MINISTRY OF EDUCATION

Te Tāhuhu o te Mātauranga

Te whai i ngā taumata atakura

Supporting Māori achievement in bachelors degrees

Learners in tertiary education

This report forms part of a series called *Learners in tertiary education*. Other topics covered by the series are access, pathways, support, participation, retention and qualification completions.

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Acronyms

EFTS	Equivalent Full Time Student – a measure of the ‘size’ of each student’s enrolment, where 1 represents a full-time, full-year enrolment
ITP	Institute of technology and polytechnic
NCEA	National Certificate of Educational Achievement
PTE	Private training establishment
OECD	Organisation for Economic Cooperation and Development

1 Introduction

Background

This study arose from a joint project between the Ministry of Education and Te Tapuae o Rehua to examine what makes a difference for success of first-year, first-time degree students.

The Ministry of Education's role in tertiary education includes providing system leadership, strategic direction setting, and monitoring and evaluating system performance.

Te Tapuae o Rehua Ltd is a joint venture company owned by five South Island tertiary education institutions[1] and the South Island iwi Ngāi Tahu. The company was established in 1998 to enable the partners to work together to support Māori development aspirations through a shared commitment to increase access, participation and achievement in tertiary education for Māori. Te Tapuae is the 'collaboration vehicle' for the partners to explore and apply ways of thinking and action that aspire to the mission of the partnership. It provides a 'hub' to coordinate initiatives and provide leadership.

Te Tapuae has developed, and supported its partners to implement, a number of approaches to improving Māori achievement at degree level. These include study and career advice, mentoring, scholarships and developing a model articulation agreement between a polytechnic and a university.

This project supports the focus of the Tertiary Education Strategy 2007-12 on "success for all New Zealanders through lifelong learning" by "ensuring maximum education opportunities for all New Zealanders". In particular, it provides insights into ways of achieving the specific priority of "increasing educational success for young New Zealanders [with] more achieving qualifications at level four and above by age 25".

Purpose of the study

The purpose of this study is to build understanding about how to increase the number of Māori attaining bachelors degrees or higher.

The project examines the trends in degree attainment, outcomes and participation, using descriptive data. This data provides a sense of the size of the changes required and where and for whom changes could be achieved.

The descriptive data is complemented with results of a set of logistic regression models looking at what makes a difference to outcomes for Māori degree students. This provides further insight into which groups of students may need extra support to succeed in their studies. However, while it stops short of identifying the kinds of interventions that may work for these students, it provides a stronger basis for discussion on what these interventions might be.

Approach and limitations

Descriptive data provides a view of the numbers and proportion of people in particular groups. It establishes the overall differences between the Māori and non-Māori population in aggregate, the degree to which differences exist and the way in which these are changing over time. It doesn't explain why those differences exist.

[1] Christchurch Polytechnic Institute of Technology, the University of Canterbury, Lincoln University, Otago Polytechnic and the University of Otago.

Regression models provide further explanation about why students within a given population achieve different outcomes. In this study, the models are focused on Māori students and are segmented by age group. These models provide insights into the factors that explain the different levels of achievement among Māori students within these age groups.

Regression models focus on the things that make a difference 'at the margin' – that is, they identify factors that some students 'have more of' and others 'have less of' that can be statistically correlated to the differences in the outcome measure. They do not take account of things that all students have more or less equally. Therefore, there will be a range of things which are 'givens' relating to the New Zealand tertiary education system and to the abilities of degree students, which are not shown in the models. Also, regression models only establish statistical association, they do not prove causation.

The factors highlighted in the models provide possible explanations of why differences may exist among students in each group, given what we know about them. They do not necessarily provide information on how the differences could be reduced. For example, having no school qualifications comes through as a significant factor for explaining lower achievement in older Māori degree students. However, this doesn't necessarily mean that the best solution for these students is to send them back to school.

The factors identified in these models are similar to those found in other studies, nationally and internationally. These studies have been summarised in an earlier Ministry study on the factors that make a difference to getting a degree (Scott and Smart, 2005). This summary is reproduced in Appendix 1.

The findings from the models suggest that Māori degree students experience barriers to, and enablers for, success similar to other degree students worldwide – in so far as these kinds of models are able to provide explanation. However, it doesn't necessarily follow that the same approaches and services will work the same for all students. Further discussion and study are required to identify specific solutions that meet the needs of specific groups of students within specific situations.

In summary, from the descriptive data we can establish that there are population-level differences between Māori and non-Māori with regard to degree participation and success. The regression models provide some insight into what could explain the variation in success experienced by Māori students in different age groups. Further discussion and study are needed to identify specific actions that address the needs of Māori students in specific situations and contexts.

2 Overview and policy implications

The Tertiary Education Strategy 2007-12 provides clear messages about maximising the educational opportunities of all New Zealanders in order to contribute fully to the economy and society.

This study looks at what matters for the success of first-time Māori students studying at degree level. There is clear evidence that holding a degree benefits Māori economically, as well as having social and cultural benefits. However, while the level of Māori degree attainment has increased, it still lags behind the rest of the New Zealand population and international standards.

Young Māori continue to be underrepresented in degree participation, while many Māori have entered degree studies as adults. The higher recent participation of Māori as adults has masked the continued low participation of younger Māori in degree studies. Younger students tend to be more successful in completing degrees than older students. However, neither younger nor older Māori are as successful as non-Māori in the same age group.

The number of Māori going into degree studies from school is increasing, in line with the increased number of Māori school leavers attaining university entrance or higher. This reflects increasing numbers of Māori in this age group, rather than an increase in the proportion achieving and participating. The number of Māori entering degree studies as adults is decreasing, as opportunities in the workforce increase due to the tight labour market.

In order to make a step change in the number of Māori attaining degrees, the most important change would be to increase the number of Māori secondary school students achieving university entrance or better. This remains the major constraint on success. It limits the number of younger Māori who can enter degree studies. It is also an important factor for success where Māori students have entered degree studies later in life.

Improved support for first-year Māori students within degrees is also important to ensure those who enter degree study succeed to the best of their abilities. For both younger and older students, this study reinforces the importance of the first-year experience, especially during the first semester.

A major finding is that success during the first year of study is only partially explained by the kinds of variables captured in enrolment data – that is, demographics, school background and area of enrolment. This reinforces a general theme throughout the international literature that there is a complex set of factors, institutional, personal and external, which influence student success. These include readiness for degree study, goal commitment, ability of the student to fit into the institution and ability of the institution to adapt to the student.

Many of these wider factors are amenable to influence through student support services, improved institutional practice and teacher professional development. A key aspect for Māori students is likely to be the extent to which Māori students are able to maintain their cultural identity, access social and support networks outside of the institution and feel that their experiences are valued within the context of their learning.

The study confirms that first-year success is a critical factor for retention and completion of students. In both age groups, passing 75 percent or more of first-year courses is an important determinant of remaining in study beyond the first year. There is also evidence that some students quit degree study having failed a number of first-semester courses. Passing 75 percent or more of all degree courses taken is a critical factor for completing a degree.

The study also highlights a number of other issues relating to degree achievement:

— There is a definite advantage in being able to study full-year, full-time – especially in the first year. This is true for both age groups. It is likely that part-time students have to juggle study with work and/or family commitments.

— For students aged under 20, those in more specialised subjects do better in their first year than those in more general qualifications. This may reflect explicit and implicit entry criteria to specialist degrees, greater clarity of goals for students in specialist degrees and more active support for students in those degrees. It suggests that one of the groups of students at greater risk of failure is younger students who enrol in generic degrees without a clear sense of what they want to achieve from their degree studies.

— In this younger age group, students who commit early to an area of study and follow it through are more likely to complete within five years. Students who are uncertain about their study goals and change direction during their study risk not completing a degree, even though they continue studying.

— For older students, having sufficient school qualifications is important to achieving a degree. Those with low or no school qualifications are less likely to be successful. Staircasing through lower-level tertiary studies to degree studies does not seem to be sufficient to make up for a lack of school qualifications.

— About a quarter of older Māori students enrol extramurally in degree studies. On the whole they do as well as intramural students, with those studying at institutes of technology and polytechnics (ITPs) being more likely to continue in degree studies than other students. However, extramural students with low or no school qualifications do not do as well as intramural students with the same level of qualifications.

3 Māori and degree achievement

This introductory section provides background information on the benefits of degree achievement for Māori, trends in Māori degree attainment, and participation in, and completion of, bachelors degrees by Māori.

3.1 Benefits of degree attainment

This section looks at the economic benefits for Māori of attaining a bachelors degree or higher. Attaining a degree also has social and cultural benefits. However, these are less easily quantified and less information is available on them.

Key points

Having a bachelors degree or higher improves the chances of finding a job, particularly for Māori.

Both Māori women and men gain additional income as a result of attaining a degree.

A completed degree is worth considerably more, in terms of income, than an incomplete qualification. The income gain is greater for Māori than for non-Māori.

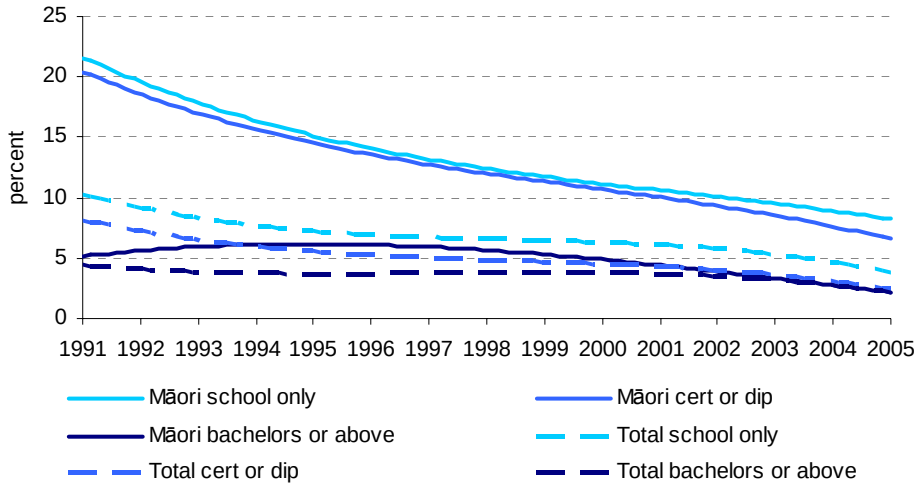
While students who complete degrees have significantly higher student loans than those who do not, those who complete a degree pay their loans off faster.

The comparisons made in this chapter look only at the overall differences between Māori and the total population. Much of the difference will be due to the level and nature of the qualifications held and their value in the labour market, rather than the ethnicity of the holder. A recent study on factors impacting on earnings three years after study found that industry of employment, qualification level, the tertiary provider attended and the field of study were the most significant factors in explaining different levels of income. Demographic variables, including ethnicity, were not strongly related to earnings, once the other factors were taken into account (Nair, 2006).

Better employment opportunities

Over the last 15 years, Māori with a bachelors degree or higher have experienced similar low rates of unemployment to others with a bachelors degree. However, Māori with qualifications below bachelors have had higher rates of unemployment than the overall unemployment rate for people with school qualifications only.

Figure 3.1: Unemployment rates by highest qualification



Source: Statistics New Zealand, Household Labour Force Survey (June quarters)
Notes:
1. For population aged 15 and over.
2. Lines shown are estimated trend lines, which smooth out the variations due to sample error.

In general, people with bachelors degrees or higher have higher labour force participation rates[2] than those with lower-level qualifications. Māori with bachelors degrees or higher have higher labour force participation rates than people in other ethnic groups with the same level of qualifications (Smart, 2006).

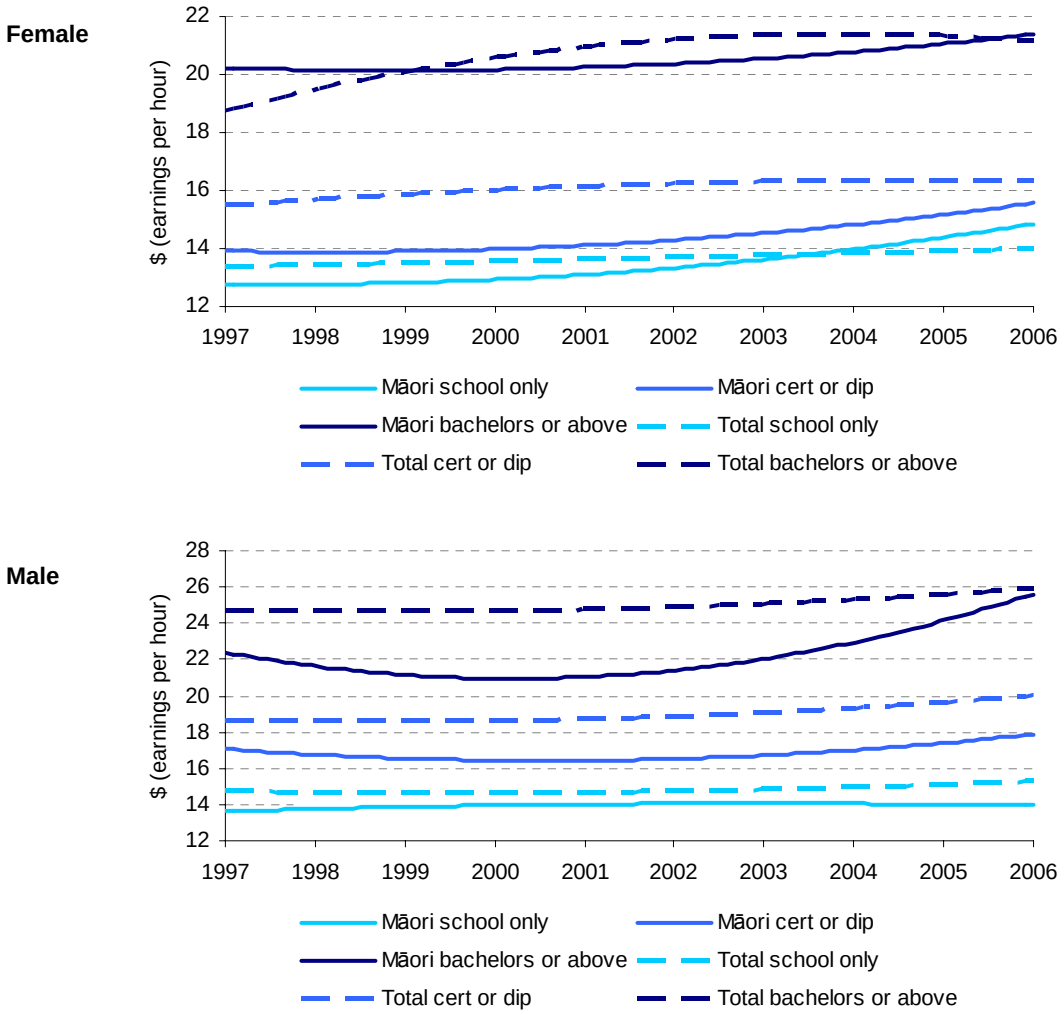
Greater income

Māori women with bachelors degrees earn similar wages to other women with degrees. However, Māori women with school or lower-level tertiary qualifications have earned less than their non-Māori counterparts. The gap in income for lower-level qualifications has closed recently as labour demand has increased across all skill levels.

Until recently, Māori men with degrees have had a lower median wage than non-Māori men with degrees. The gap has closed in the last five years. Māori men with lower-level qualifications have had lower median wages than non-Māori men with the same level of qualifications and there has been little relative change between them.

[2] The labour force participation rate is the proportion of the population that are employed or actively looking for work.

Figure 3.2: Real median hourly wages by highest qualification and gender



Source: Statistics New Zealand, New Zealand Income Survey
Notes:

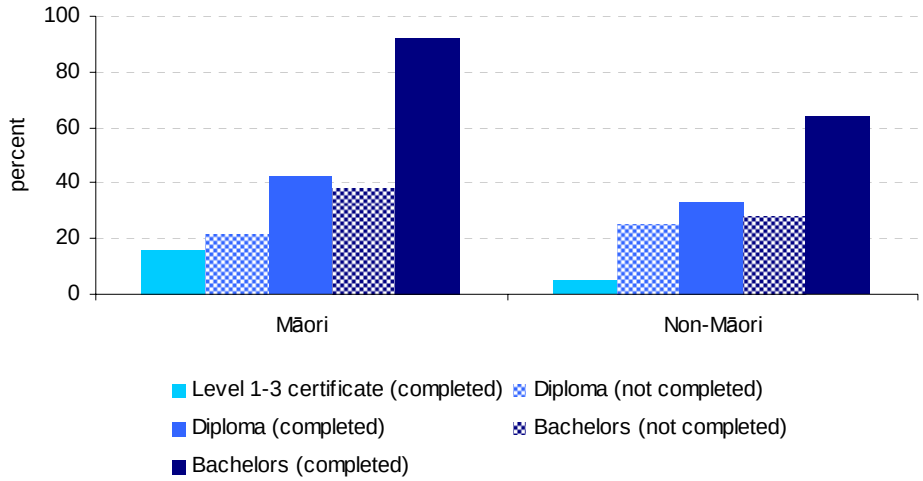
1. For population aged 15 and over.
2. Earnings are expressed in 2006 dollar values.
3. Lines shown are estimated trend lines, which smooth out the variations due to sample error.

Completing a bachelors degree matters

Data from the Integrated Dataset on Student Loan Scheme Borrowers provides more detail on the income by qualification level of people leaving study in the same year, and whether or not they completed qualifications.

This data shows that students who complete bachelors degrees have a significant income advantage over those who do not complete a bachelors degree or study at lower tertiary levels. This difference is greater for Māori than non-Māori, as the attainment of a bachelors degree almost entirely removes the disparity in income that exists between Māori and non-Māori with lower-level tertiary qualifications. The additional income for a completed bachelors degree increases over time for both Māori and non-Māori (Hyatt and Smyth, 2006).

Figure 3.3: Premium on qualification attainment over a non-completed level 1 to 3 certificate seven years after leaving study

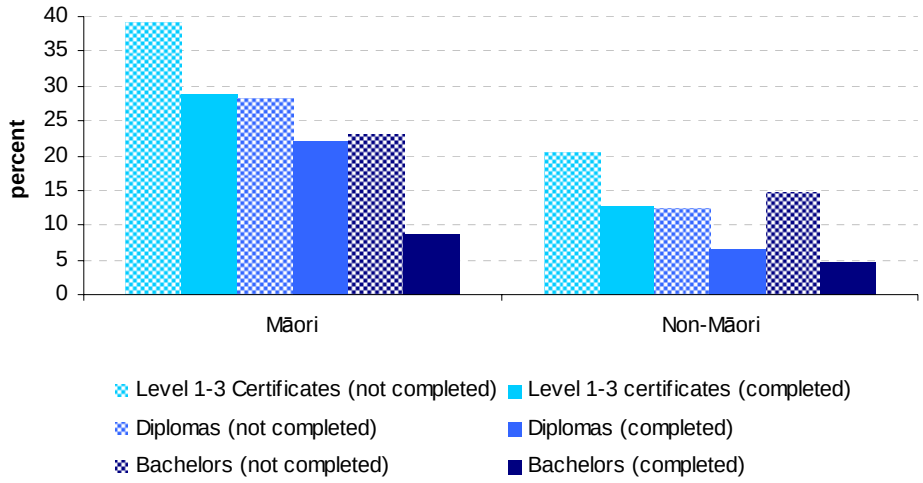


Source: Statistics New Zealand and Ministry of Education, Integrated Dataset on Student Loan Scheme Borrowers
Notes:

1. Refers to students who borrowed from the Student Loan Scheme and last studied in 1997.
2. 'Premium' on qualification attainment refers to the percentage by which the average income for each group, seven years after leaving study, exceeds the average income of those who left with a non-completed level 1 to 3 certificate, seven years after leaving study.

Māori and non-Māori who complete bachelors degrees are also much less likely to have income from benefits than those who did not complete a bachelors degree or studied at a lower level. While Māori with completed bachelors are somewhat more likely to have benefit income than non-Māori with completed bachelors, completing a bachelors degree still has a greater effect for Māori in reducing the likelihood of being on a benefit, than it does for non-Māori.

Figure 3.4: Proportion of people who had income from benefits seven years after leaving study



Source: Statistics New Zealand and Ministry of Education, Integrated Dataset on Student Loan Scheme Borrowers
Note: Refers to students who borrowed from the Student Loan Scheme and last studied in 1997.

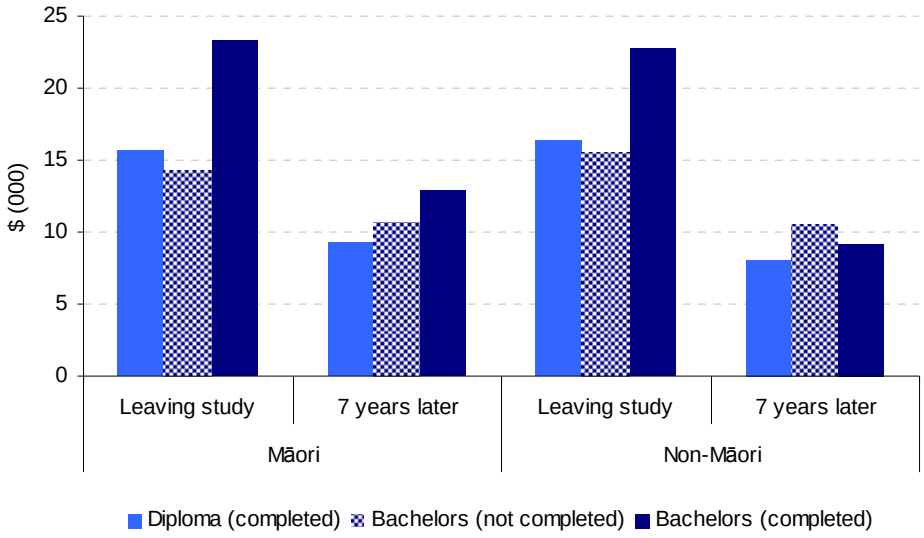
Higher loans, but paid off faster

Students who complete bachelors degrees have significantly higher loans on leaving than those who leave without completing a degree, as they tend to be enrolled for a longer time. However, seven years out from leaving study, those who completed their degree have paid off a much larger proportion of their loan, reflecting their higher earnings.

While it takes longer for Māori students who have completed to pay off their loan than non-Māori who have completed, Māori students who have completed still make significant reductions to their loan balance over a seven-year period compared with those who do not complete and with those who complete at a lower level.

The introduction of interest-free loans from 2006 will enable students to reduce the repayment times on their loans.

Figure 3.5: Average loan balance by completion status seven years after leaving study



Source: Statistics New Zealand and Ministry of Education, Integrated Dataset on Student Loan Scheme Borrowers
Notes:
1. Refers to students who borrowed from the Student Loan Scheme and last studied in 1997.
2. Loan balances are adjusted to 2005 dollar values.

3.2 Trends in degree attainment

This section looks at the proportion of the Māori and total population who have attained bachelors degrees or higher and makes comparisons internationally, as well as by gender and age group.

Key points

The proportion of the Māori and total New Zealand population with a degree or higher has increased markedly over the last 15 years.

Overall, New Zealand sits below the average for the OECD. However, while the proportion for Māori has increased greatly, it would rank at the bottom of the OECD.

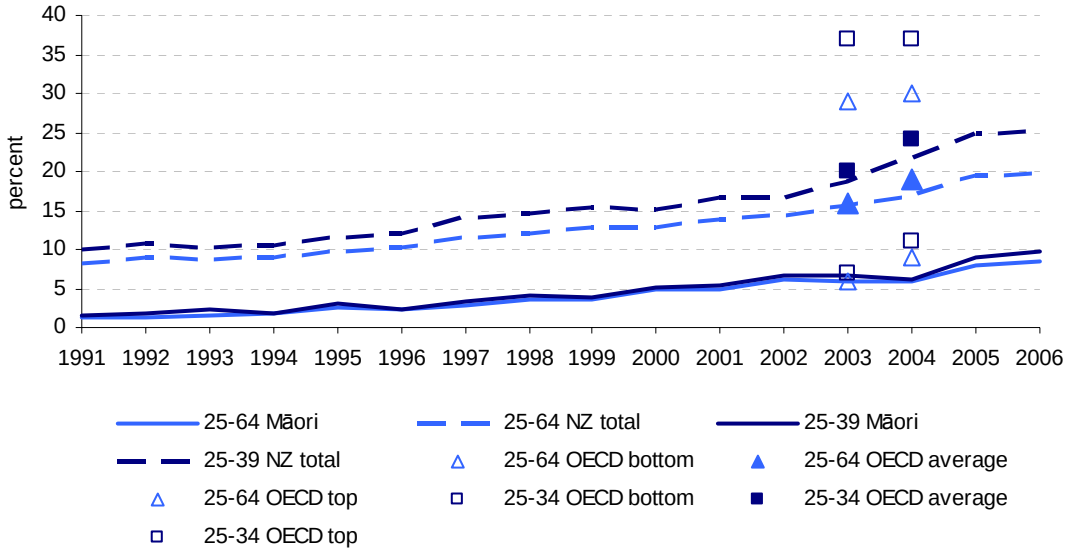
Māori women are as likely to hold a degree as Māori men. Māori over 40 are as likely to hold a degree as those under 40.

More people with degrees – but attainment rates lagging behind OECD

Over the last 15 years, the proportion of the New Zealand population with a bachelors degree or higher has increased markedly. In 1991, 8 percent of the population aged 25 to 64 had a bachelors degree or higher qualification. By 2006, the figure was 20 percent. The proportion of the total population with a bachelors degree or higher is higher in the younger age groups. In spite of this growth, New Zealand lags behind the Organisation for Economic Cooperation and Development (OECD) country average and has lower rates of degree attainment than in Australia, the UK, the USA, some East Asian countries and the Scandinavian countries.

Degree attainment rates for Māori have also increased over this time period, from just 1 percent in 1991 to 8 percent in 2006. While this growth is substantial, it has not been sufficient to catch up to the total New Zealand population or international standards. If these rates were compared with OECD countries' overall results, the Māori population would be ranked at the bottom of the OECD. However, it should be noted that similar results are likely to be found for subpopulations in other OECD countries.

Figure 3.6: Proportion of population with a bachelors degree or higher

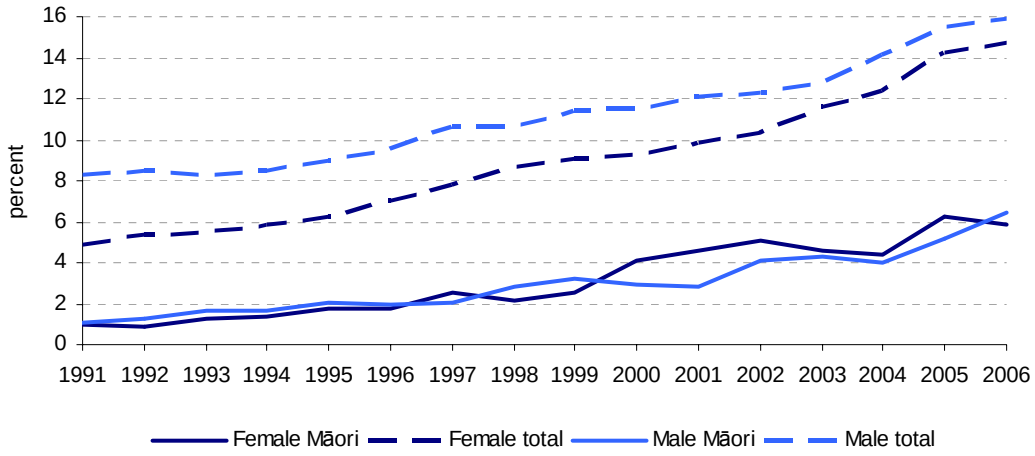


Source: Statistics New Zealand, Household Labour Force Survey and OECD, *Education at a Glance* 2005 and 2006, table A1.3a

Māori women as likely to hold a bachelors degree as Māori men

A notable feature of Māori degree attainment has been the relative success of Māori women. Māori women are as likely as Māori men to hold a bachelors degree. In contrast, for the total population, men are still more likely to hold a degree than women, although the gap between men and women is closing.

Figure 3.7: Proportion of population with a bachelors degree or higher by gender

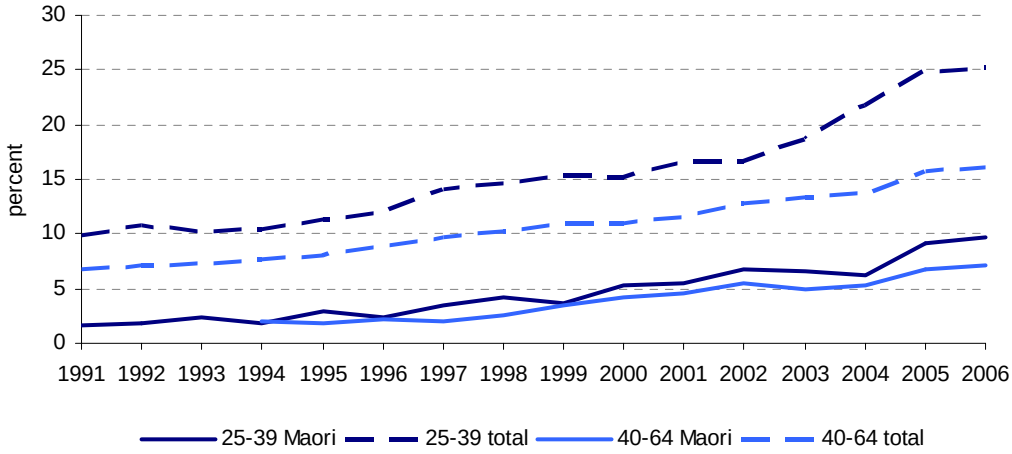


Source: Statistics New Zealand, Household Labour Force Survey
Note: For population aged 15 and over.

Younger Māori still less likely to hold a degree

Another notable feature of Māori degree attainment has been differences by age. For Māori, there is little difference in the rates of degree attainment between those aged under 40 and those aged over 40. This has been due to the large participation of older Māori in degree studies, as discussed in the next section. By contrast, in the total population, the largest recent growth in degree attainment has been by those aged under 40.

Figure 3.8: Proportion of population with a bachelors degree or higher by age group



Source: Statistics New Zealand, Household Labour Force Survey

3.3 Participation and completion

This section provides an overview of Māori participation, retention and completion in bachelors degree studies.

Key points

Māori under 25 are less likely than non-Māori to be enrolled in degree studies. Māori and non-Māori 25 and over are as likely to be enrolled.

The number of first-year Māori students aged under 20 continues to increase, reflecting the increases in population size in this age group. The number of first-year Māori students aged 20 and over is decreasing as employment opportunities improve.

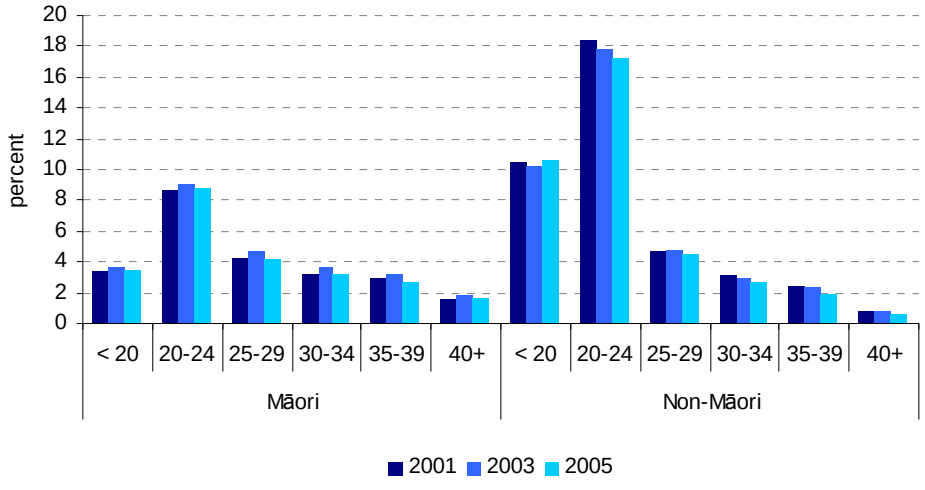
Māori who start degree studies before they are 20 are more likely to remain in study and complete a degree than Māori who start at a later age.

However, Māori under 25 have lower retention and completion rates than non-Māori in the same age group. Retention and completion are similar for Māori and non-Māori aged 25 and over.

Trends in participation rates

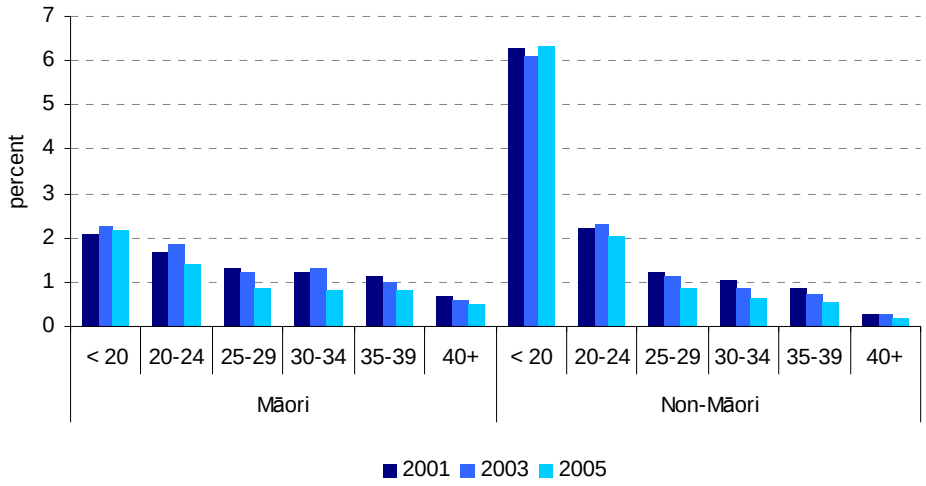
The differences by age group for Māori and non-Māori are evident in the proportion of the populations enrolled in degrees. Māori aged 25 and over have participation rates similar to or higher than those of non-Māori in the same age groups. However, this masks continuing lower levels of participation for those under 25, where Māori participation rates are less than half of those of non-Māori.

Figure 3.9: Proportion of population enrolled in bachelors degrees by age group



This pattern is even starker when looking at first-year, first-time bachelors degree students. The proportion of the Māori population in this group aged under 20 is around a third of that of the non-Māori population.

Figure 3.10: Proportion of population enrolled as first-time, first-year students in bachelors degrees by age group

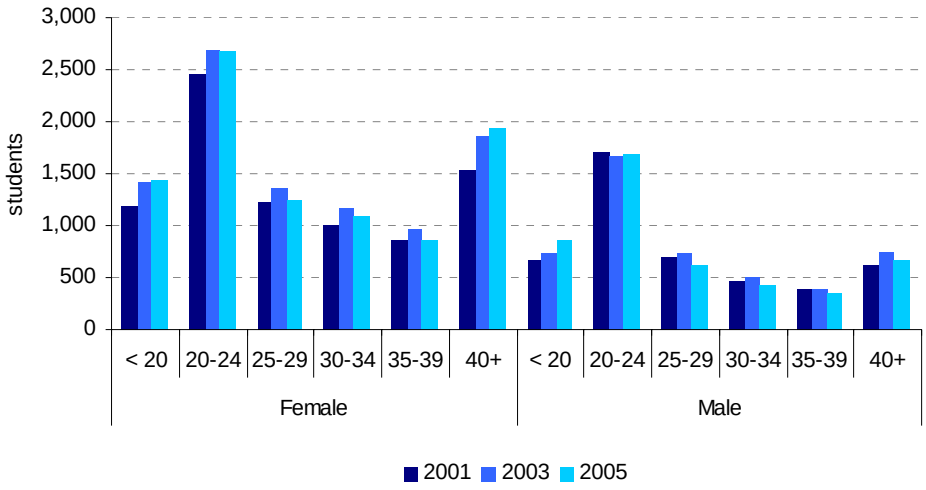


From 2003 to 2005, a decrease in first-year enrolments by students aged 20 and over is also evident for both Māori and non-Māori. This is likely to be a result of improving employment opportunities during this period.

Trends in numbers

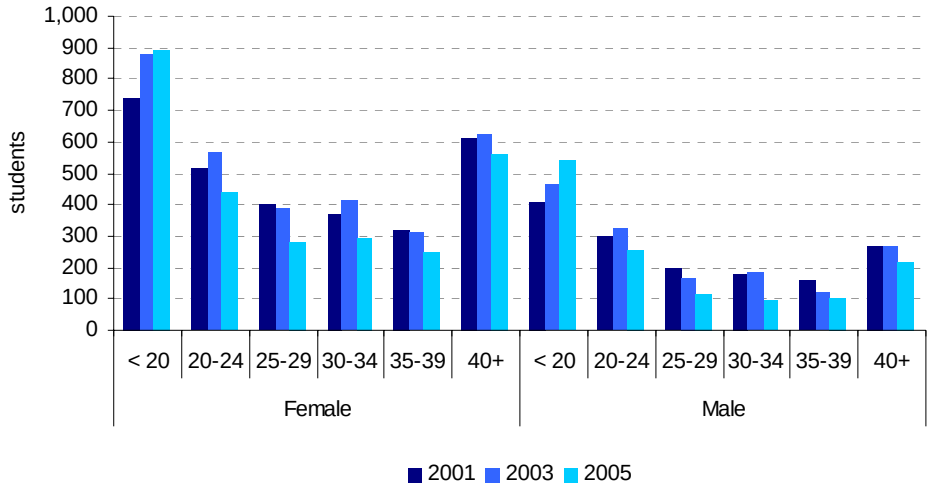
Looking at the number of Māori students enrolled, it can be seen that there have been continuing increases in numbers aged under 20, offset by decreases in those aged 25 to 39. The increase in numbers of Maori students aged under 20 mostly reflects the increased population in this age group. The pattern by age group is similar for men and women, although the number of women continues to be significantly higher than the number of men.

Figure 3.11: Number of Māori enrolled in bachelors degrees by gender and age group



Again, looking at the number of first-year enrolments provides a clearer picture of trends and shows that first-year enrolments for students under 20 are continuing to increase, while numbers are decreasing across all age groups aged 20 and over.

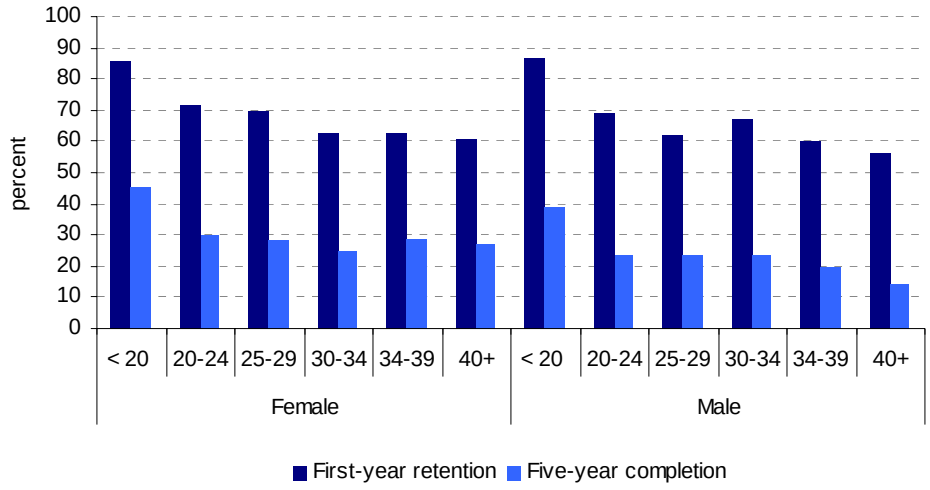
Figure 3.12: Number of Māori enrolled as first-time, first-year students in bachelors degrees by gender and age group



Retention and completion

First-year retention rates refer to the proportion of first-year students who continue to study towards a bachelors degree at any institution after the first-year. First-year retention rates are similar for Māori men and women. The major differences are by age group. For those who are under 20, over 80 percent carry on to study for two or more years. For those aged 20 and over, 60 percent or less continue in further study after one year.

Figure 3.13: First-year retention and five-year completion rates for first-time Māori students in bachelors degrees by gender and age group

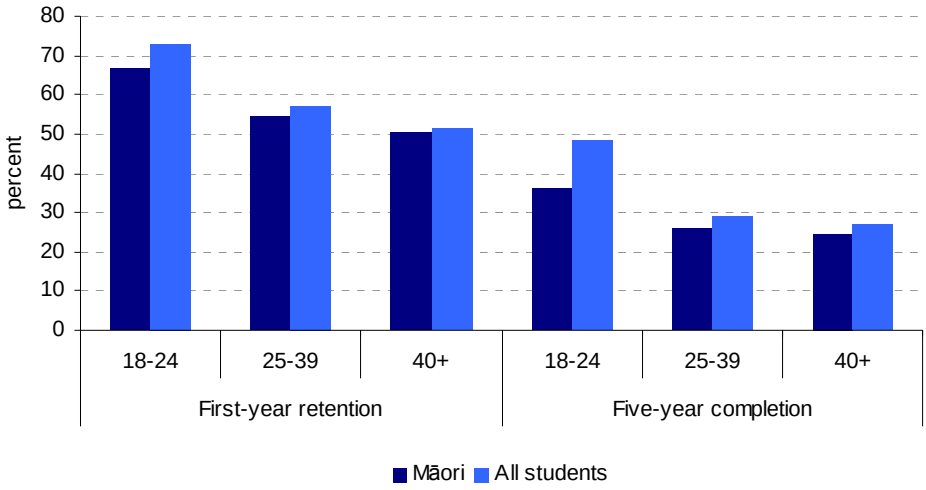


Note: For students starting in 2001.

The differences by age group flow through to degree completion. Around 45 percent of Māori women and 40 percent of Māori men who started study aged under 20 complete a degree within five years. These proportions drop to 30 percent or less for older age groups.

Comparing Māori with all students, Māori under 25 are less likely than other students in the same age group to remain in study and complete a qualification. The differences in outcome for Māori and all students aged 25 and over are not so great.

Figure 3.14: First-year retention and five-year completion rates for bachelors degrees by age group



4 Entering degree study from school

This chapter looks in detail at Māori students, aged under 20, who enter degree study either directly from, or within a year of leaving, school. Students in this age group require a university entrance qualification to enter degree study at a university. However, they can enter degree study in other sub-sectors with a qualification below university entrance or apply for provisional entrance to a university.

Key points

The number of first-year Māori degree students aged under 20 is increasing in line with the increased number of Māori school leavers with university entrance or better.

Most of these students study at a university. The most common fields of study are society and culture, sciences, and management and commerce.

Māori students are less likely to pass all of their courses in the first year than non-Māori, with males being less likely than females to pass all their courses. Māori students are more likely to drop out after one year than non-Māori and are less likely to complete their degree.

The key factors for first-year success are likely to be a set of institutional, personal and external influences. Passing 75 percent or more of courses is a key determinant of remaining in study and completing a qualification.

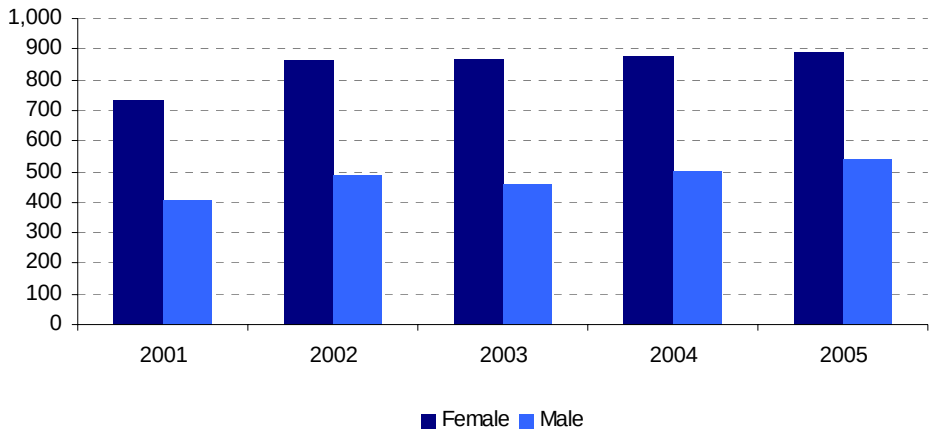
The main intervention point to support students to succeed appears to be in the first semester in the first year of study.

4.1 Overall trends

Numbers increasing in line with school leavers

From 2001 to 2005, the number of first-year Māori students in bachelors degrees increased by 25 percent. Sixty-two percent of students in 2005 were female. In the period from 2001 to 2005, the number of male students increased at a faster rate than the number of female students (33 percent compared with 21 percent).

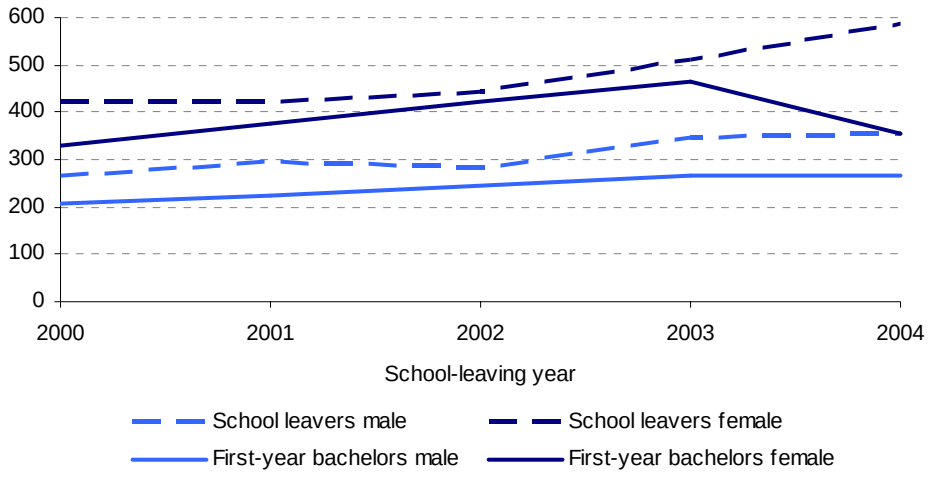
Figure 4.1: Māori first-year bachelors students aged under 20 by gender



Sixty-two percent of the students in 2005 were aged 18, 9 percent were aged under 18 and 29 percent were aged 19. Seventy-two percent of the first-year students entered degree study directly from school. An estimated 50 percent had attained the equivalent to university entrance or above.[3]

The increase in first-year Māori degree students follows the trend in increased numbers of Māori leaving school with university entrance or better, as illustrated in Figure 4.2. The apparent decrease shown for 2004 is likely to reflect students who have delayed degree studies until 2006.

Figure 4.2: Estimated comparison of Māori school leavers with university entrance with Māori first-year bachelors students aged under 20

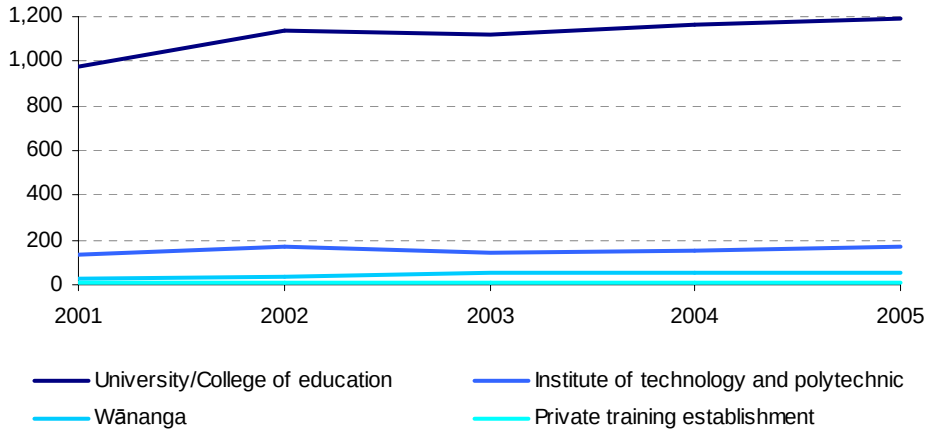


Note: This graph compares the number of Māori school leavers who had university entrance or better with the number of Māori first-year bachelors students with university entrance or better by the year they left school. Both data series are estimates, are from separate data collections, with differing rules, and are subject to coding and categorisation errors.

Most studying at university

In 2005, 83 percent of Māori first-year degree students aged under 20 were enrolled with a university or college of education, 12 percent were enrolled with an ITP and 4 percent with a wānanga. There has been steady growth in numbers across all three of these sub-sectors since 2001.

Figure 4.3: Māori first-year bachelors students aged under 20 by sub-sector

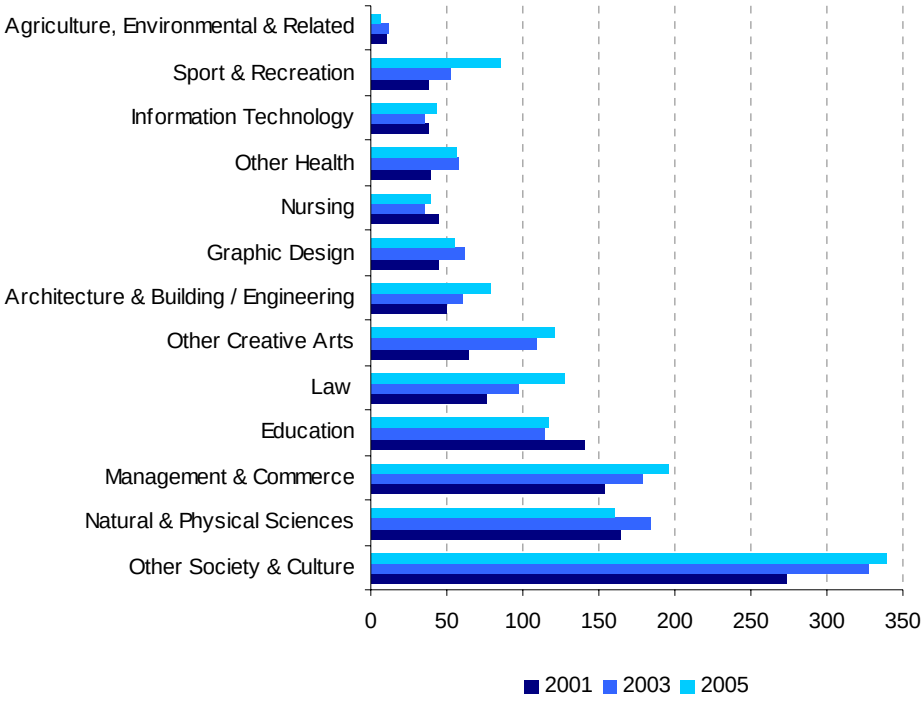


Note: Universities and colleges of education have been combined to illustrate the overall trend during a period where two of the four colleges have merged with universities.

[3] School qualification is collected by providers and coded to a pre-defined codes. The following codes were included as representing university entrance or above: entrance qualification from Bursary / 42+ NCEA Level 3 credits; A or B Bursary / NCEA Level 3; Scholarship / NCEA Level 4; Overseas qualification.

The most common field of study for Māori students aged under 20 is society and culture, which includes humanities and social sciences. The fields of study with the most growth in enrolments since 2001 have been society and culture, management and commerce, law, creative arts, architecture, building and engineering, and sport and recreation. Numbers have been steady or declining in health, education and sciences.

Figure 4.4: Māori first-year bachelors students aged under 20 by field of study

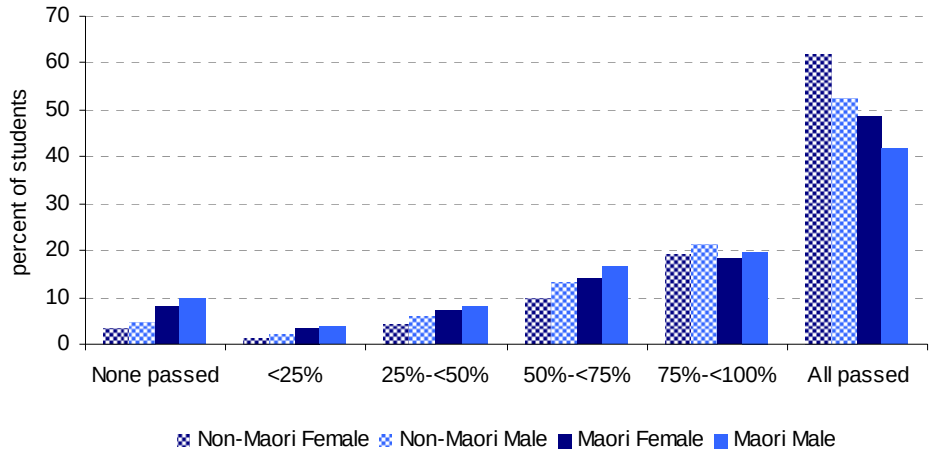


4.2 Success and completion

Māori less likely than non-Māori to pass all their first-year courses

Over the period from 2001 to 2005, 49 percent of Māori female students and 42 percent of Māori male students passed all their first-year courses. This compares with 62 percent and 52 percent for non-Māori. At the other end of the scale, 17 percent of Māori female students and 22 percent of Māori male students failed more than half of their courses. This compares with 7 percent and 13 percent for non-Māori. There was little variation in these rates from year to year.

Figure 4.5: Distribution of first-year bachelors students aged under 20 by proportion of courses passed and gender



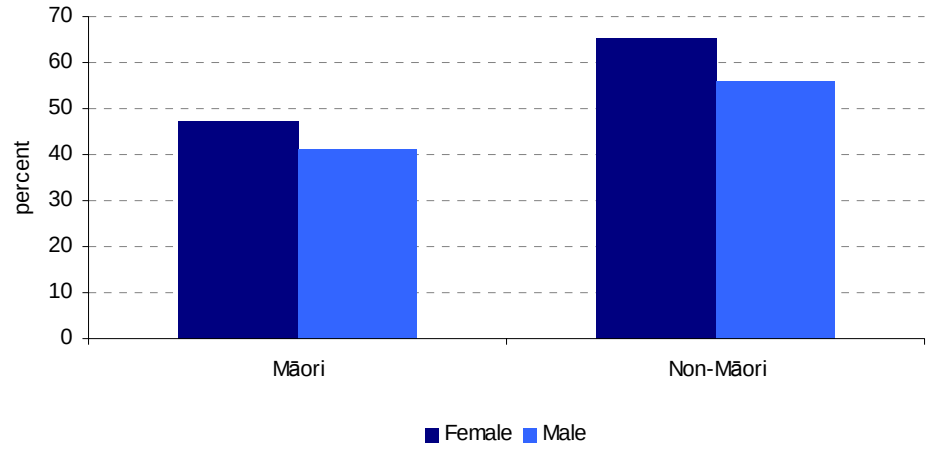
Note: For students enrolled 2001 to 2005.

Māori less likely than non-Māori to remain in study and complete a degree

Over the period from 2001 to 2004, 13 percent of Māori first-year students aged under 20 did not return to further study. This compares with only 9 percent of non-Māori students. These rates have been fairly similar across years and for males and females.

Forty-seven percent of Māori female students, and 41 percent of Māori male students, aged under 20 who started degree study in 2001 completed a bachelors qualification by 2005. This compares with 65 percent of non-Māori female students and 56 percent of non-Māori male students.

Figure 4.6: Five-year completion rates for bachelors students aged under 20 by gender



Note: For students starting study in 2001.

4.3 What makes a difference for Māori bachelors students aged under 20?

Three logistic regression models have been developed to look at what factors make the most difference for first-year Māori students under 20 in influencing first-year pass rates, first-year retention rates and five-year completion rates.[4]

The key findings from these models are:

First-year pass rates

— The most important influences on success are not captured in the enrolment data. Variables contained in the enrolment data include school background, demographics and course enrolments. These variables explain around 15 percent of the variation in pass rates. This finding reinforces a general theme throughout the international literature that there is a complex set of factors, institutional, personal and external, which influence student success. These include readiness for degree study, goal commitment, ability of the student to fit into the institution and the ability of the institution to adapt to the student.

— The most significant factor captured within the enrolment data is the subject of the qualification. Students in more specialised qualifications were more likely to pass most of their courses than those in more generic qualifications.

— The second most significant factor is whether the student is enrolled full-time or part-time and full-year or part-year, along with the amount of study undertaken. This factor points to a group of students who may be withdrawing from study having failed a number of first-semester papers.

— Whether the student went straight to degree study from school or undertook another activity in between was also significant. Students who were overseas in between had greater success than those going straight from school. Students who were unemployed or in lower-level tertiary study between school and degree study had lower rates of success than those going straight from school.

First-year retention

— Around a third of the variance in first-year attrition can be explained by information captured in enrolment data. Again, other personal, institutional and external factors are likely to be important.

— The key determinant of continuing in study captured within the enrolment data is passing 75 percent or more of first-year courses. This factor explains three-quarters of the variation captured in the model.

Five-year completion

— Nearly half the variation in five-year completion rates can be explained by information captured in enrolment data.

— The key determinant of completion captured within the enrolment data is passing 75 percent or more of all degree courses. This factor explains just under two-thirds of the variation captured in the model.

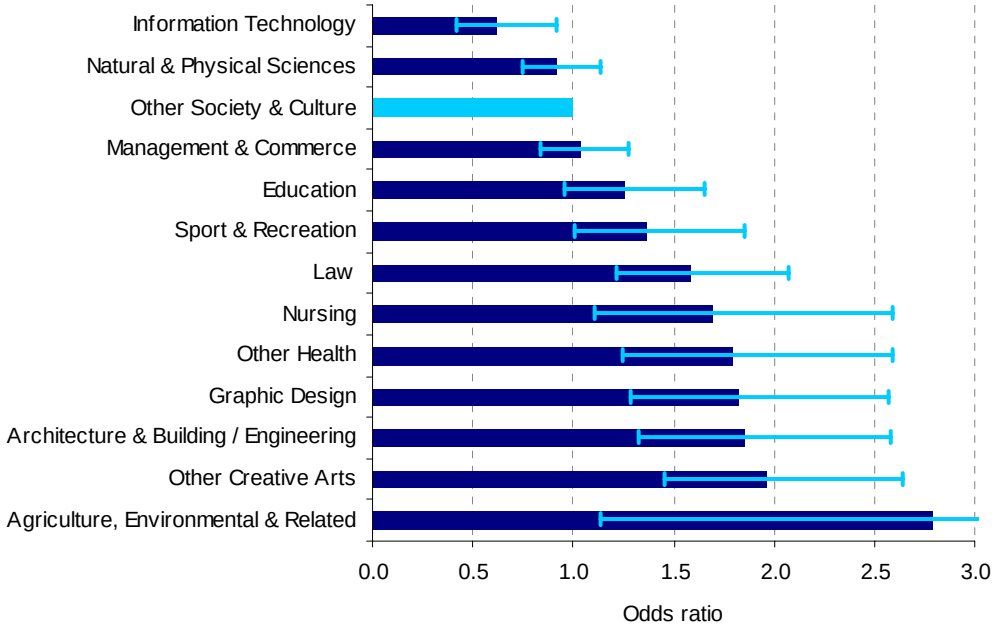
[4] A summary of these models is provided in Appendices 2 and 3. A more detailed write-up can be found at www.educationcounts.edcentre.govt.nz.

— The size and student composition of the provider also had an impact on completion in this age group.

First-year pass rates

As stated above, the most significant factor in the model affecting first-year pass rates for Māori degree students under 20 was the subject of qualification. Overall, students in more specialised degrees had better pass rates than those in more generic degrees. The more generic degrees include science, management, social science and humanities. The only exception was information technology, which had the lowest pass rates.

Figure 4.7: Odds ratio for passing 75 percent or more of courses for Māori first-year bachelors students aged under 20 by subject ('Other society and culture' = 1.0)



Note: The error bars indicate the 95 percent confidence interval on the ratios. Where the bars do not include 1, the result is statistically significantly different from the reference group – 'Oher society and culture'.

Students in the more specialised fields of study (excluding information technology) made up 48 percent of first-year Māori students in 2005, but only 38 percent of students who passed less than 75 percent of their courses. The proportion of students in these more specialised fields has increased from 45 percent in 2001.

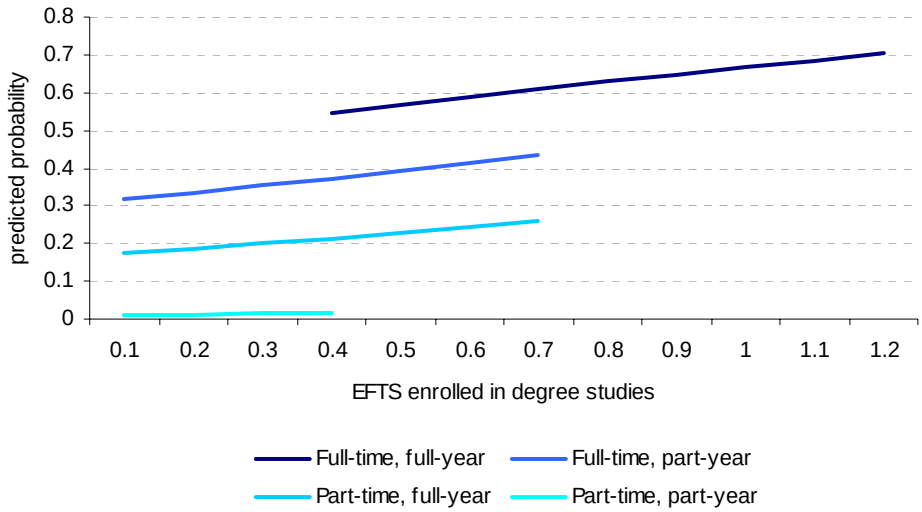
These patterns of achievement by field of study have been found in other studies, nationally and internationally. [5] The differences are likely to reflect a number of factors including explicit and implicit entry criteria, motivation and goal setting of students and support provided within different disciplines.

The model also shows variation in success by whether students were enrolled full-time or part-time and full-year or part-year, along with the amount of study undertaken.

[5] See for example Scott and Smart (2005) pp 23-25 and Bailey and Borooah (2007).

Students who were full-time and full-year in tertiary studies had the best chances of passing 75 percent or more of their courses. This group included students who studied some degree papers and some lower-level papers, and therefore had lower levels of EFTS at degree level. The model suggests that those who were enrolled entirely in degree-level papers had better success at degree level than those who had a mix of degree- and lower-level papers.

Figure 4.8: Predicted probability of passing 75 percent or more of courses for Māori first-year bachelors students aged under 20 by enrolment status and degree-level EFTS



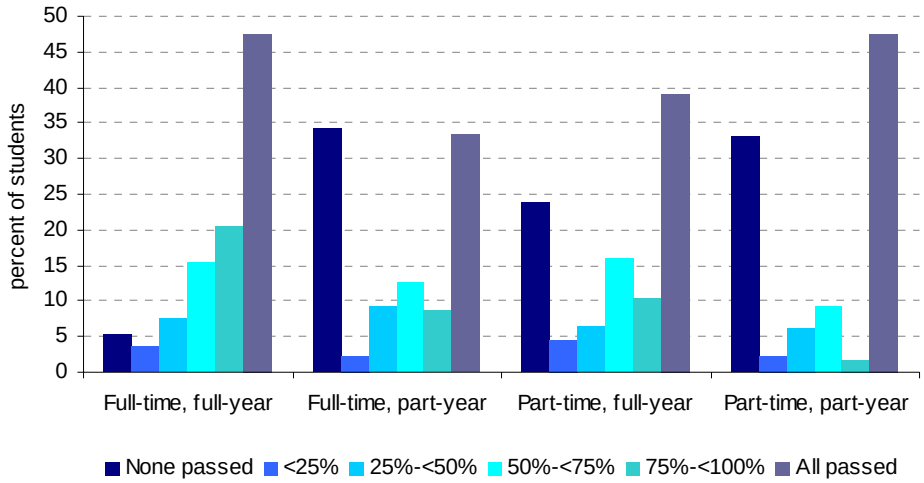
The next most successful group were part-time, full-year students. These students were likely to be balancing study with work and/or family demands. Again, with this group, those taking more papers were more successful than those taking fewer.

Part-year students were less successful than full-year students. This group included students who studied for one semester and failed most or all of their courses and then withdrew from study. Those who were part-year, part-time were the least successful of all. Within this group there may have been students who 'tried out' one or two degree courses, failed them and decided not to continue in study.

Full-time, full-year students made up 87 percent of Māori first-year students under 20 in 2005. Full-time, part-year students made up 6 percent, part-time, full-year students 5 percent and part-time, part-year students 2 percent. These proportions were very similar in previous years.

While students who study less than full-time, full-year are a minority, they made up 45 percent of students who failed all of their first-year courses. As shown in Figure 4.9, these students tend either to fail all or to pass all of their courses. In particular, the data shows that part-year, part-time students fall into two groups – those who fail all and those who pass all their courses. The former may be students who are 'trying out' degree studies. The latter may be students who are interested in passing one or two courses but not attaining the qualification.

Figure 4.9: Distribution of Māori first-year bachelors students aged under 20 by proportion of courses passed and enrolment status

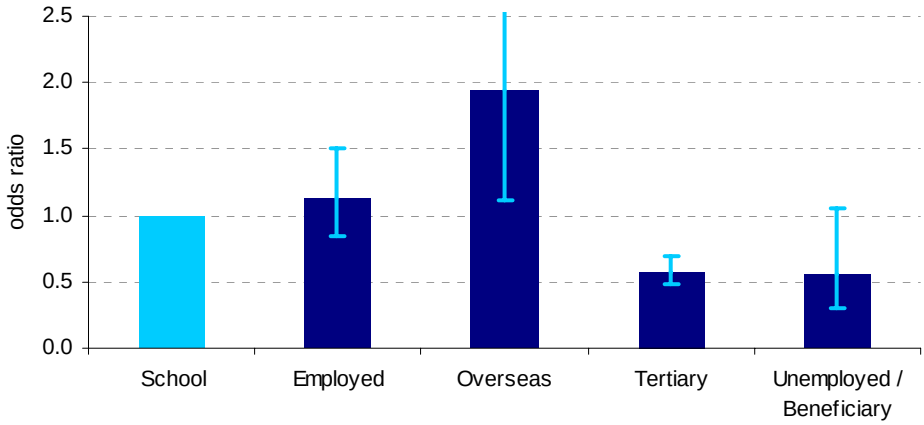


Note: For students enrolled from 2001 to 2005.

The model also shows that the activity of students between school and degree studies had a significant relationship to first-year success. Students who went overseas prior to degree studies did better than those who went straight into degree studies from school. Students who were employed between school and degree studies had similar results to those who went straight from school.

Students who went from school to a sub-degree programme and then on to degree study did not do as well as those who went straight from school. This latter finding may reflect as much on the academic ability of those students as on the effectiveness of sub-degree programmes as a pathway to degree studies. Students who were unemployed between school and degree studies had similarly poor outcomes to those who were in lower-level tertiary studies.

Figure 4.10: Odds ratio for passing 75 percent or more of courses for Māori first-year bachelors students aged under 20 by prior activity ('School' = 1.0)

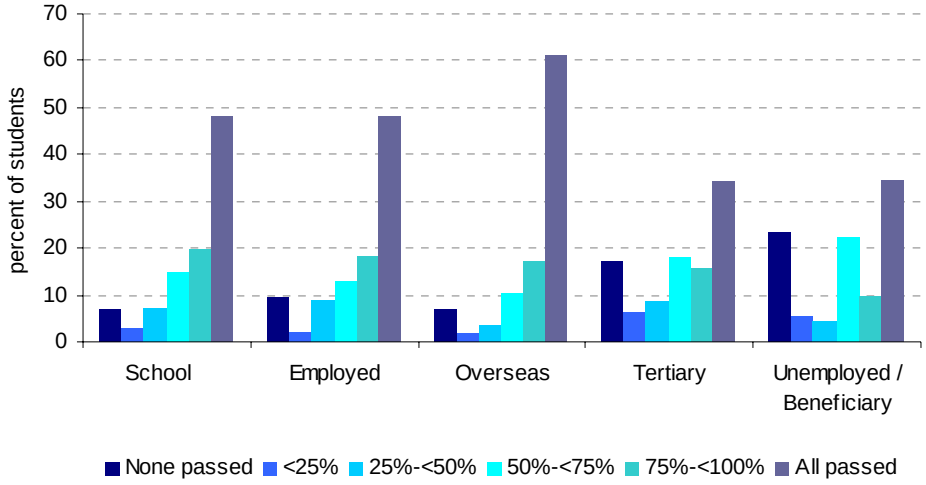


Note: The error bars indicate the 95 percent confidence interval on the ratios. Where the bars do not include 1, the result is statistically significantly different from the reference group – 'School'.

Over the period from 2001 to 2005, three-quarters of Māori first-year degree students aged under 20 went straight from school to degree studies, 15 percent went into lower-level tertiary studies in between, 5 percent were employed in between, 2 percent were overseas and 1 percent were unemployed or beneficiaries. These proportions have been similar in each year.

Students who went straight from school or who were employed or overseas in between had very similar distributions of course pass rates, with those who went overseas being more likely to pass all of their courses. Those who were in lower-level tertiary studies or were unemployed or beneficiaries between school and degree studies also had similar profiles, with the main difference being that those who had been in lower-level tertiary study were more likely to pass some courses than those who had been unemployed or beneficiaries.

Figure 4.11: Distribution of Māori first-year bachelors students aged under 20 by proportion of courses passed and prior activity



Note: For students enrolled 2001 to 2005.

The following factors had a smaller contribution, but significant effects within the model:

— **Sub-sector:** Students at ITPs and wānanga were less likely to pass 75 percent or more of their courses than students at universities and private training establishments (PTEs). This may reflect the stronger focus in university and degree-granting PTEs on degree students and/or more selective entry criteria.

— **Percent of postgraduate EFTS at the tertiary provider:** The model shows that when other factors were controlled for, students in providers with a lower proportion of postgraduate EFTS did better than those in providers with a larger proportion of postgraduate EFTS. This suggests that a strong focus on postgraduate studies may reduce the support given to bachelors students.

— **School decile:** Students from low decile schools[6] had poorer results than those from middle and high decile schools. This can be interpreted as a broad proxy for low socio-economic background.

— **Gender:** Female students performed better than male students.

— **Highest school qualification:** Students with school qualifications below NCEA Level 2 were less likely to succeed in their first year. Only 8 percent of Māori first-year degree students aged under 20 had school qualifications below NCEA Level 2.

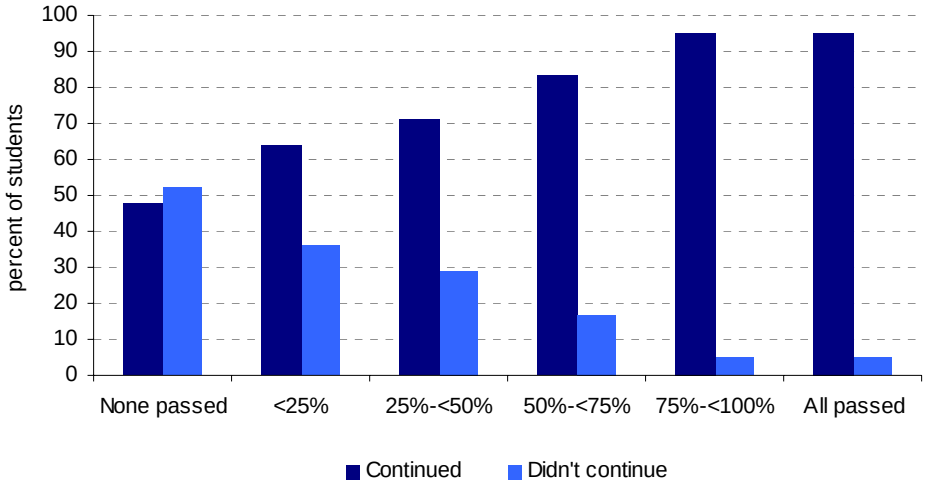
[6] Deciles 1 to 3.

— **School definition:** The analysis found that students from Māori boarding schools did not do as well in their first year as students from other schools. However, students from kura kaupapa Māori did as well as students from other schools. Students from these types of schools made up 2 percent and 1 percent of first-year Māori degree students under 20 respectively.

First-year retention

The single most significant factor in the model for first-year retention was whether or not students passed 75 percent or more of their first-year courses. Overall, 13 percent of Māori first-year students did not continue in degree study after one year. However, 52 percent of those who failed all of their courses did not continue, compared with only 5 percent of those who passed 75 percent or more of their courses.

Figure 4.12: Proportion of Māori first-year bachelors students aged under 20 who continued or discontinued study by proportion of first-year courses passed



Note: For students enrolled 2001 to 2004.

The following had a smaller contribution, but significant effects within the model:

— **Full-time, full-year enrolment:** Students who enrolled full-time, full-year were more likely to continue in study than other students, even after controlling for their greater level of course success.

— **Subject:** There were a few statistically significant differences by subject. Students in sciences were more likely to continue in study than students in general society and culture degrees. Students in education were less likely to continue than students in general society and culture degrees.

— **Iwi affiliation:** The model suggests that students who have one or more iwi affiliations are slightly more likely to continue in study than those who do not. This may be a result of stronger cultural and social capital and/or access to social and financial resources. However, this is a tentative conclusion as the finding may also reflect improvements in data quality over the time period.

— **Highest school qualification by gender:** Neither gender nor school qualification were significant on their own. However, females with no school qualifications were less likely to continue in study than other students.

— **Sub-sector:** Students at wānanga had a lower chance of continuing in degree study (at any provider) than students in other sub-sectors. The number of degree students aged under 20 at wānanga is quite small.

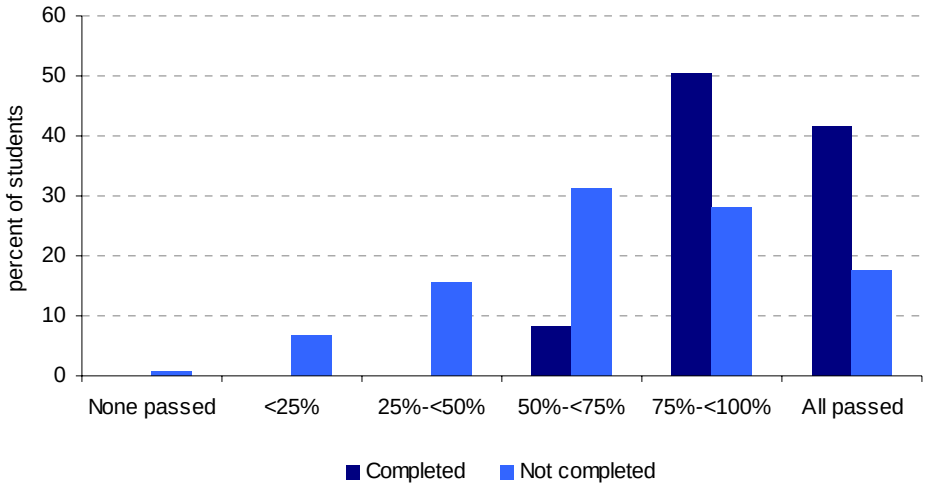
— **Percent of bachelors EFTS at the provider:** Students at providers with a very low proportion of EFTS at bachelors level were less likely to continue in degree study (at any provider).

Five-year completion

The model shows that the major factor in whether a Māori student under 20 completes a degree within five years (other than completing the required study) is passing 75 percent or more of all courses. This factor explains nearly two-thirds of the variation captured in the model.

Nearly all of the students who started in 2001 and completed by 2005 had passed 75 percent or more of their courses. More than half of those who had not completed did not pass 75 percent or more of these courses. However, there were some who had passed all their courses and still did not complete, indicating that there are other factors that are also important.

Figure 4.13: Distribution of Māori bachelors students aged under 20 by proportion of total courses passed and five-year completion status



Note: For students starting in 2001, enrolled in three-year bachelors degrees who completed at least 2.9 EFTS of study by 2005.

The following factors had a smaller contribution, but significant effects within the model:

— **Bachelor EFTS by postgraduate EFTS in the provider:** This variable provides a measure of the amount of provision within a provider at bachelors level and above, with a weighting towards providers with larger numbers of postgraduate EFTS. This variable reflects sub-sector differences, with universities having the largest values. The model shows that Māori first-year students under 20 have greater chances of completing a degree if they are at a provider with a larger amount of bachelors and postgraduate provision.

— **Percentage of postgraduate students at the provider:** This is the proportion of all students at the provider who were enrolled at postgraduate levels. The model shows that, given the same level of provision of bachelors and postgraduate studies (as expressed in the variable above), an increased proportion of postgraduate students was associated with a decreased level of completion by Māori students aged under 20. This could be a result of greater focus being given to postgraduate students and less to bachelors-level students.

— **EFTS enrolled in the first year:** The amount of study undertaken in the first year had a significant effect on the probability of completing within five years, even given that students completed three years' full-time study within the five-year period or changed the amount of study they undertook in the following years.

— **Highest school qualification:** Students who had not attained NCEA Level 3 or the equivalent had a much lower chance of completing within five years.

— **Additional time in study:** Students who were enrolled for more than three EFTS for a three-year degree had a reduced chance of completing a degree within five years. These students may have been studying towards a double major, have failed some courses and/or have changed their major subject along the way.

— **Full-time/full-year over the degree period:** Students who were enrolled full-time, full-year over the full period of degree studies were more likely to complete within five years.

5 Entering degree study for the first time as an adult

This chapter looks in detail at Māori students, aged 25 to 39, who enter degree study for the first time as adults. These students have had a significant gap since leaving school and will still have a considerable period within the workforce following their degree studies.

Key points

The number of first-year, first-time Māori students aged 25 to 39 has declined since 2001. The largest proportional decreases have been in male students, students aged 25 to 39 and students at universities.

Most first-time students in this age group entering degree study for the first time have low or no school qualifications and an increasing proportion have enrolled for lower-level tertiary study before starting their degree.

The most common fields of study for first-time students in this age group are society and culture, education, management and commerce, and nursing. Around a quarter of the students are enrolled extramurally.

Māori students are less likely to pass all of their courses in the first year than non-Māori, with males being less likely than females to pass all their courses. Attrition rates after one year of study are similar for both Māori and non-Māori. However, Māori students are less likely to complete within five years, with males being less likely than females to complete.

The key factors for first-year success are likely to be a set of institutional, personal and external influences. Passing 75 percent or more of courses is a key determinant of remaining in study and completing a qualification.

The main intervention point to support students to succeed appears to be in the first year of study, with a focus on students who have low or no school qualifications, are part-time and/or were unemployed or in lower-level tertiary studies previously.

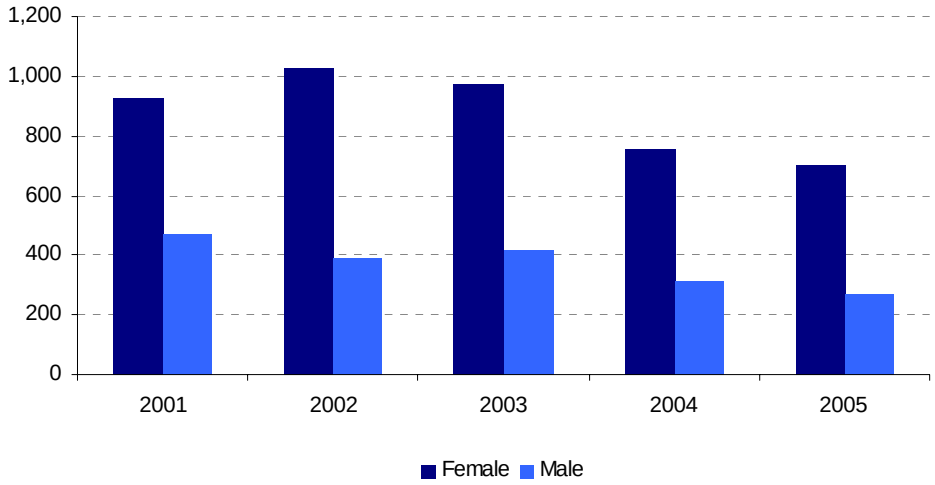
5.1 Overall trends

Numbers of first-time students decreasing

The number of first-time, first-year Māori degree students in this age group has been decreasing over the last five years. This probably reflects improved employment opportunities, in terms both of finding jobs and of being promoted within existing jobs. It may also reflect that the pool of interested students is decreasing, following a period of heavy recruitment of Māori adult students into tertiary study.

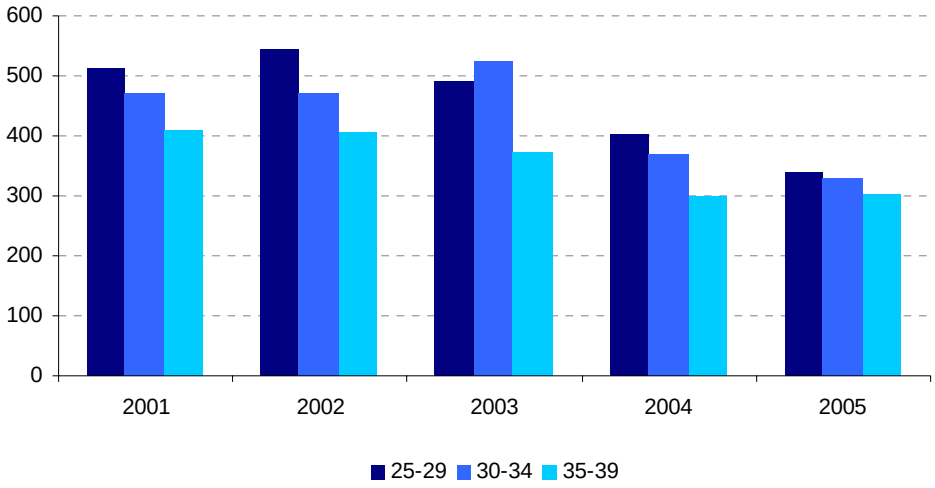
From 2001 to 2005, the number of first-year, first-time Māori students in bachelors degrees aged 25 to 39 decreased by 30 percent. The proportional decrease was larger for males (42 percent) than for females (24 percent). In 2005, 72 percent of Māori students in this age group were female.

Figure 5.1: Māori first-time, first-year bachelors students aged 25 to 39 by gender



The decrease in numbers has been most notable at the younger end of the age group. In the period from 2001 to 2005, the largest decrease has been in students aged 25 to 29, a decrease of 34 percent. The numbers of students aged 30 to 34 have decreased by 30 percent and those aged 35 to 39 by 26 percent.

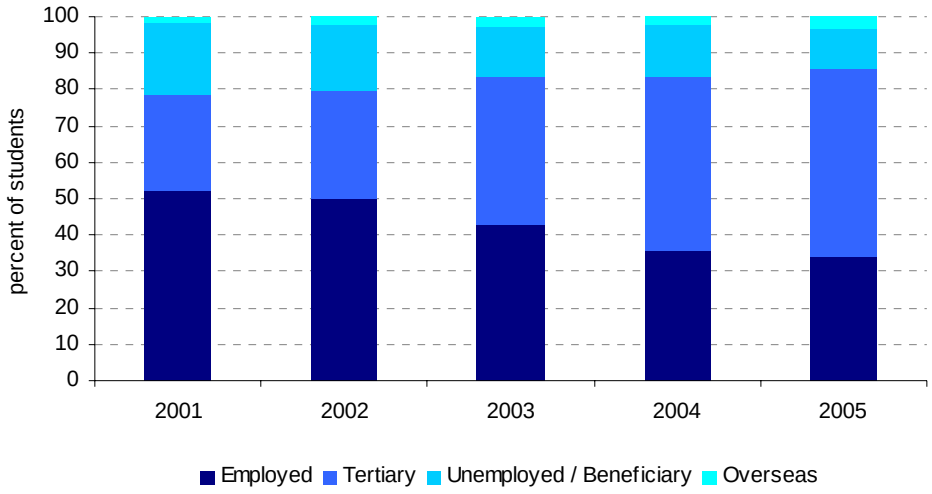
Figure 5.2: Māori first-time, first-year bachelors students aged 25 to 39 by age group



More students staircasing from lower-level tertiary

Most first-time, first-year Māori students have no or lower-level school qualifications. In 2005, 28 percent had no school qualifications and 50 percent had school qualifications below university entrance. An increasing proportion of these students were in lower-level tertiary study in the year before enrolling for degree studies. In 2001, 26 percent were enrolled in lower-level studies the previous year; this increased to 51 percent in 2005.

Figure 5.3: Māori first-time, first-year bachelors students aged 25 to 39 by prior activity

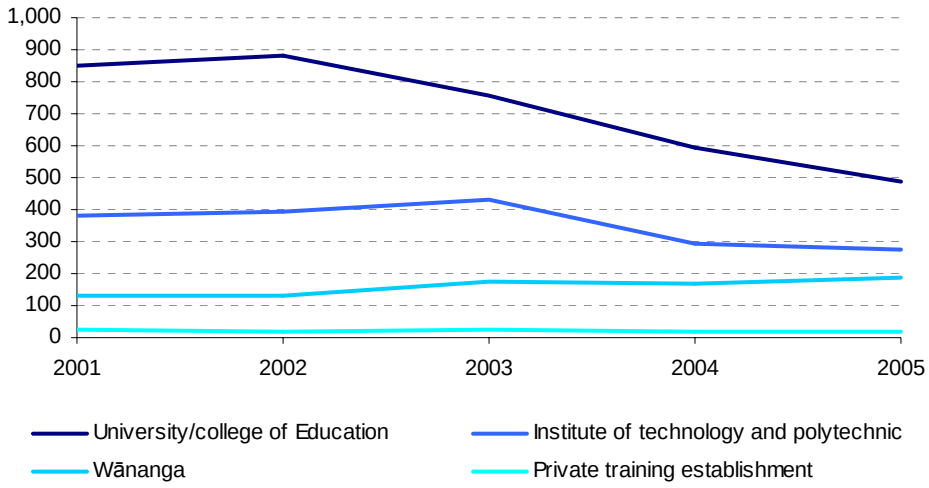


Largest decrease at universities

The largest decrease in numbers in this age group has been in enrolments at universities and colleges of education. This has been followed by a more recent decrease in numbers at ITPs. Meanwhile, numbers at wānanga have continued to increase steadily.

In 2005, 23 percent of students in this age group were enrolled extramurally. This was a decrease in proportion from 30 percent in 2004. Most of the extramural students (70 percent) are enrolled in a university, with nearly all the rest being enrolled at an ITP.

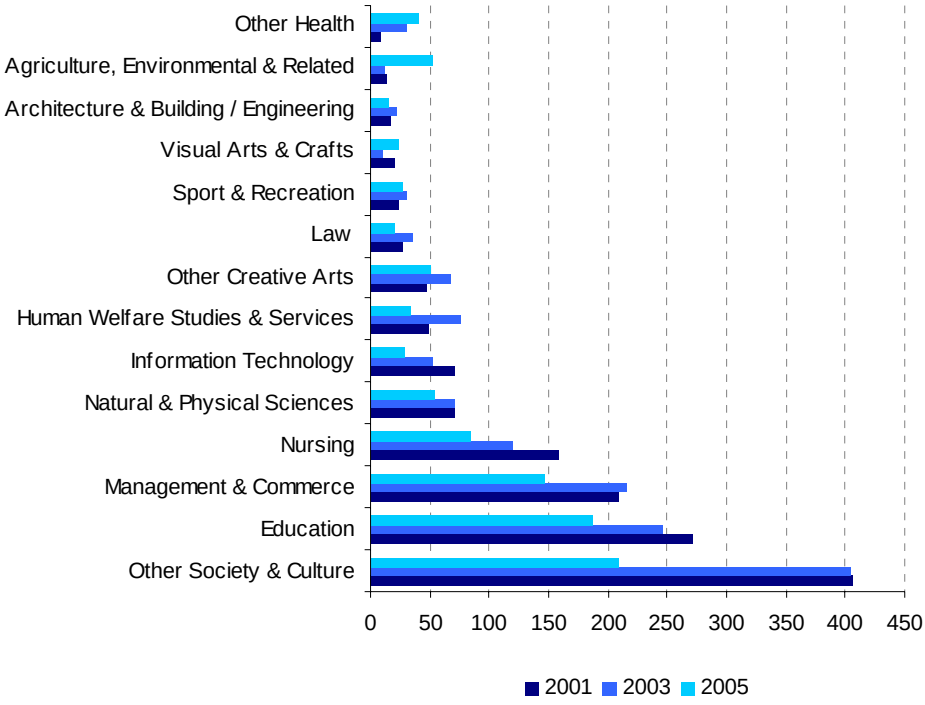
Figure 5.4: Māori first-time, first-year bachelors students aged 25 to 39 by sub-sector



Note: Universities and colleges of education have been combined to illustrate the overall trend during a period where two of the four colleges have merged with universities.

The most popular field of study for first-time, first-year Māori degree students aged 25 to 39 is society and culture, which includes humanities and social sciences. This is also the field with the largest decrease in enrolments from 2003 to 2005. Other fields with larger numbers of enrolments are education, management and commerce, and nursing. These fields have also had decreased enrolments.

Figure 5.5: Māori first-time, first-year bachelors students aged 25 to 39 by field of study

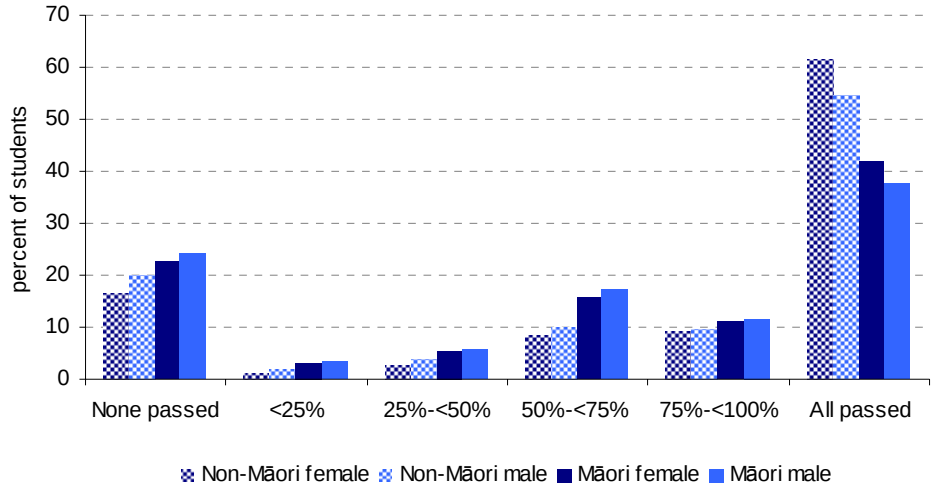


5.2 Success and completion

Māori students less likely than non-Māori to pass all their first-year courses

Over the period from 2001 to 2005, 42 percent of first-time Māori female students and 38 percent of first-time Māori male students passed all of their first-year courses. This compares with 61 percent and 55 percent for non-Māori. At the other end of the scale, 31 percent of Māori female students and 33 percent of Māori male students failed more than half of their courses. This compares with 21 percent and 26 percent for non-Māori. There was little variation in these figures from year to year, even with the decreasing student numbers and change in relative composition of students and providers.

Figure 5.6: Distribution of first-time, first-year bachelors students aged 25 to 39 by proportion of courses passed



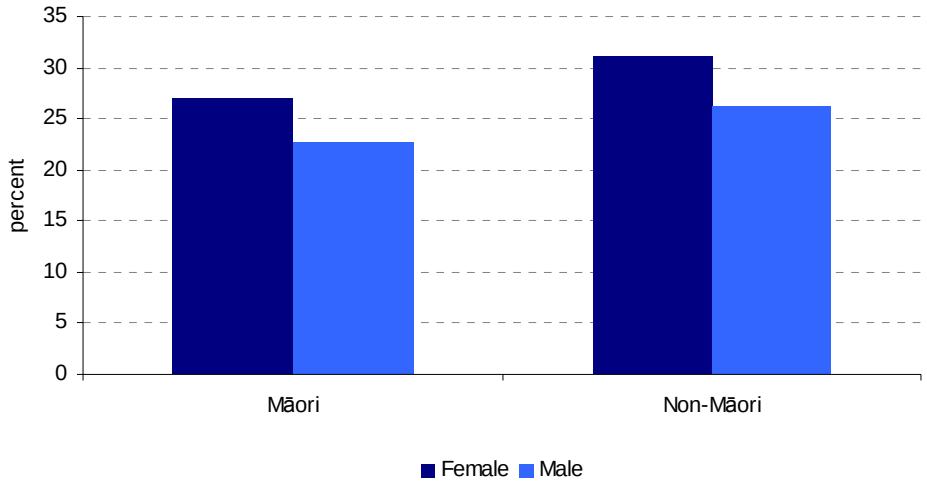
Note: For students enrolled from 2001 to 2005.

Māori students as likely as non-Māori to remain in study, but less likely to complete

Over the period from 2001 to 2004, 36 percent of Māori first-year students aged 25 to 39 who started degree study for the first time did not return to further study. This proportion was similar for males and females, as well as for Māori and non-Māori. It has remained similar from year to year.

Twenty-seven percent of Māori female students, and 23 percent of Māori male students, aged 25 to 39 who started degree study in 2001 had completed a bachelors qualification by 2005. This compares with 31 percent of non-Māori female students and 26 percent of non-Māori male students.

Figure 5.7: Five-year completion rates for first-time bachelors students aged 25 to 39 by gender



Note: For students starting study in 2001.

5.3 What makes a difference for first-time Māori bachelors students aged 25 to 39?

As with the school leaver group, a set of three regression models was developed to look at what factors make the most difference for first-time Māori degree students aged 25 to 39 in influencing first-year pass rates, first-year retention and five-year completion rates. [7]

The key findings from these models are:

First-year pass rates

— The most important influences on success are not captured in the enrolment data. The model explains around 23 percent of the variation in pass rates. As noted with the younger students, there will be a range of personal, institutional and external factors that impact on success. In this age group, balancing family and work demands with study requirements is also likely to be a very important issue.

— The most significant factors captured within enrolment data arre the subject enrolled in and the sub-sector in which the student was enrolled, as well as the student's level of school qualification and extra- or intra-mural status.

[7] A summary of these models is provided in Appendices 2 and 3. A more detailed write-up can be found at www.educationcounts.edcentre.govt.nz.

First-year retention

— As with the younger students, around a third of the variation in first-year retention can be explained from the information in enrolment data. Again, other factors not present in the model are likely to account for the majority of the variation.

— The single most important factor affecting first-year retention is the first-year pass rate. Students who passed 75 percent or more of their first-year courses were much more likely to remain in study. This factor explains around three-quarters of the variation captured in the model.

Five-year completion

— Nearly half of the variation in five-year completion rates can be explained by information capture in enrolment data.

— The only significant factor in this model for this age group is their overall pass rate. Students who passed 75 percent or more of their courses were much more likely to complete within five years. No other factors proved statistically significant in the model.

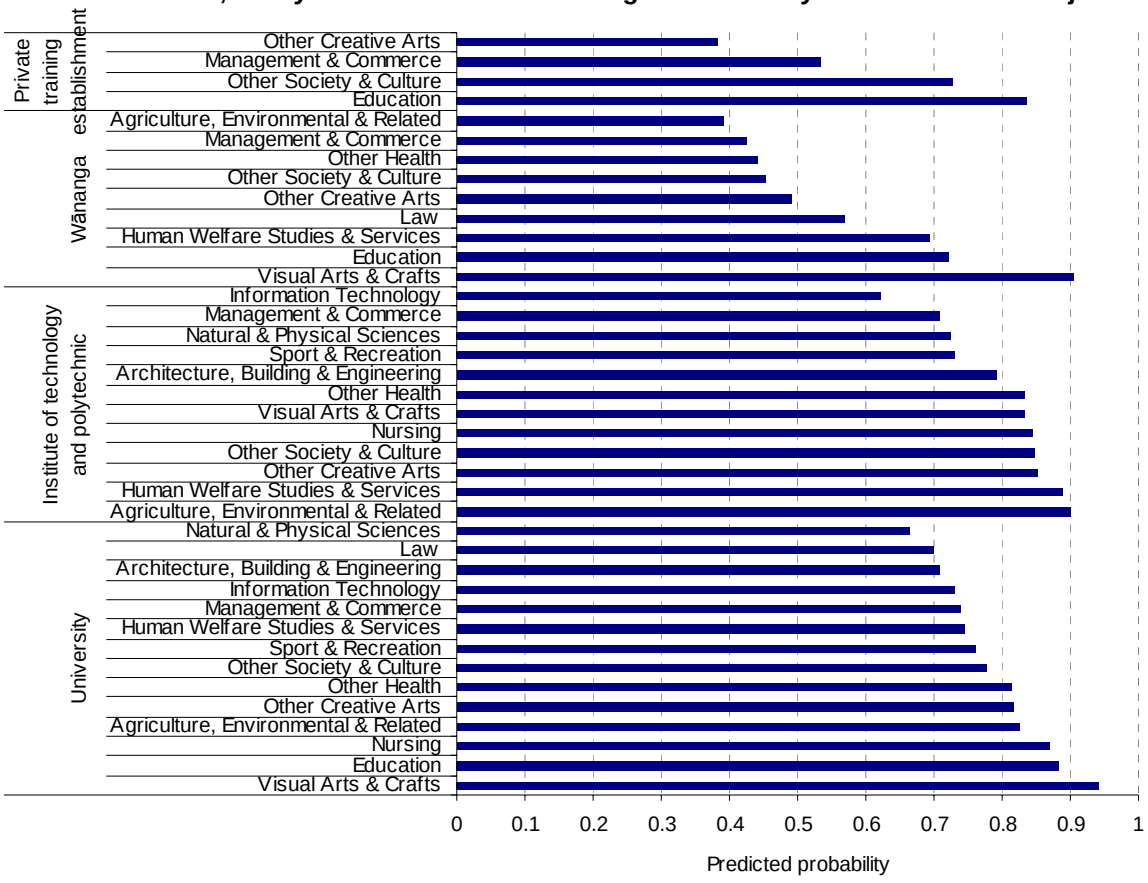
First-year pass rates

The subject of the qualification and the sub-sector a student is enrolled in together provided the strongest factors in the model for explaining variation in first-year pass rates for Māori first-time degree students aged 25 to 39.

In contrast with the school leavers, there was no clear differentiation between more generic and more specialised qualifications. Overall, students at wānanga had lower pass rates than students in other sub-sectors.

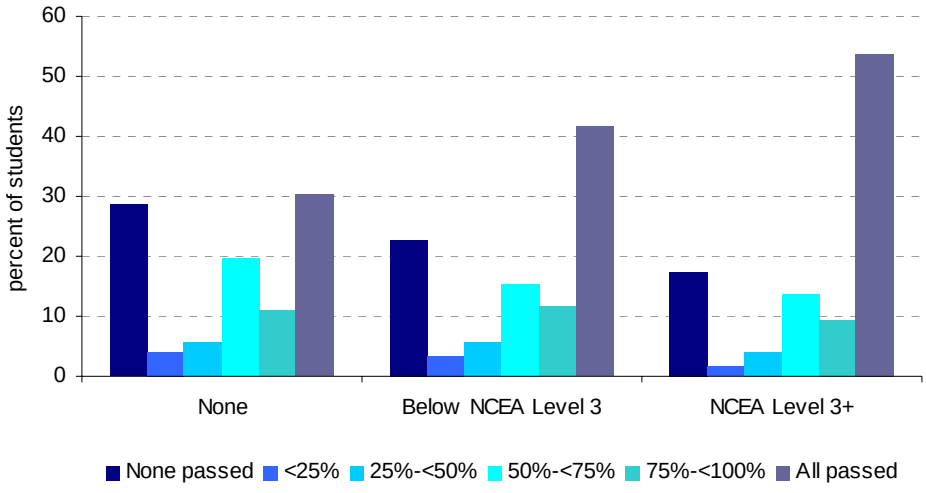
However, results varied considerably by subject across sub-sector. In universities success was highest in nursing, education, and visual arts and crafts. In ITPs, success was highest in agriculture, environmental and related studies and human and welfare studies and services. In wānanga, success was highest in visual arts and crafts, and education. In PTEs, success was highest in education.

Figure 5.8 **Predicted probability of passing 75 percent or more of courses for Māori first-time, first-year bachelors students aged 25 to 39 by sub-sector and subject**



The highest level of school qualification is also a strong factor in the model. Students with no school qualifications were more likely to fail all of their courses and less likely to pass all of their courses. Conversely, students with the equivalent of NCEA Level 3 or higher were more likely to pass all of their courses and less likely to pass none of their courses.

Figure 5.9: **Distribution of Māori first-time, first-year bachelors students aged 25 to 39 by proportion of first-year courses passed and highest school qualification**



Note: For students enrolled 2001 to 2005.

Furthermore, students with NCEA Level 1 only, or no school qualifications, had lower pass rates in extramural studies than in intramural studies. There was little difference between extramural and intramural studies for students with NCEA Level 2 or higher.

— **EFTS enrolled and study type:** Students who were enrolled full-time, full-year in degree studies were more likely to be successful than students enrolled part-time and/or part-year. Students enrolled for part-year only were less successful than those enrolled for a full year. The former group includes students who failed most or all of their first-semester courses and pulled out of study.

— **Prior activity:** Students who were in tertiary study below degree level, or were unemployed, prior to enrolling for degree study did not do as well as those who were employed in the previous year. Students returning from overseas did better than other students; however, their numbers were quite small.

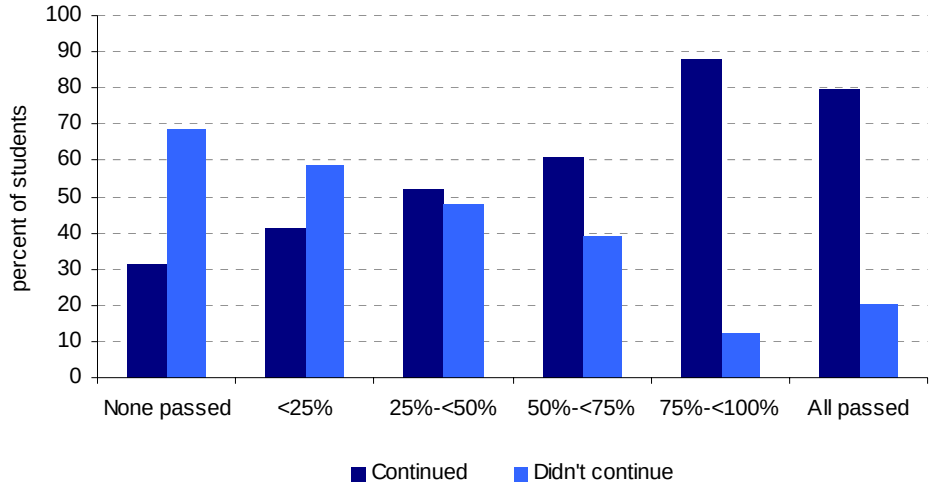
— **Age:** The chances of passing 75 percent or more of first-year courses increased with age, once other factors were controlled for.

— **School decile:** Students from low decile schools (deciles 1 to 3) had a lower chance of success than those from medium and high decile school, once other factors were controlled for – even when returning to study as adult students. The difference, however, was less than for students entering tertiary study from school.

First-year retention

As with the under-20-year-old students, the single most significant factor in the model for first-year retention is whether or not students passed 75 percent or more of their first-year courses. Overall, 36 percent of Māori first-time, first-year degree students aged 25 to 39 did not continue in degree study after one year. However, 69 percent of those who failed all of their courses did not continue, compared with only 12 percent of those who passed at least 75 percent, but less than 100 percent, of all of their courses. Of those who pass all of their courses, 21 percent did not continue in study. This may be because this group includes students who only intended to study for one or two courses and did not intend to complete a qualification.

Figure 5.10: Proportion of Māori first-time, first-year bachelors students aged 25 to 39 who continued or discontinued by proportion of first-year courses passed



Note: For students enrolled 2001 to 2004.

The following had a smaller contribution, but significant effects within the model:

- **Subject:** There were some variations across subjects, although the results for most subjects were not statistically significantly different from each other. Students in visual arts and crafts were less likely to continue in study. Students in education, sciences, architecture, building and engineering, nursing and agriculture, and environmental and related studies were more likely to continue in study than students in general society and culture degrees.

- **Sub-sector and extra-/intra-mural status:** Overall, there were no statistically significant differences among sub-sectors. However, when extra-/intra-mural status is also considered, the model shows that extramural students at ITPs were more likely to continue in study than other students in ITPs or other sub-sectors.

- **EFTS enrolled in degree studies:** Students who undertook greater amounts of study, in terms of EFTS, were more likely to continue in study in the following year.

- **Age:** The probability of continuing in study reduced slightly with the age of the student.

- **Study type:** Students who studied full-time, full-year in their first year were more likely to continue in study than those who were part-time and/or part-year.

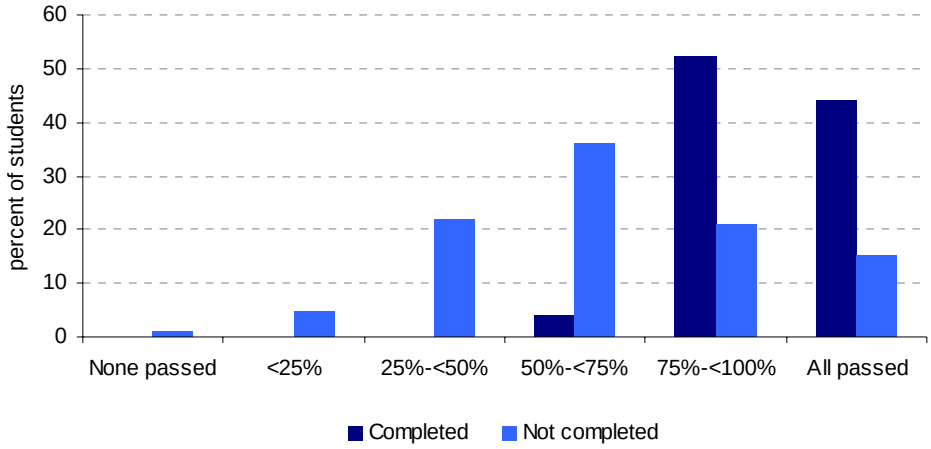
- **Iwi affiliation:** The model suggests that students who had one or more iwi affiliations were more likely to continue in study than those who did not. This may be a result of stronger cultural and social capital and/or access to social and financial resources. It may also reflect improvements in data quality over the time period.

Five-year completion

The only statistically significant factor in the model for five-year completion by first-time Māori degree students aged 25 to 39 is whether or not they passed 75 percent or more of all of their degree courses.

As with under 20 year olds, nearly all of the students who started a three-year degree in 2001, and had completed by 2005, had passed 75 percent or more of their courses. Nearly two-thirds of those who did not complete had failed 25 percent or more of their courses. There were some who had passed all or most of their courses and still did not complete, even though they had completed three years of study. This suggests that there were other factors not captured by enrolment data and therefore not in the model.

Figure 5.11: Distribution of Māori first-time bachelors students aged 25 to 39 by proportion of total courses passed and five-year completion status



Note: For students who started degree study for the first time in 2001, enrolled in three-year bachelors degrees who had completed at least 2.9 EFTS of study by 2005.

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Appendix 1: Summary of international and New Zealand research on first-year degree experience

Reprinted from:

Scott and Smart (2005), What factors make a difference to getting a degree in New Zealand? Wellington: Ministry of Education.[8]

Much has been written on student attrition. It is one of the more widely researched aspects of tertiary education around the world. However, New Zealand-based research in this area remains light by comparison. The summary below discusses the factors that feature prominently in the literature, with a special focus on New Zealand research.

Many studies comment on the complex and interactive nature of factors in a student's decision to stay or leave. A number of studies point out that factors that influence some students negatively will be motivating influences for other students. One student's reason to leave is another's reason to stay. Many studies comment that a student's stated reason for leaving may, in fact, mask a combination of factors. A student citing family commitments may have done so after the culmination of other factors, such as also having to work part-time, and not having a great deal of interest in the course anyway. Often these factors interact in ways unique to each student.

"The research shows consistently that it is unusual for students to cite just one factor influencing their decision to leave. Distinguishing conceptually between so-called 'personal' and institutional reasons for non-completion does not make a lot of sense in reality." (Yorke and Longden, 2004, page 41)

And in a later chapter, the authors conclude….

> "…we remain unconvinced that a single theoretical formulation – a 'grand theory' – can be constructed to include all of the possible influences that bear, via the student's psychological state, on retention and success, whilst being practicable in terms of research and institutional practice."

As with other fields of study involving human processes, this should not stop, and has not stopped, the considerable discussion, debate, research and efforts to help those undertaking study to realise their education outcomes. Indeed a number of general themes have emerged from the literature, and some of these are summarised below.

A number of studies provide useful groupings of broadly related factors, including demographic, institutional, sociological, psychological, economic etc. However, the relative importance and interaction of each of these has been the subject of continuing debate (eg see Yorke and Longden, 2004, Chapter 6).

While this study is not intended to provide a comprehensive review of this literature, such a study would not be complete without some discussion of the key themes in the literature. For a more extensive discussion of the literature, readers are referred to a number of good reviews on this topic (Prebble et al, 2005; McInnis et al, 2000; Pascarella and Terenzini, 2005; Braxton, 2000; Yorke and Longden, 2004 (especially Chapter 6); and, more historically, Tinto's well-known 1975 review).

[8] Refer to the list of references on page 43 for works cited in this appendix.

The work of Tinto, Bean and others in the United States has been particularly important in advancing the theoretical understanding of attrition. In his 1975 review of the literature, Tinto proposed a model where factors such as goal commitment and institutional commitment, and how they lead towards academic and social integration with an institution, were important factors (Tinto 1975).

Bean applied a work model of turnover to attrition, and used satisfaction and intent to leave as intervening factors to test the indirect effects of particular factors in the decision to withdraw. Factors found to be significant in addition to intent and satisfaction were institutional commitment, previous qualifications, grades, belonging to campus organisations, the perceived practical value of the study, the perceived opportunity to transfer, goal commitment, and low sense of gaining development (Bean, 1980, 1983; Bean and Metzner, 1985). Bean and Eaton (in Braxton, 2000) review more psychologically-based theories that challenge the sociological constructs of Tinto's model.

Cabrera, Castañeda, Nora and Hengstler (1992) found significant overlap between the theories of Tinto and Bean, concluding that interactions between institutional, personal and external factors are all to a varying degree important. Braxton (2000) also provides a good review of the theory and models of student persistence and departure. This includes discussion where retention is about how institutions need to fit around the student, rather than how the student integrates with the institution. This adaptation versus assimilation discourse is elaborated further in, for example, Prebble et al (2005).

It is important to note that this research is based in a US setting. System-wide differences in the type of students, modes of learning, institutions and provision between countries will lessen the impact of some factors, and fail to recognise others when applied to the New Zealand context. For example, the factors influencing a full-time, degree-seeking freshman at a four-year US college are not necessarily applicable to an older person with no previous qualifications returning to the education system to study part-time at a wānanga.

In their 2000 review of non-completion, McInnis et al provide the following summary of factors affecting non-completion:

> "Factors such as wrong choice of course or subject, poor preparation and lack of readiness and commitment figure prominently in the reasons for non-completion."
>
> "…the quality of the initial student experience" … "student dissatisfaction with the university experience, style and quality of teaching and learning, workloads, and a lack of fit between student capacities and institutional demands..."

They go on to summarise:

> "This interaction between personal, institutional and external/societal factors seems the most fruitful way to proceed…"

One of the key factors established in the literature is academic ability. This is often measured by using proxies such as school grades or qualifications, or by prior tertiary grades or qualifications. External commitments such as work, finances, health and family are also cited as factors established in the literature as impacting on non-completion.

Perhaps the most comprehensive New Zealand review of the literature to date is Prebble et al (2005). While this report is principally concerned with two broad institutional factors, namely student support services and academic staff development, it nevertheless provides a useful frame for retention. This frame is expressed in terms of 13 propositions grouped under the two broad themes of assimilation and adaptation.

Assimilation

- Institutional behaviours, environments and processes are welcoming and efficient.
- The institution provides opportunities for students to establish social networks.
- Academic counselling and pre-enrolment advice are readily available to ensure students enrol in appropriate programmes and papers.
- Teachers are approachable and available for academic discussions.
- Students experience good quality teaching and manageable workloads.
- Orientation/induction programmes are provided to facilitate both social and academic integration .
- Institutions provide and foster academic learning communities.
- A comprehensive range of institutional services and facilities is available.
- Supplemental Instruction (SI) is offered for difficult subjects.
- Peer tutoring and mentoring services are provided.

Adaptation

- There is an absence of discrimination on campus, so students feel valued, fairly treated and safe.
- Institutional processes cater for diversity of learning preferences.
- The institutional culture, social and academic, welcomes diverse cultural capital and adapts to diverse students' needs.

The two broad discourses of *assimilation* and *adaptation* are further discussed in a separate, related paper from two of these authors:

> "….the Tinto assimilationalist model is still predominant. The institution's role is to assimilate students, socially and academically, to foster their academic success…… But a new discourse is emerging in recent theoretical and research literature. The assimilationalist model is being challenged and alternative processes are proposed. Central to this emerging view is the idea that students should maintain their identity in their culture of origin, retain their social networks outside the institution, have their cultural capital valued by the institution and experience learning that fits with their preferences…" (Leach and Zepke, 2003).

Stewart and Rawrhiti (2004) cite two models in their discussion of institutionally based retention strategies for indigenous students at Victoria University of Wellington. The *Beatty-Guenter Strategy Model* involves five broad categories: Sorting (activities to improve how well students are placed to enter an institution); Connecting (activities that help 'bond' students and make them feel they belong to an institution); Supporting (activities that help support the student, eg child care, health services etc); Transforming the Student (activities that help the student meet their academic expectations, eg skill

improvement workshops, goal setting, academic advice etc); and Transforming the Institution (adjustments required by the institution to meet the needs of a diverse student body).

Secondly, they discuss the application of Durie's *Whare Tapa Wha* model (Durie, 1994). In this holistic model, Māori development is seen as "a four-walled house where each wall represents a core dimension necessary to ensure good health". These four walls are 'Te Taha Wairua' – the spiritual dimension, 'Te Taha Hinengaro' – the emotional dimension, 'Te Taha Tinana' – the physical dimension, and 'Te Taha Whānau' – the family dimension.

Other New Zealand literature also includes discussion of strategies that could be, or have been, put in place at New Zealand institutions (Billings, 2003; Clark and Crome, 2004; Acheson, 2004). Other literature is based more around specific research, at a course, qualification or institution level (Manthei, 1994; Unitec, 2000; Wilson, 2002; Bunn, 2004; Boddy and Neale, 1997; Brookefield and Macfarlane, 1996; Brown, 2000). These are not summarised here, except that factors found to be significant in influencing retention are included in Table 1 below. National-level analysis of retention and completion has also become available in recent years (Scott, 2004a, 2004c, 2005; Ministry of Education, 2004). These provide useful insights in a New Zealand context, which are particularly important when attempting to generalise from the overseas literature.

A summary of factors from the literature reviewed by the authors is presented in Table 1 below. Factors have been arranged according to the authors' own groupings, which are broadly consistent with the literature. The aim of the table is to give the reader a flavour of factors that are reasonably established or discussed in the literature reviewed. The sampled literature covers a mixture of original research, meta-analyses, reviews and strategies. It doesn't aim to cover all the factors, nor does it claim to comprehensively include all factors cited in any referenced study. Readers will see that many factors can clearly be located in more than one group, although they have been listed only once in this table.

When making generalisations from the literature, it is important to recognise that many studies relate to particular courses, qualifications or institutions. Many of the students who withdraw from a course or qualification, or from an institution, often enrol and complete somewhere else, and so attrition from an institutional viewpoint is not necessarily attrition from a student, or national system, viewpoint. Because many studies often relate to a particular environment, be it course, qualification, institution, institution type, type of student, mode of learning, or country, attempts to generalise outside of that environment should be taken mindfully and, in some cases, not be taken at all.

Summary of factors affecting attrition and completion

Each number in the references column is indexed to a corresponding reference in the References section that follows.

Factor	References
Ability	29
• high school achievement, (qualifications or grades)	1,2,4,13,15,25,26,40,41
• performance, grades at a tertiary institution	1,2,3,15,26,40,41,47
Background/ Demographic	
• parental income	43
• parental education	13
• socio-economic status, family background	24,40,41,45,46
• non-English-speaking background	24,45
• age	4,23,24,26,27,34,44,45
• gender	23,24,27,34,43,44,45
• ethnicity	4,24,26,27,34,43,44,45
• physical and mental well-being	16,22,25
• urban/rural	24,45
• occupation (industry training)	38
• literacy	44
Transition, engagement, integration	14,31,38
• socially (students, teachers, extra-class activities)	19,25,30,31,40,41
• academically (tutors, mentors, study facilities)	19,20,25,31,40,41
• academic counselling	31
• participation (eg in campus activities)	2,3,40,41
• environment didn't suit	6
• on-campus employment	12
• sense of belonging	20,40,41
• initial/first-year student experience	13,25,49
• direct from school vs delayed entry	43
• transition to tertiary	25
• length, stage of study	49
• welcoming and induction activities	31,49
• lack of preparedness	25,
• mismatching expectations	16,25
• perceptions of practical value, eg for employment	2,3,26,38,46
• class attendance	4
• perceptions of self-development	2,40
• study load, full- or part-time study	4,23,24,26,28,37,43,45
• distance-based isolation, extramural	8,10,45
• pre-entry and early engagement activities	22,28,30,34,37,41,42
Satisfaction	2,3,26,38,41,46
• with course	6,25
• with teachers, with the institution	25

Factors	References
Commitment and motivation	
• commitment to and readiness to study, motivation	6,19,25,30,40,41,46
• commitment, loyalty to the institution	2,40,41
• goal commitment	2,40,41,43
• intent to complete or leave	3
External commitments	8,10,22
• family/whānau, care of dependants	16,25
• full- or part-time work	13,25,46
• time commitments	16
Opportunity	2,6
• economy and job market	
• marriage and family	3
• opportunity to transfer	2,3,26
Resources and support	
• computer-related, technical support	1,8,10
• campus location, distance and travel costs	22,46
• lack of information	46
• lack of finances	6,30,41,46,49
• student support services	1,10,31,38
• borrowing to study	18
Teaching/Institution	40,41
• style and quality of teaching	25,31
• academic staff development	31,49
• cultural inclusiveness	31
• curriculum adaptation	49
• class size	9
• workloads	25,31
• materials (access to, quality of – relates to distance-based)	8,10
• milestone protocols	20
• type of institution	4,13,27,34,43
• institution-specific factors	23
• timetabling	47
• personal or peer tutoring, mentoring	31, 49
• supplemental instruction	31
Subject choice	
• subject major, field of study	15,20, 23,24,45
• wrong, did not like or poor choice of subject	2,3,6,25,30

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Appendix 2: Summary of models

Under 20 years		
First-year pass rates	*First-year attrition*	*Five-year completion*
R^2 = 0.15	*R^2 = 0.36*	*R^2 = 0.41*
Subject EFTS enrolled and study type Prior activity	First-year pass rate	Total pass rate
Sub-sector *Percent postgraduate EFTS in provider* *School decile*		*Bachelors EFTS/Postgraduate EFTS in provider* *Percent postgraduate EFTS in provider*
Gender School qualification School definition	Study type Subject With(out) iwi affiliation School qualification and gender Sub-sector *Percent bachelors EFTS in provider*	EFTS enrolled in first year School qualification Additional time in study Full-time/full-year over degree enrolment
25 to 39 years		
First-year pass rates	*First-year attrition*	*Five-year completion*
R^2 = 0.23	*R^2 = 0.33*	*R^2 = 0.48*
Subject and sub-sector School qualification and extra-/intra-mural	First-year pass rate	Total pass rate
EFTS enrolled and study type *Prior activity*		
Age Decile	Subject Sub-sector and extra-/intra-mural EFTS enrolled Age Study type With(out) iwi affiliation	

Key
R^2 estimates the amount of all variation explained by the model
Explains around 50% of variation
Explains around a further 25% of variation
Explains remaining variation

Note: Where a model has interactions, the contribution of each of the main effects and the interaction have been added together to estimate the contribution of the group.

Appendix 3: Model definitions

The following provides a brief description of the parameters for each model. A full description of the models can be found at www.educationcounts.edcentre.govt.nz.

All six models focused on first-year, first-time Māori degree students. The national student number and the Ministry's statistically generated student number were used to identify this group. The numbers provided in this report should be treated as estimates. Extramural students were excluded from all three models for those aged under 20 years. There were only a few such students and their atypical characteristics tended to distort the models. All models used logistic regression with a binary outcome.

First-year pass rates

These models covered first-year, first-time students enrolling from 2002 to 2005 inclusive. The outcome groups were those who passed 75 percent or more of their first-year courses and those who did not.

Pass rates were calculated by taking the average of two definitions of successful completion and dividing by the number of courses taken. The first definition was the number of courses for which a pass was recorded. The second was the number for which a pass was recorded plus courses for which the outcome had not been recorded. See Scott (2006) for further discussion on this point.

First-year retention

These models covered first-year, first-time students enrolling from 2002 to 2004 inclusive. The outcome groups were those who continued in study after one year and those who did not.

Continuing in study was defined as returning study towards a bachelors degree at any institution following the first year of study, anytime within the period to 2005. The following groups of students were included as continuing:

- Students who switched from one bachelors qualification to another
- Students who moved from one provider to another
- Students who returned to study after a gap of a year or more.

Five-year completion

These models covered first-year, first-time students who enrolled in 2001 in a three-year degree programme and completed more than 2.9 EFTS of degree study in the period to 2005. The outcome groups were students who completed a bachelors or bachelors with honours degree by 2005 and those who did not.

The models were initially run with students who were enrolled for two or more years of study. This approach showed time in study to be the strongest factor – that is, a student needs to complete at least 3.0 EFTS of study to complete a three-year bachelors degree. This is a self-evident finding, so the model was adjusted to only include those who had completed more than 2.9 EFTS of degree study. The model was limited to three-year degrees to remove confounding effects of longer programme requirements.

A completed degree was identified as the first completion of any bachelors or bachelors with honours degree by the student.