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Effective pathways through education to good labour market outcomes for Māori: Literature summary

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Abstract

This literature review provides background for a forthcoming empirical investigation of the pathways through education that lead to successful labour market outcomes for Māori students with different aptitudes in high school. It summarises three main areas of existing literature. The first is the pathways students can take through the Aotearoa New Zealand education system. This includes summary statistics on the proportion of students who pursue each pathway, and the differences in these by ethnicity and gender. The second is the relationship between higher education and labour market outcomes internationally, in Aotearoa, and for Māori in Aotearoa specifically. It also highlights non-financial potential benefits that may motivate students to pursue higher education. The third is the value in the labour market of Māori-medium education and te reo-English bilingualism.

JEL codes

I20, I30, I23, I26, J15, J24

Keywords

education, Māori, New Zealand education system, bilingual education

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INTRODUCTION

This literature review provides background for a forthcoming empirical investigation of the pathways through education that lead to successful labour market outcomes for Māori students with different aptitudes in high school. It summarises three main areas of existing literature. Section 1 lays out the pathways students can take through the Aotearoa New Zealand education system. It also gives summary statistics on the proportion of students who pursue each pathway, and the differences in these by ethnicity and gender. Section 2 outlines existing literature linking education to earnings on the international stage, in New Zealand, and for Māori specifically to show the effects of higher education on labour market outcomes. It also highlights non-financial potential benefits that may motivate students to pursue higher education. Finally, Section 3 summarises what is known about the value in the labour market of Māori-medium education and te reo-English bilingualism.

SECTION 1: PATHWAYS THROUGH THE NEW ZEALAND EDUCATION SYSTEM

ECE, primary, and secondary education

The New Zealand education system is structured into three tiers: early childhood education (ECE), primary and secondary education, and further education. ECE is offered as non-compulsory care for children under age 5 generally in preparation for primary school education. While ECE isn't compulsory it has a high rate of uptake, with around 96.8% of children attending (Ministry of Education – Te Tāhuhu o te Mātauranga (MOE), 2021).

Children aged 5-19 are entitled to free education at schools that are government owned and funded; schooling is compulsory for children aged 6 to 16. The school system is split into 13-year levels, with the primary school system educating children from year 1 until year 8 (approximately ages 5 to 12), and secondary education covering years 9 to 13 (approximately ages 13 to 17). The National Curriculum taught in primary and secondary schools consists of two alternative curricula from different philosophies, the New Zealand Curriculum and Te Marautanga o Aotearoa. Kura Kaupapa Māori are state schools (teaching years 1 to 8 or 1 to 13) that teach Te Marautanga o Aotearoa, which is based on Māori philosophies (Bishop, 2012). Similarly, Wharekure are schools that teach this curriculum to students above year 8. These schools teach in predominantly Māori-medium, meaning te reo Māori is the language of instruction at least 51% of the time. A school is considered English-medium if te reo Māori is the language of

instruction less than 51% of the time. While it is possible for Kura Kaupapa Māori to teach in English-medium, there is little evidence of this being done.¹

The New Zealand Curriculum is taught in English-medium and is based on a Western perspective of education. Both forms of curriculum focus on building children's competencies for work and further learning. State schools and state-integrated schools² must follow the National Curriculum (i.e. either curriculum), whereas private schools are able to develop their own learning programmes.

During year levels 11 to 13, students at schools following either curriculum study towards level 1 to 3 National Certificate of Educational Achievement (NCEA) qualifications.³ NCEA qualifications cover a wide range of subjects, each of which is built around a number of learning standards (e.g. "apply numeric reasoning in solving problems" in mathematics). Students are awarded credits for each learning standard they achieve, and when they achieve sufficient credits in a subject, they gain the NCEA certificate in the subject ([New Zealand Qualifications Authority \(NZQA\), n.d.](#)). Specialised NCEA standards for Māori-medium education, particularly for numeracy and literacy, are presently being designed. These are expected to be implemented in 2023 ([MOE, 2021a](#)).

NCEA certificates are a prerequisite of many higher education pathways. Most notably, university entrance (UE) is a requirement for admission to a bachelor's degree.⁴ This is generally attained by earning a set number of credits in literacy, numeracy, and three other approved NCEA level 3 subjects.⁵ In 2017, NCEA qualifications were entry requirements for 49% of all entry-level tertiary qualifications (covering 57% of new enrollees).⁶ Universities and higher-level qualifications were more likely to require NCEA, and wānanga and lower-level qualifications were less likely ([Roos and Scott 2018](#)).

Tertiary education

Approximately 60,000 students leave school in Aotearoa New Zealand each year. Twenty-eight percent of these students enter the workforce, 6% travel overseas, and 55% carry on to tertiary study ([Scott, 2018](#)).⁷ These students choose from a range of education providers and study

¹ This can occur if they are established under section 204 (s204) of the Education and Training Act 2020, rather than section 201 (s201) ([Education Counts, 2021a](#)).

² A state-integrated school is a former private school that integrated into the state education system.

³ Some secondary schools offer international secondary school qualifications that are recognized in New Zealand as equivalent to NCEA subjects (e.g. Cambridge International General Certificate of Secondary Education (IGCSE)).

⁴ As an alternative route, there are provisions in the NZQA entry requirements for bachelor's courses and above that permit entry based on having suitable practical, professional, or educational experience.

⁵ UE may also be gained through qualifications that are recognized in New Zealand as equivalent to NCEA subjects (e.g. Cambridge International General Certificate of Secondary Education (IGCSE/CIE) and International Baccalaureate (IB)).

⁶ Entry-level tertiary qualifications are those that do not require a prior tertiary qualification.

⁷ See also [Scott \(2020\)](#) for the education and earnings outcomes of students who completed high school in 2011.

options. Tertiary education institutions include universities, institutes of technology, polytechnics, wānanga, and Private Training Establishments (PTEs). In 2019, 388,730 students were enrolled in tertiary education across New Zealand, 227,285 (58.5%) of whom were female and 73,500 (18.9%) of whom were Māori ([Education Counts, 2021b](#)).⁸

In recent years, Māori have been relatively well represented in tertiary education, though they disproportionately study at lower levels. Their tertiary participation has been aided by institutions such as the Māori Education Trust via financial assistance and scholarships.⁹

Approximately 63% of Māori high school leavers enter some type of tertiary study, with 49% of these students completing at least one tertiary qualification ([BERL, 2019](#)). Māori age-adjusted participation in tertiary education was 13.2% in 2020, compared with 8.7% for Asians, 11.0% for Europeans, and 11.4% for Pacific people ([MOE, 2021b](#)). Wāhine Māori (Māori women) participate at higher rates than tāne Māori (Māori men), 15.1% compared with 11.1%. For the full population, these participation rates are 11.9% for women and 10.2% for men, so in percentage terms the gender disparity is slightly larger for Māori ([MOE, 2021b](#)).

Programmes such as the Gateway programme and the Youth Guarantee assist young students to transition into further education or workplace learning. Gateway funding is available to secondary schools for the provision of workplace learning for senior students that is integrated with school learning and awards credits towards NCEA qualifications ([Tertiary Education Commission, 2021](#)). The Youth Guarantee helps 16- to 19-year-olds by providing fees-free tertiary places for NCEA Level 2 or NZQA levels 1-3 qualifications (Tertiary Education Commission, 2020). Trade academies may also offer students in years 11 to 13 technology programmes that are delivered through schools or other education providers.

Types of tertiary qualification

Tertiary qualifications follow a framework set by the NZQA that categorises education into 10 levels. These levels relate to the complexity and depth of the qualification and reflect the skills and understanding that result from the graduate attaining the qualification ([NZQA, 2016](#)).

Qualifications follow a credit system similar to NCEA, where credits relate to the amount of learning involved in the qualification. Students are typically expected to achieve 120 credits over a year of full-time learning.

⁸ This figure and subsequent figures relating to 2019 tertiary education enrollments exclude those in non-formal learning and on-job industry training.

⁹ Specifically, in 2021, they awarded 772 students a total of \$1,049,868, building on the 561 students awarded \$794,999 in 2020 (Māori Education Trust, 2021).

Table 1: Qualification types and NZQA levels

Level	Qualification types
10	Doctoral Degree
9	Master's Degree
8	Postgraduate Diplomas and Certificates Bachelor Honours Degree
7	Bachelor's Degree Graduate Diplomas and Certificates
5-7	Diplomas
1-6	Certificates

Source: <https://www.nzqa.govt.nz/assets/Studying-in-NZ/New-Zealand-Qualification-Framework/requirements-nzqf.pdf>

Certificate qualifications span levels 1 to 6 of the NZQA framework and require students to attain at least 40 credits at the specified level. Level 1 to 3 certificates are similar to the corresponding level of senior secondary education (i.e. NCEA levels 1-3) and basic trades training. There are no formal entry requirements for certificate qualifications. New Zealand Apprenticeships fall under level 4 with certificates, and consist of at least 120 credits ([MOE, 2015](#)). Diplomas span levels 5 to 7 and require students to achieve at least 120 credits at the level of the diploma or one level below. At least 72 of those credits must be at the level of the diploma. For example, a level 6 diploma must contain at least 120 credits at level 5 or above, and at least 72 of those credits must be at level 6 or above ([NZQA, 2016](#)). NZQA does not impose any formal prerequisites for certificates and diplomas, though education providers may impose NCEA prerequisites.

The use of NCEA prerequisites varies by qualification subject and level. In 2017, 4% of level 1 and 2 certificates, 35% of level 3 certificates, 41% of level 4 certificates, and 71% of level 5 to 7 certificates and diplomas had NCEA prerequisites. Entry requirements for level 1 to 3 certificates were predominantly level 1 NCEA qualifications, whereas entry requirements for level 4 to 7 certificates and diplomas were predominantly level 2 NCEA qualifications ([Roos and Scott, 2018](#)). In 2019, 198,070 students (51.0% of all tertiary students) were enrolled in level 1 to 7 certificates and diplomas, of whom 60,160 (30.4%) were Māori (81.9% of all Māori tertiary students) and 115,260 (58.2%) were female ([Education Counts, 2021b](#)). This comparison between Māori and the full population shows Māori tertiary students are much more concentrated in level 1 to 7 certificates and diplomas than are tertiary students overall. As well as diplomas, level 7 includes bachelor's degrees, graduate diplomas, and graduate certificates. Bachelor's degrees require students to attain 360 credits from levels 5 to 7, and

usually span three years (six semesters) of full-time study ([NZQA, 2016](#)).¹⁰ Entry into bachelor's degrees usually requires UE and may have additional requirements that depend on the field of study.¹¹ For instance, degrees in fields such as medicine, law, and engineering may require students to achieve a set amount of credits in specific NCEA level 3 subjects (e.g. mathematics and physics for engineering degrees from certain providers) in addition to UE ([Roos and Scott, 2018](#)). In 2019, 145,680 students (37.5% of all tertiary students) were enrolled in bachelor's degrees, of whom 18,660 (12.8%) were Māori (25.4% of all Māori tertiary students) and 89,135 (61.2%) were female ([Education Counts, 2021b](#)). These ethnic comparisons show Māori are relatively underrepresented in bachelor's level study.

Graduate certificates require students to attain at least 60 credits, at least 40 of which must be at level 7 or higher, and graduate diplomas require at least 120 credits, including at least 72 at level 7. Admission to graduate certificates and diplomas generally requires students to have completed a bachelor's degree. However, entry is sometimes granted to students without a bachelor's degree who have demonstrated suitable practical, professional, or educational experience ([NZQA, 2016](#)). In 2019, 15,075 students (3.9% of all tertiary students) were enrolled in graduate certificates or diplomas, of whom 735 (4.9%) were Māori (1.0% of all Māori tertiary students) and 8,700 (57.7%) were female ([Education Counts, 2021b](#)). These comparisons show Māori students are underrepresented among students studying towards graduate certificates and diplomas.

Level 8 includes postgraduate diplomas, postgraduate certificates, and bachelor honours degrees. Postgraduate diplomas and certificates follow the same credit convention as their graduate counterparts, but one level higher. Admission to these qualifications can be granted by completion of a bachelor's degree, completion of a graduate diploma or certificate in a similar area, or being able to display sufficient competency through work or professional experience. A bachelor honours degree can be either a 480-credit standalone degree or a 120-credit degree following from a bachelor's degree. Honours degrees are usually more selective than other forms of study at this level and require above average achievement in specific subjects within the bachelor's level study ([NZQA, 2016](#)). In 2019, 32,015 (8.2% of all tertiary students) students were enrolled in honours degrees or postgraduate certificates, of whom 2,540 (7.9%) were Māori (3.5% of all Māori tertiary students) and 17,485 (54.6%) were female ([Education Counts, 2021b](#)). Again, Māori students are underrepresented at this level of study.

¹⁰ Some bachelor's degrees, notably in engineering, health sciences and law, extend over four years and contain 480 credits.

¹¹ Various universities offer special entry provisions for older students. For example, University of Canterbury ([n.d.a](#)), University of Auckland ([n.d.](#)), and Victoria University of Wellington ([n.d.](#)) offer provisions for students aged over 20 who do not have UE.

Levels 9 and 10 correspond to master's degrees and doctoral degrees (PhDs) respectively. The requirements for admission to a master's degree are determined by the education provider offering the degree. These must be at minimum completion of a bachelor's degree or an equivalent combination of work experience and study. In 2019, 22,610 (5.8% of all tertiary students) students were enrolled in master's degrees, of whom 1,830 were Māori (2.5% of all Māori tertiary students) and 13,605 (60.2%) were female ([Education Counts, 2021b](#)). NZQA (2016) does not specify formal minimum entry requirements for doctoral degrees. However, the doctoral degree is an extension of the knowledge and skills gained in related undergraduate and postgraduate education, and institutes offering the qualification impose entry requirements such as a research-focused honours or master's degree completed to a high standard ([University of Canterbury, n.d.b](#)). In 2019, 10,395 PhD students (2.7% of all tertiary students) were enrolled, of whom 665 (6.4%) were Māori (0.9% of all Māori tertiary students) and 5,590 (53.8%) were female ([Education Counts, 2021b](#)). These comparisons again show Māori are underrepresented at the master's and doctoral levels.

Types of tertiary institutions

Universities

New Zealand's eight universities offer qualifications at levels 3 to 10 ([Education Counts, 2021b; 2021c](#)).¹² In 2020, 146,925 domestic students (44.6% of all domestic tertiary students) were enrolled in universities, taking a total of 114,415 EFTS. These students were primarily enrolled in higher level qualifications, with 97,215 (66.2%) enrolled at the degree level, and 47,645 (32.4%) at postgraduate level.¹³ Māori made up 12.3% of all domestic students attending universities, and 25.9% of all Māori tertiary students attended universities. Of Māori students enrolled at universities, 65.8% were female ([MOE, 2021b](#)). The ethnic comparisons show Māori in tertiary study have a much lower concentration at universities than do non-Māori, consistent with Māori tertiary students being more likely to study at lower levels.

Wananga

Wānanga are state-owned Māori teaching and research institutions that teach based on the principles of āhuatanga Māori (Māori tradition) and tikanga Māori (Māori custom). Aotearoa

¹² Within universities, level 3 certificates are taught only to international students.

¹³ These numbers, and the parallel ones in subsequent sections, are all taken from the Education Counts data on provider-based enrolment, accessed at <https://www.educationcounts.govt.nz/statistics/tertiary-participation> on 27 October 2021. Students are counted in each sub-sector, and student numbers are rounded to the nearest 5. Therefore, total percentages may not sum to 100%. Enrollment figures are for students enrolled at more than 0.3 EFTS. The number of postgraduate students double counts individuals who were enrolled at multiple postgraduate levels. ([MOE, 2021b](#))

New Zealand has three wānanga: Te Wānanga O Aotearoa; Te Wānanga O Raukawa; and Te Whare Wānanga o Awanuiarangi. Wānanga offer qualifications at levels 1 to 10 ([Education Counts, 2021c](#)).

The prerequisite education requirements for study at a wānanga vary by course. Entrance into wānanga also requires the applicant to demonstrate the necessary skills and ability to complete the programme successfully. This includes a commitment to research of te reo Māori, iwi, and hapū. For entry into postgraduate study at wānanga, students must also demonstrate competency in written and spoken te reo Māori ([Te Wānanga o Raukawa, n.d.](#)). These institutes are open to both Māori and non-Māori students. In 2020, 30,100 domestic students (9.1% of all domestic tertiary students) were enrolled in wānanga, taking a total of 17,780 EFTS. These students were primarily enrolled at lower qualification levels, with only 1,435 (4.8%) enrolled at the degree level, and 475 (1.6%) at the postgraduate level. Māori made up 54.9% of all domestic students attending wānanga, and 23.7% of all Māori tertiary students attended wānanga. Of Māori students enrolled at wānanga, 73.9% were female ([MOE, 2021b](#)). Unsurprisingly, Māori students are well-overrepresented at wānanga.

Te Pūkenga subsidiaries: Institutes of technology and polytechnics

In April 2020, the government implemented reforms to the vocational education sector, resulting in institutes of technology and polytechnics becoming subsidiaries of the New Zealand Institute of Skills and Technology, later renamed Te Pūkenga ([NZQA, n.d.a](#)). Te Pūkenga subsidiaries are the largest provider of vocational education and offer qualifications ranging from level 1 certificates to level 10 doctorates ([Education Counts, 2021b](#)).

In addition to offering courses that are solely study-based, Te Pūkenga subsidiaries offer qualifications that involve a combination of coursework and practical work experience in students' field of study. For instance, managed apprenticeships involve students being enrolled in polytechnics and institutes of technology but also working and training in a field that relates to their apprenticeship ([Mahoney, 2015](#)).

In 2020, 113,105 domestic students (34.3% of all domestic tertiary students) were enrolled in institutes of technology and polytechnics, taking a total of 53,140 EFTS. These students were primarily enrolled at lower qualification levels, though 21,470 (10.0%) were enrolled at the degree level, and 5,575 (4.9%) were enrolled at the postgraduate level. Māori made up 22.3% of all domestic students attending institutes of technology and polytechnics, and 36.2% of all Māori tertiary students attended institutes of technology and polytechnics. Of Māori students enrolled at institutes of technology and polytechnics, 58.8% were female ([MOE, 2021b](#)). These numbers

suggest Māori in tertiary study are similarly concentrated at institutes of technology and polytechnics to non-Māori.

Private Training Establishments

Private Training Establishments (PTEs) are tertiary education providers (such as Industry Training Organisations (ITOs)) that are privately owned and operated but are registered with NZQA. They offer vocational education related to the needs of industry.

ITOs administer the industry training system (including industry training apprenticeships and traineeships), where employed learners are able to gain both on-job and off-job training towards qualifications ([MOE, 2015](#)).¹⁴ As part of the April 2020 vocational education reform, ITOs (now referred to as 'transitional' ITOs) are in the process of transferring education administration responsibilities to Te Pūkenga subsidiaries ([NZQA, n.d.b](#)).

PTEs offer qualifications at levels 1 to 9. In 2020, 48,115 domestic students (14.6% of all domestic tertiary students) were enrolled in PTEs, taking a total of 27,685 EFTS. These students were primarily enrolled at lower qualification levels, with only 4,710 (9.8%) enrolled at the degree level, and 2,815 (5.9%) enrolled at the postgraduate level. Thirteen percent of Māori students in tertiary education pursue apprenticeships, with approximately half of these completing their training and gaining a qualification ([BERL, 2019](#)). More broadly, Māori made up 26.6% of all domestic students attending PTEs, and 18.4% of all Māori tertiary students attended PTEs. Of Māori students enrolled at PTEs, 62.7% were female ([MOE, 2021b](#)). Relative to their numbers in tertiary study overall, Māori are slightly overrepresented at PTEs.

Characteristics of students who attend tertiary education

The likelihood students will attend and complete a tertiary qualification at level 4 or above is influenced by numerous factors. [Earle \(2018\)](#) finds secondary school qualifications are the most significant factor influencing participation in tertiary education at level 4 and above.¹⁵ This is not surprising given that secondary school qualifications are a prerequisite for many tertiary qualifications. He also highlights that while various situational, demographic, behavioural, and socioeconomic factors are correlated with participation in tertiary education, many of these factors bear little to no relationship once controlling for secondary school qualifications and performance. Factors that remain significant predictors of participation in tertiary education

¹⁴ Industry training apprenticeships are another form of New Zealand Apprenticeship, equivalent to the managed apprenticeship offered by Te Pūkenga subsidiaries. Traineeships are industry training programmes that do not meet the requirements of a New Zealand Apprenticeship. They are often short-term skills acquisition training ([MOE, 2015](#)).

¹⁵ French et al. (2014) find consistent results.

include ethnicity and more specific parental factors such as parent's qualifications and mother's age, with children of young mothers less likely to attend tertiary education.

Meehan et al. (2017) find Māori are 19.8 percentage points less likely than Pākehā to participate in tertiary education at the degree level, and 86.7% of this difference is explained by factors such as parents' qualifications, academic performance at school, characteristics of the school attended, distance to the nearest tertiary education provider, tertiary education completion rates, and highest school qualification achieved.¹⁶ They attribute the remaining 13.3% to unobserved factors such as culture.

Although many school leavers proceed directly into tertiary education, others work for a period before returning to education. In 2020, 29.2% of full-time full-year domestic students and 66.5% of part-time full-year domestic students were over the age of 25. Older students are engaged in tertiary education at a range of levels. Of the 15.0% of full-time students over the age of 40, 5,510 students (5.4%) were completing a level 7 bachelor's degree, 1,275 (28.3%) a level 7 graduate certificate/diploma, 1,780 (10.2%) a level 8 honours or postgrad certificate/diploma, 2,165 (24.8%) a level 9 masters' degree, and 1,345 (36.9%) a level 10 doctorate degree.¹⁷ Of the 55.1% of part-time students over the age of 40, 2,200 (42.6%) were completing a level 8 honours or postgrad certificate/diploma, 2,095 (40.6%) a level 9 masters' degree, and 1,000 (19.4%) a level 10 doctorate degree.

Many of the same factors that are related to tertiary participation are related to successful qualification completion. Earle (2018) finds that bachelor's students at universities who pass their first-year classes are more likely to complete their qualification than students who do not. Completion rates also vary by ethnicity. He finds Pacific youth are as likely as other young people to attend university for study at level 4 or above, but are less likely to complete their qualification. Māori youth are less likely to attend study at levels 4 and above, and those who enter qualifications from level 5 certificates to level 7 bachelor's degrees are less likely than non-Māori students to complete their qualifications. European youth are more likely to achieve and complete tertiary qualifications at levels 4 and above than other ethnic groups. Scott (2005) finds rate of completion increases as level of qualification studied rises. He also finds women are 6 to 9% more likely than men to complete their qualifications at degree level and below; the gap narrows at the postgraduate study level. Māori students have some of the highest completion rates below the degree level, but low completion rates at degree level and above. Students

¹⁶ 77.8% of the participation gap is explained by school performance and engagement, which is lower on average among Māori (Meehan et al. 2017; Cunningham and Stevenson, 2016). The second most important factor affecting participation is socioeconomic status (8.4%) followed by parents' highest qualification (3.1%).

¹⁷ See MOE (2021b)

under age 25 have the highest qualification completion rates at all levels. At degree level, they are almost 1.5 times as likely to complete their qualifications than students over age 25. This is likely to be because older students are more likely to be studying part time or combining study with work or family commitments.

SECTION 2: THE EFFECT OF EDUCATION ON EARNINGS

International

Education is an invaluable tool in improving labour market outcomes. It increases an individual's human capital thus making them more productive, and acts as a signal to imperfectly informed potential employers that an individual is likely to be productive. A vast international literature estimates the relationship between education and labour market outcomes, summarised in several literature surveys. [Chen et al. \(2016\)](#) find a positive association between education and earnings. Specifically, they find that the average returns to one additional year of education in OECD countries, Asian countries, and the world in the 20th century are approximately 7.5%, 9.9%, and 9.7% respectively. Similarly, [Hughes et al. \(2016\)](#) determine, from comparing 73 studies from OECD countries since 1996, that 67% of the literature identifies a positive relationship between earnings and education. The remaining 33% of the studies evaluated find mixed results with no distinct patterns in terms of outcomes. Of the studies evaluated, none find evidence that educational intervention is linked to poorer adult labour market outcomes. Likewise, [Sianesi and van Reenen \(2002\)](#) find compelling evidence that education increases productivity (which under weak assumptions is expected to increase wages). Specifically, a one-year increase in average education using neoclassical specifications increases output per capita by 3 to 6%, or over 1% using new growth specifications.¹⁸

The strength of the relationship between education and earnings varies by demographic characteristics. [Morgan et al. \(2009\)](#) theorise students from lower socioeconomic backgrounds benefit less from education than students from higher socioeconomic backgrounds do because they develop academic skills slower, potentially due to having less access to resources and support. Furthermore, schools in lower socioeconomic areas are often under-resourced, negatively affecting student's outcomes ([Aikens and Barbarin, 2008](#)). Socioeconomic background thus has lasting impacts on learning, behaviour, and health ([Committee on Psychosocial Aspects of Child and Family Health et al. 2012](#)) which translate into decreased educational success

¹⁸ The neoclassical specifications assume input factors are exogenously determined. The new growth specifications assume input factors are endogenously determined.

(McLaughlin and Sheridan, 2016). DeLuca et al. (2021) argue instead, however, that socioeconomic background effects education through a different mechanism. They propose that disadvantaged students make post-secondary education decisions anticipating more adverse shocks, and thus select into shorter more flexible programs. Such programmes yield lower labour market returns. A literature review by Han (2019) finds evidence that overall and worldwide, the influence of family background on the returns to education is significant. Specifically, children whose fathers earn more per annum generally have higher returns to education than children of low earning fathers. This is further evidenced by Crawford and Van der Erve (2015), who find higher education has a limited impact on social mobility. They observe significant differences between earnings of graduates from lower and higher socioeconomic backgrounds in the United Kingdom, even when accounting for a wide array of characteristics, skills, experience, and field of study. They speculate this is because individuals from higher socioeconomic backgrounds may have higher levels of parental investment which are reflected in educational attainment, or individuals from lower socioeconomic backgrounds may be excluded from the right social networks and lack knowledge of how to best use their qualifications to increase their earnings, which reduce their likelihood of success in the labour market.

Gender is another demographic characteristic with which the effect of education on earnings varies. Historically, women have been less committed to the labour market than men largely due to social expectations about women's roles in society. Elements of this persist in today's political climate with women still disproportionately represented in the home, raising and caring for children. Women therefore tend to have higher returns to education when the whole population is considered, because qualifications for women are often associated with entering the labour force as well as lower unemployment and higher wages conditional on working. In contrast, qualifications for men are primarily associated with lower unemployment and higher wages (Arrazola and de Hevia, 2007). Kim et al. 2015 find the variation in lifetime total earnings by education and gender in the United States supports this hypothesis, and is not fully explained by differences in field of study. Despite women experiencing a larger earnings increase than men from qualifications, educated women earn less than equally educated men (Carnevale et al. 2018). Some evidence suggests that the wage gap attributable to discrimination, tastes, and circumstances is reduced by education (Dougherty, 2005).

Returns to education also vary by ethnicity. Culture-specific values and preferences may lead different ethnicities to pursue different fields of study and different types of careers despite the same qualifications. Additionally, ethnicities that face discrimination may find this limits their job

opportunities and thus the extent to which they can benefit from their qualifications. [Li \(2018\)](#) finds evidence of this in the United Kingdom, where minority ethnic groups are overrepresented in higher education, yet their returns to education are lower. Ethnic minorities face significant barriers to gaining salaried positions, and these barriers persist even among second-generation degree holders. [De Silva \(2009\)](#), [Ōpō et al. \(2004\)](#), and [Trentini \(2013\)](#) corroborate these findings in other countries.

The effect of education on earnings is strongly affected by field of study. [Kim et al. \(2015\)](#) finds in the United States variation in earnings across fields of study is greater than earning differences between students who did versus did not attend higher education. [Kirkeboen et al. \(2016\)](#) finds equivalent results in Norway. Further, using information on next-best alternatives to courses to examine the pattern of sorting into fields, they argue that the payoffs to field of study are consistent with individuals choosing fields in which they possess a comparative advantage. Fields such as medicine, law, and dentistry yield the highest earnings.

Higher education and the resulting increased earnings also have nonpecuniary advantages. These include but are not limited to increased longevity ([Fletcher and Noghanibehambari \(2021\)](#), and [Mirowsky and Ross \(2003\)](#)), greater economic wellbeing ([Carlson et al. 2014](#)), increased civic duty ([Baum et al. 2010](#)), and greater life satisfaction ([Kristoffersen, 2018](#)). [McMahon \(2009\)](#) also highlights private benefits including better health, better education, life, and wellbeing for children, better outcomes for non-degree qualified partners, better ability to live in a nicer house in a better area with better access to recreation and entertainment; and public benefits including increased political stability, higher social cohesion, lower costs for justice, health and welfare, more private investment, and intergenerational benefits.

While the link between education and earnings is well researched, it has focused primarily on correlation without a strategy for identifying the causal effect of additional education. This means the relationship found could be overestimated due to selection bias. Such selection bias would arise if able and motivated students, who would earn high incomes regardless of their education, tend to gain more education. An extensive literature has investigated this concern using various identification strategies including instrumental variables (IV), ordinary least squares (OLS), and propensity score matching (PSM) methods (e.g. [Angrist and Krueger, 1991](#); [Card, 1999](#); [Titus, 2007](#)). [Card \(1999\)](#) compares various studies that use both IV and OLS and finds a strong positive relationship between education and earnings regardless of the estimation method. Moreover, he finds a stronger relationship in the IV model than the OLS. This is contrary to expectations if IV models correct for a positive selection bias that is present in OLS models. Card offers a range of possible explanations. One explanation is that marginal returns to

education for certain subgroups, particularly relatively disadvantaged groups with low education outcomes, are higher than the average marginal returns to education in the population as a whole. Administrative settings, often used to implement IV analysis, may disproportionately capture the effect on these groups. [Bhuller et al. \(2017\)](#) and [Bhatti, Bourdon, and Aslam \(2013\)](#) similarly find IV estimates of the returns to education are larger than OLS estimates. Additionally, [Brand and Xie \(2010\)](#) find evidence in favour of the negative selection hypothesis, which postulates that individuals who are least likely to obtain a college education have the highest returns from college because education has a larger effect on their employment. Overall, this literature suggests the positive relationship between education and earnings should not be dismissed as being caused by selection bias. Although simple OLS estimates of the relationship might not be entirely unbiased, they are likely to offer a reasonable approximation to the true causal relationship.

New Zealand-specific

Studies of the returns to education in Aotearoa New Zealand draw similar conclusions to the international literature, with more educated individuals achieving stronger outcomes in the labour market. [Park et al. \(2014\)](#) observe that employment rates increase with level of qualification. For example, 35% of New Zealand students who complete a level 1 to 3 certificate and remain in the country are employed one year after completing their qualification. Fifty-four percent of bachelor's graduates are employed one year post-study. Along similar lines, [Nair et al. \(2007\)](#) find those with bachelor's degrees or higher qualifications have lower unemployment rates than do those with level 1 to 3 certificates.

As well as being associated with higher rates of employment in Aotearoa New Zealand, education is associated with higher earnings. [Scott \(2020\)](#) uses Statistics New Zealand's Household Labour Force Survey (HLFS) and New Zealand Income Survey (NZIS) to show over the last decade individuals with a bachelor's degree or higher earn 40% higher weekly wages than do individuals with no qualifications. Similarly, [Nair et al. \(2007\)](#), using data drawn from the integrated dataset on Student Loan Scheme borrowers, find 5 years post-study a level 4 certificate is associated with 5% higher earnings than a level 1 to 3 qualification, and this increases to 22% for a level 5 to 7 diploma, 35% for a level 7 bachelor's degree, and to 58% for a level 8 to 10 higher degree. [Scott \(2009\)](#) finds higher qualifications are associated with higher annual earnings. Degree holders earn 15 to 20% more annually nine years post-school than those who completed their education with UE, and 40-50% more than those with NCEA Level 2. Furthermore, [Park et al. \(2014\)](#) find the median annual earnings of young people five years after

completing a bachelor's qualification is 46% above the annual national median earnings for those aged 15 to 64, and 45% above the earnings of young people with a level 1 to 3 certificate. Tumen et al. (2015) find that even among those who leave secondary school without obtaining level 2 NCEA qualifications, small positive effects are observed on their labour market outcomes when they gain level 1 to 4 qualifications. These effects are larger when they gain qualifications at levels 5 to 6.

In contrast, Crichton and Dixon (2011) find individuals who complete a level 1 to 4 certificate after joining the labour market and subsequently work do not experience higher earnings than a comparable group who did not study. They speculate these findings underestimate the effect of education on earnings, however, because 60% of the sample studied already had degrees and thus did not necessarily increase their highest qualification.

As in the international case, field of study affects the gain in earnings from education in New Zealand. Maré and Liang (2006) see comparable trends to international literature in variation among earnings in different fields of study when looking at post-school qualifications of 18- to 30-year-old New Zealand graduates between 1996 and 2001. Comparing students who completed qualifications at the same level in different fields, they find the highest median incomes are for medicine, accounting, mechanical and industrial engineering, and law and legal studies. The lowest median incomes are for creative arts and design, beauty service and hairdressing, language and literature, and computer and information science. Differences between fields are large: the median income for medicine is three times the median income for creative arts and design.

Scott (2009) observes similar variation by field when he compares the annual median incomes of students with a bachelor's degree in different fields. Compared with humanities graduates, medical studies graduates earn 2.59 times more three years post-study. In descending order, other high-earning fields and their respective median earnings compared with humanities are veterinary studies (1.61 times more), law (1.47), electrical engineering (1.44), pharmacy (1.43), accountancy (1.42), computer science (1.36), and nursing (1.26). Graduates with bachelor's degrees in tourism, performing arts, visual arts, and graphic and design arts earn between 10 and 20% less annually than humanities graduates. Park et al. (2014) confirm that young graduates with bachelor's degrees in medicine are the highest earning of bachelor's graduates five years post-study. Bachelor's graduates in creative arts have the lowest median earnings of all young bachelor's graduates, and higher rates of benefit receipt.

Maré et al. (2017) observe that science, technology, engineering, and mathematics (STEM) graduates have higher earnings growth than non-STEM graduates regardless of their level of

qualification, suggesting earnings growth varies by field of study. Measuring earnings as the median level of FTE-adjusted annual earnings in 2009, they find STEM graduates with a bachelor's degree or higher qualification have the highest median earnings one-year post-study, and the highest median earnings growth rate in the first six years post study at 49%. STEM graduates with less than a bachelor's degree also observe a median earnings growth rate of 49% in the six years following their graduation, compared with 36% for equivalently qualified non-STEM graduates.

Like internationally, returns to education in Aotearoa New Zealand differ with demographic characteristics such as gender and ethnicity. Here we summarise the literature on differences by gender; differences by ethnicity are discussed in section 2.3. [Mahoney \(2014a\)](#) finds differences by gender in both earnings and earnings growth. He concludes returns to education immediately after the completion of study are higher for women, but men's earnings grow more overall in the first five years post-study. Furthermore, among those who complete a bachelor's degree, graduate certificate, or a diploma level qualification, earnings for men and women are equal in the first year post study, but among those who complete higher- or lower-level qualifications men earn more in the first year post study. Five years post study, women's earnings are approximately 85% of men's among those who completed a level 1 to 3 certificate, 90% among those with a diploma, 92% among those with a bachelor's degree, 84% among those with a master's degree, and 85% among those with a doctorate. This suggests education decreases the gender wage gap up to the level of a bachelor's degree, but men gain more than women in terms of earnings from higher qualifications. [Mahoney \(2011\)](#) similarly finds differences between male and female earnings in the labour market post-study. Focussing on the employed, he observes men earn higher wage and salary income than women after tertiary education and experience higher earnings growth in the four years after study. He estimates women experience higher returns to education than men, where returns to education are calculated by comparing median earnings of qualified individuals with median earnings of all individuals of the same gender. However, women's higher estimated returns may be in part because women's national median earnings are depressed by their lower labour force participation rate. [Crichton and Dixon \(2011\)](#) corroborate these findings.

Gender differences in the returns to education are likely to be affected by when earnings are measured because of the differential effect of parenthood on earnings for men and women. Women tend to reduce the weekly hours they work when they have children and may also experience an hourly wage penalty, whereas men's monthly wage earnings on average grow steadily over the period they become parents ([Sin et al. 2018](#)). With the median age of women

at childbirth in Aotearoa New Zealand now around 30, and more educated women tending to have children at older ages, four or five years after completing their qualifications a substantial proportion of women will be yet to have children ([Stats NZ, 2019](#)). We can speculate that a greater number of years post-study women may have fallen further behind men with the same education due to the career effects of parenthood. This would be consistent with literature that shows the gender wage gap is greater at the top of the earnings distribution, among individuals who are likely to be older and to have already had children ([Ministry for Women, 2017](#); [Sin et al. 2020](#)). Aside from parenthood effects, gender differences in earnings among those with similar qualifications are likely to be driven by a wide range of factors including sorting by occupation, industry, or employer, gender differences in success in bargaining for higher wages, gender differences in productivity conditional on education, and discrimination ([Sin et al. 2020](#); [Dougherty, 2005](#)).

[Mahoney \(2014a\)](#) also observes variation in the gender gap in earnings by field of study. For instance, he finds young bachelor's completers in the top three earning fields five years post study have different gender gaps in earnings. Men earn \$113,800 after completing a bachelor's degree in medicine compared with \$105,600 for women, \$74,700 compared with \$73,800 for pharmacy, and \$57,500 compared with \$66,100 for veterinary studies. The lowest-earning fields five years post study include performing arts (\$30,300 for men and \$35,700 for women), and visual arts and crafts (\$38,300 for men and \$40,500 for women), which also have very different gender gaps. Men tend to earn more than women in the majority of fields five years post-study, the exceptions being justice and law enforcement (where women earn 19% more), performing arts (18% more), veterinary studies (15% more), rehabilitation therapies (13% more) geomatic engineering (11% more), earth sciences (10% more), visual arts and crafts (6% more), and political science and policy studies (1% more). The largest gender pay gaps occur for individuals who received their bachelor's in building (women earn 17% less annually than men), nursing (14% less), business and management (13% less), accountancy (13% less), curriculum and education studies (12% less) and sales and marketing (11% less). Fields with a gender wage gap closest to zero include information systems, behavioural science, political science and policy studies, pharmacy, agriculture, and architecture and building.

Multiple studies also find higher education in New Zealand has nonpecuniary benefits. These effects are hypothesised to be both direct and indirect; an increase in education directly increases knowledge of the risks and benefits of certain activities, and indirectly increases income, thus enabling individuals to afford better care and living conditions. Some benefits New Zealanders experience from increasing education include better health ([Nair et al. 2007](#)), lower

cigarette and alcohol consumption ([OECD, 2005](#)), lower mortality rates ([Atkinson 2004](#)), and a higher standard of living ([MSD Living Standards 2004](#)).

Māori-specific

More than two decades ago, [Maré \(1995\)](#) characterised the Māori labour market experience as one of low participation, high unemployment, and employment in low-wage jobs. He highlighted education as a key way to improve these outcomes. The government has since pushed for Māori to attend tertiary education, resulting in a small increase in the number of Māori studying at the bachelor's level or above from 16,400 (31.9% of Māori tertiary students) in 2011 to 18,360 (41.9% of Māori tertiary students) in 2020 ([MOE, 2021b](#)). Despite this increase, [Callister \(2011\)](#) finds Māori and Pacific men remain particularly under-represented, though wāhine Māori too are under-represented compared with Pākehā women (15% of wāhine Māori complete bachelor's degrees compared with 26% of Pākehā women ([MOE, 2021b](#))).¹⁹ He postulates this gender imbalance, which is also present among non-Māori, may be because of a focus on recruiting women and because returns to education for women are generally higher. He proposes shifting promotion of higher education to the whole population as a solution.

Increasing Māori participation in higher education requires addressing the different barriers to education and employment-related training faced by Māori. [Theodore et al. \(2017\)](#) find Māori tertiary graduates at all levels are twice as likely as non-Māori, non-Pacific graduates to have student loans, have 15% larger loans, and have significantly worse overall financial strain. Despite these differences, [Watane and Gibson \(2015\)](#) find Māori encounter cost as a barrier to education at a similar rate to other ethnicities. However, barriers relating to family circumstances and access to childcare are more common for Māori and Pacific people than for Pākehā.

[Mahoney \(2014b\)](#) assesses how Māori attending tertiary education between 2004 and 2009 benefit from their qualifications. He finds Māori who complete tertiary qualifications experience greater increases in median income from these qualifications than do similar non-Māori. However, the lower earnings of Māori among those without tertiary qualifications mean the earnings of Māori graduates do not necessarily catch up with those of non-Māori graduates. Māori are more likely than non-Māori to be unemployed in the first year after study. Furthermore, while non-Māori graduates experience high and steady earnings growth in the years after completion, earnings growth for Māori graduates is highest in the first year post-study and declines rapidly. This is consistent across all levels of qualifications except for the

¹⁹ Supporting this observation, [Theodore et al. \(2016\)](#) find that Māori graduates were disproportionately female (71%).

doctorate level, where Māori earn more than non-Māori graduates five years post-study. Specifically, the annual median graduate earnings for non-Māori graduates compared with Māori graduates five years post study are higher by \$3,300 for masters' completers, \$3,800 at level 8, \$1,800 at level 7, \$2,000 at bachelors' level, \$2,100 at diploma level, \$2,600 for level 4 certificate completers, and \$3,200 for level 1 to 3 certificate completers. In contrast, Māori doctorate graduates have median annual earnings \$9,400 higher than those of non-Māori graduates.²⁰ One possible explanation for the strong outcomes of Māori with PhDs may be the increasing emphasis on Vision Mātauranga in research proposals, placing Māori with a research background in extremely high demand.

Mahoney also finds the Māori/non-Māori gap in median earnings varies by field of study. For example, Māori bachelor's students of graphic and design studies earn more 5 years after graduation than non-Māori students (103% of non-Māori graduates' median earnings) as do Māori graduates of nursing (104%), other health (111%), computer science (105%), sales and marketing (102%), biological sciences (104%), earth sciences (106%), and studies in human society (102%). Conversely, Māori who complete a bachelor's degree in rehabilitation studies, information systems, and philosophy and religious studies and other natural physical sciences experience the widest difference in earnings, with median earnings being 79%, 81%, and 85% of non-Māori graduates' median earnings respectively. Furthermore, Māori who study at the bachelor's level are more likely than similar non-Māori to be in employment 5 years post-study if they received a bachelor's degree in economics and econometrics, chemical sciences, earth sciences, rehabilitation therapies, philosophy and religious studies, or nursing. In other fields, non-Māori are more likely to be employed than Māori 5 years post-study. These results suggest the fields of study most valuable in the labour market for Māori may not be the same fields that are most valuable for non-Māori.

As both a cause and consequence of these differences, the distribution of Māori students across fields of study differs to that of non-Māori students. Māori studying at the bachelor's level and above are most likely to gain qualifications in humanities/education (50.8% of a representative sample of 626 Māori graduates in 2011), followed by commerce (17.7%), science/engineering (15.4%), health sciences (10.9%), law (2.8%), and PhD study in any field (2.4%). A survey of Māori graduates showed the most common areas Māori want to work in following graduation are education and training (28.3%), health care and medicine (17.4%), and government (11.8%) (Theodore et al. 2016). Along similar lines, Meehan et al. (2017) find Māori graduates at the bachelor's level are more likely than New Zealand European graduates to study

²⁰ See also Theodore et al. (2017).

society and culture (35.8% compared with 27.7%), education (7.6% compared with 6.2%), health (8.4% compared with 7.7%), and creative arts (15.1% compared with 12.2%).²¹ The differences in field of study are likely to contribute to the overall ethnic difference in returns to tertiary qualifications.

Additionally, Māori culture emphasises a different set of values to Western culture, which may contribute to ethnic differences in labour market returns to education. Martin (2012) states Māori culture focuses on more holistic principles surrounding the whānau, hapū, and iwi rather than Westernised ideologies of success, which are more individualistic and income-centric. Goals of education for Māori may focus on the revitalisation of the language, raising awareness of cultural practices among youth, and obtaining qualifications that benefit the iwi rather than the individual (Martin, 2012). Theodore et al. (2017) provide evidence consistent with this, observing that Māori and Pacific graduates are significantly more likely to help others (e.g. whānau and friends) in a range of situations and report higher levels of volunteering than do non-Māori. Differences in geographical mobility may also contribute to ethnic differences in labour market returns to education, with Māori considered less mobile than other ethnic groups because of attachment to the rohe (region) of their iwi and to their iwi (Walker, 1990). Sin and Stillman (2013) find that Māori who live in areas local to their iwi are less mobile than comparable Europeans in the same areas, and are less likely to enter tertiary education, preferring to stay in the rohe of their iwi. They attribute this reluctance to move from their rohe for university or jobs to social ties and family more than to land-based attachment.²² Furthermore, Vaithianathan (1995) finds Māori living in traditional iwi areas are less mobile than Māori living outside their traditional iwi area. Literature suggests willingness to migrate to a job maximises labour market returns to qualifications, with mobile students earning more than less mobile students (Kidd et al. 2017). This could mean the desire of Māori graduates to work in their rohe constrains their earning potential (Renkow and Scrimgeour, 2005).

One way Māori tertiary graduates achieve labour market success is through running their own business, and Māori businesses also play a big role as employers of Māori. Such businesses are thus a channel for realising Māori returns to education. Employment in Māori businesses is growing almost twice as fast as average employment across all of New Zealand, and these firms employ 43% Māori staff on average, triple the rate of non-Māori businesses (TPK, 2020; NZQA, 2013; StatsNZ, 2021).

²¹ See also Theodore et al. (2019).

²² See also Sin and Stillman (2005).

TPK's 2020 report finds Māori businesses to be far more prevalent than previously thought. While 1,300 businesses were already identified as Māori, the 2020 report identifies another 8,800 businesses with Māori as majority shareholders, 14,700 Māori sole traders, and 10,200 businesses that are significant employers of Māori. The report highlights construction and professional services as the most common industry types for Māori-owned businesses. In an earlier report by the NZ Institute of Economic Research ([NZIER, 2003](#)) it is noted that Māori businesses tend to be more profitable than the average New Zealand business. Māori businesses also offer the opportunity to employ, benefit, and provide income for whānau, hapū, and iwi. Driven by community-centric values, they have the potential to create positive feedback loops for Māori employment.

Māori entrepreneurship is not limited to men. The [Ministry for Women's 2020](#) report found wāhine Māori are also active in businesses across all regions of Aotearoa New Zealand, employing and providing income for other wāhine Māori and their whānau. The most common areas for wāhine Māori businesses are agriculture, forestry and fishing; professional, scientific and technical services; construction, healthcare and social services. Of the Māori women in business, 28% have degree level or higher qualifications, with the younger age bracket (20-34) being the most qualified.

SECTION 3: THE LABOUR MARKET BENEFITS OF BILINGUALISM AND BILINGUAL EDUCATION

Ethnic differences in the labour market return to higher education in Aotearoa New Zealand may be influenced by differences in students' objectives for their education. For instance, Māori are more likely to pursue higher education to improve their te reo or understanding of tikanga Māori (Māori customary practices or behaviours) because of the inherent value of this knowledge. They are thus much more likely than Pākehā students to take higher qualifications in these areas. Understanding the labour market returns to these subjects therefore helps us understand the ethnic differences in labour market returns to higher education.

Conceptually, bilingualism can be beneficial in the labour market for three key reasons. Firstly, because it has broader cognitive benefits that are useful to employers, secondly, because it improves educational outcomes, and thirdly, because it is a useful and valued skill in itself. This section discusses key findings on the cognitive benefits of bilingualism, evidence on the relationship between bilingual education and academic attainment, and evidence on the labour market value of bilingualism. It concludes with an overview of the benefits of te reo skills and tikanga Māori knowledge that extend beyond the labour market.

The cognitive benefits of bilingualism

May and Hill (2004) summarise an extensive literature on cognitive benefits of bilingualism. They conclude that familiarity in two languages increases divergent and convergent thinking, metalinguistic awareness (word, syntactic, and phonological awareness), communicative sensitivity, and field dependence and independence. To the extent these abilities are useful to employers, they are likely to be rewarded in the labour market.

Bilingualism, Māori-medium education, and educational outcomes

The relationship between bilingualism in indigenous languages and educational outcomes has been widely studied internationally. Lindholm-Leary and Genesee (2014) summarise key findings from this literature. In the majority of studies they review, students in bilingual educational programmes achieve on par with or better than their peers in mainstream monolingual programmes. Additionally, bilingualism and academic achievement are positively related, regardless of whether the student's first language is a minority or majority language. However, they highlight this doesn't necessarily mean acquiring a second language improves the academic outcomes of students; students who are predisposed to higher academic achievement may instead be more likely to learn a second language.

Within Aotearoa New Zealand, Māori-medium education helps students become bilingual and bilateral learners, teaching Māori values as well as helping with the revitalisation of Māori culture. Rata (2013) argues Māori-medium education is important for four main reasons: 1) indigenous kaupapa Māori education is a revolutionary initiative, 2) it has reversed the decline of te reo, 3) it provides a valid educational alternative for an ethnically and culturally distinctive population, and 4) it is a cultural solution to Māori educational underachievement. The fourth claim is particularly relevant. Murray (2007) analyses the success of the programme, finding that "Candidates in [Māori-medium education] were more likely to gain NCEA level two compared with their Māori peers in English-medium (mainstream) schools" and "Candidates at immersion and bilingual schools (in 2003 and 2004) were more likely to gain a National Certificate of Educational Achievement (NCEA) than Māori candidates in English medium schools." Wang and Harkess (2007) corroborate these findings, comparing year 11 to 13 Māori-bilingual student achievement to that of Māori students in English-medium schools from 2004 to 2006. They find Māori-bilingual students are more likely to pass NCEA at each level, and more likely to meet UE requirements by end of year 13. Similarly, the Ministry of Education (2011) find the proportion of Māori in Māori medium settings achieving the literacy requirements for NCEA Level 1 (in either English or te reo Māori) was higher than for Māori learners in English medium settings. In

2011, 96.5% of Māori learners in Māori medium settings achieved the literacy requirements, compared with 78.5% of Māori candidates in English medium settings and 90.4% of non-Māori candidates. Further, [BERL \(2019\)](#) observe higher achievement scores in Māori students who complete their entire schooling in Māori-medium education than their Māori peers in English medium settings. Overall, these findings suggest bilingual and higher levels of immersive education are likely to improve Māori labour market outcomes by improving educational attainment. However, researchers cannot rule out positive selection of students into these types of education, so the full relationship observed may not be causal.

[Hill \(2011\)](#) evaluates the outcomes of New Zealand students in Māori-medium education with varying lengths of time spent in English classes, a controversial point among many kura. He finds that where an English programme occupies a significant place in a school timetable and is staffed by teachers aware and eager to attend the learning needs of bilingual students, higher literacy scores and greater student satisfaction are observed than in Māori-medium schools that teach solely in te reo. (See also [Schwinge \(2016\)](#) and [Hill \(2016\)](#).) Similarly, [Lowman et al. \(2007\)](#) find biliteracy (the ability to read and write proficiently in two languages) increases in grades 7 and 8 for partial immersion students exposed to multiple languages used interchangeably relative to those in schools with a narrow focus on a single language.

Bilingualism and labour market outcomes

Several international studies investigate the relationship between bilingualism in an indigenous language and labour market outcomes. [Quella et al. \(2012\)](#), studying Spain where the Catalan and Spanish languages co-exist, find proficiency in Catalan (the indigenous language) increases the likelihood of being employed, being an entrepreneur, and entering white-collar occupations and communication-intensive jobs. [Ugwu \(2014\)](#) finds indigenous language revitalisation can create jobs. Studying Nigeria, where youth unemployment and crime rates are high, he finds learning the indigenous language helps to address these problems, creating jobs, and increasing the ability to start and run small businesses. However, these findings may not generalise to other settings, because a high number of people in Nigeria speak only the indigenous language, so bilingualism operates predominantly by opening up opportunities to interact with these communities.

[Henley and Jones \(2005\)](#) investigate the effect of indigenous language bilingualism on earnings in Wales. Wales is similar to New Zealand in that their indigenous language, Cymraeg, is subject to state protection and advocacy much like te reo Māori. Henley and Jones find positive private returns to bilingualism, observing a raw earnings differential of 8 to 10% in favour of

bilinguals. Furthermore, the earnings premium is greater for higher levels of fluency in Cymraeg. An individual who can understand the language experiences an earnings premium of 6.3%. Skills in speaking, reading, and writing Cymraeg have earnings premiums of 6.6%, 6.9%, and 8.7% respectively. The earnings differential is substantially smaller in workplaces that report using Cymraeg than in monolingual workplaces. This suggests employers demand and are willing to pay for higher level Cymraeg language skills, but these are not necessarily used for communication within the workplace.

Chiswick et al. (2000) find a different relationship between bilingualism and labour market outcomes in the context of Bolivia's developing economy, where they compare labour force participation and earnings of those who are employed among Spanish monolinguals, indigenous language monolinguals, and bilinguals. They find male monolingual indigenous speakers have a higher participation rate than male monolingual Spanish speakers and male bilinguals. Among women, monolingual indigenous speakers have a higher participation rate than bilinguals, and both have higher participation rates than monolingual Spanish-speaking women. Monolingual Spanish speakers earn approximately 25% more than bilinguals. The authors speculate this may be because bilinguals are penalised for being less proficient in Spanish. In addition, female monolingual indigenous speakers earn about 25% less than bilinguals. Results from this study emphasise that population differences in labour market outcomes of bilingual compared with monolingual individuals don't necessarily capture the benefit a monolingual person will receive from becoming proficient in a second language because of selection into bilingualism.

One conclusion from the literature on bilingualism is that its benefits depend on context. In the case of Aotearoa New Zealand, the labour market value of te reo skills is likely to be affected by te reo's recent history. For many years, the use of te reo was in decline. Only in the last 30 years have community and government initiatives been established to aid in the revitalisation of te reo Māori and tikanga Māori. The first kōhanga reo (Māori ECE) opened in 1981 in Wainuiomata, and the first kura kaupapa Māori (total immersion school) opened in 1985 in Auckland. Initiatives such as these led to the Māori Language Act, which recognised te reo as an official language of New Zealand in 1987, and the 1990 reform of the Education Act, which recognised wānanga as educational institutions. In a commitment to revitalise the language, the New Zealand government has set a goal for basic te reo to be spoken by at least 1 million people by 2040 (Beehive, 2019). This has been accompanied by investments in Māori media ([Beehive, 2021a](#)), as well as initiatives to better track progress towards this goal ([Beehive, 2021b](#)). As of 2013, 257,500 Māori adults (55%) could speak te reo to some degree, a rise from 153,500 (42%)

in 2001 ([StatsNZ, 2014](#)).²³ Similarly, the number of tertiary students formally studying te reo has increased over recent years, from 16,925 EFTS in 2011 to 27,695 EFTS in 2020 (MOE, 2021b).

Today, revitalisation efforts are accompanied by an increasing demand of graduates with te reo experience, especially in professional pathways and government roles. This has created jobs for te reo speakers in particular in sectors such as governance, education, criminal justice, health, and social services ([University of Canterbury, n.d.c](#)). Furthermore, cultural competency may open doors to conducting business or research in communities that would otherwise remain inaccessible. On the other hand, those who speak te reo Māori are nearly all fluent in English and there aren't large communities of monolingual Māori speakers, so te reo skills may not increase firms' customer bases to the extent indigenous language skills do in Nigeria, and are unlikely to be necessary for within-organisation communication. To the best of the authors' knowledge, no empirical evidence exists on the relationship between te reo skills and tikanga Māori knowledge and earnings.

Non-labour market benefits of te reo skills and tikanga Māori knowledge

In addition to their likely value in the labour market, te reo skills and tikanga Māori knowledge have intrinsic value and also yield benefits in other realms of life. For instance, embracing the Māori language enhances the intergenerational transmission of cultural knowledge and practices, and strengthens Māori community and identity ([Keegan, 1996](#); [McCarty, 2019](#)). Revitalising te reo may positively impact mental health; [Hallett et al. \(2007\)](#) find that suicide rates in indigenous communities in British Columbia without their own language are higher than in those that embrace their language. Embracing indigenous languages also enhances cultural identity, which decreases crime rates ([Maynard et al. 1999](#); [Shepard et al. 2017](#)), decreases the likelihood of recidivism ([Department of Corrections, 2003](#); [McFarlane-Nathan, 1999](#); [Nathan et al. 2003](#)), and also reduces family violence ([Shea et al. \(2010\)](#)). Other positive values from embracing the Māori language and culture include changes in the attitudes of New Zealanders towards the Māori language. [Te Puni Kōkiri \(2006\)](#) observed in three consecutive studies conducted by the Ministry of Māori Social Development in 2000, 2003, and 2006 that the percentage of respondents with positive attitudes towards te reo being spoken in public spaces and at work rose from 68 to 94% among Māori and from 40 to 80% among non-Māori. This suggests te reo Māori is becoming more common in New Zealand and gaining greater prestige. Furthermore, the wider population (including non-Māori) learning te reo may aid in the

²³ The 2018 Census shows a decrease in the number of te reo speakers from 2013, but this figure may be unreliable due to the poor coverage of Māori communities that was achieved in the 2018 Census.

revitalisation of the language. Caution is warranted, however. As Albury (2015) explains, “Indigenous people may legitimately fear that majority-group members acquiring the indigenous language equates to the colonization of yet another indigenous commodity.” This could compound the existing negative effects of colonisation and decrease some of the previously mentioned non-labour market benefits.

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