

# Doing a bachelors degree

## *Comparing university entrance and NCEA levels*

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# COMPARING UNIVERSITY ENTRANCE AND NCEA LEVELS

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For students who progress onto degree-level study after leaving school, those with higher school achievement, on average, do better in their tertiary studies. For students who meet the university entrance requirement, those who achieve NCEA level 3 do better than those who do not gain NCEA level 3. And while those who don't meet the university entrance requirement tend not to perform as well as those who do, it is the achievement of NCEA level 3, over level 2, that is associated with the greatest improvement in performance.

Bachelors degrees offered at polytechnics and universities have different orientations. The distribution of students across fields of study is also different. So are the demographic and study characteristics of students at the two institution types—polytechnic students are older and more likely to be part-time.

If we just focus on young, full-time students, the polytechnic students have lower prior school achievement—a proxy for the innate academic ability of the students.

But when we control for age, full-time status and the level of school achievement in NCEA, polytechnic degree students have slightly higher first-year pass rates than university students. And the five-year qualification completion rates of these students in the two institution types are similar.

However, this doesn't suggest that polytechnics are actually doing a better job than universities—only that for the group of students we are interested in for this study, the polytechnic pass rate is better.

## Introduction

This paper looks at differences in the performance of young people who leave school and progress on to bachelors degree study. It compares the performance of students with different levels of school achievement. It also compares the performance of young degree students at polytechnics and universities. We use qualification completion rates and first-year course completion rates as the measures of performance in tertiary study. We look only at young students studying on a full-time basis, and we take account of the achievement of the students in secondary school.

## Background

It is well known that tertiary education pass rates vary by qualification level, with higher level qualifications having higher pass rates (Scott 2006). Ministry of Education statistics show that for bachelors degrees, course pass rates were 81 percent in 2009, while for level 1 to 3 certificates, the rate was 69 percent (Ministry of Education 2010a). Analysis of Tertiary Education Commission (TEC) data reinforce these differences. For qualifications at level 7 and 8—bachelors, graduate and postgraduate diplomas and honours degrees—course pass rates are above 80 percent. By contrast, for levels 3 and 4, the rate was around 70 percent (Tertiary Education Commission 2010).

It is also well known that, on average, students with higher school achievement perform better when they study at tertiary level, especially at bachelors level. Engler (2010) and Scott (2008) have looked at pass rates in bachelors study and find that there is a strong association between

scores in NCEA level 3 and course pass rates in bachelors degrees. The analysis in this paper takes those studies further, by focussing on differences in the tertiary education achievement of students with different school qualifications.

Other characteristics of students influence completion rates. Part-time students have lower completion rates (Ministry of Education 2010b). So do older students – largely because they are more inclined to be part-time (Scott and Smart 2005).

These data raise the question of differences between types of tertiary education institution. How do students perform at different types of institution when we control for differences in students' school achievement levels, age and mode of study. In this study, we analyse the performance of bachelors degree students at polytechnics and universities by looking at qualification completion rates and course completion rates. We know that polytechnic bachelors students tend to be older than university bachelors students. And they are more likely to be part-time. So, comparing the two types of institution, we restrict our analysis to young students studying on a full-time basis, and we control for differences in school achievement. These limits strengthen our focus on differences between the institution types, rather than differences between student types. However, it is not the whole story—we don't look at older students, part-time students, extramural students, or those with other school qualifications (such as International Baccalaureate or Cambridge International Examinations) because we don't (yet) have the data to do a robust analysis of their performance.

The report begins with some descriptive statistics about the students studying bachelors degrees, by UE status and subsector, followed by data on student performance.

## The data

The study population used for the analysis of course pass rates is 17 to 19 year old students who have left school in the years 2004 to 2008. The course pass rates are calculated for each student's first year of a bachelors degree, studying intramurally, and full-time for the full year.<sup>1</sup> There were 57,136 students in the study population used to calculate course pass rates.

School performance is measured by looking at the students' performance in the National Certificate in Educational Achievement (NCEA). We use three measures from NCEA:

- the NCEA achievement score – a number between 0 and 100 that takes account of how well students do in their achievement standards
- whether the students have met the university entrance (UE) requirement through NCEA
- what level of NCEA certificate the student has received.<sup>2</sup>

Note that for the age group used in this study, all students attending university must meet the UE requirement.<sup>3</sup> Because polytechnics are not bound to comply with the UE requirement, some of the polytechnic students in this study – around 30 percent – have not met the UE requirement.

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<sup>1</sup> Extramural students, and those who study either part-time, or part-year, have lower course pass and qualification completion rates. While not many young bachelors degree students are part-time, or study extramurally, they are excluded from the analysis to remove their effect on the results and to focus the analysis on differences that result from institution type.

<sup>2</sup> School achievement is reported as the highest NCEA qualification gained. Students who did not gain NCEA level 3 but met the UE requirement had achieved NCEA level 2; these students had also gained at least 42 credits at level 3 since they met the UE requirement. To gain NCEA level 3, a student needs to gain at least 60 credits at level 3 and 20 credits at level 2 or above.

<sup>3</sup> The data contains students attending universities who are recorded as not meeting the UE requirement. This can come about because students can take non-NCEA examinations—Cambridge International, or International Baccalaureate—so their NCEA school achievement does not reflect their entire school qualifications. These students will have met an equivalent university entrance requirement. In other cases students improve their school achievement through bridging courses after they leave school.

Course pass rates are weighted by a student’s study load, calculated over all the first-year courses a student starts in a given year. The course completion rate assumed that half of the students who were yet to complete at the point of data collection would ultimately complete successfully and half would not. For bachelors degrees, there is little difference in course pass rates which include these ‘pending completion’ courses, or not, as the proportion with pending results is only between 1 and 2 percent.<sup>4</sup>

Course pass rates are shown averaged over all students, and results are presented for all students, and when controlling for school achievement.<sup>5</sup>

Five-year qualification completion rates are calculated for 17 to 19 year old students starting their bachelors degree in 2005. Again, only full-time students studying intramurally are included in the rate calculations. Data which includes school achievement scores is only available from 2005 onward, so only a single cohort of students can be used to calculate a five-year rate. The size of the cohort entering degree-level study at polytechnics in 2005 – that is, the subgroup whose results are known five years later – is relatively small, being just 565 students. For universities, 6,183 students were in that cohort. Some of the qualification completion rate breakdowns for polytechnics by school achievement are therefore based on small numbers, and their robustness suffers as a result. However, we can draw indicative conclusions. The data for first-year course pass rates, and universities generally, is more robust.

## Students’ background details

Table 1 shows the numbers and proportion of students in the study population in each of the subsectors.

**Table 1**

Number and percentage of first-year bachelors degree students aged 17-19 in each subsector, 2005–2009

Subsector	Number	Proportion
Universities	52,751	92.3%
Polytechnics	4,201	7.4%
Other subsectors	184	0.3%
Total	57,136	100.0%

Note: The numbers in this table are of those who took NCEA at school. This means that students who took other school qualifications are excluded, even if they entered degree study between 2005 and 2009. Only full-time, full-year, intramural students are counted.

It is clear that the majority of students in the study population who study for bachelors degrees attend universities.

Table 2 gives data on the background—demographic and study-related—of the study population for universities and polytechnics. While all university students are assumed to meet the UE requirement, 69 per cent of polytechnics students meet the UE requirement.

It can be seen that the background characteristics of university and polytechnic students who meet the UE requirement are quite similar. Polytechnic students who do not meet the UE requirement are different in a number of their characteristics from other students. Each of these differences may impact on the tertiary study performance for this group. In this study, course pass rates are reported unadjusted, and adjusted for school achievement.

<sup>4</sup> Refer to Scott (2006) for a fuller explanation of and justification for the approach. The extent of the imprecision is set out in Ministry of Education (2010a).

<sup>5</sup> School achievement is a score ranging from 0 to 100, based on the grades achieved in the standards a student takes in either NCEA level 2 or 3. The score is higher for a student who gains more merit and excellent grades compared to one who obtains predominately more achieved or not achieved grades.

**Table 2**

Breakdown of students by university entrance status and subsector, for full-time full-year intramural first-year students aged 17-19, 2005–2009

Background variable		Did meet UE requirement		Did not meet UE requirement
		Universities (n=52,751)	Polytechnics (n=2,879)	Polytechnics (n=1,322)
Age	17	2%	1%	3%
	18	77%	77%	70%
	19	21%	22%	27%
Gender	Female	62%	71%	56%
	Male	38%	29%	44%
School decile	1-2	4%	4%	8%
	3-8	54%	65%	70%
	9-10	42%	31%	22%
Gap year	None	94%	92%	90%
	One or more	6%	8%	10%
Ethnicity <sup>‡</sup>	European	65%	78%	62%
	Māori	2%	2%	4%
	Māori-European	7%	8%	11%
	Pasifika	2%	1%	4%
	Asian	13%	4%	8%
	Other	11%	7%	11%
Highest school qualification	NCEA level 2	8%	6%	68%
	NCEA level 3	92%	94%	32%
Mean NCEA level 3 achievement score*	All students	50	44	32

Because of rounding, percentages in each category don't necessarily add to 100 per cent.

<sup>‡</sup> Ethnicity is reported using single/multiple response categories. For example, Māori includes those students who *only* selected Māori as their ethnicity. Māori-European includes those who indicated both Māori *and* European as their ethnicity. Not all ethnic group combinations are reported.

\* See footnote 5 for a description of the achievement score.

Students at universities have much higher school achievement than those at polytechnics, even if we look just at those polytechnic students with UE.

Of those who do not meet the UE requirement, there are proportionally:

- more 19 year old students
- more males
- more students from lower- and middle-decile schools, and fewer from higher-decile schools
- more students who take a gap year before starting their studies
- fewer Europeans, and more Māori and Pasifika students
- many more students whose highest school qualification is level 2.

Differences in the school achievement of different groups mean that school achievement needs to be controlled for when comparing first-year course pass rates.<sup>6</sup>

<sup>6</sup> School achievement is a strong predictor of first-year course pass rates. It is likely to be a less strong predictor of tertiary performance over the five years it takes to complete a degree. In any case, there are too few students in this group selected for this study to be able to control for school achievement in the calculation of qualification completion rates.

Data on the fields of study taken by students is shown in table 3. The data is based on students where a student is counted in each field of study they are enrolled in. Universities and polytechnics differ in the relative proportions of enrolments in the different fields of study. Proportionally more university students are enrolled in management and commerce, society and culture, and health, and proportionally fewer in creative arts, health, architecture, and information technology. These differences will contribute to differences in the overall course pass rates and qualification completion rates between the two institution types, since these rates vary between the fields of study.

**Table 3**

Fields of study by university entrance status and subsector, for full-time full-year intramural first-year students aged 17-19, 2005–2009

Field of study	Did meet UE requirement		Did not meet UE requirement	Total Polytechnics
	Universities	Polytechnics	Polytechnics	
Biological sciences	10%	5%	4%	5%
Mathematical sciences	8%	2%	3%	2%
Studies in human society	8%	2%	3%	2%
Business & management	6%	4%	5%	4%
Language and literature	6%	1%	2%	1%
Economics	5%	2%	2%	2%
Communications & media studies	4%	9%	10%	10%
Behavioural sciences	4%	1%	2%	1%
Accountancy	4%	2%	2%	2%
Law	4%	2%	1%	1%
Computing science	3%	4%	8%	5%
Information systems	2%	4%	8%	5%
Graphics & design studies	1%	9%	6%	8%
Visual arts & crafts	1%	9%	7%	8%
Nursing	<0.5%	8%	5%	7%
Total count of enrolments by field of study	258,344	8,442	4,881	13,323
Number of unique students	52,751	2,879	1,322	4,201

Each student is counted in each field of study they are enrolled in. This means that many students are counted in several rows in this table. As a consequence, the number of enrolments by field of study is greater than the number of students. Percentages will not add to 100 per cent because not all fields of study are listed.

The mix of students between the fields of study varies between universities and polytechnics, with universities having higher proportions in sciences, social sciences, business and languages, while polytechnics have more in nursing, communications, design and computing. There are also differences within polytechnics, between students with and without UE. Computing science and information systems are subjects which have disproportionately *more* students without UE. Nursing, and graphics and design studies, on the other hand, have disproportionately *fewer* students who did not meet the UE requirement.

## Differences in student performance

### First-year course pass rates

First-year course pass rates are higher for students who meet the UE requirement (table 4). This is the case for unadjusted rates, and those adjusted for school achievement.<sup>7</sup> There is less difference in adjusted course pass rates between students with or without UE. This is because the average school achievement is lower for students without UE than it is for students with UE, and course pass rates are correlated with school achievement.

Unadjusted course pass rates for students with UE are on a par between polytechnics and universities. The adjusted rates show a larger difference, because the average school achievement of these polytechnics students is lower than for university students.

**Table 4**

Average first-year course pass rates, adjusted and unadjusted for school achievement, for students with NCEA levels 2 or 3, controlling for university entrance status

Subsector	University entrance status	All students			NCEA level 3 school achievement between 44 and 55 <sup>†</sup>		
		Mean	Confidence limits	Number of students	Mean	Confidence limits	Number of students
Universities	Did meet*	<b>85%</b>	±0.2%	52,751	<b>87%</b>	±0.4%	14,025
Polytechnics	Did meet	<b>89%</b>	±0.8%	2,879	<b>93%</b>	±1.2%	828
	Did not meet	<b>73%</b>	±1.7%	1,322	<b>78%</b>	±6.2%	100
	All polytechnic students	<b>84%</b>	±0.9%	4,201	<b>91%</b>	±1.3%	928

All students at universities are assumed to have met the UE requirement.

<sup>†</sup> Students who don't gain NCEA level 3 do take some level 3 subjects, so a level 3 achievement score can be calculated for them. Most students gain NCEA level 3.

The data relates to full-time full-year intramural first-year students aged 17-19, 2005–2009  
Confidence limits are at the 95 percent level.

What is interesting is that the pass rates of polytechnic students with UE is higher than that of the university students, even though the average NCEA achievement score of the polytechnic students is 6 points lower. Focussing only on those with NCEA achievement scores in the range 44 to 55 shows the same sort of difference—the polytechnic students with UE are similar to and slightly ahead of the university students, while the margin between the students with and without UE closes appreciably.

### Five-year qualification completion rates

Table 5 shows qualification completion rates for full-time intramural students, by university entrance status for both institution types.

**Table 5**

Five-year qualification completion rates for students with NCEA levels 2 or 3

Subsector	University entrance status	Mean	Number of students
Universities	Did meet*	<b>76%</b>	6,183
Polytechnics	Did meet	<b>76%</b>	290
	Did not meet	<b>52%</b>	275
	All polytechnic students	<b>64%</b>	565

All students at universities are assumed to have met the UE requirement.

Data relates to full-time full-year intramural first-year students aged 17-19, 2005–2009

<sup>7</sup> In tables 4, 6 and 7, average first-year course pass rates are given for students with the same level of school achievement. The level of school achievement selected was 50, the average school achievement for university students. However, there were too few students with school achievement scores of exactly 50, so an average was calculated using NCEA level 3 achievement scores in the range 44 to 55.



The results mirror those for course pass rates; those students who meet the UE requirement show higher performance, in terms of five-year qualification completion rates, than those who do not. The qualification completion rates for students with UE in both institution types are on a par. The average qualification completion rate for polytechnics, over all students, is lower than for universities because of the lower rate for polytechnic students without UE.

### The effect of highest school qualification on first-year course pass rates

Tables 6 and 7 show the first-year course pass rates for students whose highest school qualification is NCEA level 2 and 3 respectively. Students can meet the UE requirement without gaining NCEA level 3, although few students do this. The rates calculated with low student numbers are consequently not as robust as other rates.

**Table 6**

Average first-year course pass rates controlling for university entrance status for students whose highest school qualification is **NCEA level 2**

Subsector	University entrance status	All students			NCEA level 2 school achievement between 44 and 55		
		Mean	Confidence limits	Number of students	Mean	Confidence limits	Number of students
Universities	Did meet*	<b>69%</b>	±0.9%	4,130	<b>70%</b>	±2.1%	825
Polytechnics	Did meet	<b>77%</b>	±4.4%	174	<b>86%</b>	±7.3%	40
	Did not meet	<b>69%</b>	±2.2%	894	<b>78%</b>	±5.1%	145
All polytechnic students		<b>71%</b>	±2.0%	1,068	<b>80%</b>	±4.3%	185

All students at universities are assumed to have met the UE requirement.  
Confidence limits are at the 95 per cent level.  
The data relates to full-time full-year intramural first-year students aged 17-19, 2005–2009

**Table 7**

Average first-year course pass rates controlling for university entrance status for students whose highest school qualification is **NCEA level 3**

Subsector	University entrance status	All students			NCEA level 3 school achievement between 44 and 55		
		Mean	Confidence limits	Number of students	Mean	Confidence limits	Number of students
Universities	Did meet*	<b>86%</b>	±0.3%	48,621	<b>87%</b>	±0.3%	13,684
Polytechnics	Did meet	<b>90%</b>	±0.8%	2,705	<b>93%</b>	±1.1%	813
	Did not meet	<b>79%</b>	±2.8%	428	<b>88%</b>	±6.7%	49
All polytechnic students		<b>88%</b>	±0.8%	3,133	<b>93%</b>	±1.1%	862

All students at universities are assumed to have met the UE requirement.  
Confidence limits are at the 95 per cent level.  
The data relates to full-time full-year intramural first-year students aged 17-19, 2005–2009

Students who gain NCEA level 3 have higher unadjusted course pass rates than students who gain NCEA at no higher than level 2. This occurs for both institution types and whether students met the UE requirement or not. Because the numbers with highest school qualification as NCEA level 2 are so small, the rates are relatively less precise, so when we focus on those who scored between 44 and 55, the only group to show statistically significant differences is the university students.

The tables also show that polytechnic students who meet the UE requirement have higher first-year course pass rates than students who do not meet the UE requirement at both levels of NCEA qualification achieved. Polytechnic students with UE have higher pass rates than university students at both qualification levels, whether we look at the whole group or only at those with achievement scores in the middle range.

## The effect of highest school qualification on five-year qualification completion rates

Table 8 shows five-year qualification completion rates for full-time intramural bachelors degree students at universities and polytechnics. There are few polytechnic students who meet the UE requirement with NCEA level 2 as their highest school qualification, so their estimate of student performance is less robust.

**Table 8**

Five-year qualification completion rates by university entrance status and NCEA level

Subsector	University entrance status	NCEA level 2		NCEA level 3	
		Completion rate	Number of students	Completion rate	Number of students
Universities	Did meet*	<b>59%</b>	752	<b>78%</b>	5,431
Polytechnics	Did meet	<b>52%</b>	29	<b>79%</b>	261
	Did not meet	<b>46%</b>	211	<b>70%</b>	64
	All polytechnic students	<b>47%</b>	240	<b>77%</b>	325

\* All students at universities are assumed to have met the UE requirement.

The data relates to full-time full-year intramural students who began study for a degree in 2005

## What do (and don't) these results mean?

The results of the analysis reported in this paper suggest that those with NCEA level 3 have significantly better pass rates than those who met the UE requirement but didn't achieve NCEA level 3. And while those who didn't meet the UE requirement did significantly worse than those who did, it is the achievement of NCEA level 3, over level 2, that is associated with the greatest improvement in tertiary performance. Lastly, when we control for prior school achievement, young, full-time degree students at polytechnics do a little better in passing their first year courses than their university counterparts. But we can't infer from these results that polytechnics are teaching 'better' or that their students learn 'better'.

One possible reason for the difference between university and polytechnic student performance could be that the polytechnic student performance reflects polytechnics' traditional focus on teaching and smaller classes. Another possible reason may relate to differences in pass rates by field of study; as noted in Table 3 above, the distribution of university and polytechnic students by field of study is quite different. Further, the universities will note that they take on the highest proportion of students who qualify for degree study through International Baccalaureate or Cambridge International Examinations, many of whom would be expected to perform well. They could also charge that they apply higher standards and that is why their pass rates for their students who came in through NCEA are lower.

In addition, the number of polytechnic degree students in the study is reasonably small so we can't control for all the possible differences between university and polytechnic students.

For these reasons, the relative performance of students with differing school achievement and studying at different types of institution will remain a focus for future work.

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