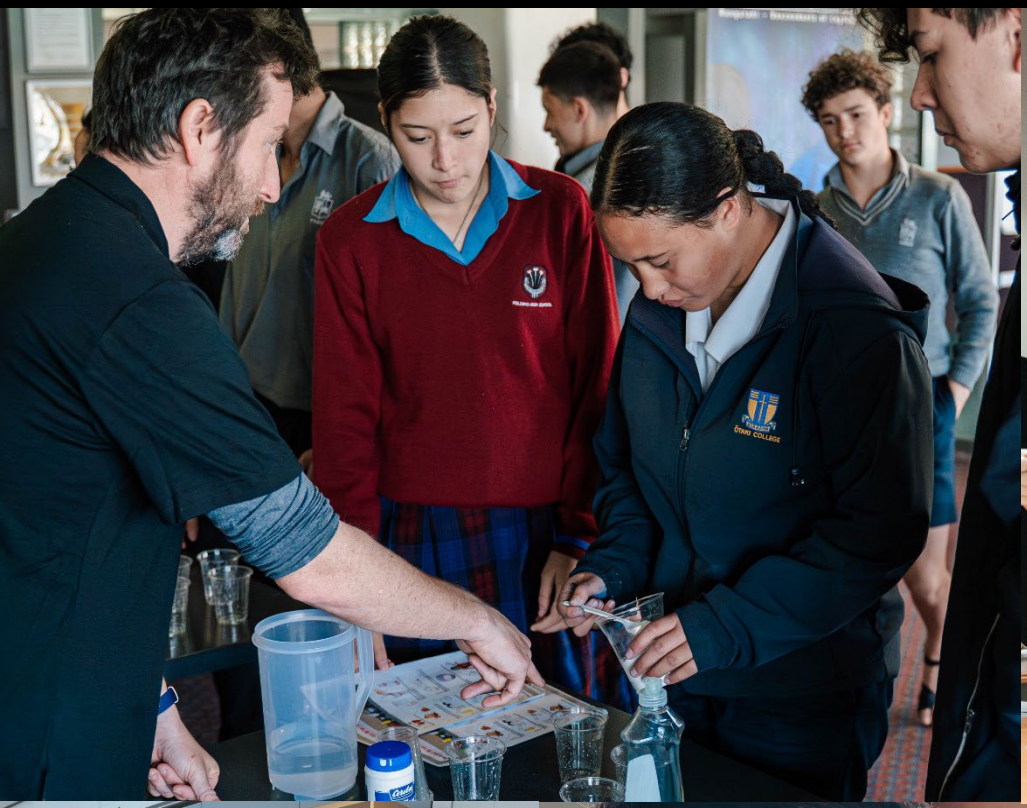
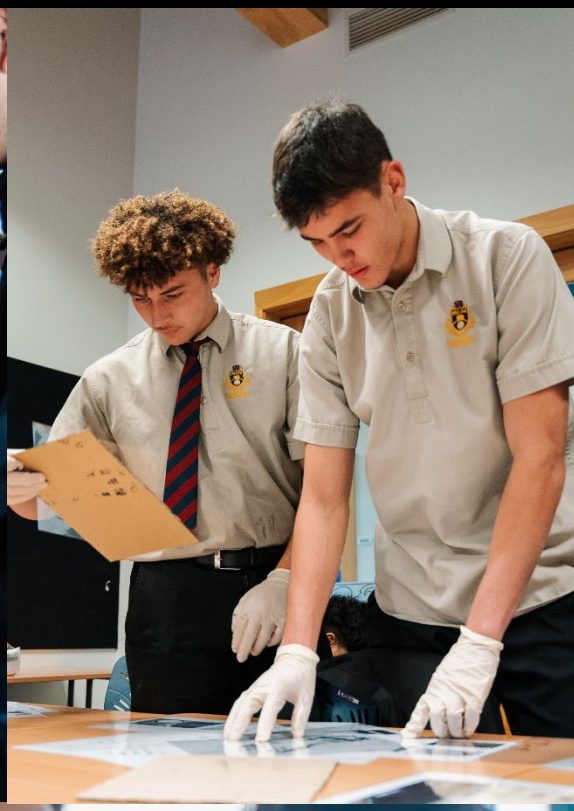
Report

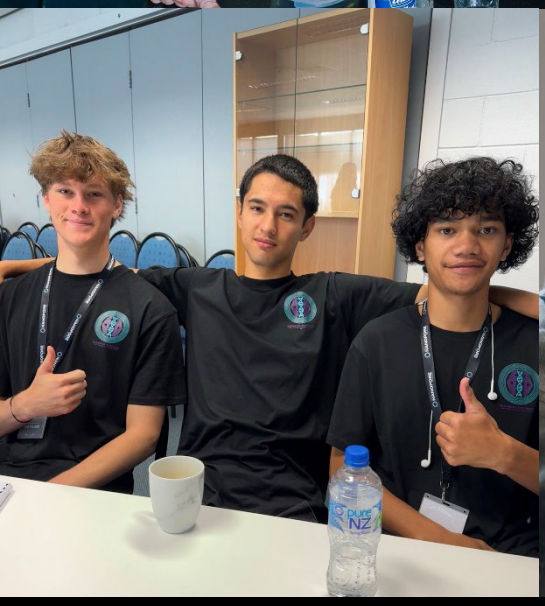
Pūhoro STEMM Academy & ESR
March 2024

Social Cost-Benefit Analysis

Economic Impacts of the Pūhoro STEMM Academy







PŪHORO

E/S/R
Science for Communities
He Pūtaiao, He Tāngata

MATATIHI

Executive Summary

As a young and growing population, the future of New Zealand lies in Māori, particularly rangatahi, and their ability to gain and retain quality employment and business opportunities.

The Pūhoro STEMM Academy partners with numerous secondary schools to operate a STEMM (science, technology, engineering, mathematics, and Mātauranga) Academy to increase Māori student engagement in STEMM programmes. Pūhoro supports students in secondary schools and tertiary education to prepare their Māori science students for employment and higher education. The Academy has had significant success in improving Māori educational performance rates.

Following three prior reports from 2018, 2019 and 2021, this latest report presents a thorough economic analysis highlighting the Pūhoro Academy's substantial economic advantages to students, the national economy, and wider society.

The Pūhoro Academy is working to improve Māori students' National Certificate of Educational Achievement (NCEA) pass rates, thus contributing to their educational and economic prospects. A cost-benefit analysis (CBA) reveals that the Academy's high school and university programs cover their costs by factors ranging from 2.8 to 125 times, respectively. In other words, for every dollar of investment, $2.80 is generated within the high school programme, and $125 is generated within the tertiary programme. In what we consider the most robust scenario, the net present value of the Pūhoro STEMM Academy exceeds $1,800 per high school student and $367,000 per tertiary student. These figures represent net benefits of over $11 million for the high school program and $112 million for the tertiary program, marking an improvement from the 10:1 CBA ratio found in our 2019 analysis.

The net present value of the Pūhoro STEMM Academy exceeds $123m.

The Pūhoro Academy's impact extends beyond individual economic gains, stimulating regional economies with over $5 million in added value annually and supporting 5.7 full-time equivalent positions outside its direct operations. The Academy's influence extends through communities, enhancing family wellbeing, increasing job satisfaction, promoting healthier lifestyles, and fostering greater civic participation among its graduates.

Moreover, the Academy plays an important role in addressing contemporary challenges, such as homeownership, by equipping students with the skills and qualifications necessary to improve their life prospects. The analysis underscores the Pūhoro Academy's effectiveness in providing immediate educational benefits and driving long-term economic and social improvements across New Zealand, thereby affirming its value as a valuable educational intervention.

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Background

In September 2018, Matatihi undertook the first cost-benefit analysis (CBA) of the Pūhoro STEMM Academy. This first CBA focused on the potential economic benefits Pūhoro was generating by assisting students through higher school qualifications. In February 2019, Matatihi provided a second CBA for Pūhoro, considering the potential economic impact of extending the Pūhoro STEMM Academy into tertiary education at a bachelor's degree level. Both CBAs found that significant economic benefits could be realised by assisting this same cohort of students through higher education levels in STEMM fields. By July 2021, Pūhoro had extended its operations into the tertiary sector. Matatihi undertook a third CBA, including the first cohort of tertiary students, new locations, and other expansions of its operations. Again, a significant economic impact was found to be generated by Pūhoro. In the third report, we looked beyond the financial benefits to individuals, considering the regional economic benefits, including jobs and flow-on financial impacts stimulated through Pūhoro's operations.

The impact of Pūhoro is significant for individuals and the broader New Zealand economy. In 2021, it was shown that, based on the most likely scenario, Pūhoro's high school and university programme's potential economic benefits outweighed the financial costs by a factor above 14 to 1 and 16 to 1, respectively. The total net present value of the potential economic benefit in July 2021 was calculated to be above $79,169 per high school student and above $121,035 per tertiary student. The net benefit for the high school program was above $60 million, and $32 million for the tertiary program.

In conducting CBAs and multiper analyses, we are constrained to only quantifying impact where a direct connection between Pūhoro's operations and a monetary value can be drawn. This means focusing on job opportunities, career progression, and subsequent flow-on effects like tax generation and job creation. However, numerous other economic benefits are being stimulated by Pūhoro. There are well-established links between education, health, cultural belonging, professional network development, social support, and other benefits Pūhoro stimulates at an individual and societal level. In the previous and current reports, we have focused our analyses on economic impacts where a direct relationship can be established while recognising that this is only a small part of the Pūhoro impact.

Nonetheless, that small part is significant, providing lifetime benefits to individual students and other economic stimuli that ripple out through regions and the nation. In addition to the positive benefits, education mitigates potential adverse outcomes associated with educational underachievement. Negative framing of Māori data, typically based on flawed data sets or mischaracterisation, has been a long-running problem for Māori. We have not quantified the avoidance of adverse outcomes in this report to move away from negative framing and focus on the substantial positive impacts of Pūhoro, thereby illustrating the role of Māori as frontier innovators and industry leaders in the knowledge sector.

Introduction

The Māori population will grow to nearly 20 percent of New Zealand's total population and one-third of New Zealand's children by 2038[1]. As a young and growing population, the future of New Zealand lies in Māori, particularly rangatahi, and their ability to gain and retain quality employment and business opportunities. Educational achievement is one of the most powerful drivers of economic and social growth. As an entity focused on improving the education outcomes for young Māori, the Pūhoro STEMM Academy is generating positive societal impacts. In this report, we quantify some of this impact in monetary terms at an individual level and broad societal scale.

This report presents three primary analyses. First, we provide a social cost-benefit analysis (CBA) using the Treasury's CBAx model. The CBA quantifies the lifetime earnings of an individual based on their potential educational achievement. Second, we provide an economic analysis of the multiplier effects of the Pūhoro STEM Academy. We investigate the value the Academy contributes to the national economy and the number of indirect and induced jobs created by the Academy's operations. Finally, we provide some qualitative insights on the indirect benefits of higher levels of education for Māori rangatahi that are being stimulated by the Academy's operations.

[1] https://thehub.swa.govt.nz/resources/future-demographic-trends-for-maori-part-one-population-size-growth-and-age-structure/

Social Cost Benefit Analysis of Pūhoro

The CBA provided here is based on the Treasury's CBAx model, particularly the CBAx version for Budget 2024, which was released in December 2023. While the model's functioning remains the same as in our previous reports, there have been updates to the CBAx database to reflect underlying data changes. These changes mean that some of the impacts or impact values used in our previous reports differ from the current report. Additionally, we now have higher-quality data on Pūhoro's tertiary students. Previously, we blended the impacts in the transition from secondary to tertiary education. In this report, these two models are kept distinct so that tertiary education benefits are associated only with tertiary study and secondary school benefits are associated only with Y13 NCEA. Therefore, this report should be read as a standalone and not compared directly to previous reports. Like our earlier CBAs for Pūhoro, the analysis also takes direction from Dalziel et al. (2017) Measuring the Economic Impact of Whānau Ora Programmes: He Toki ki te Mahi Case Study, who estimate the economic benefits of a Māori trade skills training programme using CBAx.

We have split the analysis into two models, one considering the impact of Pūhoro's tertiary support and another evaluating the effect of their high school activities. The starting point for our analysis is the following question:

> ***How does participation in Pūhoro influence students' educational attainment, and what quantifiable effect does this have on their lifetime earning potential over a 40-year career span?***

To answer this question, we need to understand the effect Pūhoro generates in relation to a baseline. That is, what is the difference between the likely outcomes for a Pūhoro student in comparison to a typical Māori student? This is the most difficult challenge for the analysis. Myriad social, cultural, economic, and environmental factors influence an individual's life trajectory. We have data on national averages for Māori students; however, the challenge is in determining whether the students entering Pūhoro are 'average' students. In other words, what proportion of students participating in Pūhoro would have obtained the same educational outcomes regardless of whether they participated in Pūhoro? For example, we know that approximately 14 percent of Māori Y13 students enter a bachelor programme the year after they leave high school. We also know that roughly 82 percent of Pūhoro students make the same transition. However, we do not know precisely whether these Pūhoro students are representative of the 14 percent or the 86 percent that typically do not make this transition.

Here, we must make assumptions based on the best evidence we have. That evidence is the significantly higher Pūhoro tertiary entrance rates, which is not typical based on an assessment of available education statistics. Second, and perhaps more importantly, the deep understanding that Pūhoro has of its students and their assessment of the students' educational trajectory upon entering Pūhoro. We have been told previously by Pūhoro founder and ex-CEO Naomi Manu that around 75 percent of Pūhoro students were not on an academic pathway when they first entered Pūhoro. In other words, Pūhoro students are not typically considered to be 'above average' upon entering the program. Some students may be considered 'average' and a small undetermined proportion 'above average'. This assessment by a highly knowledgeable insider strongly suggests that most Pūhoro students are not in the 14 percent, but that Pūhoro is responsible for putting students onto a higher educational pathway. In short, we approach the analysis assuming that Pūhoro students are representative of national averages for Māori students.

Cost Benefit analysis

Gabriel Makhlouf, Secretary to the Treasury, stated that:

> Cost-benefit analysis is first and foremost an organising principle. It is a way of organising information in a consistent and systematic way. It is about making best use of whatever information is available. It is about evidence-based policy development.
>
> Gabriel Makhlouf
>
> Secretary to the Treasury
>
> (Treasury, 2015, p. 3)

This is the approach we follow here. We have used the CBA to structure the best available information while acknowledging our uncertainties. We have also provided a range of scenarios to test the sensitivity of the CBA and in recognition of the uncertainties. We have erred on the side of making conservative assumptions. Additionally, we are not accounting for the numerous additional economic benefits Pūhoro is stimulating beyond education attainment, job creation, and career progression.

The Pūhoro STEMM Academy Overview

The Pūhoro programme is best described by the 2017 Pūhoro Annual Report:

> *As we engage rangatahi in STEMM with a Māori worldview, our vision and purpose of building an indigenous science community that can positively impact whānau, communities, hapū and iwi is becoming a reality.*

Pūhoro was launched in 2016 and is a transformative programme aimed at advancing Māori leadership and capability to deliver a world-class science community. The programme works directly with secondary school students and their whānau nationwide. It provides students and whānau with mentoring, tutoring, wānanga (experiential learning/field trips) within culturally appropriate settings to help them navigate career pathways into science and technology-related industries. The program has now launched its second phase, where it tutors and supports students through university and tertiary studies.

The Pūhoro Academy Students and Locations

Pūhoro commences with a three-year programme (Years 11 – 13) within secondary schools. Pūhoro partners with multiple secondary schools in the regions listed in Table 1, covering most of the country.

Table 1. Secondary student numbers and locations

Central Auckland	185
Christchurch	172
Hawkes Bay	252
Manawatū	294
Rotorua	100
Ruapehu	22
South Auckland	210
Te Tai Tokerau	50
Waikato	208
Total	**1493**

Pūhoro seeks to support secondary schools to prepare their Māori science students for transfer to tertiary study and employment. All students selected to be a part of Pūhoro must participate in and sit at least three of the required external science achievement standards at National Certificate of Educational Achievement (NCEA) Levels 1, 2 and 3. They must also attend Pūhoro at wānanga at Massey University each term. The Academy has many methods to engage with students, including career mentoring, study noho, wānanga, tutorials, expos, study/exam workshops, and kaihautū mentoring.

In 2020, most Pūhoro students who completed Te Urunga Tū (Phase 1 High School programme) successfully transitioned into tertiary study, apprenticeships, the defence forces or employment in

2021. Te Urunga Pae (Phase 2 Tertiary programme) students are now in tertiary education from their first year to their PhD studies. While we do not have any precise data, Te Urunga Tapu (Phase 3 Employment) cohorts are growing after graduating from university in 2022. Furthermore, the Academy seeks to support Māori access to the STEMM industry through internships with partners and access to research opportunities in STEMM.

As of 2024, there were 301 students in tertiary education; however, tracking of these students did not begin until late 2023; therefore, only limited data are available on what stage of their education these students are in.

The Participants in Pūhoro

Pūhoro is relatively new regarding educational providers, and data on the participants' success are still limited. Achievement data for different educational standards is critical to our analysis. We do not have updated pass rates from 2023 and rely on past data from 2017 to 2021. Our data suggest that Pūhoro students currently have pass rates of at least 15% higher than the national average, with Pūhoro stating that their goal is to get this up to 20%. We also do not have complete data on achievement rates for tertiary students. However, Massey University provided data that showed Semester 1 2020 Successful Course Completion (SCC) rates for Pūhoro students were on par with, or exceeded, SCC rates for non-Māori students. Table 2 provides the most recent data for the 2023 Year 13 students' plans for the following year.

Table 2. Secondary students' plans for the year after high school

Next Year Plan	**Count**
Study	88
Work	26
Defence Force	6
Gap Year	14
Other	2

Of the 136 students whose intentions are known, 65 percent intend to move into tertiary education. The most recent data[2] shows that, on average, 16 percent of Māori students enter some form of tertiary education the year after leaving high school. Therefore, Pūhoro outperforms the average by 49 percent.

[2] https://www.educationcounts.govt.nz/statistics/what-happens-to-school-leavers

Model Development and Counterfactual

The Guide to Social Cost-benefit Analysis explains that the counterfactual is the situation that would exist if a policy does not go ahead (Treasury, 2020, p. 10). The following analysis is based on 1493 high school students and 306 University students. Due to data limitations, we have excluded students who enter a trade or other career pathways in the model. A series of interconnected assumptions have been made to establish Pūhoro's impact on students in relation to the counterfactual. These assumptions are outlined below within the series of steps to determine the impact of Pūhoro.

Steps in the Development of the Tertiary Model

Private benefits

1. Obtain details on the qualification each student is undertaking.
2. Concorde similar qualifications where institutions apply different terminology to equivalent degrees and where qualifications include specialisations. For example, all variations of the Bachelor of Applied Science have been combined.
3. Determine the percentage of the Pūhoro cohort to which each qualification applies based on Pūhoro's data.
4. Determine a representative job that graduates with a particular qualification will likely move into. Career options, such as dentistry or architecture, can be readily determined. Career pathways are more varied in other cases, such as a Bachelor of Commerce. This step was undertaken by reviewing the qualifications of career websites, querying job posting websites by qualification, and sense-checking results using GPT-4. Each qualification was then assigned a representative or 'typical' job outcome.
5. Determine each job's entry and senior-level salary range using New Zealand career websites. The high and low figures for each job were then averaged. The rationale for this is that the CBA is being undertaken over 40 years; therefore, using an average of junior and senior salary ranges is more representative of a working career than using a salary single career time point. Our estimates were then cross-referenced to values found by NZIER[3] to ensure their appropriateness.
6. Source national percentages for Māori students entering tertiary education at different qualification levels the year after high school from official government statistics[4]. For bachelor programmes, this is 14.2 percent, and for certificate and degree programmes, this is 22.5 percent.
7. Determine the percentage of Pūhoro students expected to enter tertiary education while involved with Pūhoro after completing high school. In 2022, 65 percent of Pūhoro students moved into tertiary education. From this 65 percent, remove 14.2 percent of bachelor and 22.5 percent of certificate and degree students from the cohort as they

[3] https://www.universitiesnz.ac.nz/sites/default/files/uni-nz/University%20economic%20impact%202022%20%28Final%29_0.pdf

[4] https://www.educationcounts.govt.nz/statistics/achievement-and-attainment

would have been expected to enter tertiary education without Pūhoro. This is the core determinant of the Pūhoro Effect, which we suggest increases bachelor enrolment by 51 percent (65% Pūhoro enrolment – 14.2% national average) and certificate/diploma enrolment by 43% (65% Pūhoro enrolment – 22.5% national average). This is the critical determinant of impact in the tertiary model and is explained in more detail following the description of steps.

8. The Pūhoro intervention is then applied to the cohort. For example, 0.65% of the original cohort (two students) are undertaking a Bachelor of Dental Surgery (BDS). The likely job outcome for these students is to become a dentist. A dentist can expect to earn an average of $191,500 per annum over their career. This is $134,681 per annum more than the counterfactual salary[5]. After accounting for the Pūhoro intervention described in Step 7, we assign this benefit to 0.3 percent of the cohort annually. This lowers the impact to account for students we would have expected to enter this type of programme in the absence of Pūhoro. **The Pūhoro intervention for this qualification equates to $404 per annum.** That is 0.3 percent of $134, 681.
9. Each qualification is entered into the CBAx model, including the difference from the counterfactual each qualification is expected to produce and the proportion of the cohort assigned to that impact following the rules established in Steps 7 and 8.
10. Attrition rates are then included. National averages are used for this as data on Pūhoro students are limited. However, Massey University provided data that showed Semester 1 2020 Successful Course Completion (SCC) rates for Pūhoro students were on par with, or exceeded, SCC rates for non-Māori students. We have, therefore, used national average attrition rates to determine the success rate for each impact in the model. In 2022, success rates were about 91 percent for Bachelor qualifications and above and 73 percent for certificates and diplomas.
11. Finally, the time lag for impact is included in the model based on the time it typically takes to undertake each qualification.

Public Benefits.

In addition to the private benefits accruing to the students, there are also direct public benefits generated through income tax and ACC levy from students moving into higher levels of education. Based on the proportions described in the previous section, we have assigned the following three public benefits in the model:

- 25% of Marginal average annual income after tax - Upper secondary school qualification to Level 4-6 certificate/diploma – Assigned to 4 percent of the cohort.
- 25% of Marginal average annual income after tax - Upper secondary school qualification to bachelor's degree – Assigned to 45 percent of the cohort.
- 25% of Marginal average annual income after tax - Bachelor's degree to Postgraduate – Assigned to 0.3 percent of the cohort.

[5] The counterfactual salary was determined by starting with the Treasury's measure of 100% of Average annual income after tax - Upper secondary school qualification, and then projecting this salary to eight years in the fture accounting for 2% annual growth resulting in a figure of $52360.68 p.a.

Steps in the Development of the Secondary Model

The secondary model followed a more straightforward approach. Benefits, defined as the increase in marginal average annual income after tax from obtaining an upper secondary school qualification, were attributed to Year 13 students only. This is because these benefits directly result from completing the qualification at the end of Year 13. In previous years, the Treasury has defined a monetary impact for lower secondary school qualifications; however, the impact database in CBAx has now been limited to 'No qualification to Upper secondary school qualification'. We have defined this as equivalent to 'No qualification to NCEA level 3', listed in earlier CBAx versions. There are 1493 students in the Pūhoro cohort divided into

- Year 11: 802
- Year 12: 451
- Year 13: 240

The steps and assumptions used to develop the secondary model were as follows.

Private Benefits

1. Pūhoro staff have stated that in 2016, 75% of students were not on an academic pathway – this can be interpreted to mean that the students are not 'above average'.
2. We do not have updated pass rates for 2023 and are relying on past data from 2017 to 2021. Being conservative, our data suggest that Year 13 Pūhoro students are likely to have pass rates at least 15% higher than the national average, with Pūhoro stating that their goal is to get this up to 20%. We expect this figure to be conservative; data from Pūhoro shows that Y11 and Y12 students have pass rates from 30 to 33 percent above the National Māori pass rate.
3. We set up the model to run for three years to account for a full rotation of Pūhoro cohorts. Each year, the costs are assigned to the entire cohort, but the benefits are only assigned to 15% of the Y13 cohort (in the base model). This 15% is what we consider to be the Pūhoro Effect in the base High School model.
4. Since the inception of Pūhoro, student numbers have grown approximately 34 percent per annum. This factor scales the total cohort and associated costs for years two and three in the model.

Public Benefits.

Based on the proportions described in the previous section, we have assigned the following public benefit in the model:

- 25% of Income tax and ACC levy: Marginal value - No qualification to Upper secondary school qualification

Summary of the estimated potential economic benefits

306 tertiary students were grouped into impact categories based on their field of study, all contributing to the estimated potential economic benefits.

- Bachelor programme enrolment is increased by 51 percent over the national Māori average
- Certificate/diploma enrolment is increased by 43 percent over the national Māori average.
- The qualifications that these students gain provide a career pathway that has an earning potential above the counterfactual salary (Appendix A)

Pūhoro students have been shown to achieve tertiary qualifications at or above the national average pass rates. Therefore, the following success rates were applied to the Pūhoro Effect Cohort.

- 91 percent success for Bachelor qualifications and above and
- 73 percent success for certificates and diplomas.

The 1493 high school students analysed in this chapter are grouped into one category as benefits, defined as the increase in marginal average annual income after tax from obtaining an upper secondary school qualification, were attributed to Year 13 students only. The Pūhoro intervention that provides for benefits above the counterfactual was defined as:

- Y13 Pūhoro students have pass rates that are 15% higher than the national average.
- The benefits accrue to 15% of the Y 13 cohort annually.
- The benefits are an increase in marginal average annual income after tax from obtaining an upper secondary school qualification as defined by the CBAx Impacts Database.
- The model is run for three years to clear one high school cohort.
- Student numbers grow 34 percent per annum.

This report follows Dalziel et al. (2017 p.20) in selecting an appropriate discount rate. To calculate the total net present value of these benefits, it is necessary to determine a suitable discount rate, acknowledging “that most people would prefer receiving a dollar today over receiving a dollar in a year’s time” (Treasury, 2015, p. 34). This preference is linked to interest rates earned on savings, so the discount rate is set to reflect current interest rates and the risks of social investment. The discount rate recommended by the Treasury in 2020 is 5 percent, which is the rate used in this study.

Using the base assumptions described above, the total net present value of the potential economic benefit in February 2024 is **$1,859** per high school student and **$367,388** per tertiary student. This means the net benefit for the high school program is above **$11 million** and **$112 million** for the tertiary program.

The estimated economic costs

Operational costs of $2,335,640 for 2023 have been used in the analysis. The costs per year were divided evenly per student between the university and high school programs, and this was used to derive a cost of approximately **$1,298** per student per annum.

For the tertiary model, costs were applied to each member in the cohort based on the typical number of years required to complete their qualification. This ranged from one year for a certificate programme to eight years for postgraduate students.

For the high school model, costs were applied evenly across the cohort, increasing alongside student numbers for three years.

Based on the assumptions made above, the total net present value of the economic costs associated with all participants in February 2024 is calculated to be **$6.1 million** and **$0.9 million** for the high school and university programmes, respectively, costing **$7 million.**

This cost is well below the combined net present value of potential economic benefits (above **$123 million**). Thus, the Pūhoro initiative is producing potential economic benefits beyond its costs.

Sensitivity analysis

The final step in a cost-benefit analysis is to reflect on whether the assumptions in the analysis have unintentionally incorporated an 'optimism bias', leading to overestimation of future benefits or underestimation of costs (Treasury, 2015, p. 31). The alternative is to consider pessimistic scenarios to understand the sensitivity of the result to key assumptions (Dalziel et al. 2017).

For the high school program, we reduced the Pūhoro intervention to a 10 percent increase over the national average and a 5 percent increase. We also include a 20 percent scenario as this is a goal for Pūhoro.

For the tertiary model, we provide a scenario where the Pūhoro Effect is halved:

- Bachelor programme enrolment is increased by 25.5 percent over the national Māori average.
- Certificate/diploma enrolment is increased by 21.5 percent over the national Māori average.

And a scenario where this impact is a quarter of the base model.

- Bachelor programme enrolment is increase by 12.75 percent over the national Māori average.
- Certificate/diploma enrolment by is increased by 10.75 percent over the national Māori average.

These are highly conservative scenarios. In the most pessimistic, only 37 students from the cohort of 306 gain any economic benefit from their involvement in Pūhoro, a scenario that seems very unlikely based on the success Pūhoro has demonstrated. The results of the base scenarios and the sensitivity models are presented in Table 3 and Table 4.

Table 3. Sensitivity analysis of Pūhoro's impact - High School program

40-Year NPV ($m)	**Base Pūhoro Impact**	**5% Pūhoro Impact**	**10% Pūhoro Impact**	**20% Pūhoro Impact**
Total marginal impact	17.6	5.8	11.7	23.4
Total cost of initiative	-6.2	-4.3	-4.3	-4.3
Net economic benefits	11.4	0.3	5.5	17.2
CBA Ratio	2.8	0.9	1.9	3.8

Table 3 shows that the Pūhoro Academy high school program covers its costs by a factor of 1.9 under the 10 percent scenario but does not cover costs under the 5 percent scenario. However, we know that Pūhoro students are already achieving success rates 15% over the national average, making this scenario highly unlikely. More likely is the 20% scenario that Pūhoro is working towards, under which costs would be covered by a factor of 3.8

For the University program (Table 4Table 4), we again altered the Pūhoro effect assumptions to test the robustness of conclusions.

Table 4. Sensitivity analysis of Pūhoro's impact – University program

	Base Scenario	**Half Impact**	**Quarter Impact**
40-Year NPV ($m)			
Total marginal impact	113	48	28
Total cost of initiative	-0.9	-0.9	-0.9
Net economic benefits	112	47	27
Average net economic benefit per cohort member (40y)	0.38	0.15	.089
CBA Ratio	124.9	53.3	31.3

Table 4 shows that the Pūhoro Academy University program covers its costs by a factor of 31.3 under the most pessimistic scenario to 124.9 times in what we consider the most likely scenario.

Due to the significant lifetime benefits possible through higher educational achievement, the Pūhoro Academy covers its costs under almost all scenarios. It provides a significant economic benefit under the primary scenario. Hence, the fundamental conclusion of the analysis, that the Pūhoro Academy is likely to continue generating a positive economic impact is robust.

The stated intentions of the Pūhoro Academy students suggest that the Academy has had a significant impact on their future educational pathways. The analysis has assumed that these students will continue to receive support from the Pūhoro Academy throughout their tertiary studies. However, even in the absence of this support, it is likely that these students have been put on an educational pathway they are unlikely to have followed without the support of Pūhoro.

Because the intervention targets young people, the economic benefits continue for a long time, up to 40 years. Hence, the total benefits to a participant are substantial. More significant gains come from the successful completion of higher levels of qualifications. In addition, Pūhoro is targeting STEMM qualifications, which tend to attract larger salaries than other fields.

Multiplier Analysis – Broad National Impacts

A multipliers analysis considers the immediate financial and employment impacts of business activities and the beneficial ripples through the community that these activities can generate. The analysis is based on isolating the effects of Pūhoro's contribution to the education industry and the subsequent flow on impact to the national economy from this contribution. Multipliers are a measure of an Industry's connection to the broader economy by way of input purchases, payments of wages and taxes, and other transactions.

Economic activity has direct and indirect effects in that the demand for a product or service draws in inputs from other sectors. For example, Pūhoro requires inputs from other industries outside education, such as Postal Services, Publishing Businesses, Telecommunications, Rental Services, and many more. By purchasing inputs from suppliers, Pūhoro generates income for people who supply Pūhoro (e.g., cleaners, caterers, suppliers, etc.). These people will then spend some of their income on inputs for other businesses. Evaluating the national economic impacts of Pūhoro requires assessing these flow-on multiplier effects. Multipliers make it possible to identify the direct, indirect, and induced effects in terms of expenditure, overall economic impact, and full-time equivalent (FTE) employment. For the multipliers analysis, Pūhoro is classified as being in the 'Adult, community, and other education' sector.

Input-output tables are a powerful analytical tool for describing multiplier effects. Input-output analysis looks at the product of each enterprise as a commodity demanded for final consumption and as a factor in the production of itself and other goods. The process consists of constructing an input-output table where the rows describe how one enterprise's total product is divided among various production processes and final consumption, and the columns denote the combination of productive resources used within an industry.

1. *Direct impacts* result from direct spending injected into the local and national economy by Pūhoro's economic activity.
2. *Indirect impacts* result from downstream revenue created by other firms selling goods and services to organisations operating in the related sector.
3. *Induced impacts* are the effects of the above two contributions on further household spending, which generates revenue due to increased purchases of household goods and services.

In presenting the results, we use Type I and Type II multipliers:

- Type 1 - A measure of an industry's connection to the wider local economy by way of input purchases only (no induced effects, no institutions internalised). Calculated as (Direct Effects + Indirect Effects) / (Direct Effects).
- Type 2 - A measure of an industry's connection to the wider local economy by way of input purchases, payments of wages and taxes, and other transactions. Calculated as (Direct Effects + Indirect Effects + Induced Effects) / (Direct Effects).

The employment multiplier, expressed as full-time equivalent or FTE, is the ratio of direct plus indirect (plus induced if Type II multipliers are used) employment changes to the direct employment change. In other words, if you have the change in FTE employment for the industry, the employment multiplier can be used to calculate the change in FTE employment for the economy as a whole.

For this report, we used national Input-Output tables developed by Insights Economics. These tables are based on the most recent National Accounts provided by Statistics New Zealand. These data allow the study of individual enterprises and their interrelationships as reflected in sectoral multipliers. In analysing these inter-relationships, it is necessary to think in terms of an equilibrium model, where the effects of an exogenous change in any one enterprise can be traced through the entire economy. In our previous report, we provided a regional analysis, while here, we provide figures at a national scale. This decision was made for two reasons. First, Pūhoro now operates across most regions in New Zealand, and second, the accessible regional multipliers are based on 2017 data and are, therefore, less accurate than the latest national release.

Results

The first assessment of impact we make is known as 'Value Added' (Table 5). Value added can be thought of as a contribution to regional GDP. It is the level of value added per unit of economic output. For example, a direct value-added ratio of 0.7 means that for every million dollars of economic output Pūhoro generates, $700,000 of value is directly added to the regional economy. We also model indirect value added. Indirect value added is the additional value added to the regional economy as supporting industries increase their economic output to serve Pūhoro's needs. Finally, we include induced value added, quantifying the change in employee household personal consumption expenditures due to direct and indirect changes.

Value Added (GDP) Multipliers

Value Added reflects the total economic value an organisation adds to GDP (Table 5). It encompasses not only the direct output of the organisation but also the indirect and induced effects that result from its operations. It measures the contribution to the economy in terms of goods and services produced, reflecting increases in efficiency, productivity, and economic output.

Table 5. Value Added (GDP) Multipliers - based on an economic output of $2,335,640

Industry	Direct	Indirect	Induced	Type I	Type II
Adult, community, and other education multipliers	0.55	0.34	0.32	1.63	2.20
Impact	$1,287,062	$804,633	$739,770	$3,795,814	$5,138,279

Type I Multiplier: $3,795,814.

The Type I multiplier of 1.63 suggests that for every dollar of direct output in the education sector, an additional $0.63 of value is added to the economy through indirect activities. Indirect activities include the goods and services the education sector purchases from other industries, such as educational materials, utilities, and services. This multiplier considers the supply chain effects, not the broader economic impacts of employee spending.

Type II Multiplier: $5,138,279.

The Type II multiplier is larger, at 2.20, indicating that for every dollar of direct output, the total value added to the GDP is $2.20 when considering direct, indirect, and induced effects. Induced effects are the economic activity generated by spending incomes earned in direct and indirect activities. For example, when teachers and staff spend their salaries on housing, food, and other personal services, it stimulates further economic activity.

Gross Household Income Multipliers

The Gross Household Income multiplier measures the impact of an organisation's operations on personal incomes across the economy, including direct employees and those in the supply chain and broader economy (Table 6). It captures the effect on households' living standards and spending power, which can lead to increased consumption and further economic activity. The Gross Household Income Multipliers indicate the impact of output in the adult, community, and other education sector on household income across the economy. This measurement is crucial because it shows the extent to which the industry contributes to the earning capacity of households, which can have further implications for consumption and investment patterns.

Table 6. Gross Household Income Multipliers - based on an economic output of $2,335,640

Industry	Direct	Indirect	Induced	Type I	Type II
Adult, community, and other education multipliers	0.36	0.15	0.12	1.43	1.77
Impact	$835,328	$359,906	$280,864	$3,341,964	$4,127,282

Type I Multiplier: $3,341,964.

The Type I multiplier combines direct and indirect effects to show that for every dollar of output, there is a $1.43 increase in household income. This multiplier does not include the consumption-related (induced) effects but gives a measure of the impact of the industry's operation and its immediate supply chain.

Type II Multiplier: $4,127,282.

The Type II multiplier, which is higher at 1.77, considers the direct, indirect, and induced effects. It suggests that for every dollar of output, total household income in the economy increases by $1.77 when accounting for all three levels of economic activity. This is a more comprehensive measure of the impact on household income and reflects the full economic cycle, from production to wage spending.

For an education provider, these multipliers are indicative of the sector's capacity to influence economic well-being. The Type I multiplier is useful for understanding the immediate impact of the sector's output on household incomes, including those employed by the sector and its suppliers. The Type II multiplier provides insight into the extended impact, including the additional household income generated by the subsequent spending of wages earned in the sector and its supply chain.

These multipliers suggest that Pūhoro has a significant impact on gross household income, highlighting its role not just as an educational service provider but also as a contributor to the economic prosperity of households. This information can be used by policymakers and education providers to advocate for investments in the sector, showcasing the broader financial benefits to the economy and households.

Employment Multipliers

Employment multipliers provide insight into the broader impact that spending in the education sector has on job creation beyond the initial investment or expenditure (Table 7). For an education provider, these multipliers help in understanding not only how many jobs are directly created within the institution due to spending (such as hiring teachers and administrative staff) but also the wider economic implications of this spending. We have based the analysis on 40 FTE staff at Pūhoro.

Table 7. ***Employment (FTE) Multipliers – based on an economic output of $2,335,640 and 40 FTE***

Industry	Direct	Indirect	Induced
Adult, community, and other education multipliers	-	2.49	2.24
FTE Impact	40	5.7	5.1

Indirect Jobs created: 5.7FTE

The indirect multiplier reflects the number of jobs created in other industries as a result of the institution's spending. For Pūhoro, this would encompass the jobs generated because of the institution's purchases of goods and services necessary for its operation. In essence, the indirect multiplier captures the 'ripple' effect in the economy due to the education provider's procurement activities.

Induced Jobs Created: 5.1 FTE

The induced multiplier measures the number of jobs created across the economy as employees in the direct and indirect sectors spend their incomes. For employees of the education provider and its suppliers, this spending can create jobs in a variety of sectors, such as Retail jobs, as employees buy consumer goods or Real estate and housing-related jobs, as employees pay rent or purchase homes. This multiplier is an indicator of how the spending power of wages earned within and in connection with the education provider supports broader economic activity and job creation.

Both indirect and induced multipliers are critical for understanding the full economic impact of Pūhoro. They demonstrate that the value of an educational institution to the economy extends far beyond the jobs it creates directly. The full measure of its economic contribution includes the additional employment sustained in a wide array of sectors due to its operational spending and the subsequent spending by the people it employs.

Multipliers Summary

While value-added and gross household income both measure economic impact, they do it differently, and their values cannot be simply added together. Instead, each multiplier should be applied to its relevant base figure (e.g., output for Value Added and salaries for Household Income) to calculate the total economic impact in monetary terms. It's important to note that these multipliers may already capture some overlapping effects, especially in the induced component, as household incomes contribute to GDP. Hence, simply summing the multipliers could double-count some aspects of the economic impact. Therefore, the broad impact of Pūhoro on the national economy should be understood by studying each multiplier independently.

Social Impacts

The Cost-Benefit Analysis (CBA) conducted focuses primarily on the direct benefits received by students participating in the Pūhoro Academy. Despite this, it is acknowledged that broader social benefits likely emerge from such educational initiatives. The challenge in quantifying these benefits lies in the complexity of social impact measurement and the relative scarcity of comprehensive data. Available financial analyses tend to emphasise costs over benefits, offering a limited perspective on the full value of education.

Higher levels of education in New Zealand are associated with significant social benefits. Research and statistical data show that higher education leads to better employment prospects and higher lifetime earnings, contributing to improved well-being and more satisfying lives (Theodore et al., 2018) (Alimi, Maré, & Poot, 2018). For Māori individuals, higher education success is seen as a key enabler for transformation, providing opportunities to build critical consciousness, accrue material wealth, and contribute to collective transformation (Grootveld 2013). Furthermore, completing a qualification in the tertiary education system in New Zealand is associated with higher earnings and employment rates, with the biggest jump in earnings observed between those with qualifications below degree level and those with degrees (Zaneta, et al 2014). Tertiary certificates and diplomas at different levels are associated with varying employment rates and income levels compared to school qualifications or no qualifications. Level 1 to 3 certificates are linked to lower employment and income than school qualifications but better than having no qualifications. Level 4 certificates show higher employment rates, especially for men in trades qualifications. Diplomas are associated with similar employment rates as bachelor's degrees (Earl 2010). Women with diplomas tend to have better health, higher life satisfaction, engage more in volunteering, and read more to their children compared to women with no qualifications. These social benefits are less evident for men (Earl 2010).

Māori and Pacific graduates exhibit higher levels of volunteerism and are more inclined to support others financially, indicating significant contributions to societal well-being (Theodore et al., 2018). While direct references to health benefits from education in the literature are sparse, the holistic benefits of higher education—such as improved employment outcomes, financial stability, and enhanced societal engagement—indirectly contribute to better health outcomes.

The Treasury (2017) report shed light on potential service costs associated with at-risk youth, identifying categories of expenses such as income support, correctional services, and child and youth services. In terms of 2024 dollars, projected service costs for individuals not considered at-risk fall below $ 58,583per person by age 35. Conversely, for those in various risk categories, costs escalate to between $ $ 210,899 and $ 480,380. Key risk indicators include maternal education levels, with the lack thereof being linked to increased dependency on social services. Exposure to a single risk factor could elevate service costs by an additional $ 76,158 by age 35, escalating with each additional risk.

Research by Wolfe & Haveman (2002)

Wolfe & Haveman (2002) describe multiple non-market benefits from education including:

- a likely positive link between one’s own schooling and the schooling received by one’s children.

- a likely positive association between one's own schooling and the health status of one's family members.
- a likely positive relationship between one's own education and one's own health status.
- a likely positive relationship between one's own education and the efficiency of choices made, such as consumer choices (the efficiency of which contributes to a wellbeing similar to the contribution of money income).
- a relationship between one's own schooling and fertility choices (for example, decisions of one's female teenage children regarding nonmarital childbearing).
- a relationship between schooling in one's neighbourhood and youth decisions regarding their level of schooling, nonmarital childbearing, and participation in criminal activities.

Baum & Payea (2013) provide further non-financial and somewhat more personal benefits that can be generated by increased education:

- Increased job satisfaction and associated wellbeing.
- Increase likelihood to vote in elections.
- Less likely to smoke.
- Decreased obesity rates.
- Increased family involvement and associated wellbeing.

The Pūhoro Academy illustrates the substantial, multifaceted social benefits of targeted educational programs. These benefits span health improvements, educational advancement, stronger family relationships, wealth creation, and reduced dependency on social services.

Home Ownership

Homeownership represents a critical challenge across New Zealand, with Māori communities facing particularly acute impacts due to declining rates. Data from historical records indicate a dramatic decrease in Māori homeownership, from approximately 74 percent in 1926 to 28 percent in 2013. This trend highlights a significant disparity and poses a range of socio-economic and health-related challenges for Māori populations. The broader implications of homeownership on societal outcomes, such as employment stability, crime reduction, welfare dependency, and asset wealth creation, underscore its importance.

Research suggests a strong correlation between homeownership and various independent factors, including health and educational attainment. Māori, in particular, face socio-economic disadvantages compared to the wider population, affecting their homeownership rates. A study by Whitehead and Walker (2021) identified key socio-economic and non-economic factors influencing Māori homeownership. Among these, income and educational aspirations held by parents for their children

emerged as critical determinants, alongside relationship status. Specifically, the expectation of higher education for children markedly increased their future homeownership prospects.

This research emphasises the role of education in influencing homeownership, with parental educational aspirations playing a pivotal role. The Pūhoro STEM Academy, by fostering educational achievement among Māori youth, could therefore significantly contribute to improving homeownership rates within this community. Whitehead and Walker's analysis categorises individuals into five groups based on socio-economic advantage, revealing that those in the highest advantage group were significantly more likely to achieve homeownership than their counterparts in the lowest.

The decline in Māori homeownership not only reflects broader socio-economic challenges but also underscores the potential of education to alter life trajectories positively. The association between educational achievement and homeownership suggests that initiatives aimed at enhancing educational opportunities for Māori youth, such as the Pūhoro STEM Academy, may offer a pathway to reversing the trend of declining homeownership rates.

Conclusion

Due to the significant lifetime benefits possible through higher educational achievement, the Pūhoro Academy covers its costs under almost all scenarios tested. It provides a significant economic benefit under the primary scenarios. The Pūhoro Academy University programme covers its costs by a factor of 31.3 under the most pessimistic scenario to 124.9 times in what we consider the most likely scenario. The Pūhoro Academy high school program covers its costs by a factor of 1.9 under a more pessimistic scenario but does not cover costs under the most pessimistic scenario that assumes a 5 percent impact over baseline. However, we know that Pūhoro students are already achieving success rates 15% over the national average, making this scenario irrelevant at present and highly unlikely in the near future. More likely is the 20% scenario that Pūhoro is working towards, under which costs would be covered by a factor of 3.8.

The analysis illustrates the power of a successful intervention in a young person's life; in our analysis, Pūhoro is having a significant impact on the lifetime earnings of its students. The conservative assumptions used throughout the report likely underestimate the direct economic impacts that Pūhoro has on its students. The sensitivity analysis indicates that the results from the cost-benefit analysis are robust. The Pūhoro Academy is delivering economic benefits above its costs. These benefits are being realised by students obtaining qualifications that they would not have been likely to obtain in the absence of the Pūhoro Academy, what we have referred to as the 'Pūhoro Effect'. The benefits considered in this analysis will likely ripple out through whānau, both in the present and future.

We quantified a small proportion of these ripple effects. We found that Pūhoro is having a significant economic and social impact on regional economies, stimulating over $5m value added to New Zealand's economy per annum and 5.7 FTE positions outside of Pūhoro's direct operations. We also estimated a $4m per annum impact on household incomes, and 5.1 FTE positions induced from this increase. These figures only account for easily quantifiable impacts and do not account for a wide range of other beneficial impacts Pūhoro is stimulating.

The unquantifiable impacts include multiple wellbeing outcomes in health, employment, social participation, family welfare and many more. We are confident of the impact higher levels of educational achievement have on these wellbeing outcomes; however, few data are available to quantify a direct connection between the Pūhoro STEMM Academy and these outcomes. Despite this limitation, the research has demonstrated a clear and significant positive impact generated by the Pūhoro STEM Academy on young Māori, whanau communities, regional economies, and Aotearoa.

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Appendix A – Tertiary Student Data

Number of students	% of Cohort	Adjusted for success rate (use for Segment of policy intervention cohort per year (%))	Qualification Level	Māori Pass Rate	Māori School leavers in their first year after leaving 2018-2022	Proportion of Pūhoro students getting benefit	Academic Qualification Example	Job Possibility	Entry Salary	Senior Salary	Average	Difference from Counterfactual (8 year 2% growth 100% of Average annual income after tax - Upper secondary school qualification)	Primary Source
2	0.65%	0.003	Bachelor	0.8	14.2	0.51	Bachelor of Dental Surgery (BDS)	Dentist	$129,000	$254,000	$191,500	$134,681	https://www.careers.govt.nz/jobs-database/health-and-community/health/dentist/
11	3.59%	0.018	Bachelor	0.8	14.2	0.51	Bachelor of Medicine and Bachelor of Surgery (MBChB)	General Practitioner	$115,000	$220,000	$167,500	$110,681	https://www.enz.org/salary-general-practitioner.html
4	1.31%	0.007	Bachelor	0.8	14.2	0.51	Bachelor of Applied Science (Medical Imaging Technology)	Diagnostic Radiologist	$64,000	$251,000	$157,500	$100,681	https://www.careers.govt.nz/jobs-database/health-and-community/health/diagnostic-radiologist/
6	1.96%	0.010	Bachelor	0.8	14.2	0.51	Bachelor of Veterinary Science (BVSc)	Veterinarian	$80,000	$220,000	$150,000	$93,181	https://www.careers.govt.nz/jobs-database/animal-care-and-conservation/animal-care/veterinarian/
22	7.19%	0.037	Bachelor	0.8	14.2	0.51	Bachelor of Arts (BA)	Communications Professional	$110,000	$180,000	$145,000	$88,181	https://www.careers.govt.nz/jobs-database/arts-and-media/advertising-marketing/communications-professional/
8	2.61%	0.013	Bachelor	0.8	14.2	0.51	Bachelor of Business (BBus)	Management Consultant	$70,000	$200,000	$135,000	$78,181	https://www.careers.govt.nz/jobs-database/business/management-consulting/management-consultant/
4	1.31%	0.007	Bachelor	0.8	14.2	0.51	Bachelor of Computer and Information Sciences	Software Developer	$110,000	$160,000	$135,000	$78,181	https://www.careers.govt.nz/jobs-database/it-and-telecommunications/information-technology/software-developer/
60	19.61%	0.100	Bachelor	0.8	14.2	0.51	Bachelor of Science (BSc)	Policy Analyst	$75,000	$170,000	$122,500	$65,681	https://www.careers.govt.nz/jobs-database/government-law-and-safety/government/policy-analyst/
1	0.33%	0.002	Bachelor	0.8	14.2	0.51	Bachelor of Contemporary International Studies (BCIS)	Intelligence Officer	$75,000	$170,000	$122,500	$65,681	https://www.careers.govt.nz/jobs-database/government-law-and-

													safety/public-order-safety/intelligence-officer/
1	0.33%	0.002	Bachelor	0.8	14.2	0.51	Bachelor of Arts and Bachelor of Business	Marketing Specialist	$65,000	$170,000	$117,500	$60,681	https://www.careers.govt.nz/jobs-database/arts-and-media/advertising-marketing/marketing-specialist/
3	0.98%	0.005	Bachelor	0.8	14.2	0.51	Bachelor of Accountancy (BAcc)	Accountant	$70,000	$165,000	$117,500	$60,681	https://www.careers.govt.nz/jobs-database/finance-and-property/finance/accountant/about-the-job
6	1.96%	0.010	Bachelor	0.8	14.2	0.51	Bachelor of Commerce (BCom)	Financial Adviser	$80,000	$150,000	$115,000	$58,181	https://www.careers.govt.nz/jobs-database/finance-and-property/finance/financial-adviser/
2	0.65%	0.003	Bachelor	0.8	14.2	0.51	Bachelor of Midwifery (BMid)	Midwife	$77,000	$153,000	$115,000	$58,181	https://www.careers.govt.nz/jobs-database/health-and-community/health/midwife/
13	4.25%	0.022	Bachelor	0.8	14.2	0.51	Bachelor of Nursing (BNurs)	Registered Nurse	$68,000	$153,000	$110,500	$53,681	https://www.careers.govt.nz/jobs-database/health-and-community/health/registered-nurse/
5	1.63%	0.008	Bachelor	0.8	14.2	0.51	Bachelor of Architectural Studies (BAS)	Architect	$75,000	$140,000	$107,500	$50,681	https://www.careers.govt.nz/jobs-database/construction-and-infrastructure/architecture-technical-design-mapping/architect/
3	0.98%	0.005	Bachelor	0.8	14.2	0.51	Bachelor of Creative Media	Copywriter	$50,000	$160,000	$105,000	$48,181	https://www.careers.govt.nz/jobs-database/arts-and-media/advertising-marketing/copywriter/
17	5.56%	0.028	Bachelor	0.8	14.2	0.51	Bachelor of Engineering (Honours) BE(Hons)	Civil Engineer	$90,000	$110,000	$100,000	$43,181	https://www.careers.govt.nz/jobs-database/engineering/engineering/civil-engineer/
1	0.33%	0.002	Bachelor	0.8	14.2	0.51	Bachelor of Radiation Therapy (BRT)	Radiation Therapist	$75,000	$124,000	$99,500	$42,681	https://www.careers.govt.nz/jobs-database/health-and-community/health/radiation-therapist/
2	0.65%	0.003	Bachelor	0.8	14.2	0.51	Bachelor of Resource and Environmental Planning (BRP)	Urban/Regional Planner	$65,000	$130,000	$97,500	$40,681	https://www.careers.govt.nz/jobs-database/government-law-and-safety/government/urbanregional-planner/
13	4.25%	0.022	Bachelor	0.8	14.2	0.51	Bachelor of Laws (LLB)	Barrister	$63,000	$131,000	$97,000	$40,181	https://www.careers.govt.nz/jobs-database/government-law-and-safety/law/barrister/
3	0.98%	0.005	Bachelor	0.8	14.2	0.51	Bachelor of Applied Science (BAppSc)	Geospatial Specialist	$65,000	$120,000	$92,500	$35,681	https://www.careers.govt.nz/jobs-database/construction-and-infrastructure/architecture-technical-design-mapping/geospatial-specialist/
1	0.33%	0.002	Bachelor	0.8	14.2	0.51	Bachelor of Product Design (BProdDesign)	Industrial Designer	$60,000	$120,000	$90,000	$33,181	https://www.careers.govt.nz/jobs-database/construction-and-infrastructure/architecture-technical-design-mapping/industrial-designer/
8	2.61%	0.013	Bachelor	0.8	14.2	0.51	Bachelor of Animal Science (BAnSci)	Agricultural /Horticultural Scientist	$75,000	$105,000	$90,000	$33,181	https://www.careers.govt.nz/jobs-database/farming-fishing-forestry-and-mining/agriculture-

													horticulture/agriculturalhorticultural-scientist/
1	0.33%	0.002	Bachelor	0.8	14.2	0.51	Bachelor of Criminal Justice	Detective	$75,000	$105,000	$90,000	$33,181	https://www.careers.govt.nz/jobs-database/government-law-and-safety/public-order-safety/police-officer/
2	0.65%	0.003	Bachelor	0.8	14.2	0.51	Bachelor of Applied Hospitality and Tourism Management	Hotelmotel Manager	$80,000	$100,000	$90,000	$33,181	https://www.careers.govt.nz/jobs-database/hospitality-tourism-and-recreation/hospitality/hotelmotel-manager/
1	0.33%	0.002	Bachelor	0.8	14.2	0.51	Bachelor of Oral Health (BOH)	Oral Health Therapist	$59,000	$119,000	$89,000	$32,181	https://www.careers.govt.nz/jobs-database/health-and-community/health/oral-health-therapist/
18	5.88%	0.030	Bachelor	0.8	14.2	0.51	Bachelor of Social Work (BSW)	Social Worker	$59,000	$118,000	$88,500	$31,681	https://www.careers.govt.nz/jobs-database/health-and-community/community-services/social-worker/
25	8.17%	0.042	Bachelor	0.8	14.2	0.51	Bachelor of Health Sciences (BHealSc)	Health Promoter (High Range)	$58,000	$119,000	$88,500	$31,681	https://www.careers.govt.nz/jobs-database/health-and-community/health/health-promoter/
2	0.65%	0.003	Bachelor	0.8	14.2	0.51	Bachelor of Pharmaceutical Science (BPharmSc)	Pharmacist	$58,000	$119,000	$88,500	$31,681	https://www.careers.govt.nz/jobs-database/health-and-community/health/pharmacist/
1	0.33%	0.002	Bachelor	0.8	14.2	0.51	Bachelor of Performing and Screen Arts	Art Director	$55,000	$119,000	$87,000	$30,181	https://www.payscale.com/research/NZ/Job=Art_Director/Salary
4	1.31%	0.007	Bachelor	0.8	14.2	0.51	Bachelor of Design with Honours (BDes(Hons))	Graphic Designer	$65,000	$105,000	$85,000	$28,181	https://www.careers.govt.nz/jobs-database/arts-and-media/creative-design/graphic-designer/
4	1.31%	0.007	Bachelor	0.8	14.2	0.51	Bachelor of Education (Teaching)	Secondary School Teacher	$50,000	$103,000	$76,500	$19,681	https://www.careers.govt.nz/jobs-database/education-and-social-sciences/education/secondary-school-teacher/
8	2.61%	0.013	Bachelor	0.8	14.2	0.51	Bachelor of Sport and Exercise	Sports Coachoffici al	$47,000	$80,000	$63,500	$6,681	https://www.careers.govt.nz/jobs-database/hospitality-tourism-and-recreation/sport-and-recreation/sports-coachofficial/
1	0.33%	0.001	Certificate	0.6 5	22.5	0.43	New Zealand Certificate in Music	Music Teacher	$60,610	$101,270	$80,940	$24,121	https://www.salaryexpert.com/salary/job/music-teacher/new-zealand
1	0.33%	0.001	Certificate	0.6 5	22.5	0.43	Certificate in Core Policing	Police Officer	$75,000	$83,000	$79,000	$22,181	https://www.careers.govt.nz/jobs-database/government-law-and-safety/public-order-safety/police-officer/
1	0.33%	0.001	Certificate	0.6 5	22.5	0.43	New Zealand Certificate in Early Childhood Education and Care	Early Childhood Teacher Kaiako	$57,000	$100,000	$78,500	$21,681	https://www.careers.govt.nz/jobs-database/education-and-social-sciences/education/early-childhood-teacher-kaiako/

1	0.33%	0.001	Certificate	0.65	22.5	0.43	New Zealand Certificate in Distribution	Purchasing/ Supply Officer	$55,000	$100,000	$77,500	$20,681	https://www.careers.govt.nz/jobs-database/business/management-consulting/purchasingsupply-officer/
2	0.65%	0.003	Certificate	0.65	22.5	0.43	Military Medic Technician	Army Officer	$51,000	$101,000	$76,000	$19,181	https://www.careers.govt.nz/jobs-database/government-law-and-safety/defence/army-officer/
1	0.33%	0.001	Certificate	0.65	22.5	0.43	New Zealand Certificate in Commercial Barbering	Hairdresser /Barber	$47,000	$100,000	$73,500	$16,681	https://www.careers.govt.nz/jobs-database/retail-and-personal-services/hair-beauty/hairdresserbarber/
1	0.33%	0.001	Certificate	0.65	22.5	0.43	Certificate in Engineering (TBC)	Earthmoving Machine Operator	$52,000	$83,200	$67,600	$10,781	https://www.careers.govt.nz/jobs-database/construction-and-infrastructure/construction/earthmoving-machine-operator/
1	0.33%	0.001	Certificate	0.65	22.5	0.43	New Zealand Certificate in Cookery	Chef	$47,840	$79,040	$63,440	$6,621	https://www.careers.govt.nz/jobs-database/hospitality-tourism-and-recreation/hospitality/chef/
1	0.33%	0.001	Certificate	0.65	22.5	0.43	New Zealand Certificate in Fashion	Fashion Designer	$40,000	$82,000	$61,000	$4,181	https://www.payscale.com/research/NZ/Job=Fashion_Designer/Salary
4	1.31%	0.006	Certificate	0.65	22.5	0.43	Certificate in Applied Science	Medical Laboratory Technician	$48,000	$67,000	$57,500	$681	https://www.careers.govt.nz/jobs-database/health-and-community/health/medical-laboratory-technician/
3	0.98%	0.004	Certificate	0.65	22.5	0.43	Certificate in Automotive Engineering	Automotive Technician	$45,136	$69,014	$57,075	$256	https://www.careers.govt.nz/jobs-database/engineering/automotive/automotive-technician/
3	0.98%	0.004	Certificate	0.65	22.5	0.43	Certificate in Health Sciences CertHSc	Dental Assistant	$47,000	$62,000	$54,500	-$2,319	https://www.careers.govt.nz/jobs-database/health-and-community/health/dental-assistant/
1	0.33%	0.001	Diploma	0.65	22.5	0.43	New Zealand Diploma in Engineering (Electrical)	Electrical Engineer	$77,000	$210,000	$143,500	$86,681	https://www.careers.govt.nz/jobs-database/engineering/engineering/electrical-engineer/
1	0.33%	0.001	Diploma	0.65	22.5	0.43	New Zealand Diploma in Architectural Technology	Architectural Technician	$70,000	$125,000	$97,500	$40,681	https://www.careers.govt.nz/jobs-database/construction-and-infrastructure/architecture-technical-design-mapping/architectural-technician/
1	0.33%	0.001	Diploma	0.65	22.5	0.43	Diploma in Science and Technology (DipScTech)	Information Technology Helpdesk/Support Technician	$60,000	$120,000	$90,000	$33,181	https://www.careers.govt.nz/jobs-database/it-and-telecommunications/information-technology/information-technology-helpdesksupport-technician/
1	0.33%	0.001	Diploma	0.65	22.5	0.43	Heke Mātauranga Māori - Diploma in Mātauranga Māori	People and Culture Advisor	$75,000	$82,000	$78,500	$21,681	https://www.glassdoor.co.nz/Salaries/people-and-culture-advisor-salary-SRCH_KO0,26.htm#:~:text=The%20national%20average%20salary%20for,advisor%20salaries%20in%20your%20area.
2	0.65%	0.003	Diploma	0.65	22.5	0.43	New Zealand Diploma in Business	Office Manager	$60,000	$85,000	$72,500	$15,681	https://www.careers.govt.nz/jobs-database/business/administration/office-manager/

1	0.33%	0.001	Diploma	0.65	22.5	0.43	Health and Wellness Diploma	Health Promoter	$58,000	$87,000	$72,500	$15,681	https://www.careers.govt.nz/jobs-database/health-and-community/health/health-promoter/
1	0.33%	0.001	Diploma	0.65	22.5	0.43	Diploma in Outdoor and Adventure Education	Recreation Co Ordinator	$47,000	$83,000	$65,000	$8,181	https://www.careers.govt.nz/jobs-database/hospitality-tourism-and-recreation/sport-and-recreation/recreation-co-ordinator/
1	0.33%	0.001	Diploma	0.65	22.5	0.43	Diploma in Te Tohu Paetahi (DipTTP)	Teacher Aide	$47,840	$76,960	$62,400	$5,581	https://www.careers.govt.nz/jobs-database/education-and-social-sciences/education/teacher-aide/
2	0.65%	0.003	Diploma	0.65	22.5	0.43	New Zealand Diploma in Beauty Therapy	Beauty Therapist	$50,000	$70,000	$60,000	$3,181	https://www.careers.govt.nz/jobs-database/retail-and-personal-services/hair-beauty/beauty-therapist/
1	0.33%	0.001	Diploma	0.65	22.5	0.43	New Zealand Diploma in Veterinary Nursing	Veterinary Nurse	$50,000	$60,000	$55,000	-$1,819	https://www.careers.govt.nz/jobs-database/animal-care-and-conservation/animal-care/veterinary-nurse/
1	0.33%	0.002	Graduate Diploma	0.82	14.2	0.51	Graduate Diploma of Learning and Teaching (GradDipLnTchg)	Career Consultant	$51,000	$103,000	$77,000	$20,181	https://www.careers.govt.nz/jobs-database/health-and-community/community-services/career-consultant/
1	0.33%	0.002	Graduate Diploma	0.82	14.2	0.51	Graduate Diploma in Tourism and Hospitality Management	Event Manager	$47,000	$75,000	$61,000	$4,181	https://www.careers.govt.nz/jobs-database/hospitality-tourism-and-recreation/hospitality/event-manager/
3	0.98%	0.005	Masters	0.82	14.2	0.51	Master of Engineering	Project Manager	$90,000	$170,000	$130,000	$73,181	https://www.careers.govt.nz/jobs-database/business/management-consulting/project-manager/
1	0.33%	0.002	Masters	0.82	14.2	0.51	Master of Information Sciences (MInfSc)	Systems Administrator	$85,000	$145,000	$115,000	$58,181	https://www.careers.govt.nz/jobs-database/it-and-telecommunications/information-technology/systems-administrator/
4	1.31%	0.007	Masters	0.82	14.2	0.51	Master of Arts	Communications Professional (High Range)	$60,000	$150,000	$105,000	$48,181	https://www.careers.govt.nz/jobs-database/arts-and-media/advertising-marketing/communications-professional/
2	0.65%	0.003	PhD	0.82	14.2	0.51	PhD	Tertiary Lecturer	$60,000	$213,000	$136,500	$79,681	https://www.careers.govt.nz/jobs-database/education-and-social-sciences/education/tertiary-lecturer/


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