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Making sense of the numbers

Education Awa

Education outcomes for Māori

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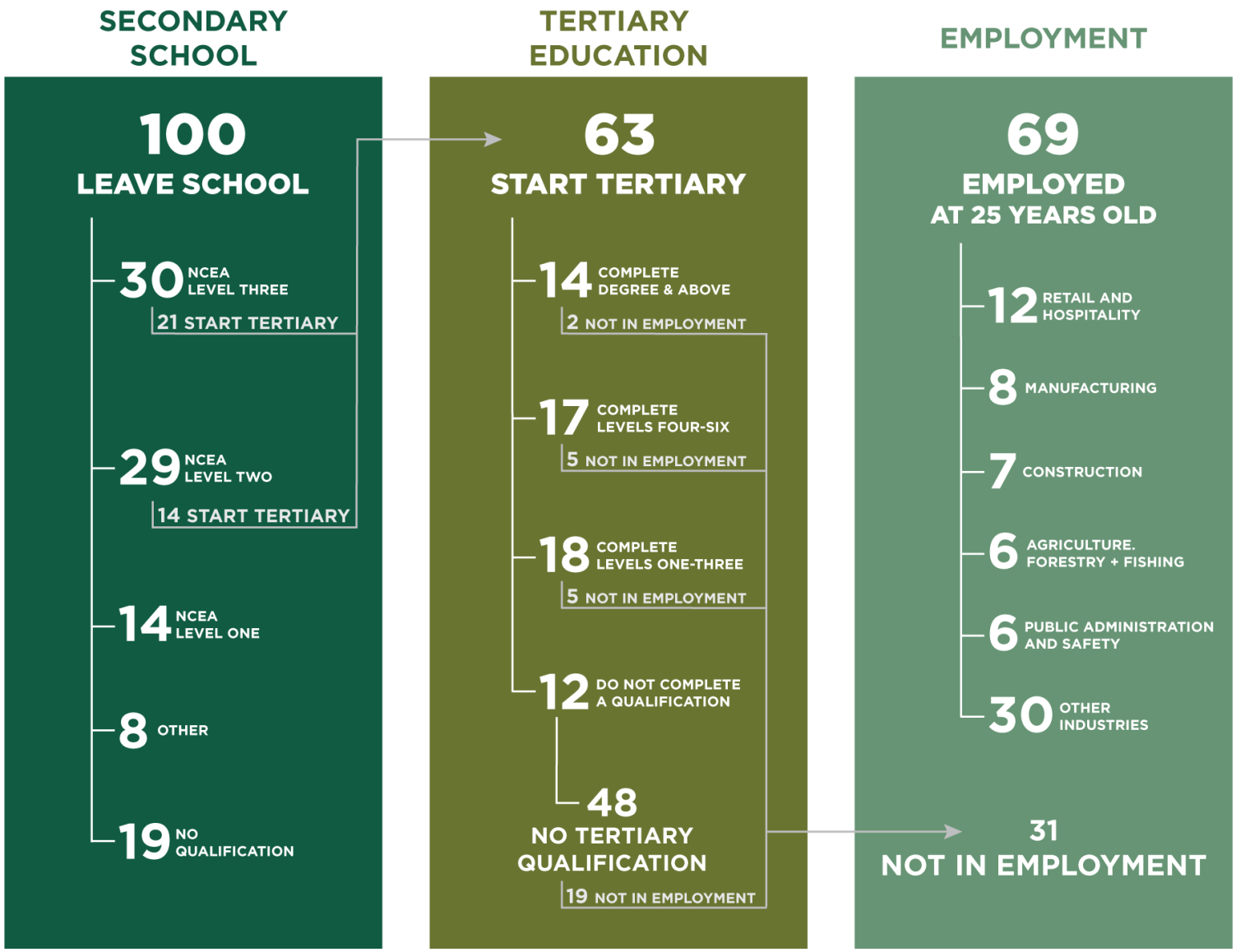
THE STORY OF 100 MĀORI SCHOOL LEAVERS



INTRODUCTION

In New Zealand, tamariki embark on a learning journey from when they begin early childhood education or when they begin compulsory schooling at or near 5 years of age. From there, it is a journey with twists, turns and various points at which they can hop off and hop back on.

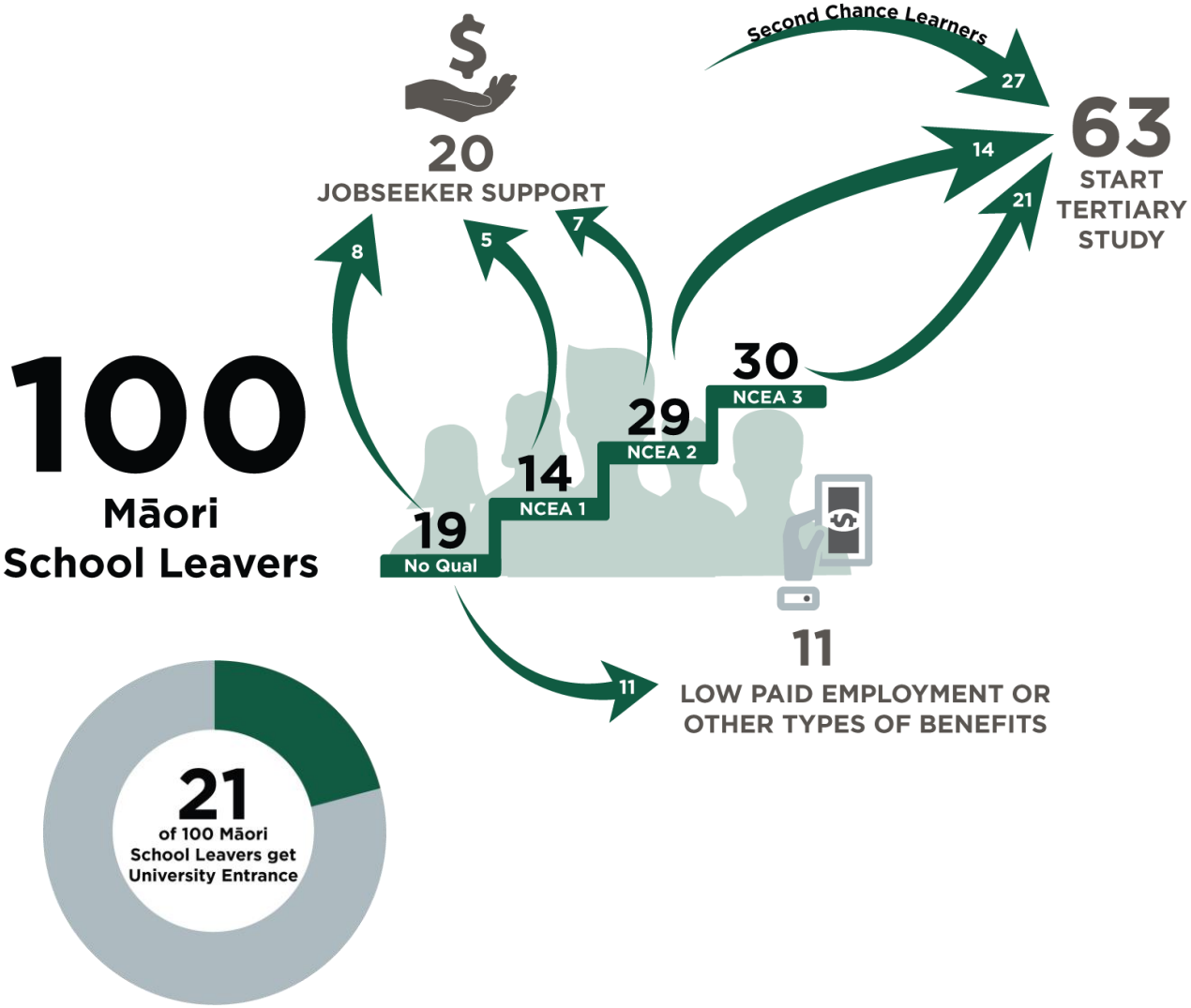
At the beginning, the destination is framed in general terms by the dreams and aspirations of their parents and guardians. They want their tamariki to do well and be equipped to lead a life characterised by prosperity and wellbeing for themselves, their whānau and their communities. As time goes on, as tamariki become rangatahi, a multitude of possibilities open up and they begin to have agency in the journey. They start to make choices which affect their direction and, ultimately, where they end up.

This idea of agency or choice could create an impression that rangatahi are therefore responsible for their journeys. This is not correct. They make choices only from options presented to them, often without adequate information, in circumstances over which they have no control and from within a system which has failed to support generations of young Māori to achieve their potential. In many cases, the choice is an illusion and their destinations are known well in advance to those looking on.

This document explores the well-trodden paths of Māori young people from when they become eligible to leave secondary school at 16 years of age. We follow their journeys from when they leave school, through tertiary study (for those who enrol) and on into the workforce.

SECONDARY SCHOOL

The journey following school is not always linear. Some rangatahi will leave school without a qualification and go onto a benefit, gain employment and go back onto benefit. After doing this for some time, they may also pursue tertiary education. The research identified 27 of the original 100 school do just that and are identified as "second chance learners" in the diagram.



TERTIARY EDUCATION

Of the 63 who enrol in tertiary study (at a private training establishment, university, polytechnic or whare wānanga), 49 complete a qualification between levels 1 and 7 before turning 25 years of age. Fourteen of the original cohort of 100 Māori school leavers will get a degree-level qualification, which remains a strong predictor of long-term prosperity. Nearly a third of non-Māori rangatahi have degrees by the time they are twenty-five.

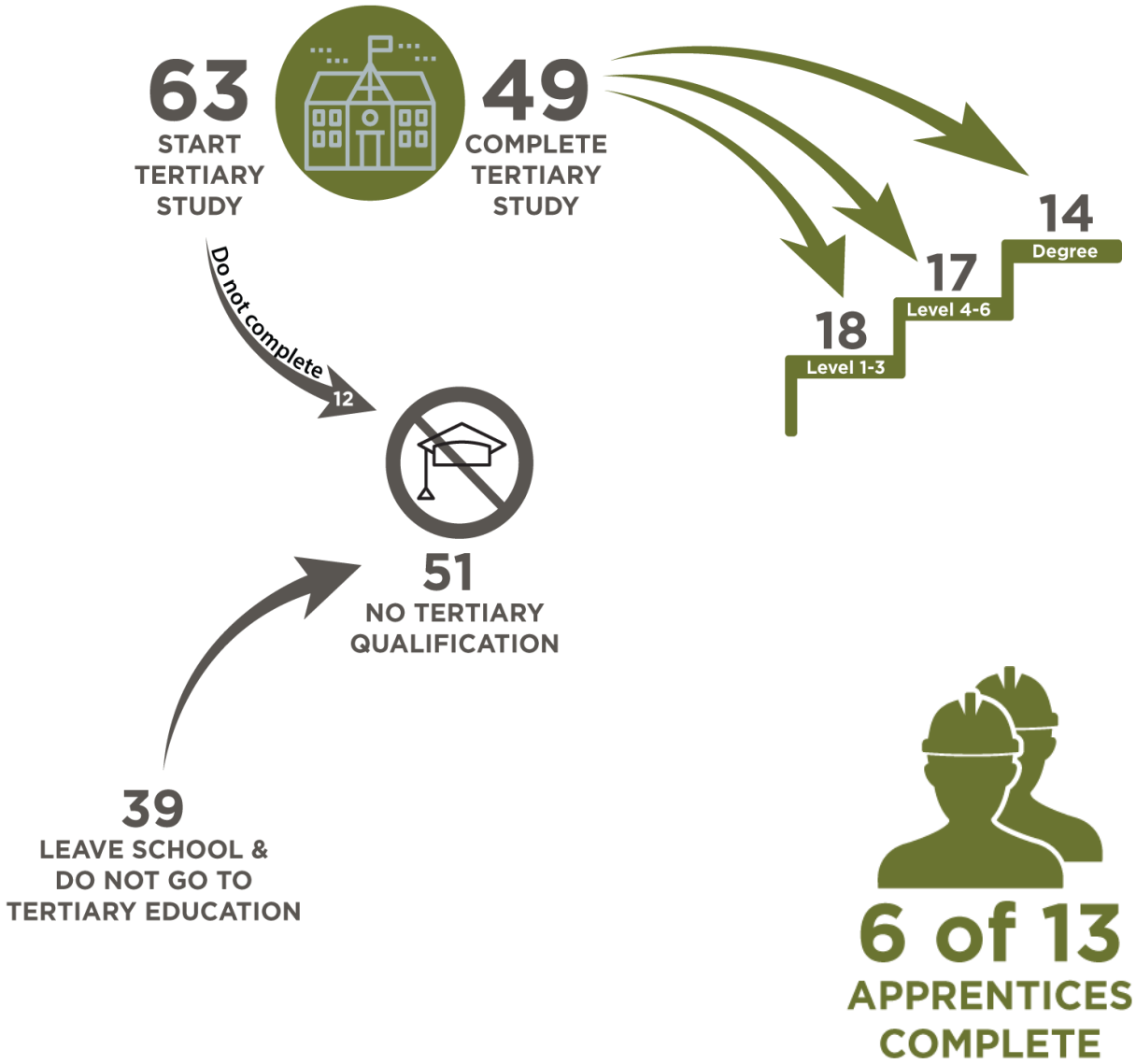
APPRENTICESHIPS

Apprenticeships are practical, low-cost, on-the-job education experiences which allow rangatahi to earn while they learn. From the data, of the 63 rangatahi who embarked on tertiary study, 13 were in apprenticeships. Of those 13, only six completed. Thisis concerning for two reasons:

1. Apprentices have similar lifetime outcomes to those who achieve degree-level qualifications; and
2. Completing the apprenticeship is a precondition of enjoying those outcomes.

Leaving an apprenticeship early, particularly for labouring jobs, can result in a short-term increase in income, but significantly diminishes the likelihood of long-term income growth.

Improving completion of apprenticeships will grow the skills of the New Zealand labour force, fill shortages in qualified tradespeople and contribute to greater prosperity.

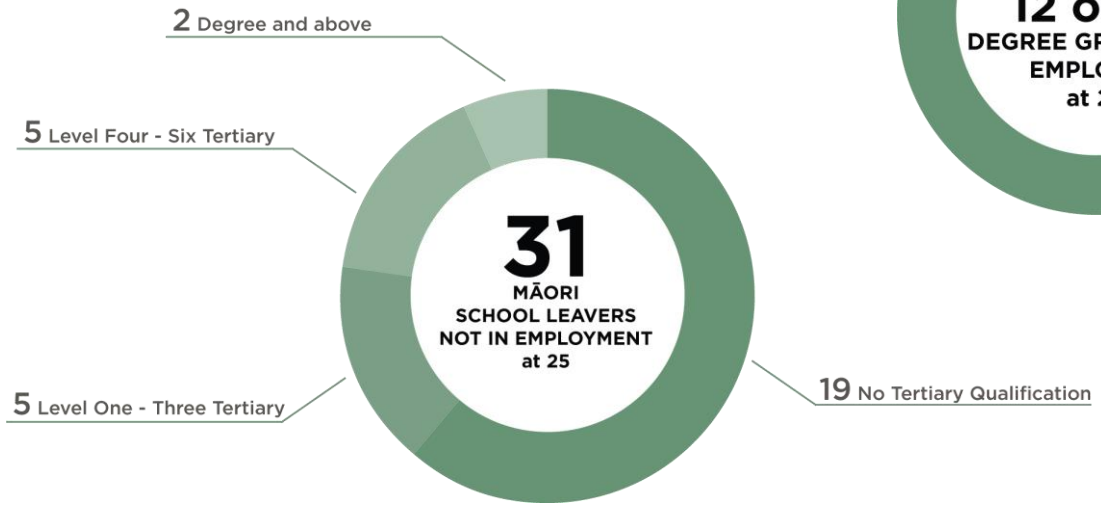


EMPLOYMENTAT 25

Nearly all rangatahi who achieve a degree-level qualification are in employment by the time they are 25 years of age. Onlytwo are unemployed.

Of the 51 with no tertiary qualification, 19 are not in employment.

69 MĀORI SCHOOL LEAVERS EMPLOYED AT 25



BIGGEST EMPLOYMENT INDUSTRIES OF THE 100 MĀORI SCHOOL LEAVERS AT 25

ONE RETAIL & HOSPITALITY

TWO MANUFACTURING

THREE CONSTRUCTION

FOUR AGRICULTURE FORESTRY & FISHING

FIVE PUBLIC ADMINISTRATION & SAFETY

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Disclaimer

The results in this report are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI), managed by Statistics New Zealand (Stats NZ).

The opinions, findings, recommendations, and conclusions expressed in this report are those of the authors, not Statistics NZ, the Ministry of Education, Inland Revenue or the Ministry of Social Development.

Access to the anonymised data used in this study was provided by Statistics NZ under the security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person, household, business, or organisation, and the results in this report have been confidentialised to protect these groups from identification and to keep their data safe.

Careful consideration has been given to privacy, security, and confidentiality issues associated with using administrative and survey data in the IDI. Further detail can be found in the Privacy assessment for the Integrated Data Infrastructure available from www.stats.govt.nz.

The results are based on tax data supplied by Inland Revenue to Statistics NZ under the Tax Administration Act 1994. This tax data must be used only for statistical purposes, and no individual information may be published or disclosed in any other form, or provided to Inland Revenue for administrative or regulatory purposes.

Any person who has had access to the unit record data has certified that they have been shown, have read, and have understood section 81 of the Tax Administration Act 1994, which relates to secrecy. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data's ability to support Inland Revenue's core operational requirements.

1 The awa of education

Participating in the New Zealand education system is like flowing down an awa to a moana of success. The system is a network of streams, with some parts being crafted into canals. From year 1 to 13, the system has been designed to focus the flow to progress students towards achieving university entrance and then moving to tertiary education.

Like flowing down the awa, while in the main flow the journey is easy, and continuing down the awa eventually lead students to the prescribed destinations. But, what if people divert from the main stem of the awa? Once outside of the traditional flow, the support systems are not there, the route is unclear and it is very difficult to return to the main flow of the awa.

In New Zealand, with a diverse and ever-changing labour force, not all students are needed to be in the same part of the moana, and having a wide range of skills will always be required. Given this need, the education system needs to be remodelled, acknowledging that there is more than one route to success, and success looks different for different students.

100 school leavers

This report includes data from two cohorts of school leavers. Throughout this report, we refer to the group as 100 representative individuals, each representing one percent of Māori school leavers from their respective cohort.

The first cohort looks at 49,500 rangatahi Māori that are in year 11 from 2008-2012. The final outcomes include outcomes at age 25 for all school leavers from 2008 to 2010. In total, this group is made up of 29,900 rangatahi Māori until they are 25 years old.

Importance of education in addressing equity

The Māori population is both growing and youthful, and in the coming years will form an increasing share of the New Zealand labour force.

In 2018, BERL completed a study on the income gap for Māori in New Zealand. Accounting for the significant differences in the age profile of Māori, they found an income gap of $2.6 billion per year. Perpetuation of this inequality with the growing Māori population will cause this gap to grow significantly. By 2040, this is projected to grow to $4.3 billion.

This study also considered the differences in employment and education levels for Māori. With low education limiting the ability for Māori to access high-skilled jobs. It is evident that we need to remove the obstacles to achieving higher education, and achieving education that has relevant and quality employment opportunities.

2 Pressure points in the awa

From the 100 school leavers it is evident that a significant proportion does not follow the well-established flow of the awa. Through our research, we have identified three significant pressure points for Māori in the education system.

2.1 Pressure point 1: Not completing NCEA level 1

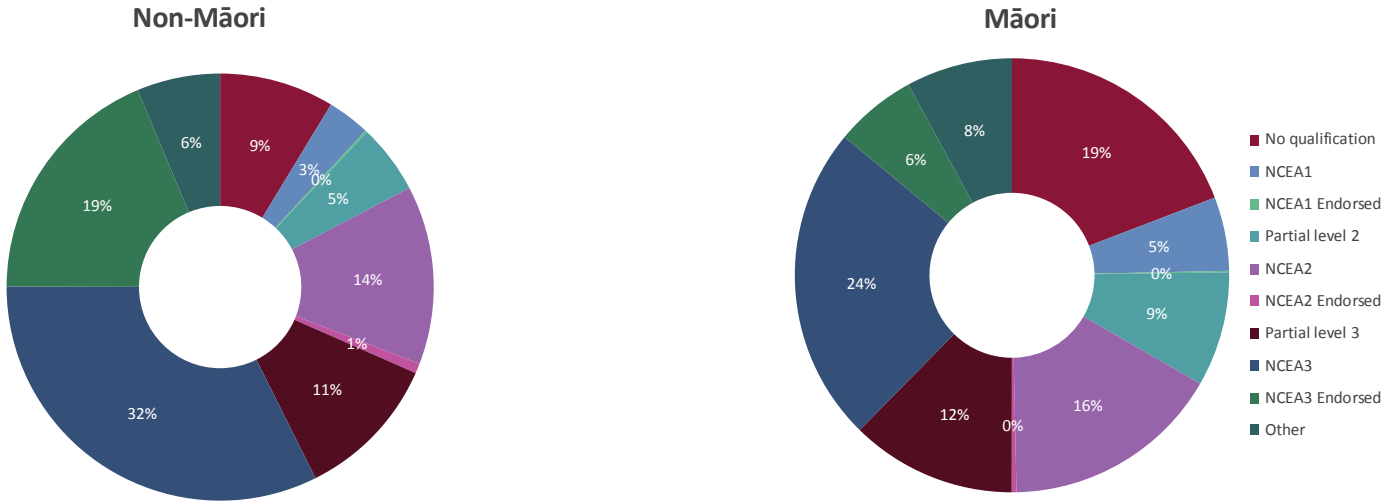
Figure 1 shows the high school attainment of school leavers for non-Māori as well as for Māori. This is a picture of the start of the crossroads, with the NCEA level 3 being the main flow. Leaving before level 3 can be the result of choosing alternative education providers.

Māori more likely to leave school with no qualifications than non-Māori

Māori are much more likely to leave school with no qualifications than their non-Māori peers. For every 100 Māori school leavers 19 have no qualifications, compared to only nine of every 100 non-Māori.

There are many characteristics that influence an individual's education decisions: many of the decisions made can depend on individual characteristics, or based on the subjects or careers that seem most enjoyable or rewarding. The decision to continue in education is closely linked with their level of achievement in previous years.

Figure 1 Highest qualification of school leavers



While high achievement typically results in continued education, lack of achievement can also result in barriers to further education. Achievement at high school can restrict opportunities to participate in subjects at higher levels while not having university entrance (UE) limits access to universities and degree programmes.

2.2 Pressure point 2: Low completion rates for apprenticeships

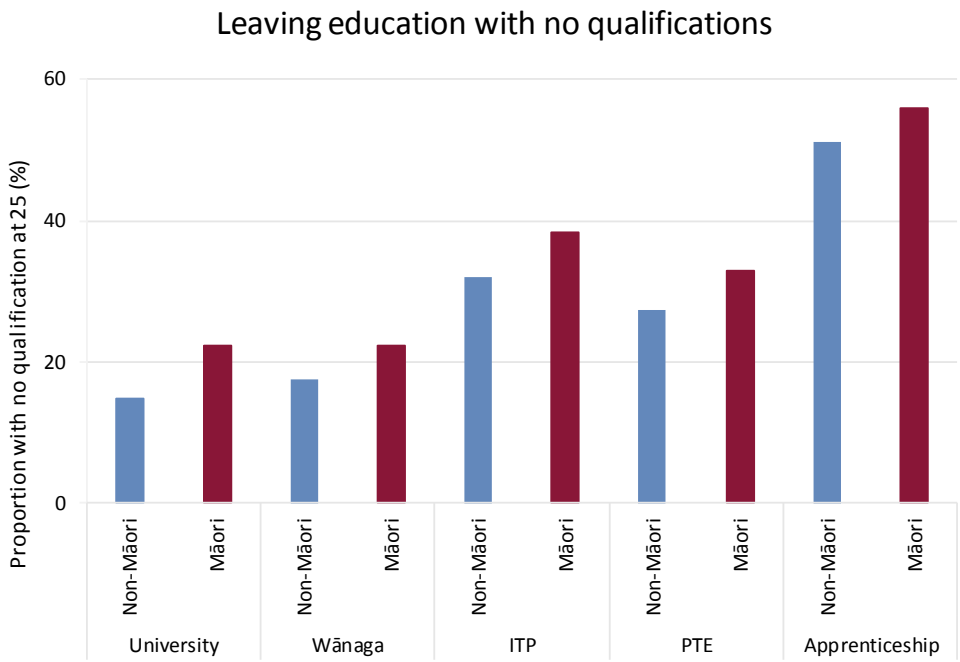
The alternative education flows to university have a number of challenges. This results in levels of completion varying significantly between types of education providers. Figure 2 shows the educational outcomes of students that enrolled in tertiary education in the three years after leaving school. In many cases, the completed qualification are not from the same provider of original enrolment. The majority of students achieve some form of tertiary qualification by the time they are 25, though some flows have much lower completion rates than others. In particular, there is very low completion rates for apprenticeships.

More than half of the individuals that start an apprenticeship do not complete

More than half of the individuals that start an apprenticeship do not complete any formal qualification as part of their apprenticeship by the time they are 25. This is a substantial leak in the education for both Māori and non-Māori, particularly with the current shortages in the labour market for trades people.

On the other hand, university education typically requires a minimum three-year programme to complete a formal qualification and by age 25; 60 percent of Māori that enrol in universities achieve a bachelor's degree or above, and 14 percent achieve a level 4-6 qualification.

Figure 2 Qualification non-completion at age 25 by enrolment[1]

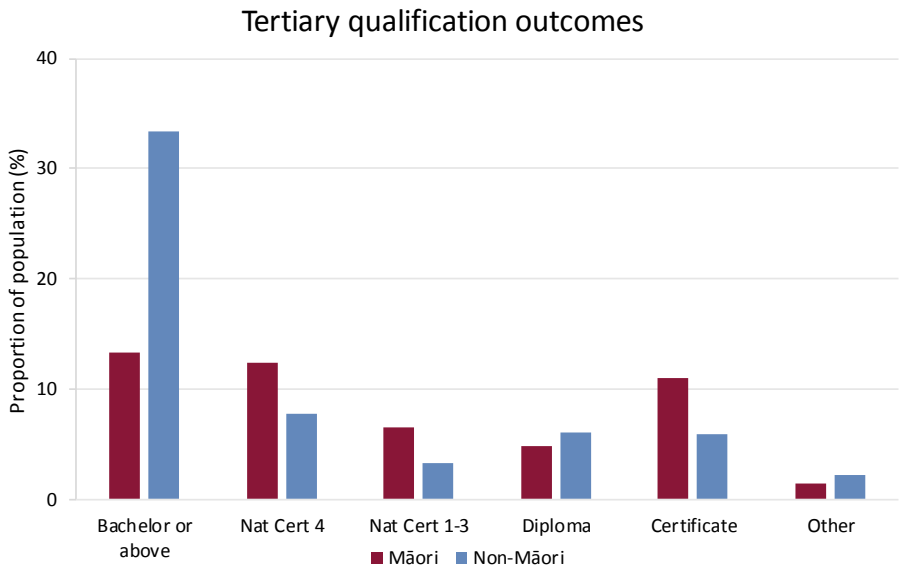


[1] A more detailed figure is presented in Appendix C with completion rates and highest qualification achieved.

2.3 Pressure point 3: Underrepresentation in Bachelor's degrees

Through the various providers and subject areas, half of Māori school leavers achieve a tertiary qualification. Māori are underrepresented with Bachelor's degrees, with just 14 of every 100 Māori school leavers achieving a Bachelor's degree by the time they are 25 years old. Māori are highly represented in National Certificates, with 12 of every 100 school leavers achieving a National Certificate level 4 and six of every 100 achieving a National Certificate level 1-3. An additional 12 students receive a level 1 to 3 certificate from a tertiary education organisation or other qualification. A significant proportion also achieve a certificate from a tertiary education organisation.

Figure 3 Education outcomes age 25 as share of population



3 Positive levers in the awa

As mentioned, from the 100 school leavers it is evident that a significant proportion does not follow the well-established currents in the awa. Through our research we have identified specific levers to support Māori in the education system.

3.1 Lever 1: Going to and staying in school

"Every day a student is not at school is a day they are not learning"[2]

The Ministry of Education has an initiative called *Every Day Matters* to assist schools to turn attendance data into insights. It aims to assist schools to develop an attendance strategy. Since 2011, the Ministry has invited all state, state-integrated and partnership schools to submit their term 2 attendance data. In summary, some of the key findings of this data is that:

- There is a positive relationship between students regularly attending school in Year 10 and Year 11, and the probability of achieving NCEA level 1.
- Year 6 students have the highest level of regular school attendance. While Year 13 students have the lowest.
- Māori students have the lowest levels of regular school attendance. Asian students have the highest.
- A higher proportion of primary and intermediate school students attend regularly than students at secondary school.
- Unjustified absences increased noticeably in the middle and end of Term 2.

These findings reinforce the importance of not only being enrolled in school, but also being engaged and seeing value in schooling. Relatively high rates of non-attendance significantly reduce the likelihood of achieving NCEA level 1, which then results in restricted future employment opportunities.

Primary schooling forms the foundation for the remainder of the education system.

From age five to 11, students learn the fundamental principles of literacy and numeracy while also forming an opinion on which subject areas they enjoy.

While there is no national level data available to measure achievement at primary school, there is substantial evidence that tamariki who do not learn to read, write and communicate well at primary school level have a range of disadvantages that continue far into their adult lives. Without effective language and communication skills, very young tamariki may struggle to grasp foundation literacy and numeracy skills. Later in schooling, difficulties in literacy and numeracy are linked to other compounding factors including truancy, exclusion, alcohol or drug abuse and increased health risks. These tamariki are more likely to leave school early, be unemployed or in low-skilled jobs, have poorer emotional and physical health, have higher rates of poverty, and are more likely to end up in prison.

This is irrespective of the innate potential of the child and represents a loss to the individual and to society, as each person affected is unable to reach their potential and contribute fully. As a component of basic education and a foundation for lifelong learning, literacy is the key to enhancing human capabilities and enabling full participation in social and civic life. Literacy and

[2] Ministry of Education. (2016). Attendance in New Zealand Schools 2015. Ministry of Education: Wellington.

numeracy carry extensive benefits not only for individuals but also for whānau, community and wider society.[3]

Throughout the education system, continuity is an important factor in maintaining engagement in education. Frequently changing school, having to make new friends and other disruptions can make learning more difficult. When changing schools also requires the primary language of the education to also change, this creates an additional barrier to learning.

The flows from primary school to high school can be a stressful transition for students, though compulsory enrolment results in the overwhelming majority of students continuing in the education system. One challenge is maintaining engagement with the education system, though this is difficult to measure until NCEA level 1.

3.2 Lever 2: School 'success' keeps students in the main flow

At high school, there is a focus on achieving academic success, and progressing students through the system. After achieving each year the default flow is to progress to the next year, resulting in a significant majority of students that pass their subjects continuing in schooling. This results in success being measured through NCEA achievement, students that meet this success measure then continue to strive for and achieve these same measures in subsequent years. From 100 Māori school leavers, none[4] achieved NCEA level 1 or NCEA level 2 with a merit or excellence endorsement and did not continue onto the next NCEA level.

For both Māori and non-Māori, the largest group of individuals that leave before year 13, have no qualification, or have NCEA level 2 with no endorsement.

3.3 Lever 3: Continuous Māori medium education

In New Zealand, schooling is available in both English and te reo Māori. As English is the most widely spoken language in New Zealand, many of these students become bilingual.

All transitions in the education system are challenging for students and transitioning from Māori medium education to English-speaking high schools is particularly challenging. Compared with all Māori, students that complete their whole school journey in Māori medium schooling have higher achievement levels. Only 22 percent of Māori in Māori medium schooling do not achieve NCEA level 1, compared with 30 percent of Māori in English medium schooling.

Table 1: NCEA level 1 achievement by school type (%)

NCEA 1 Achievement	All Māori	Māori medium primary school	
		MM high school	non-MM high school
Excellence	5	9	5
Merit	21	34	21
Achieved	45	35	37
Not Achieved	30	22	37

The inverse is true for students that participated in Māori medium primary schools, and completed NCEA level 1 in an English medium high school; 37 percent of this group did not achieve NCEA level 1, though the rates of Merit and Excellence endorsement are comparable to the overall Māori average.

After completing schooling, the enrolment in university education is comparable for students that achieved UE either through Māori medium or English medium schooling.

[3] *Early Literacy and Numeracy Matters: Enriching Literacy and Numeracy Experiences in Early Childhood*. French, G (2012). Dublin: Barnardos

[4] less than 0.5 percent of students

3.4 Lever 4: Completing school is not the only flow to tertiary education

Māori are more likely than non-Māori to engage in education outside of the traditional school system while still school age. During year 12, one-in-four Māori choose education from tertiary providers, rather than continuing through the school system. Approximately one-in-five non-Māori receive education from tertiary providers during year 12.

This shows that many Māori choose an alternative education flow, and the decision to leave school earlier is part of this education decision. For the quarter of Māori that leave school before year 13 for tertiary education, the most common tertiary providers are polytechnics followed by private training establishments (PTEs). Enrolling into apprenticeships while still high school age is uncommon.

This relationship inverts once students have completed school age; three years after year 11, students that have stayed in schooling will have completed school, and 65 percent of non-Māori and 50 percent of Māori are engaged in tertiary education.

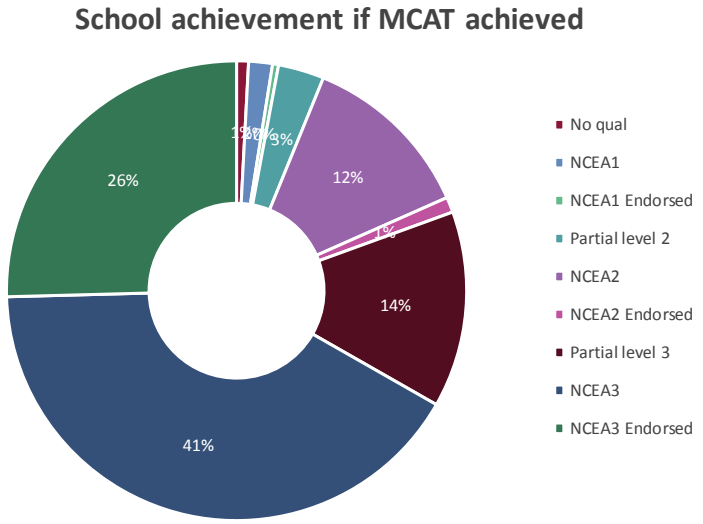
This relationship is due to a majority of students that complete high school transitioning straight to university education. Of Māori that achieve UE, 60 percent enrol in university in the first year after completing year 13. From the 100 Māori school leavers, this group is 12 students.

3.5 Lever 5: Importance of algebra

School subject decisions and achievement in certain subjects can significantly limit options later in the awa. One of the critical subjects in high school is NCEA level 1 algebra. The Mathematics Common Assessment Task (MCAT) is the standard for assessing algebra skills for NCEA level 1 students and is widely feared as one of the most challenging exams. Some schools use MCAT achievement as a pre-requisite for enrolment in mathematics in NCEA level 2 or other subjects requiring algebra including physics.

Students that achieve the MCAT have very positive educational outcomes. Two thirds of Māori students that achieve the MCAT leave school with NCEA level 3, and only six percent leave before achieving NCEA level 2. There is also a strong link with university entrance. 56 percent of Māori MCAT achievers achieve university entrance, almost three times the Māori average.

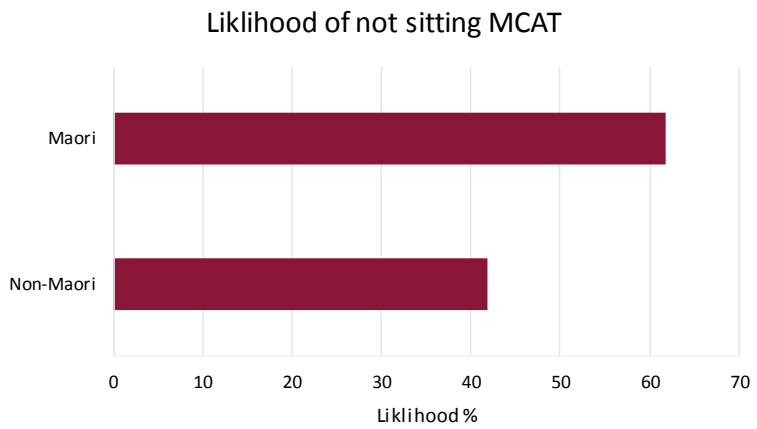
Figure 4 Achievement of school leavers that achieved MCAT assessment



While the MCAT often results in very positive outcomes, the assessment itself is a substantial challenge, and more than half of the Māori do not attempt the assessment.

There are a number of reasons individuals may not attempt the MCAT. At large schools, mathematics is often streamed, with advanced streams often sitting assessments years in advance and some streams being excluded from assessments. In some schools, individuals that are not expected to achieve the standard may also be directed, or choose not to attempt the assessment.

Figure 5 Likelihood of students not attempting the MCAT assessment



4 Your income potential – if you leave school before year 13

While the default flow for high achieving students is continuing through the school system, many students decide to leave school before completing year 13, either to pursue work or other education. On average, the lower the qualification achieved from school, the worse outcomes for individuals.

The relationship between higher qualifications and better income and employment outcomes is clear. Having higher qualifications when leaving school is often related to better employment outcomes, lower benefit receipt, and higher incomes. Of Māori that leave school with no qualifications (19 from 100), 58 percent (11) are on some form of benefit while 43 percent (8) are in some form of paid employment.

Table 2: Outcomes of Māori age 22 by school leaver qualification

Highest school qual	Employed %	Annual income ($)	Work benefit %	Other benefit %
No qualification	43	20,300	38	20
NCEA 1	52	25,100	30	12
NCEA 2	55	27,100	21	6
NCEA 3	58	20,300	16	3

4.1.1 Leaving school with no NCEA achievement

Just under one-in-five Māori leave school without completing NCEA level 1. This compares to one-in-ten for non-Māori. For both Māori and non-Māori, leaving school with no qualifications is associated with the highest level of benefit receipt, the lowest likelihood of further education enrolment and relatively low employment levels.

Of Māori that leave school with no qualifications, 40 percent are on a work-related benefit by time they are 20 years old. An additional 20 percent are on benefits related to their health or family situation.

Leaving High school with no qualifications is not the end of education for many students. Approximately one third leave school to enrol in tertiary education or commence apprenticeships.

Income prospects

On average, income levels for working Māori that left school with no qualifications are $20,000 per year when they are 22 years old. Currently in New Zealand, the living wage is defined as "the income necessary to provide workers and their families with the basic necessities of life. A Living Wage will enable workers to live with dignity and to participate as active citizens in society".

The living wage is currently estimated to be $20.55 per hour, which is approximately $40,000 per year in full time work. This means on average, school leavers with no qualifications have only half the required income to "live with dignity and to participate as active citizens in society". Only five percent of Māori that left school with no qualifications earned $40,000 in the year they turned 22 years old, and three quarters of these individuals participated in further education or training after leaving school.

4.1.2 Leaving school with NCEA level 1

Leaving school after achieving NCEA level 1 can occur for a number of reasons. Students typically start NCEA level 1 before turning 16, while still in compulsory education. For students that have already chosen a flow from school, through apprenticeships, tertiary education or employment, the end of compulsory schooling will then result in them leaving after completing NCEA level 1. From the overall cohort, this remains a fairly small proportion of school leavers.

Income prospects

Income prospects for individuals that leave school with NCEA level 1 are much higher than individuals that leave school with no qualifications. At age 22, working Māori with NCEA level 1 achieve an average annual income of 24 percent higher ($4,800) than working Māori with no qualifications.

4.1.3 Leaving school with NCEA level 2

For both Māori and non-Māori, NCEA level 2 is a level with a significant proportion of school leavers. 28 percent of Māori and 25 percent of non-Māori leave school after achieving NCEA level 2. NCEA level 2 is also a requirement for a number of apprenticeships and tertiary programmes.

A very small proportion of NCEA Level 2 achievers will enrol directly in University. While universities usually require UE, some students are allowed discretionary entrance though this usually requires the student to achieve exceptional results in NCEA level 2.

Tertiary education

Leaving school with NCEA level 2 is an entry requirement for a number of tertiary study options, including some apprenticeships. For students that leave school with NCEA level 2, just under half (48 percent) of Māori are enrolled in tertiary education in the year that they would be in year 13 if they stayed in the school system.

4.1.4 Leaving school with NCEA level 3

Completing schooling with NCEA level 3 provides a significant component of achieving UE. If students take approved subjects, achieving NCEA level 3 will usually meet the requirements for UE.

Beneficiary receipt

Achieving NCEA level 3 has the lowest benefit rate of any school leaving group. No more than one in five Māori, and one in ten non-Māori from this group are on any benefit in a year from leaving school to 22 years old. The rates of family and health benefits are also very low, with less than three percent on family benefits, and one percent on health benefits.

Tertiary education

More than two thirds of Māori and three fifths of non-Māori that achieve NCEA level 3 enrol in tertiary education or training after leaving school. This is significantly higher than any other school level. Less than half of Māori with each of NCEA 1 and 2 enrol in tertiary education after school.

Income prospects

By age 22, Māori with NCEA level 3 have the lowest average working income, equal to students with no qualifications. This is due to a very large proportion of this group being in tertiary education, resulting in many students working part time.

Having NCEA level 3 also results in much lower unemployment, and higher employment levels, with 60 percent of Māori in some form of employment.

5 End of the awa – completing tertiary education

5.1 Background

Individuals seek higher education for a wide range of reasons. Increasing capability, increased employment opportunities and higher future incomes are common reasons for pursuing tertiary educations. Having higher education levels also benefits the New Zealand economy. This provides the main rationale for the Government to invest significant resources into tertiary education and training.

The Treasury has indicated in their publication *Holding On and Letting Go: Opportunities and Challenges for New Zealand's economic performance* that the returns to the New Zealand economy from education vary widely by level, subject, provider and student group.[5] These returns also appear to be low by international standards. To improve this, the Treasury has argued that going forward the tertiary education system must be equipped to invest in "high-value areas."

To determine what these high-value areas are it is important to better understand graduate outcomes and what employers want in terms of skills, knowledge and attributes. The Government has therefore signalled that it wants a better connection between tertiary education and employers to ensure positive graduate outcomes, a good return on investment, and that people are work ready.

As a result of this, a series of research projects have been undertaken by the Tertiary Education Commission, the Ministry of Education, Statistics New Zealand, the Ministry of Business Innovation and Employment, and Careers New Zealand on graduate outcomes.

5.2 Tertiary enrolment

Enrolment in tertiary education is the most common post-school activity for our cohort, though a large proportion also have some form of employment, including as part of their education and training. The education decisions of individuals are also related to their overall employment decisions.

5.2.1 More than one way to achieve UE

While high school achievement is the usual flow to UE, there are alternative flows through a number of tertiary providers that can also provide access to university education or degree programmes. This flow is relatively small group, with 12 percent of Māori and non-Māori students that achieve UE having left school for tertiary education before year 13. After leaving school, night schools, and some tertiary providers can provide the requirements to attain UE outside of the traditional flow.

5.2.2 Tertiary education providers

Māori enrol in a more broad range of tertiary providers than non-Māori. For non-Māori in New Zealand, the significant majority of tertiary education is provided through universities while Māori are relatively more represented in polytechnics; universities, Private Training Establishments (PTEs) and apprenticeships all have comparable enrolment rates.

After completing school, half of Māori engage in tertiary education. Enrolment levels vary between tertiary providers from 31 percent in polytechnics to seven percent in wānanga. This information is shown on a yearly basis in Appendix C.

[5] The Treasury. (2014). Holding On and Letting Go: Opportunities and challenges for New Zealand's economic performance. The Treasury: Wellington.

Once in tertiary education, students have the opportunity to change their minds about their study options, either through changing subject areas or changing to different providers. Often any achievement from one provider will be able to be cross-credited to another provider, even if the fields of study are not closely related.

5.3 Tertiary enrolment and achievement

One common measure of student success is the completion of qualifications and/or the progression in to higher levels of study.

Qualifications are a signal – they are used by employers to determine what level of skill, experience or knowledge a person may have. They are also used as a signal in terms of salary.

In regulated industries or sectors, a qualification is also used as a requirement for entry, showing that a person has passed the minimum requirements for registration and may be a suitable candidate for this profession. This is a requirement for accountants, lawyers, engineers, medical professionals, builders, and many other areas of employment.

From the 100 Māori school leavers, 50 will achieve a tertiary qualification by age 25. This is slightly lower than non-Māori leavers, where 58 will achieve a qualification. The largest difference in qualifications is the level of qualifications achieved, only 13 of every 100 Māori leavers achieve a bachelor's degree compared with 33 non-Māori. This outcome is highly related to the levels of enrolment in tertiary education. From 20 percent of Māori that achieve UE, approximately 75 percent enrol in some form of tertiary education. In total, only 22 percent of Māori that enrol in university education have no tertiary qualification by 25 years old.

5.3.1 Apprenticeships, trades training and level 4 qualifications

Apprenticeships are a practical opportunity for individuals to learn on-the-job, while earning an income. With reduced need for any student loans, this can be a financially rewarding flow to the labour force. On average, some existing research shows that apprenticeships have similar lifetime outcomes to degrees. This requires that individuals complete their training. Leaving a trade early, particularly for labouring jobs, can result in a short-term increase in income, but can significantly restrict the potential for income to continue to grow. Increasing this completion rate, through improving support for apprentices to complete their apprenticeship, and perhaps new apprenticeship formats, is essential for improving the skills of the New Zealand labour force while filling shortages in qualified tradespeople.

5.3.2 Tertiary providers and degrees

New Zealand has eight universities as well as a range of polytechnics that provide degrees. On average, the population that receive a degree have the highest average income in this cohort. One of the largest hurdles for individuals to get a degree is achieving UE. The rate of degree completions at universities is very high, and much more comparable between Māori and non-Māori than achieving UE.

6 Employment and income for 25 year olds

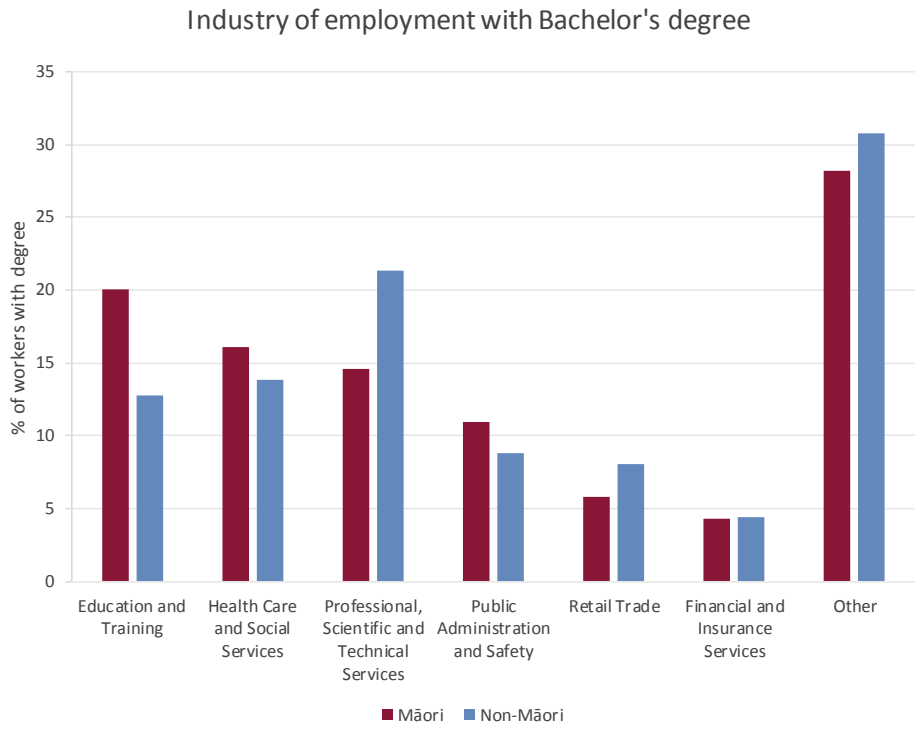
6.1 Employment of degree holders

The comparability of income for individuals that have at least a degree is particularly interesting when considering the sectors of employment for Māori and non-Māori that achieve these qualifications.

shows the industries of employment, and the income levels of Māori and non-Māori with at least a Bachelor's degree.

The industry of employment for Māori and non-Māori show some substantial differences. Māori are much more likely to go into the education and training and the health care and social services sectors, while non-Māori are more likely to be employed in the professional, scientific and technical services sector.

Figure 6 Sector of employment for degree holders seven years after high school



6.2 Employment with National Certificate level 4

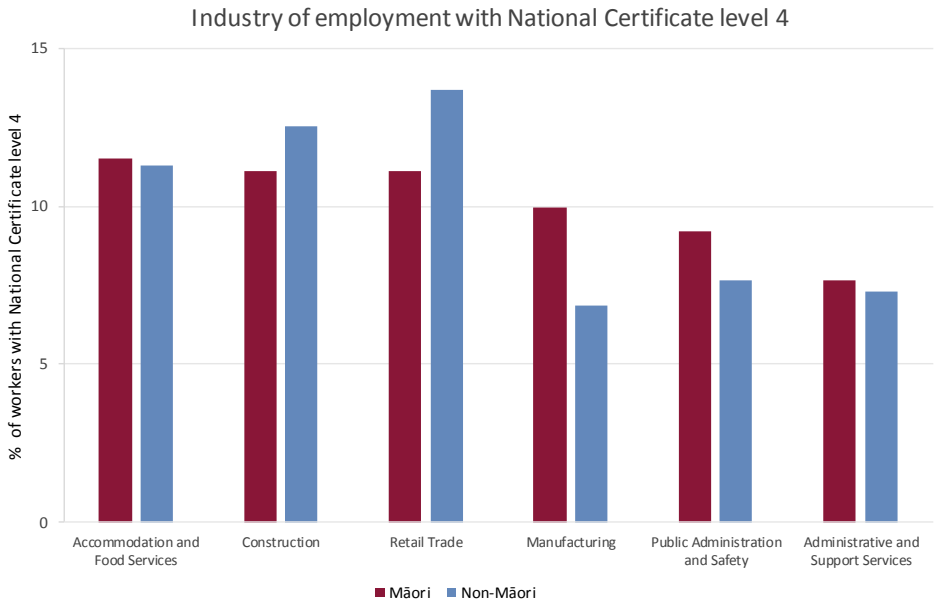
While degrees have the highest average annual earnings of the major qualification types, degrees are not the only flows to success. The high debt often required to complete a degree and the years of limited earning ability while studying can result in no different lifetime earning outcomes when compared with apprenticeships. Māori are relatively highly represented in apprenticeships, resulting in 12 percent of Māori achieving level 4 National Certificates, compared with 8 percent for non-Māori.

The types of apprenticeships are also interesting. A quarter of non-Māori apprentices and just under a third of Māori apprentices complete apprenticeships within food and hospitality sector. Māori are particularly highly represented in apprenticeships in the fields of agriculture and environmental work, accounting for almost 20 percent of Māori apprentices, compared with 11 percent of non-Māori apprentices.

Employment with a National Certificate level 4 also significantly reduces the differences in the income gaps between Māori and non-Māori as seen in Figure 7. Construction and manufacturing employ one-in-five of the working population with level 4 qualifications and have comparable income levels for Māori and non-Māori.

33 percent of Māori and 35 percent of non-Māori work in an industry not shown in Figure 7, with 5 percent of Māori workers or less in each industry.

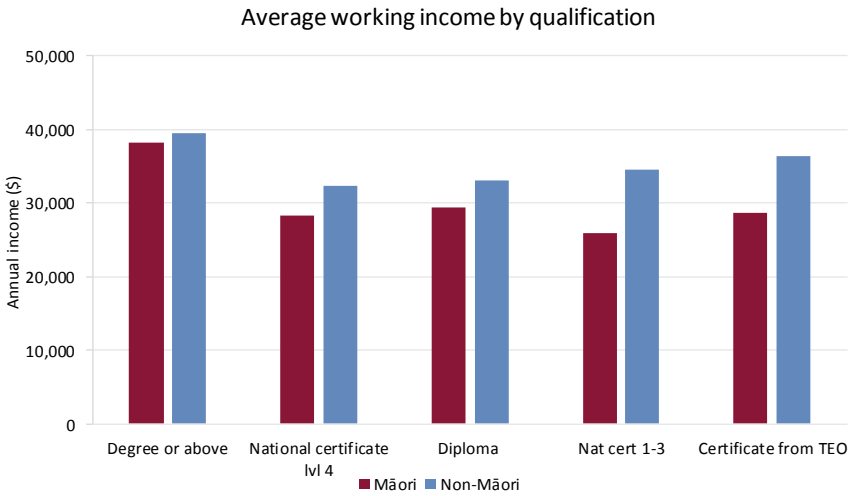
Figure 7 Top 8 largest sectors of employment for NC level 4 holders seven years after high school



6.3 Income outcomes

The end of the education pipeline is the start of an individual's career. After starting a career, some individuals retrain upskill and change occupations though for many this will be the platform that they build their career on. By age 25, there are a number of success opportunities. Having higher qualifications is associated with positive employment outcomes. Seven years after leaving high school, the income of individuals that have achieved a degree are higher than for individuals that have any other qualification or no qualification. Achieving a degree also results in a significant decrease in the income gap between Māori and non-Māori as shown in Figure 8.

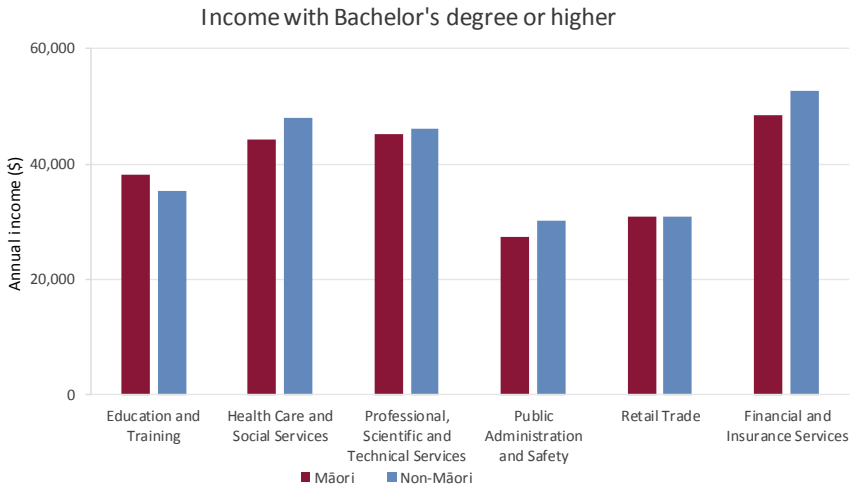
Figure 8 Average working income by qualification, age 25



6.4 Employment with qualifications

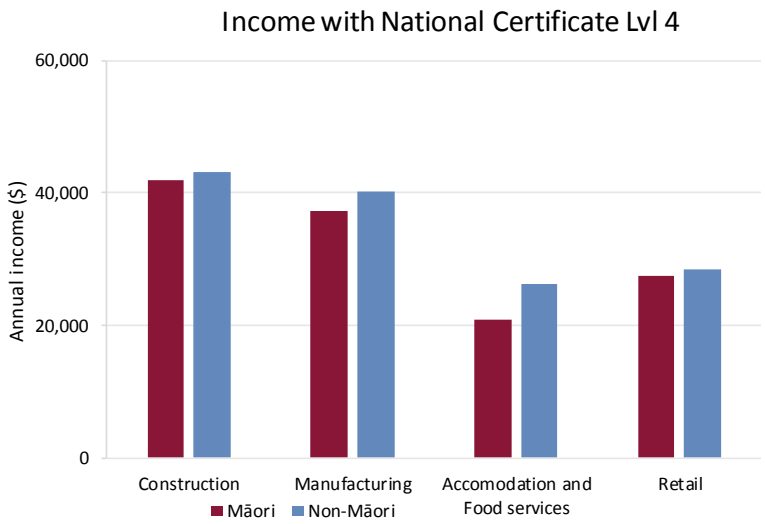
Achieving qualifications and then obtaining a job in a related field has much higher earnings prospects. This also significantly reduces the gap between Māori and non-Māori. Students that achieve a bachelor's degree and are employed as professionals or in the health sector earn an average of 50 percent more than those in the retail industry as seen in Figure 9.

Figure 9 Income by industry with a Bachelor's degree or higher, age 25



The income levels with a National Certificate level 4 is also dependent on the occupation of employment after completing the qualification. The manufacturing and construction industries, both of which have a high concentration of level 4 qualifications, have substantially higher incomes than individuals working in the tourism or retail related industries as seen in Figure 10.

Figure 10 Income by industry with a National Certificate level 4, age 25



7 Model for success

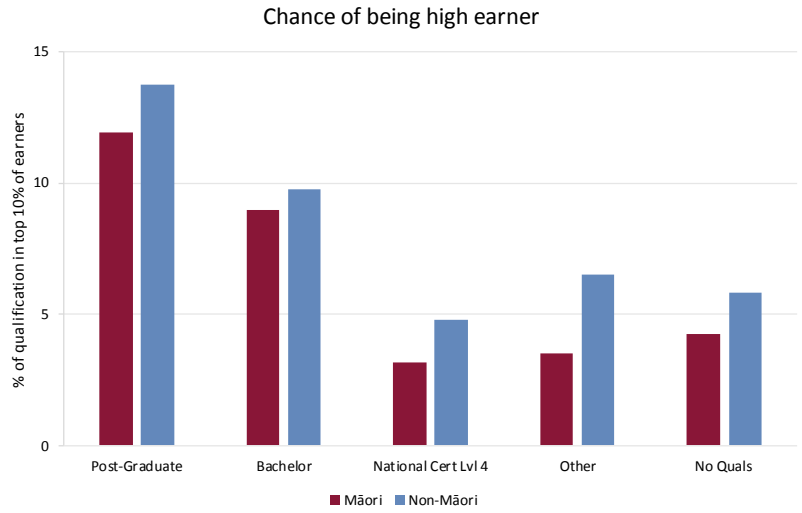
Being sucessful in terms of employment can be the result of a wide range of characteristics. No single pipeline is a sure set path to high incomes, though all high earners have a pathway to achieve their destination. Of the highest income earners, the largest group are those that achieve high qualifications, though other pathways can also be effective.

By looking at the top ten percent of earners at 25 years old, we can work backwards and explore the education and employment decisions leading to this point. The results of this section show that there is no one pathway to success in the labour market.

When considering the cumulatiutive earnings to age 25 there are also significant benefits for individuals completing apprenticeships. Of the highest earners, university students earned substantially less income than their peers doing engineering apprenticeships, or other forms of education and training.

As shown in Figure 11, having higher qualifications results in having a higher liklihood of being in the top 10 percent of earners.

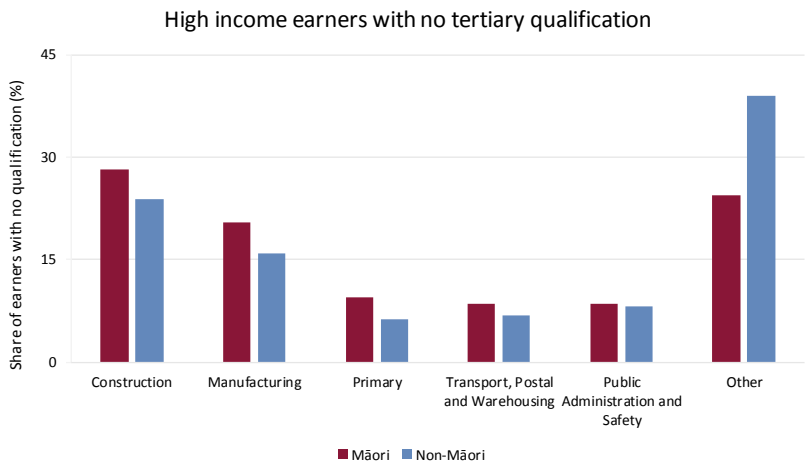
Figure 11 Top decile of income earners by highest qualification, age 25



7.1 With no tertiary education

Relatively large portions of individuals that achieve the top ten percent of income have no tertiary qualifications. However, it is important to note that these individuals are a very small portion of the overall population with no qualifications – just six percent of our cohort with no qualifications achieve the top 10 percent of high incomes. Of the highest income earners with no qualifications, the largest groups are in the primary and manufacturing industries, together making up half of the top earners with no qualifications as seen in Figure 12. When considering these numbers, it is important to consider the values relative to the overall totals. For both Māori and non-Māori, a significant proportion of individuals have no qualifications, and the individuals that achieve high incomes are a significant minority, as having no qualifications have relatively low average incomes in general.

Figure 12 Industry of employment of top earners with no qualification

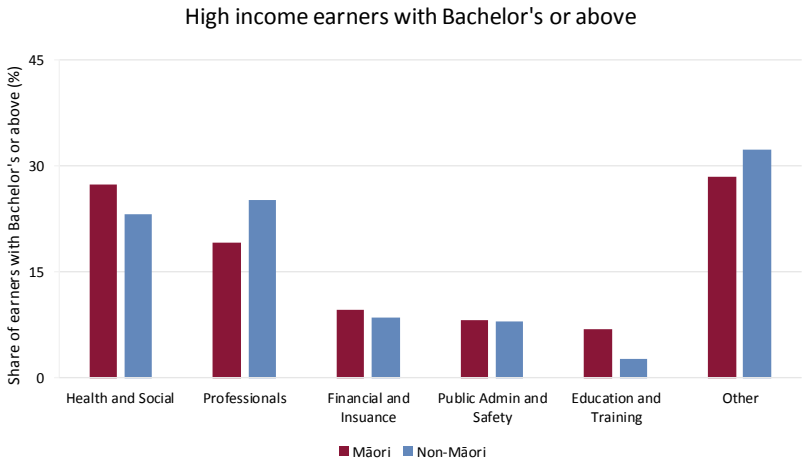


7.2 With Bachelors degree or above

Of the top decile of income earners in the cohort, the largest group is individuals with a bachelor's degree or higher. This group is the most educated, and, on average, they have the most positive outcomes. With all qualifications, the qualification itself is often the signal required for high-skill employment. This makes attainment of a high-skill job after graduating the main hurdle for the graduated.

The industries with the highest population in the top earning decile are health and social services, professionals and other industries with typically high-skill employment opportunities as seen in Figure 13. This is in line with the overall average income levels of individuals with degrees as shown in Figure 13.

Figure 13 Industry of employment of top earners with a Bachelor's degree or above



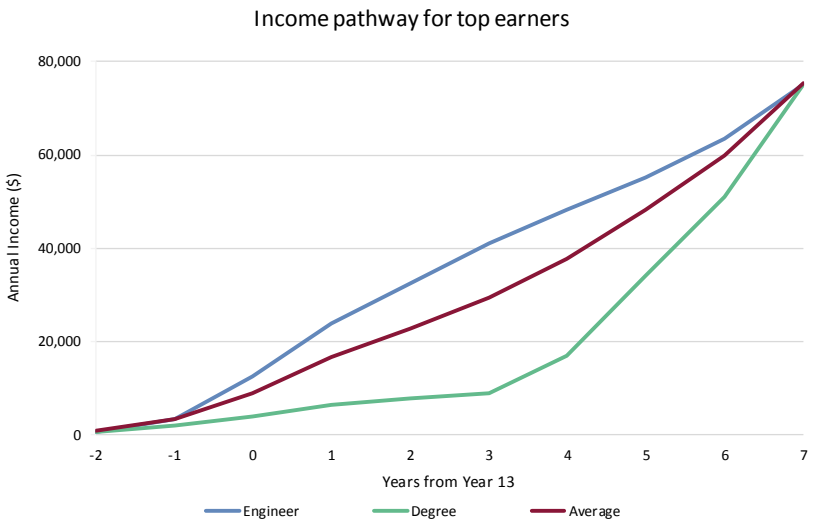
7.3 Engineering apprenticeships

Apprenticeships are also another flow of higher education and training that provides significant income potential, while also earning an income. Apprenticeships in Engineering have a particularly high representation in the highest income earner group.

Almost a quarter of Māori (22 percent) and almost a fifth of non-Māori (17 percent) in the top income decile completed engineering apprenticeships. While having a high income after completing their training, they also earn substantially more than the other top earners in the years leading up to 25 years old.

The average income of earners in the top income decile is approximately $75,000 as seen in Figure 14. For the engineering apprentices, income levels increase smoothly from leaving high school until they are 25 years old. The university pathway typically only allows for part-time employment outside of holiday periods. This results in the average income being just $10,000 per year until they graduate. After completing qualifications, students then need to find full-time employment and the income levels increase sharply.

Figure 14 Income pathway for Māori in top decile of income earners



Appendix A Data

The data used for this study is the StatsNZ Integrated Data Infrastructure (IDI). The IDI is a very detailed database linking individual data across a number of Government agencies and over a number of years. Every person in New Zealand is assigned a unique identifier, which can be used to link data from the census to their actual employment information through Inland Revenue and educational outcomes from the Ministry of Education.

Census data

The data for this analysis is limited to individuals that were present at the 2013 New Zealand Census. The Census forms the basis of the demographic information used, including sex, ethnicity and age.

Māori is defined as any individual that self-identified as Māori in the 2013 Census, as any one of their ethnic groups.

Ministry of Education data

The Ministry of Education (MoE) data is the primary data source.

Tertiary data

The tertiary education data is based on the tertiary education tables. A student is considered enrolled if they enrol with any tertiary provider in that calendar year. There are some cases where students are enrolled in more than one institution in the year and will be counted as in both groups.

Secondary school data

The secondary school data is primary sourced from the school leaver data. These data include the highest qualification attained, the reason for leaving. Students that left to go overseas are dropped and not included in the figures and statistics.

Inland Revenue data

The main financial information is obtained from Inland Revenue. These data are used for measuring annual family income, and the outcomes of students

The income in a given year for students is in calendar years rather than financial years as individuals typically finish school at the end of the calendar year. Upon completing high school, leavers range from 17 and a half to 18 and a half years old.

Ministry of Social Development data

The MSD data includes the total days on a benefit in any given year.

Our results include whether an individual received a certain type of benefit at any point in a financial year.

The types of benefit have been classified into three types of benefit, health, work and family based on the following table:

Ministry of Social Development data

The MSD data includes the total days on a benefit in any given year.

Our results include whether an individual received a certain type of benefit at any point in a financial year.

The types of benefit have been classified into three types of benefit, health, work and family based on the following table:

Family	Health	Work
Widow's Benefit	Supported living payment	Jobseeker support
Sole parent support	Invalids benefit	Jobseeker student hardship
Youth payment young parent	Sickness benefits	Jobseeker related
	Emergency benefit	

Appendix B Methodology

This report uses data from the Stats NZ Integrated Data Infrastructure (IDI) to build a picture of the education pipeline. The journey through the education system.

Due to data limitations, it is not possible to track a single group of individuals from primary school through to their career. To overcome this data limitation, we have divided the education pipeline into three sections, which can be combined to tell a picture of the full pipeline. Through the education system, there are a wide range of factors that affect an individual's ability to achieve their potential. This report considers the effect of some of these factors on individuals at that time period, to generate evidence for the whole education pipeline.

The main points being considered in this report are from primary school to high school, from high school to tertiary education or work, and tertiary education into work.

Transition 1 - Primary School to High School

The transition from primary school into high school is a significant challenge for students. There are substantial challenges that arise when students move between schools, in particular when students transition from Māori medium schooling to English medium schooling.

Transition 2 - High School into work

After completing year 11 at high school, students have a wide range of options for what they will do in the subsequent years. With no more compulsory schooling, students can seek employment, continue education in or outside of their high school or engage in neither employment nor education. While there is a wide range of possibilities, these can be significantly limited based on educational achievement and participation.

The major limiting characteristics include university entrance, having numeracy and literacy skills, and achieving NCEA levels 1 to 3.

The cohort for this transition selects individuals based on when they were in year 11 at school. Where the school enrolment did not have an enrolled year indicator, their age was used based on birth date from July to June. Students in year 11 from 2008 to 2012 were included in this cohort.

Transition 3 - Post School education and employment into work

Post-school education and employment decisions also make a significant impact on long-term employment outcomes. The skills, qualifications and work experience obtained by the time an individual is 25 years old.

The cohort for this transition is based on the time when individuals completed school. At the end of year 13, students are aged from 17 and a half years old to 18 and a half years old. We select students that are in this age range from 2008 to 2010, and track the cohort to the end of the 2018 financial year.

The main limitation to the data is the amount of consecutive years for tracking an individual. The MoE data for primary and high schools is only accurate from 2008 onwards. This limits the outcomes to be a maximum of nine subsequent calendar years. To increase the population size, and achieve more specific outcomes, years can be combined, though this reduces the number of years to track outcomes. Due to this limitation, we measure outcomes for three cohorts. To maximise the number of observations for each transition, the cohort is made up of the total population of the school year, which is then reduced based on specific characteristics to compare outcomes based on certain characteristics.

Who are the people that are part of the cohorts?

- How have we selected these people
- How do we follow them

- What information is available to us on these people.

What are the limitations of using this data

- Horizon
- What do we not know, and therefore what assumptions are we making
- How robust is the IDI data compared to other data sources, or methods of data collection such as sample surveys.

Outcomes measured

Qualifications

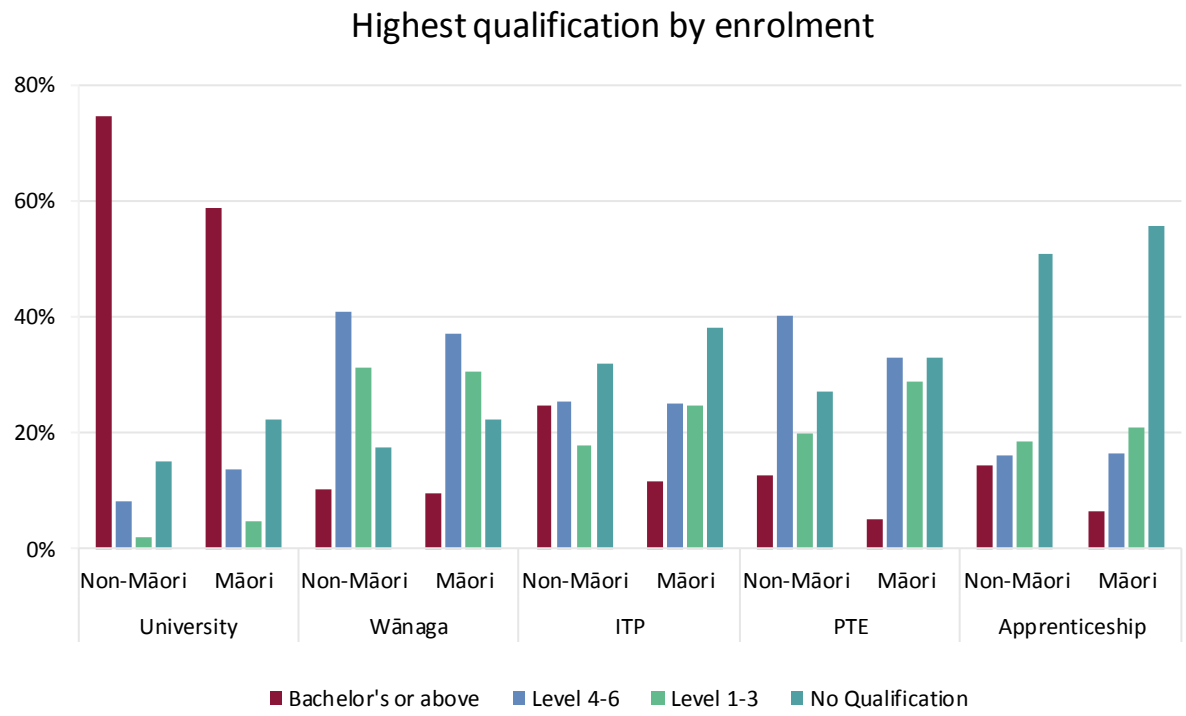
While there are significant differences in averages, some Māori have very positive outcomes. One observation from the data includes the comparison of outcomes for Māori with a bachelor's degree. Once limiting the population to individuals with at least a bachelor's degree, the difference between Māori and non-Māori disappears.

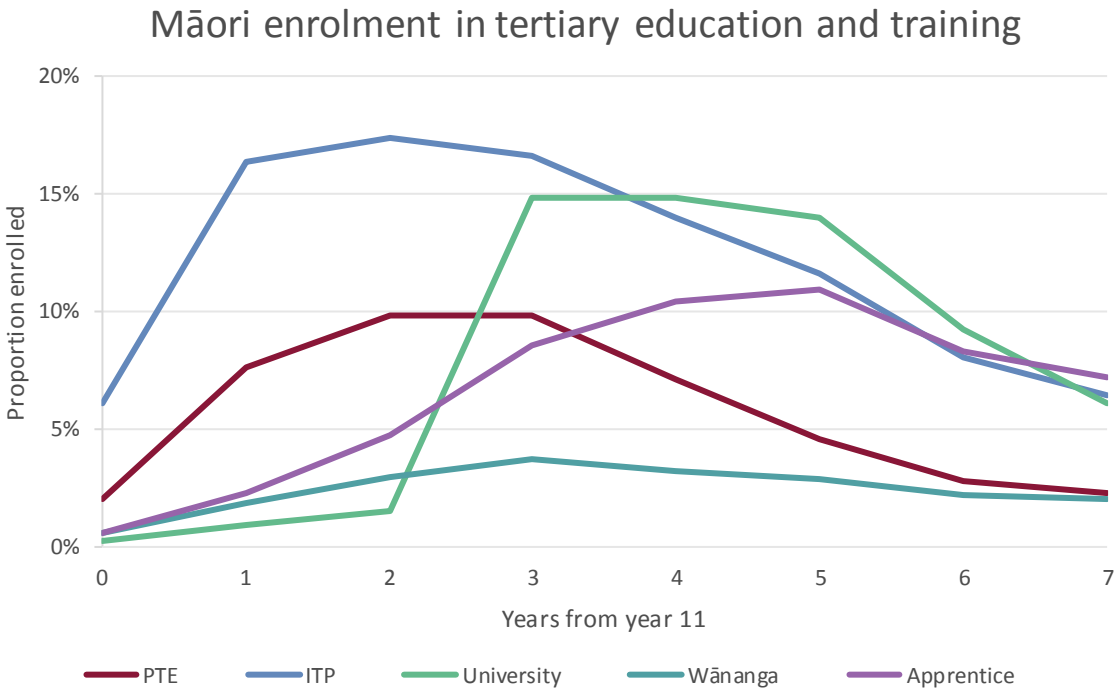
While this is a positive observation, non-Māori are much more likely to have a bachelor's degree. Around a third of the study population have a degree, compared with about 15 percent for Māori.

Industry training and apprenticeships

Another form of building capability and lifting employment outcomes is through learning trades. There are a number of benefits of trades, including the lack of student debt, earning an income while gaining experience. For Māori that completed an apprenticeship, or on-the-job training, there are also very similar income levels once these individuals are 25 years old.

Appendix C Detailed figures




Māori enrolment in tertiary education and training
20%
15%
10%
5%
0%
Proportion enrolled
0
1
2
3
4
5
6
7
Years from year 11
PTE
ITP
University
Wānanga
Apprentice