sub-contracted, occupational health and safety incidences, transition paths from VET in schools – proportion of VET in schools students who continue in VET post-school, policies or descriptive effective

practices on articulation with higher education, the proportion of students enrolled in higher education who receive credit for VET or who were admitted based on previous VET, the proportion of graduates enrolled in further study, proportion of VET by online delivery, proportion of delivery at the workplace, proportion of delivery in the classroom, proportion of graduates who report that training was relevant, extent of collaboration with industry, student attendance at institution, student participation in extra-curricular activities, extent of practices to improve program quality (for example, institution wide use of assessment results to improve program quality).

Consumer satisfaction

Overall satisfaction with the course, satisfaction of graduates with teacher quality, satisfaction with learning outcomes, whether a student achieved main goal, whether a student would recommend the institution, satisfaction of employers with training, satisfaction of graduates with teaching facilities, satisfaction of graduates with assessment quality.

Labour market effectiveness

Employment rate of graduates, employment rate of graduates of those not employed before training, level of match between course and job after training, proportion of graduates reporting their training was relevant to their job, salary of full-time workers after training, literacy rate.

Technical issues

The appropriate level of analysis

Registered training organisations, and especially TAFEs, are often large and multidisciplinary, multi-campus institutions. The idea of overall institute performance is thus problematic, as an aggregate level of analysis at the institute level may hide significant internal variance between disciplinary areas or campuses. Some areas within an RTO may have stronger systems and outcomes than other areas. Other areas within an RTO may cater for student groups that have been shown to exhibit poorer performance than the wider population.

These issues suggest that it might be better to calculate performance indicators at a field of study area, or even at a lower level of aggregation (for example, field of study by qualification level, or for specific groups of students). The problem with this is that the number of observations at a field of study level will be a lot smaller than at a whole of institution level. This means that the performance indicators will be more robust at a whole of institution level but potentially less informative (the standard errors on an estimate of a proportion reduce linearly with the square root of the number of observations).

Table A1 demonstrates the number of students for the 60 or so TAFEs to show the possibilities of calculating indicators by field of study for those indicators drawing on the students and courses collection.

Table A2 is a similar table showing the sample size from the Student Outcomes Surveys, based on a 'large survey' (the survey alternates between large and small samples with the former sufficient to produce institution level estimates).

In table A1 we see that there is a big range in the size of institutes, and within an institute there is wide variation in student numbers. In large institutes the numbers in some fields are in the thousands but in others they are in the hundreds.

Similar variation is seen in the Student Outcomes Survey sample sizes, but here the problem of small numbers becomes more pressing because the survey is based on a sample not a complete count. The variation in numbers across institutes and fields of study raises a strategic issue, that of statistical reliability. Any indicator will have underlying variability such that an indicator based on a small number of observations will be less reliable than one based on a large number. This type of variability occurs in sample surveys but it also occurs when there is no sampling variability – that is in a census. Indicators by definition are an average measure for the RTO and therefore their reliability will depend on how many observations contribute to it. The practical implication of this is that there needs to be some sort of cut-off for calculation. The precise cut-off will depend on the indicator. One way to overcome the issue of small numbers of observations is to aggregate RTOs together. For this to be meaningful we would need some set of defining characteristics as the basis for such an aggregation. The idea is that an indicator for the aggregated unit provides useful information in respect of the individual RTOs. Statistically, one technique to achieve this is 'cluster analysis' which groups units together on the basis of similarity in respect of a set of variables.

Face validity

Indicators need to satisfy some basic requirements. First, they have to be able to discriminate; if there is very little variation between RTOs then the relevant indicator is of little value. Second, they need to have a metric that makes sense and has some intuitive interpretation. An example of an indicator that is easy to interpret is 'percentage of students in employment'. More difficult to interpret are indicators based on arbitrary scales such as an average satisfaction score based on a Likert Scale (1 = very dissatisfied, 5 = very satisfied). It is also possible to have binary indicators (for example 1 = has a refectory, 0 otherwise).

Ideally, indicators should be ordinal with a natural ordering. This is best illustrated with an indicator that does not have this characteristic: course completion rate. A very high completion rate may indicate high quality training, but it also could indicate low standards. Thus completion rate may be a very useful indicator for regulators who are looking for unusual behavior as a way of informing the RTOs they wish to audit. For governments distributing funds, however, it may be risky. For consumers it may provide useful information in conjunction with a range of other indicators.

A related issue is the extent to which an indicator is open to manipulation. An indicator can almost be manipulated by an RTO in the sense that the RTO may change behaviour in order to improve their apparent performance. Whether they do so or not will depend on the stakes. If governments are funding on the basis of an indicator then it is almost certain that the RTO will change their behavior in some way in order to increase their funding. An obvious example is completion rates. If this is part of a funding formula then an RTO may find it profitable to exclude students who are at risk of failing. Chen and Meinecke (2013) argue that this can be addressed through a provider 'report card' which has multiple indicators.

Another related issue relevant to validity is the extent to which an indicator is influenced by factors other than the underlying trait which the indicator is designed to capture. For example, the percentage of graduates in employment is trying to capture the extent to which the training at a provider is leading to a job. However, the underlying composition of the student body may well be the dominant factor behind apparently good or bad employment outcomes.

Landman and Hauserman (2003) point to other issues in addition to validity and reliability; specifically measurement bias (errors in the underlying data), lack of transparency (how the indicator is calculated), variance truncation (where the scale forces observations into groups), representativeness (when an indicator is based on a sample), information bias (in a sense the choice of indicators itself introduces a bias) and aggregation issues (the relationships in the data and resulting inferences change as the level of aggregation changes).

Above we have argued that some indicators can be affected by the composition of the student body. Whether this matters is an empirical question. Our analysis suggests that statistical adjustment matters and that without it indicators will be potentially very misleading.

The following example illustrates our approach. Essentially, we model the performance of individual RTOs in respect of an indicator. In this example the indicator is student satisfaction. An estimate is

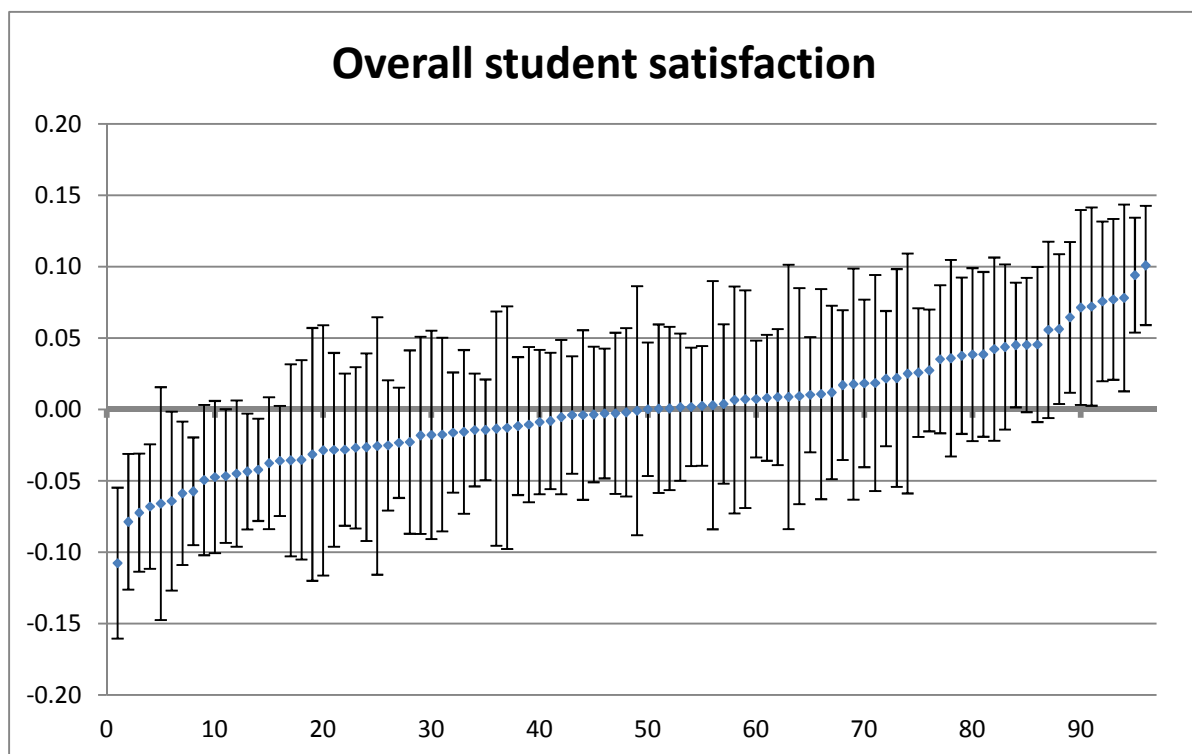
made for each RTO that takes into account a series of contextual variables. In this example the contextual variables are:

- gender
- age
- Indigenous status
- disability status
- location (as defined by institute)
- employment status before training
- prior education
- reasons for study
- field of education
- AQF level
- group status (module completer/graduate).

Thus our analysis provides an estimate of overall student satisfaction for each RTO, taking into account the characteristics of its students.

Figure 1 illustrates the results for overall satisfaction, with the error bars (+/- two standard errors) giving an indication of statistical variability).

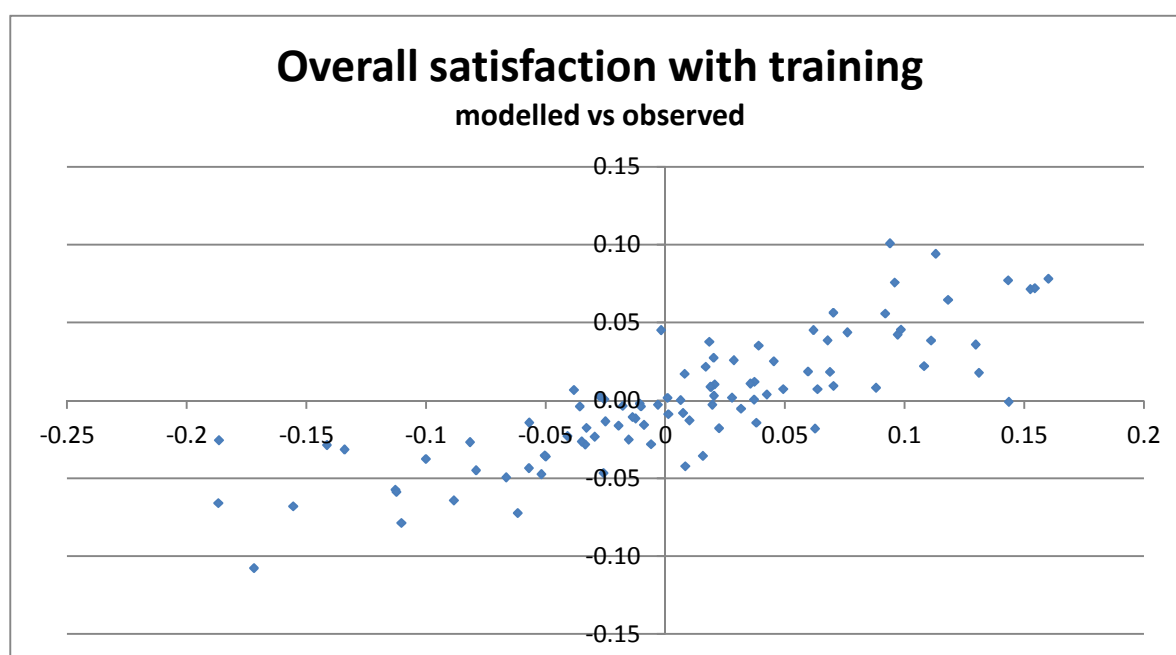
Figure 1 Modelled overall student satisfaction



The figure shows that there is variation in overall satisfaction across institutions, but that there is considerable statistical variability in the modelled estimates, as can be seen from the 95% confidence intervals in the figure. Nevertheless, in this example there are clearly some institutes which have better than average overall satisfaction and some with worse.

Figure 2 shows the importance of taking into account the contextual factors. It can be seen that the difference between the raw and modelled performance is very considerable for some RTOs, although overall there is a reasonably strong positive correlation between the raw and modelled data.

Figure 2 Difference in modelled vs actual, overall student satisfaction

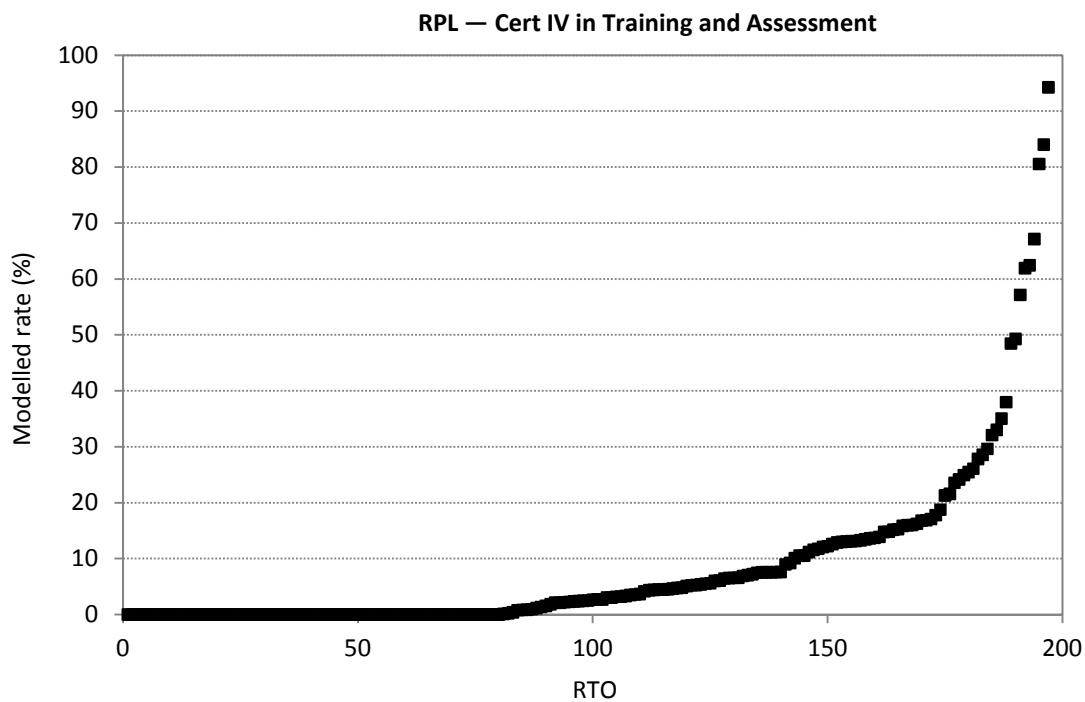


Presentation of indicators

Indicators naturally lead to discussion of league tables. We would argue that league tables are statistically invalid. The argument is that in a league table there is an implicit assumption that the difference between ranks is constant: the difference between the best RTO and the tenth RTO is the same as the difference between the tenth and the twentieth. However, figure 1 shows that this is usually not the case, with the bulk of RTOs in the middle of a distribution statically very similar.

Another example is the proportion of RPL, as seen in figure 3.

Figure 3 Proportion of RPL granted



In this example the distribution is quite skewed, with considerable numbers of RTOs undertaking very little RPL.

These examples suggest that a graphical presentation is a good way of showing relative performance, with error bars giving a reasonable indication of what constitutes a significant difference (statistically speaking).

Inevitably, however, there will be demand to present the range of indicators for an individual RTO. One way forward here might be to use some sort of traffic light or starring system, as used in *The Good Universities Guide*. For example, we could signify 'green' to represent a positive difference which is statistically different from the average, 'amber' to represent performance not statistically different from the average, and 'red' to represent performance statistically worse than the average.

This sort of colour scheme does not work so well for indicators such as percentage of RPL, because of the skewed nature of the distribution. In such cases, stars might work better, with one star indicating modal behaviour (that is very little RPL), two stars indicating significant RPL and three stars indicating abnormally high RPL.

Table 1 gives an indication of such a presentation, although one could not see standard errors and statistics being presented in a document aimed at consumers (and probably not regulators nor governments for that matter).

Table 1 Student satisfaction with teaching and assessment (excerpt only)

Institute	All students teaching satisfaction				All students assessment satisfaction			
	Estimate	StdErr	t	P>t	Estimate	StdErr	t	P>t
1	0.027	0.018	1.51	0.132	0.033	0.019	1.77	0.077
2	0.049	0.022	2.21	0.027	0.020	0.023	0.85	0.398
3	0.062	0.027	2.29	0.022	0.060	0.028	2.14	0.032
4	0.018	0.020	0.88	0.377	0.034	0.021	1.61	0.107
5	-0.048	0.020	-2.45	0.014	-0.056	0.021	-2.74	0.006
6	-0.140	0.025	-5.62	<.0001	0.065	0.025	2.56	0.010
7	0.015	0.025	0.59	0.555	-0.015	0.026	-0.56	0.574
8	-0.055	0.017	-3.21	0.001	-0.058	0.018	-3.22	0.001
10	-0.076	0.016	-4.83	<.0001	-0.082	0.017	-4.95	<.0001
11	0.057	0.022	2.53	0.012	0.046	0.024	1.95	0.051
12	-0.062	0.018	-3.39	0.001	-0.046	0.019	-2.37	0.018
13	-0.038	0.016	-2.35	0.019	-0.028	0.017	-1.65	0.098
14	0.001	0.025	0.05	0.961	-0.030	0.026	-1.16	0.248
15	-0.093	0.020	-4.57	<.0001	-0.078	0.021	-3.7	0.000

A further presentation challenge is keeping the whole exercise manageable. It does not take too much imagination to come up with a huge raft of indicators, such that the sheer magnitude is hard to present let alone absorb. Another question is whether we should present indicators at the whole of institution level or for particular qualifications. The whole of institution approach keeps the exercise more manageable, but may be less useful to the consumers of the indicators. One compromise would be to restrict individual qualification indicators to those qualifications where there are large numbers of students, and present these as well as whole of institution indicators.

Another possibility is to identify indicators that are closely related, with a view to discarding some of them (because they provide little extra information) or combining them. To illustrate this point we analysed the behaviour of a number of indicators relating to student satisfaction and student outcomes and undertook a principal components analysis, the intention of which is to isolate a small number of underlying factors.

Table 2 Principal component analysis — rotated factor patterns

	Factor 1	Factor 2	Factor 3	Factor 4
Employed after training	0.080	0.077	0.950	0.114
Salary after training	0.106	0.116	0.137	0.953
Teaching satisfaction	0.884	0.030	0.239	0.111
Assessment satisfaction	0.817	0.279	0.071	0.278
Learning satisfaction	0.719	0.112	-0.270	-0.293
Overall satisfaction	0.854	0.413	0.104	0.115
Training goal achieved	0.060	0.659	0.571	0.153
Recommend institution	0.362	0.850	0.007	0.063

In this example, we find that there is one factor relating to student satisfaction that is separate to three other factors. From this analysis it seems that we can replace eight indicators with four summary indicators. One issue is whether it is possible to present factor scores in a meaningful way, given the underlying sophistication of the analysis. The fact that factor scores are distributed normally provides one possibility: 'amber' for +/- one standard deviation, 'green' for greater than one standard deviation and 'red' for less than one standard deviation below average.

Final comment

NCVER has already undertaken considerable work on RTO level indicators, primarily for the national VET regulator, the Australian Skills Quality Agency. This work is aimed at assisting the regulator with its risk profiling. It is an obvious application of RTO indicators but one that is not that challenging for the simple reason that it identifies unusual performance rather than good or bad performance. The RTO indicators calculated for this purpose have remained confidential to the regulators and have not been published – the only RTO data to be published by NCVER is a set of descriptive statistics detailing and tabulating the number of students by various characteristics (NCVER 2012).

However, this is all about to change. The Commonwealth has launched the My Skills website with the clear intention of including performance indicators to assist consumer choice. This is consistent with the ‘transparency agenda’ (Commonwealth of Australia 2012) which puts considerable emphasis on the publication of information to aid transparency. The VET sector is lagging behind the higher education sector, in which university level indicators have been published since the early 1990s and the schools sector which has seen the publication of schools level data on the My School website. The VET sector is catching up.

NCVER is in the process of building on the work done for the national regulator. The extension of the work is on two fronts. The first is to address the needs of consumers and governments as well as regulators. This ‘ups the ante’ because consumers and governments are concerned with *good* performance not just *different* performance. The second front is the range of indicators. The work done for the regulator was restricted to available data, notably the students and courses administrative collection and the Student Outcomes Survey. The current work, being undertaken for senior officials, will canvass the broadest range of indicators irrespective of whether data are available or not.

Having compiled a list of possible indicators, the task is then to assess them in terms of ‘fitness for purpose (including reliability and validity)’ against the broad three purposes – for regulation, consumer information and government funding/accountability – and the cost of collection. The latter covers both the cost to governments and to RTOs and needs to consider response burden as well as direct dollar costs. Once NCVER has completed this work it will be considered by senior officials with a view to implementing a road map. The road map will outline the steps that will need to be taken to implement the indicators, from data collection to analysis. Keeping the costs and benefits in balance will be important, and one would anticipate that the final set of performance indicators will need to be relatively few in number to keep the whole exercise manageable.

Table A1 Students by field of study for TAFE institutes, 2009

Institute name	Natural & physical sciences	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services	Mixed field programs	Total
BARRIER REEF INSTITUTE OF TAFE	32	175	3,130	1,151	467	781	549	3,221	1,779	373	2,211	8,757	22,626
BATCHELOR INSTITUTE OF INDIGENOUS TERTIARY EDUCATION	0	0	0	351	145	219	338	100	477	340	0	314	2,284
BENDIGO REGIONAL INSTITUTE OF TAFE	197	136	2,558	1,961	1,185	1,065	375	3,129	949	649	2,175	1,777	16,156
BOX HILL INSTITUTE OF TAFE & BOX HILL INSTITUTE	132	1,337	6,493	1,901	147	1,492	1,410	5,378	2,493	1,565	1,958	3,233	27,539
BRISBANE NORTH INSTITUTE OF TAFE	0	1,083	1,694	265	2,049	8,794	1,828	11,957	4,560	1,026	3,039	12,172	48,467
CANBERRA INSTITUTE OF TECHNOLOGY	413	1,546	2,963	3,127	1,350	1,079	592	6,306	5,042	1,560	2,296	3,789	30,063
CENTRAL GIPPSLAND INSTITUTE OF TAFE	0	159	6,266	1,649	259	1,263	899	1,851	960	380	1,805	1,143	16,634
CENTRAL INSTITUTE OF TECHNOLOGY	558	639	3,477	2,266	124	1,364	3,089	6,485	5,731	3,886	432	8,122	36,173
CENTRAL QUEENSLAND INSTITUTE OF TAFE	123	101	12,052	1,274	299	401	471	4,251	2,763	670	3,613	2,832	28,850

Institute name	Natural & physical sciences	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services	Mixed field programs	Total
CHALLENGER INSTITUTE OF TECHNOLOGY	422	636	5,831	1,899	2,364	568	3,437	3,187	1,502	437	2,667	2,329	25,279
CHARLES DARWIN UNIVERSITY	10	171	2,643	685	2,867	143	1,773	2,437	1,452	880	2,588	1,247	16,896
CHISHOLM INSTITUTE	184	1,849	12,755	4,664	935	3,390	1,246	8,897	4,443	926	5,069	6,785	51,143
C.Y. O'CONNOR COLLEGE OF TAFE	0	28	859	135	1,076	271	609	1,457	833	239	156	488	6,151
DURACK INSTITUTE OF TECHNOLOGY	76	74	1,535	198	474	395	599	1,150	356	375	791	405	6,428
EAST GIPPSLAND INSTITUTE OF TAFE	0	147	2,291	1,603	2,005	1,277	484	2,327	1,014	166	3,182	1,706	16,202
GOLD COAST INSTITUTE OF TAFE	0	261	2,914	1,405	217	914	753	3,636	1,072	758	1,747	11,305	24,982
GORDON INSTITUTE OF TAFE	99	415	3,089	3,248	542	1,557	564	4,697	1,357	750	2,844	2,703	21,865
GOULBURN OVENS INSTITUTE OF TAFE	46	49	3,361	1,487	3,001	1,407	443	1,163	1,142	288	1,985	1,720	16,092
GREAT SOUTHERN TAFE	0	128	1,075	253	1,062	628	979	1,035	469	477	361	836	7,303
HOLMESGLEN INSTITUTE OF TAFE	244	950	6,987	8,398	1,178	3,125	1,356	10,756	3,605	1,000	3,493	10,374	51,466
KANGAN INSTITUTE	85	713	12,096	1,776	755	1,465	910	7,480	2,149	1,287	4,390	4,771	37,877
KIMBERLEY TAFE	0	56	479	179	728	168	1,147	601	398	336	439	251	4,782
METROPOLITAN SOUTH INSTITUTE OF TAFE	45	517	2,151	0	611	1,231	1,789	5,846	4,655	1,432	2,893	9,725	30,895

Institute name	Natural & physical sciences	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services	Mixed field programs	Total
MINISTER FOR EMPLOYMENT, TRAINING AND FURTHER EDUCATION	264	1,590	8,571	5,809	2,026	3,497	2,982	15,759	9,959	2,212	4,712	12,743	70,124
MOUNT ISA INSTITUTE OF TAFE	0	0	774	345	78	135	114	362	322	0	199	859	3,188
NORTHERN MELBOURNE INSTITUTE OF TAFE	141	1,056	6,815	5,925	2,500	768	1,348	4,402	2,609	2,020	2,738	5,927	36,249
PILBARA TAFE	0	45	3,481	197	170	593	807	977	420	98	302	533	7,623
POLYTECHNIC WEST	127	796	11,080	4,138	676	1,748	2,996	3,010	2,646	516	2,632	9,239	39,604
RMIT UNIVERSITY	330	556	4,740	1,796	61	2,338	466	5,494	1,532	2,241	0	2,048	21,602
SKILLSTECH AUSTRALIA	0	0	18,341	7,767	286	601	15	201	0	0	0	2,091	29,302
SOUTH WEST INSTITUTE OF TAFE	120	153	2,745	1,338	1,514	3,172	381	1,897	768	614	2,653	965	16,320
SOUTH WEST REGIONAL COLLEGE OF TAFE	104	194	1,871	738	1,145	391	437	1,540	671	368	506	1,020	8,985
SOUTHBANK INSTITUTE OF TECHNOLOGY	424	695	2,251	812	0	3,179	944	5,553	4,091	1,624	7,279	14,776	41,628
SOUTHERN QUEENSLAND INSTITUTE OF TAFE	0	324	5,141	1,175	1,777	1,254	944	3,434	1,981	618	4,405	4,790	25,843
SUNRAYSIA INSTITUTE OF TAFE	19	69	1,244	572	979	299	345	952	339	164	1,924	835	7,741

Institute name	Natural & physical sciences	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services	Mixed field programs	Total
SUNSHINE COAST INSTITUTE OF TAFE	37	235	2,333	1,713	563	1,661	552	2,528	3,155	816	2,079	2,546	18,218
SWINBURNE UNIVERSITY OF TECHNOLOGY	212	1,416	4,540	1,927	1,632	7,418	739	11,778	5,449	799	704	5,491	42,105
TAFE NSW — HUNTER INSTITUTE	329	1,107	13,157	4,119	3,291	3,887	1,048	7,820	3,905	1,813	4,634	12,675	57,785
TAFE NSW — ILLAWARRA INSTITUTE	30	750	5,218	2,519	1,442	1,206	628	4,784	3,010	1,248	4,681	7,687	33,203
TAFE NSW — NEW ENGLAND INSTITUTE	41	775	3,130	2,062	1,276	1,710	361	2,496	1,902	933	1,446	4,868	21,000
TAFE NSW — NORTH COAST INSTITUTE	58	2,561	4,284	2,408	2,672	1,232	1,513	7,944	3,900	1,085	3,472	11,232	42,361
TAFE NSW — NORTHERN SYDNEY INSTITUTE	123	1,961	3,493	3,661	2,691	1,394	846	8,871	5,280	2,477	3,877	12,729	47,403
TAFE NSW — OPEN TRAINING & EDUCATION NETWORK	71	533	1,358	1,377	704	2,754	764	18,289	6,823	185	1,617	6,941	41,416
TAFE NSW — RIVERINA INSTITUTE	47	747	5,691	2,488	3,430	2,116	705	3,754	2,718	357	3,616	7,849	33,518
TAFE NSW — SOUTH WESTERN SYDNEY INSTITUTE	655	2,067	12,423	8,106	1,072	1,991	1,004	13,208	8,735	1,235	3,899	18,444	72,839
TAFE NSW — SYDNEY INSTITUTE	407	2,174	10,028	5,573	0	2,844	881	14,292	11,452	4,240	4,723	17,552	74,166

Institute name	Natural & physical sciences	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services	Mixed field programs	Total
TAFE NSW — WESTERN INSTITUTE	27	737	5,339	2,036	4,171	2,866	723	4,904	3,116	1,014	5,777	7,633	38,343
TAFE NSW — WESTERN SYDNEY INSTITUTE	0	2,707	5,776	3,368	1,817	2,325	678	9,007	5,156	1,606	3,415	12,652	48,507
TAFE SA — ADELAIDE NORTH INSTITUTE	0	277	447	157	14	256	0	1,772	111	28	200	1,253	4,515
TAFE SA — ADELAIDE SOUTH INSTITUTE	0	14	215	92	0	16	0	881	39	113	39	250	1,659
TAFE SA — REGIONAL	0	5	100	82	372	66	0	644	0	0	306	665	2,240
TASMANIAN POLYTECHNIC	106	798	1,496	1,047	483	614	156	4,352	2,517	862	1,978	4,413	18,822
TASMANIAN SKILLS INSTITUTE	20	155	7,283	4,491	2,056	1,657	415	1,788	1,109	0	5,770	196	24,940
THE BREMER INSTITUTE OF TAFE	0	140	3,067	915	361	1,069	1,057	2,462	3,868	430	1,528	5,687	20,584
TROPICAL NORTH QUEENSLAND INSTITUTE OF TAFE	0	155	4,340	1,534	936	1,893	460	2,440	2,169	703	2,114	5,111	21,855
UNIVERSITY OF BALLARAT	9	182	3,372	1,466	1,010	1,518	369	2,710	1,663	438	1,135	1,864	15,736
VICTORIA UNIVERSITY	121	862	4,282	3,744	40	1,147	1,672	5,653	3,737	864	2,638	5,254	30,014
WEST COAST INSTITUTE OF TRAINING	0	462	182	185	334	1,335	2,907	2,387	1,363	60	1,416	744	11,375

Institute name	Natural & physical sciences	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services	Mixed field programs	Total
WIDE BAY INSTITUTE OF TAFE	0	186	2,215	589	1,012	244	534	2,961	2,969	305	1,757	2,852	15,624
WILLIAM ANGLISS INSTITUTE OF TAFE	0	0	643	0	0	0	62	5,506	0	42	13,799	3,698	23,750
WODONGA INSTITUTE OF TAFE	13	187	6,045	1,046	1,029	1,199	407	2,388	1,059	452	1,658	1,649	17,132
TOTAL TAFE	6,501	37,841	274,210	127,192	67,460	95,390	55,900	286,547	159,744	52,380	155,762	314,545	1,633,472
OTHER GOVERNMENT PROVIDERS	2	696	4,701	6,886	5,694	291	352	15,126	1,319	3,689	18,742	837	58,335
COMMUNITY EDUCATION PROVIDERS	0	1,125	1,880	2,331	3,490	6,706	5,458	17,836	16,171	1,302	13,496	23,238	93,033
OTHER REGISTERED PROVIDERS	908	2,095	54,425	15,266	10,434	7,642	7,230	78,946	32,058	1,954	32,807	16,114	259,879
TOTAL	7,411	41,757	335,216	151,675	87,078	110,029	68,940	398,455	209,292	59,325	220,807	354,734	2,044,719

Table A2 Estimated population of graduates by field of education, 2009

State	Institute name	Field of education												Total
		Natural & physical science	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services	Mixed field programs	
New South Wales	TAFE NSW — HUNTER INSTITUTE	7	22	173	39	23	41	25	254	116	55	66	97	918
	TAFE NSW — ILLAWARRA INSTITUTE	0	11	100	43	21	29	25	152	115	27	42	61	626
	TAFE NSW — NEW ENGLAND INSTITUTE	1	5	73	14	23	42	8	67	68	14	12	25	352
	TAFE NSW — NORTH COAST INSTITUTE	6	41	79	27	43	36	22	226	100	30	33	56	699
	TAFE NSW — NORTHERN SYDNEY INSTITUTE	0	36	56	57	80	70	11	228	159	60	57	68	882
	TAFE NSW — OPEN TRAINING & EDUCATION NETWORK	0	11	29	14	8	72	2	246	68	1	1	31	483
	TAFE NSW — RIVERINA INSTITUTE	1	19	59	37	47	25	27	104	74	11	23	48	475
	TAFE NSW — SOUTH WESTERN SYDNEY INSTITUTE	29	60	259	105	25	53	24	516	244	22	86	126	1,549

State	Institute name	Field of education											Total	
		Natural & physical science	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services		Mixed field programs
Victoria	TAFE NSW — SYDNEY INSTITUTE	5	55	165	93	0	87	32	356	336	103	90	102	1,424
	TAFE NSW — WESTERN INSTITUTE	1	3	78	21	43	54	12	135	68	11	29	37	492
	TAFE NSW — WESTERN SYDNEY INSTITUTE	0	42	91	33	25	29	16	260	124	29	46	65	760
	CHISHOLM INSTITUTE OF TAFE	11	14	156	82	21	92	98	219	124	25	113	58	1,013
	BENDIGO REGIONAL INSTITUTE OF TAFE	1	11	91	35	27	18	40	109	73	16	34	10	465
	BOX HILL INSTITUTE OF TAFE	5	12	127	29	10	64	95	256	64	32	69	25	788
	CENTRAL GIPPSLAND INSTITUTE OF TAFE	0	11	97	32	7	37	90	100	64	3	129	13	583
	EAST GIPPSLAND INSTITUTE OF TAFE	0	4	69	12	69	12	28	111	56	4	78	4	447
	GORDON INSTITUTE OF TAFE	1	11	102	42	32	34	34	162	49	16	83	20	586

State	Institute name	Field of education											Total	
		Natural & physical science	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services		Mixed field programs
	GOULBURN OVENS INSTITUTE OF TAFE	4	9	123	22	129	43	50	65	79	12	105	12	653
	HOLMESGLEN INSTITUTE OF TAFE	14	16	72	93	24	28	61	219	147	35	87	93	889
	KANGAN BATMAN INSTITUTE OF TAFE	6	64	180	24	8	38	32	228	70	15	58	36	759
	NORTHERN MELBOURNE INSTITUTE OF TAFE	11	18	129	56	81	29	83	169	72	39	60	58	805
	ROYAL MELBOURNE INSTITUTE OF TECHNOLOGY (TAFE DIVISION)	14	40	145	43	3	81	21	176	48	69	0	47	687
	SOUTH WEST INSTITUTE OF TAFE	9	12	66	36	79	25	17	59	52	18	64	6	443
	SUNRAYSIA INSTITUTE OF TAFE	3	7	84	13	69	26	58	71	52	1	50	42	476
	SWINBURNE UNIVERSITY OF TECHNOLOGY (TAFE DIVISION)	5	20	87	32	22	83	40	401	142	21	43	49	945

State	Institute name	Field of education											Total	
		Natural & physical science	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services		Mixed field programs
Queensland	UNIVERSITY OF BALLARAT (TAFE DIVISION)	0	11	109	30	34	59	13	180	81	14	50	18	599
	VICTORIA UNIVERSITY (TAFE DIVISION)	11	36	96	42	0	77	89	203	127	26	104	35	846
	WILLIAM ANGLISS INSTITUTE OF TAFE	0	0	23	0	0	0	2	196	0	0	177	0	398
	WODONGA INSTITUTE OF TAFE	2	8	137	8	27	44	45	156	64	8	57	32	588
	DRIVER EDUCATION CENTRE OF AUSTRALIA PTY LTD	0	0	13	0	0	0	2	0	0	0	0	0	15
	BARRIER REEF INSTITUTE OF TAFE	2	5	133	39	16	8	54	143	78	11	164	14	667
	THE BREMER INSTITUTE OF TAFE	0	3	60	11	14	34	104	183	97	13	124	24	667
	BRISBANE NORTH INSTITUTE OF TAFE	0	25	60	9	95	52	84	326	575	38	117	29	1,410
	CENTRAL QUEENSLAND INSTITUTE OF TAFE	7	1	292	27	14	12	30	138	95	15	181	20	832

State	Institute name	Field of education											Total	
		Natural & physical science	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services		Mixed field programs
	COOLOOLA SUNSHINE INSTITUTE OF TAFE	3	12	155	57	26	60	41	209	147	37	137	13	897
	GOLD COAST INSTITUTE OF TAFE	0	26	105	40	4	57	51	187	62	16	109	36	693
	METROPOLITAN SOUTH INSTITUTE OF TAFE	5	15	47	0	21	57	121	290	134	33	146	57	926
	MOUNT ISA INSTITUTE OF TAFE	0	0	47	7	1	0	31	42	19	0	18	3	168
	SOUTHBANK INSTITUTE OF TAFE	23	36	69	13	0	77	55	120	56	57	295	68	869
	SOUTHERN QUEENSLAND INSTITUTE OF TAFE	0	16	183	24	99	34	49	185	84	33	307	17	1,031
	TROPICAL NORTH QUEENSLAND INSTITUTE OF TAFE	0	15	159	16	32	83	53	130	102	10	93	12	705
	WIDE BAY INSTITUTE OF TAFE	0	7	91	18	32	2	37	210	133	13	116	9	668
	SKILLSTECH AUSTRALIA	0	0	498	183	13	0	0	6	0	0	0	0	700

State	Institute name	Field of education											Total		
		Natural & physical science	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services		Mixed field programs	
Western Australia	SWAN TAFE	8	29	406	125	22	83	85	154	78	6	99	118	1,213	
	WEST COAST TAFE	0	9	10	2	17	76	66	143	109	6	92	15	545	
	CHALLENGER TAFE	18	21	266	53	77	26	122	181	87	19	105	29	1,004	
	CENTRAL TAFE	16	16	100	49	6	54	77	323	220	145	13	215	1,234	
	CENTRAL WEST TAFE	3	1	139	10	68	14	22	120	30	17	43	10	477	
	GREAT SOUTHERN TAFE	0	15	50	17	89	18	26	119	71	24	58	30	517	
	SOUTH WEST REGIONAL COLLEGE OF TAFE	8	18	131	59	94	37	59	137	50	14	55	20	682	
	KIMBERLEY COLLEGE OF TAFE	0	1	36	0	31	2	27	31	28	13	55	6	230	
	C.Y. O'CONNOR COLLEGE OF TAFE	0	1	70	5	79	22	35	82	91	5	16	40	446	
	PILBARA TAFE	0	3	242	4	3	13	32	97	31	6	28	15	474	
	CURTIN UNIVERSITY - VTEC	0	1	56	12	59	19	36	78	30	0	9	13	313	
	EDITH COWAN UNIVERSITY	0	0	0	0	0	0	0	0	0	76	0	0	76	
	South Australia	TAFE SA REGIONAL	2	6	54	14	90	68	132	267	241	14	25	94	1,007

State	Institute name	Field of education												Total
		Natural & physical science	Information technology	Engineering & related technologies	Architecture & building	Agriculture, environmental & related studies	Health	Education	Management & commerce	Society & culture	Creative arts	Food, hospitality & personal services	Mixed field programs	
	TAFE SA ADELAIDE SOUTH	5	16	112	75	0	22	52	327	204	18	52	97	980
	TAFE SA ADELAIDE NORTH	7	12	127	62	9	133	161	171	192	36	107	112	1,129
Tasmania	INSTITUTE OF TAFE TASMANIA	6	30	242	95	115	40	59	261	161	42	294	48	1,393
Northern Territory	BATCHELOR INSTITUTE OF INDIGENOUS TERTIARY EDUCATION	0	0	1	1	1	6	7	3	6	9	0	0	34
	CHARLES DARWIN UNIVERSITY	2	28	164	26	120	26	112	295	138	21	148	45	1,125
Australian Capital Territory	CANBERRA INSTITUTE OF TECHNOLOGY	15	35	67	41	21	51	83	257	207	77	72	30	956
Australia total (TAFE)		277	1,012	7,240	2,208	2,248	2,514	3,005	10,839	6,392	1,541	4,924	2,513	44,713

Source: Student Outcomes Survey 2009.

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