

Student Success: Overcoming Quality Systems and Data Problems

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Abstract

TEC expects ITPs to achieve high student success rates (2007) and to demonstrate appropriate contributions in their plans and reports. This requires accurate and truthful statistical analysis and suitable management practices to achieve the required contribution levels. The value of good programme management will be indispensable. With the National Advisory Committee on Computing Qualifications (NACCQ) being the only recognised advisory organisation to ITPNZ, it has a responsibility to visibly share and help improve the ITP sector management of ICT qualifications. McCarthy (2007) raised this matter, covering work of Scott (2005) and others, but no subsequent papers have been presented at following NACCQ annual conferences. This paper presents a case study from one institution to provide further work on this very important matter.

Keywords: Completion, retention, pass rate, quality, programme management.

1 Introduction

TEC is increasingly pursuing an improvement in tertiary “success” rates, based on factors such as completion and retention. This paper does not specifically consider various existing definitions related to “success”. Instead it subjectively reports the experiences based on this case study. It shows how ontological consideration of organizational systems was more important than the epistemology of specific information.

ITP investment plans now commit institutions to targets regarding student success and this was covered in WINTEC’s investment plan of 2008. During 2008 the institution began tackling “success rates” more systematically. The Student Experience unit initiated a pilot project to identify students “at risk” of being unsuccessful, for early intervention.

Executive Summary
This strategy is focused on improving first year student attrition and retention by contacting at risk students and using extensive support systems as interventions. At risk students are those who are at risk of not completing enrolment, failing courses, dropping out, or needing support.

stated that only one in five students complete a particular programme. In other words, only one in five students is “successful”. Such a low figure is obviously of huge concern. This statistic and possible intervention were included in documentation of our quality systems that were shared with TEC representatives.

2 Context

The programme environment for consideration include (context) performance targets from the Investment Plan, self-assessment practices of the quality management system, traditional management information systems, the student First Year Experience strategy and finally the place of the specific qualification in the IT pathway.

WINTEC committed in the investment plan to lift course and qualification (programme) completion:

Quality and Outcomes
<p>The Government and the ITP sector itself have a goal to achieve internationally comparable levels of quality. This requires development of infrastructure and performance, combined with a dedication to continuous quality improvement. In terms of the Government’s investment in the ITP sector, a particular focus over this investment period must be the lifting of overall educational outcomes including:</p> <ul style="list-style-type: none">• Course and qualification completion and retention rates<ul style="list-style-type: none">• Increased progression from lower levels of provision to levels 4 and above• Higher levels of overall provision at levels 4 and above of the framework• Continuing to align provision more closely to the needs of the region. <p>Wintec intends to achieve these, and its wider quality goals, through the following major initiatives:</p> <ul style="list-style-type: none">• Developing an underlying culture of quality improvement through the adoption of a business excellence framework across all the major areas of Wintec’s operations• Significant investment in improving processes and systems right across the range of operations.• Further developments in student outcomes monitoring, culminating in comprehensive education outcomes reporting that can be benchmarked against wider sector performance

<p>1.6.2 Programme completion statistics</p> <p>The sector is now well provided with overall trend and outcome data regarding several aspects of programme completion.</p> <p>These include:</p>

Figure 1: First Year Experience (FYE) Retention Strategy

The School of IT hopes to be included from 2009.

WINTEC also operates a management quality system that proves to TEC that shortcomings are proactively identified and followed up with corrective action. We will show how one of our institution’s internal documents

- First year attrition rates: The percentage of learners starting a qualification that have not completed it in that year AND are not enrolled in the following year.
- Qualification retention rates: The rates (after 1, 2, 3 and 4 years) of learners who have completed the qualification or are still enrolled in it
- Programme completion rates: The overall rate (after 1, 2 and 3 through to 6 or more years) of learners beginning the programme in any given year who have completed the qualification.

Wintec is currently working through a major project, the Student Outcomes Monitoring Project, to develop accurate internal reporting of outcomes performance along the lines of the TEC statistics. An integral part of this project is to continue reporting on Māori, Pasifika and international learners sub-groups as well. When completed this project, along with improved participation rate monitoring, will allow a much more comprehensive view of the direct educational outcomes achieved by Wintec for the region. In the longer term, by improving this reporting and analysis, in addition to increasing overall alignment between Wintec's delivery and regional needs, Wintec will be in a much stronger position to gauge the overall outcomes it delivers for the region, not just directly, in terms of completions etc, but also how well it is matching the region's needs.

Figure 2: Extracts from the institution's investment plan

Specific numerical targets for completion were for the institution:

Table 4.1 Wintec's KPIs for TEC Plan Approval

Investment Guidance KPI		Historic	2008	2009	2010
Customers and Stakeholders					
Outcomes	subgroups	Base Year	Result	Outcome Commitment	
TEC course retention rate - level 4 and above	Total	2006	86.2%	85.0%	85.0%
	Maori	2006	79.2%	80.0%	82.5%
	Pasifika	2006	76.2%	78.0%	82.0%
TEC course completion rate - level 4 and above	Total	2006	80.1%	80.0%	80.0%
	Maori	2006	72.5%	73.0%	76.0%
	Pasifika	2006	70.0%	72.5%	75.0%
1st-year attrition rate - level 4 and above (TEC EFTS)	Total	2006	46.4%	44.0%	42.0%
	Maori	2006	54.3%	52.0%	48.0%
	Pasifika	2006	40.8%	40.0%	40.0%
Percentage of TEC learners in employment or further study six months after completion	Total	206	94.9%	95.0%	95.0%
	Maori	2006	93.4%	95.0%	95.0%
	Pasifika	2006	83.3%	85.0%	90.0%

Table 4.2. Wintec Balanced Scorecard KPIs

KPI	2008	2009	2010
Customers and Stakeholders			
International			
International course completion rate	80.0%	80.0%	80.0%
1st-year International attrition rate	34.0%	32.0%	30.0%
International student satisfaction rate	70.0%	72.5%	75.0%

Figure 3: Extracts from the institution's business plan

WINTEC volunteered to be one of five institutions where evidence of self-management would replace detailed annual auditing. A quality system framework with many dimensions and parameters is being used for this purpose. The first visit of assessors to assess practices, was during October 2008. During preparation, several qualifications were identified for scrutiny of management practices. The local Certificate in Computing and Information Technology (CCIT) had apparent poor completion rates so the Quality and Academic Unit (QAU), together with

Executive Management, added it to the list of five programmes.

QAU drafted a self-assessment report including details of each programme across the many parameters of the framework. In their view there were shortcomings re curriculum, tutor workload, student e-portal, completions, stakeholder involvement and the need to have ITIL "accreditation" included. The report was unfortunately inaccurate in most regards, which lead to a series of unfortunate events.

Below is their recording of their observations regarding specifically achievement of students on the CCIT programme.

How well do learners achieve?	• Completions are very low at 18%. Reasons for low completions include learners getting jobs before completing the qualification, learners not being motivated to complete and challenges regarding follow-up of non-attending learners.
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Figure 4: Extract from self-assessment report - Observations

For each observation, and specifically for student completion, they drafted interventions. These were briefly discussed with the relevant Programme Manager, unfortunately without proper explanation of process context and details. The draft for completions indicated the following:

• Completion rates are very low. Investigate options for restructuring the programme with early exit points, or considering the introduction of more assessments in the workplace may address this trend.

Figure 5: Extract from self-assessment report - Possible Interventions

The visiting external assessors met with staff to confirm documentation and actions. During this meeting the HOS and PM indicated that the self-assessment report is inaccurate, but that we undertake to investigate matter anyway and take corrective action:

Focus area: Certificate in Computing and Information Technology (CCIT)			
OFIs (Opportunities for Improvement)	Contact Person	Timeline	Explanation
Learners often need ITIL certification in addition to qualifications gained at Wintec for entering the job market. In order to be responsive to industry, the School of IT may consider applying for ITIL accreditation.	Christo Potgieter / Garry Robertson	Dec 2010	ITIL actually allows certification opportunities for staff, not accreditation for institution. Therefore scheduled training of some staff to review School curriculum, explore short courses and advise industry.
Completion rates are very low. Investigate options for restructuring the programme with early exit points, or considering the introduction of more assessments in the workplace may address this trend.	Christo Potgieter / Garry Robertson	Jul 2009	The 6-month qual bridges NCC3 into Dip/CITLS. To investigate student retention, practicalities of early exit and efficiencies of workplace assessment.
Processes for changes to programmes are perceived to be a barrier to responsiveness by programme staff. Conversations with the Quality and Academic Unit (QAU) may improve understanding around the development, approval and changes of programmes, including academic timetables involved.	Christo Potgieter / Garry Robertson	Dec 2008	Sounds unsubstantiated. To hold some discussions with programme staff to verify comments and inform role players
Efforts are made to support tutors during current demanding circumstances. Further follow up on tutor support may be needed to ensure tutors are able to provide the supportive classroom environment required by learners.	Christo Potgieter / Garry Robertson	Dec 2009	Excluding academic workload - managed via workload policy. Suggest corporate perspective where support for tutors with actions, will emerge via the 'Academic Directions' project

Figure 6: Extract from assessment report by NZQA's external assessors - Findings re CCIT

We were of the belief that completion statistics were inaccurate, but did not formally record that. After their visit, the assessors were satisfied with WINTEC practices and mentioned the following regarding CCIT:

4.2 Certificate in Computing and Information Technology (Level 5)

For the first three of the KEQ's, the evaluation team found good and consistent evidence to answer the questions. For KEQ 4 the evidence available, in the Institute's Self Assessment Report and from discussions with Wintec staff, was conflicting and insufficient to answer the KEQ. For KEQ 5 the evidence available was inconsistent. For example, there was a lack of evidence available to determine why rolls are declining in spite of the "critical IT skills shortage in the industry". More data needs to be collected on how well learners achieve and on the values of outcomes for stakeholders including learners – see the recommendations in Sections 5.4 and 5.5 below.

Programme performance against all five KEQs was found to be adequate because there was evidence that minimum requirements were being met. Action is required to improve both completion rates and satisfaction levels, both of which are low compared to other programmes.

Figure 7: Extract from assessment report by NZQA's external assessors – Conclusions re CCIT

They indicated that evidence for industry trends re vacancies could improve, which is easy to provide. But they also indicated the need for improvement of completion rates, which is what this paper focuses on.

3 Getting into CCIT

CCIT is a 63-credit level 5 one semester qualification, using NACCQ Blue Book modules, offered in the second semester of every year. The prerequisites include the equivalence of the National Certificate of Computing level 3 (NCC L3), which is offered in both semesters. Most CCIT applicants students come from NCC L3, having either re-entered the workplace and tertiary studies, or having already failed elsewhere in some regard or to some extent.

Upon completion, students can continue into the Diploma in Information and Communications Technology Level 5 (DipICT L5) or BInfoTech year one in the School of IT. The certificate therefore makes an important contribution in providing a study pathway for slightly more mature students.

Enrolments are relatively low, never filling up our 18-seat PC labs. Fortunately enrolments still exceed minimum levels to avoid closure due to financial viability. However, there has always been a significant number of students exiting over the period, including withdrawals, non-completions and failures. This is what QAU was concerned about in their self-assessment.

In line with good quality systems practices, QAU were told that an analysis would be completed, discussions with programme committees and the employer partnership group (Advisory committee) would be held, followed by a management meeting with QAU to formulate an appropriate set of actions. The key regarding student achievement (completion) is obviously to have the base data sorted properly, so an analysis of statistics was performed first.

4 Evidence regarding programme completions

The analysis covered the period 2003-2008. All programme enrolments were included, regardless of number of modules enrolled for. Students who did not arrive and those who did not submit any work, were

excluded thereby covering students who were in class and active. Also, success was recorded against the first year of enrolment regardless of when students eventually meet all requirements of being awarded the qualification.

Enrolments and therefore class sizes declined over the period. This happens to coincide with the general climax of economic growth and high employment rates in New Zealand. At this stage economic sustainability is of concern. Smaller classes have both positive and negative learning experiences.

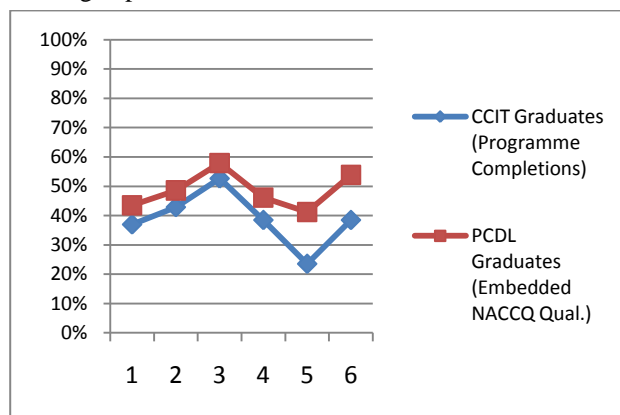


Figure 8: Our statistics re completions (manually calculated)

Completions appear cyclic, with increase to 2005, then decline in 2006 and 2007 but recovery in 2008. The period of decline (2006 and 2007) happen to coincide with the climax of New Zealand economic growth and high employment rates. We have noticed several students withdrawing with reference to personal situations, including family and employment. These were also the most common reasons recorded across the institution.

Most importantly, over the years, completions vary around 40%, in the range of 25% to 55%. While still much lower than the institutional 80% target, it is evident that each year is significantly higher than the 18% completion rate observed by QUA.

Furthermore, the PCDL (PC Drivers Licence) qualification that is imbedded in CCIT, as explained by Robertson & Corbett (2007). We therefore found that several students who have not completed CCIT, actually meets requirements for PCDL. They obviously just need to apply to NACCQ for the qualification to be awarded. This has not been considered to date and should be used in future communications with TEC.

There are several reasons that might cause our levels to be higher than that of QAU, for example:

- We included studies exceeding one semester
- We included credit recognitions done
- We excluded students who withdrew

However, both sets of data show that student success is of concern, so it does not really matter which is most accurate! Instead, one needs intervention with students as top priority, clarity for managing this in the quality system and managing improvement to analysis. These are ontological matters.

5 Further analysis of fall-out

It seems a significant number of students stopped studies fully or partially during the semester (see below DNC = “Did Not Complete”). Basically 30-50% of the students simply did not complete their studies by doing assessments to the very end. This would include students who formally withdrew for whatever reason. Main reasons given for withdrawal were Personal/Family, Employment and None.

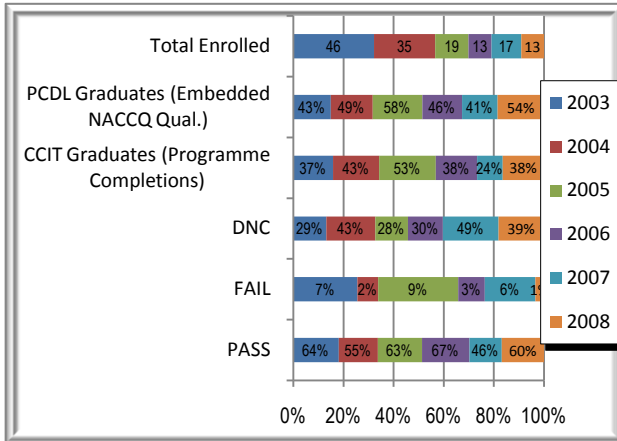


Figure 9: Breakdown per year of final turn-out

The sum of PASS and FAIL are students who submitted all assignments, therefore actively participating to the very end. This varies between 52% and 79%. The FAIL portion are students who were still not successful – usually less than 10% of students, continuing to the end.

Unfortunately a low percentage of students continue participating to the very end. It is possible that in the current worsening economic climate students might be more committed to studies. Regardless, the WINTEC student retention strategy by which “at risk” students are contacted might also help to improve study to the very end with improved pass rates, provided it comes associated with support for problems encountered with the students personal lives.

While it is preferable for students to complete the full CCIT, they can meet requirements for DipICT level 5 and BInfoTech with partial completion. This is because CCIT is a level 5 qualification. For a picture of student success, one needs to consider retention of students in the pathway. Here we compared CCIT students continuing in the School to enrolments of the previous year.

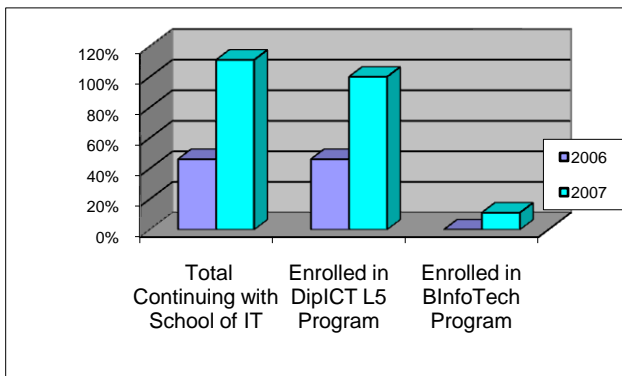


Figure 10: Students continuing studies in the School

In 2007, when the economy was still strong, the figure was only 40%. However, in 2008 it exceeded 100% because candidates were joined by graduates from previous years.

With so many students continuing with further studies in IT at the institution, it is clear student success is better than portrayed by the initial QUA statistics. Having said that, one should still consider progress within the qualification.

6 Module level analysis

Because students don’t need to complete all modules in the qualification in order to continue, they often don’t even enrol in all modules and do not pursue completion for success. To consider efficiency of teaching and TEC funding, one obviously should analyse module completions.

In the diagram below, “DNC” indicate “Did Not Complete” – students did not sit all assessment at least once, so do not pass the course. Pass rates of modules varied around 60% for the past six years. This is much higher than the programme completion rate we calculated above and three times higher than QAU’s programme completion.

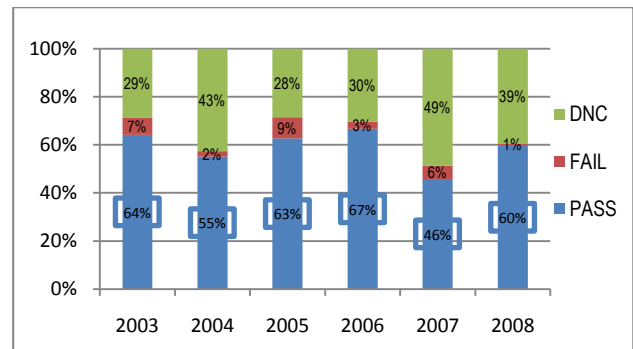


Figure 11: Student outcomes at module level

Also note there is not a clear correlation between module pass rates and programme completion rates. While programme completions improved in 2004 and 2005, module completions actually did not change and had a slight dip for 2004. However, both module pass rates and programme completion rates were worst in 2007.

Excluding DNCs, very few students who continued to the end of semester with all assessments, actually failed:

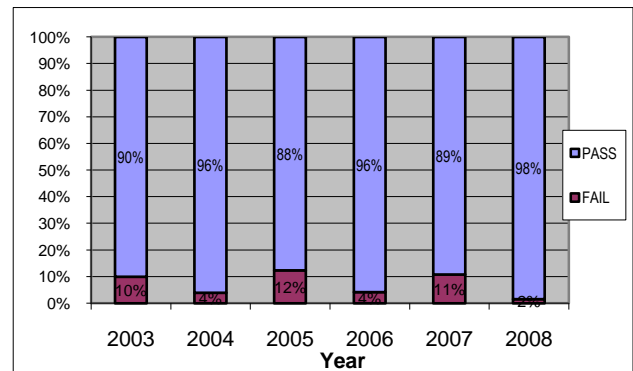


Figure 12: Full semester study: Pass vs Fail at module level

The proportion of International students significantly increased in 2008 but remained less than 20% per class. However, we noticed their pass rate is lower than that of domestic students, which will be subject to further investigation.

Even with above analysis projecting a more positive picture than the original statistics of QAU, module pass rates are still too low to achieve institutional programme targets and meet TEC expectations, so will require some consideration.

7 Retention for higher levels

TEC wants students to increase proportion of students completing studies at NQF levels 5 and 6. Completion of CCIT makes contribution to improvement of outputs for NQF level 5. We showed above that the majority of students continue with IT studies at WINTEC so eventually contribute to completions at higher levels, as required by TEC.

While pass rates and programme completion of CCIT might overall not be satisfactory, the fact remains that those who continue onwards end up making a contribution to other TEC strategic goals. In the extreme event of CCIT being closed down, one will also reduce this flow-through effect that TEC actually expects.

One such ex-student was class representative and is now member of our Employer Partnership Group. This demonstrates the value of a low-level programme in the pathway that feeds higher level qualifications and eventually industry collaboration.

There appears to be more to be considered than one statistic in the early part of the value chain.

8 Closing the loop

We showed with above analysis that student success is much better than originally signalled. We also noticed that further study is needed into student retention, as expected by TEC

This analysis was done for one of the items in the WINTEC QAU self-assessment report. To ensure it feeds into the management system, it was discussed at programme committee of tutors, an Employer Partnership Group meeting and School management (HOS and PMs).

Getting back to the quality system environment! Our first observation was that most of the notes by QAU were inaccurate and lead to misunderstandings later on. We will therefore need to tighten the self-assessment practice to ensure accuracy and agreement.

What now remains is for the School to firstly record this in the annual programme report. The revised format includes a self-assessment section, where this analysis will be very useful. These reports are considered by QAU and Executive Management, which closes the loop. We will also update QAU regarding all actions taken to verify that the loop has been closed by feeding info into the quality system for management.

9 Conclusion

It is very noticeable how this study has moved from an evidently epistemological question of statistics, to the

ontological domination of process and behaviour. This is possible the biggest challenge for left-brain, objectivistic scientific IT practitioners and educators and managers. While the statistical evidence has shown there to be some problems associated with retention and completions the overall value of the CCIT programme needs to be considered within the pathway context. When the statistics are examined at the module level, in terms of successful outcomes, it is evident that student success can be measured according to module pass rates. This also indicates a very low failure rate among the student cohort successfully completing the programme. QAU have already confirmed the ongoing value of this programme, in terms of the number of successful students enrolling onto higher level programmes and continuing to progress the ICT pathway towards higher value outcomes.

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