

chapter four

TERTIARY EDUCATION OUTCOMES

INTRODUCTION

This chapter explores some of the outcomes of tertiary education and looks at the evidence for the benefits that people hope to gain from tertiary education. Tertiary education sector outcomes are linked to the concept of 'human capital'. Human capital includes the set of skills that individuals develop, enhance or maintain, usually through education or training, and then offer in return for earnings in the labour market.

This chapter draws from the Census, Statistics New Zealand's *Household Labour Force Survey* (HLFS), the integrated dataset on Student Loan Scheme borrowers, the Statistics New Zealand report: *Human Capital Statistics 2003*¹, studies analysing the impact of tertiary qualifications on income, and other surveys. It focuses on the following areas:

- the attainment of educational qualifications
- the employment status of those with tertiary qualifications
- the income of those with tertiary qualifications, and
- the link between education and economic growth.

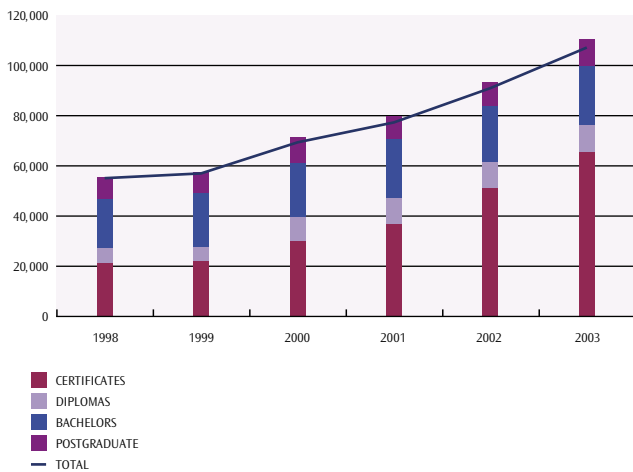
In addition, the chapter touches on information on living standards.

The educational attainment of the adult population highlights the qualifications achieved by individuals and is a measure of the supply of skills in different fields and at different levels of study. The relationship between educational attainment and employment is an indicator of the long-term outcomes of the tertiary education system for individuals. Earnings are also positively related to educational attainment, and the section in this chapter on income examines the earnings of people with different educational attainments.

QUALIFICATIONS ATTAINMENT

An increasing number of New Zealanders are attaining tertiary-level qualifications, most noticeably certificates. Between 2000 and 2003, the number of students completing a tertiary level qualification rose by 51 percent from 68,717 to 103,748. The rise in total completions was almost entirely driven by an increase in certificate completions of 116.8 percent – from 29,972 to 64,969². The remaining qualification categories showed more modest rates of increase. Students completing diplomas increased by 23.3 percent, bachelors degrees 2.0 percent, and postgraduate qualifications decreased by 1.8 percent.

FIGURE 4.1: STUDENTS COMPLETING BY TYPE OF QUALIFICATION 1998-2003



Notes:

- ¹ Data prior to 2000 excludes completions from private training establishments (PTEs) and other tertiary education providers (OTEPs).
- ² 'Certificates' include certificates from levels 1 to 4.
- ³ 'Diplomas' include diplomas from levels 5 and 6.
- ⁴ Students have been counted in each type of qualification they completed. Hence the sum may not add to the total number of students.

The annual growth rate of students completing bachelors degree and postgraduate qualifications has fallen since 2000. Between 1998 and 1999, the number of students completing a bachelors degree increased by 10.3 percent, whereas between 2000 and 2003 the average annual rate of growth was just 0.7 percent. There is a similar trend in completion of postgraduate qualifications, where between 1998 and 2000 the number of students completing increased by an average annual growth rate of 9.5 percent per year, but between 2000 and 2003 this average annual growth rate decreased by 0.6 percent.

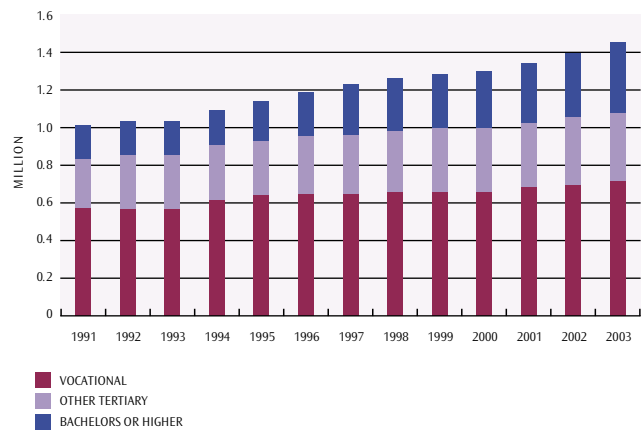
¹ Statistics New Zealand (2003), *Human Capital Statistics*.

² Wānanga students contributed 55.0 percent of this increase.

The growth in completions is reflected in the New Zealand population as a whole. Statistics from the *Household Labour Force Survey* (HLFS) show a trend for an increasing proportion of the population to hold tertiary-level qualifications. This trend has been especially pronounced since 1994. Looking at the data from the HLFS by the type of highest tertiary qualification attained, it is apparent that the growth in qualifications between 1994 and 2003 was driven mostly by people attaining qualifications at bachelors level or higher. The number of people in the population as a whole with a bachelors degree or higher qualification increased by 92.1 percent from 195,100 to 374,800 between 1994 and 2003. By comparison, the number of people with a tertiary qualification below bachelors level increased by 22.5 percent from 295,000 to 361,300 and the number of people with a vocational qualification rose by 17.5 percent from 607,600 to 714,000.

While the largest growth between 1994 and 2003 was in those people holding bachelors qualifications, the expansion of enrolments and completions at the sub-degree level since 2000 is expected to lead to faster growth in sub-degree qualifications over the next decade.

FIGURE 4.2: HIGHEST TERTIARY-LEVEL QUALIFICATION ATTAINED BY POPULATION AGED 15 AND OVER 1991-2003



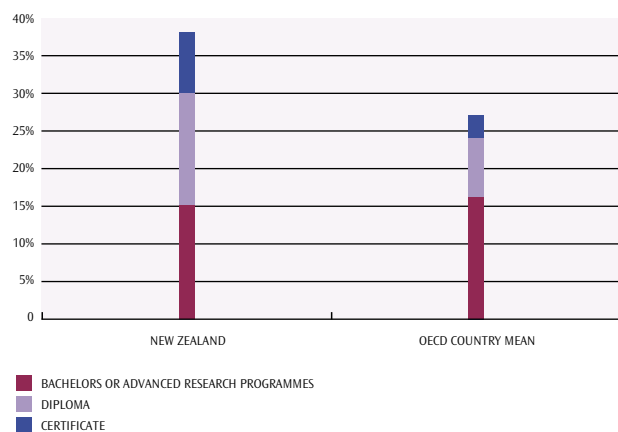
Notes:

- ¹ Data is for the June quarter in each year.
- ² Bachelors or higher qualifications include postgraduate degrees, certificates or diplomas.
- ³ Other tertiary qualifications include university certificates or diplomas, teaching certificates or diplomas, nursing certificates or diplomas, New Zealand certificates or diplomas, and other tertiary qualifications.
- ⁴ Vocational qualifications include technicians' certificates, local polytechnic certificates or diplomas, and trade certificates or advanced trade certificates.

Source: Statistics New Zealand, *Household Labour Force Survey*.

Organisation for Economic Cooperation and Development (OECD) data shows that New Zealand compares favourably with the OECD average in terms of educational attainment. The OECD's publication *Education at a Glance: OECD Indicators 2004*³ observed that, in 2002, 38 percent of the New Zealand population aged 25 to 64 years had achieved a tertiary-level qualification, compared with an OECD country mean of 26 percent. However, as can be seen in the following graph, it is at the sub-degree level that New Zealand outperforms the OECD average, with the proportion holding a bachelor-level qualification or higher (15 percent) being roughly the same as the OECD mean (16 percent).

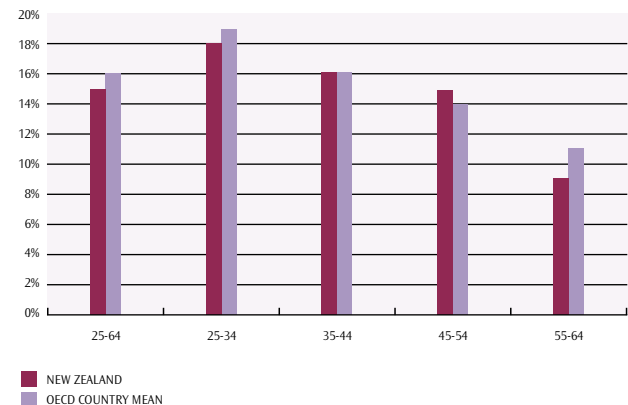
FIGURE 4.3: DISTRIBUTION OF THE 25 TO 64-YEAR-OLD POPULATION BY HIGHEST LEVEL OF QUALIFICATION 2002



Source: OECD, *Education at a Glance: OECD Indicators 2004*.

A pattern of increasing attainment over time is observed in the OECD data. Figure 4.4 shows that in the younger age bands, a significantly larger proportion of the population, both in New Zealand and in the OECD as a whole, holds tertiary qualifications at bachelors degree level or above.

FIGURE 4.4: PERCENTAGE OF POPULATION WITH BACHELORS QUALIFICATIONS OR ABOVE BY AGE GROUP 2002



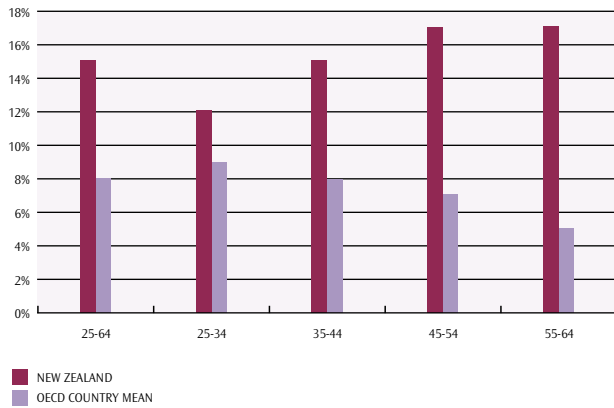
Source: OECD, *Education at a Glance: OECD Indicators 2004*.

The proportion holding a bachelors degree or above is especially high in the 25 to 34 age group, where 18 percent of the New Zealand population has a degree-level qualification. This compares with 16 percent in the 35 to 44 age group, 15 percent in the 45 to 54 age group, and 9 percent in the 55 to 64 age group. This increase reflects the large increase in enrolments in, and hence completion of, higher-level qualifications in New Zealand in the period since 1990. Overall, the proportion of the New Zealand population holding a degree-level qualification is similar to the OECD mean.

The proportion of New Zealanders who have completed diploma-level qualifications is higher than the OECD mean in every age group. However, whereas the proportion with degree-level qualifications is higher in younger age groups, the proportion with diploma-level tertiary qualifications is lower in younger age groups, reflecting the shift towards enrolments in higher qualifications during the 1990s.

³ OECD (2004), *Education at a Glance: OECD Indicators 2004*, Paris: Organisation for Economic Co-operation and Development.

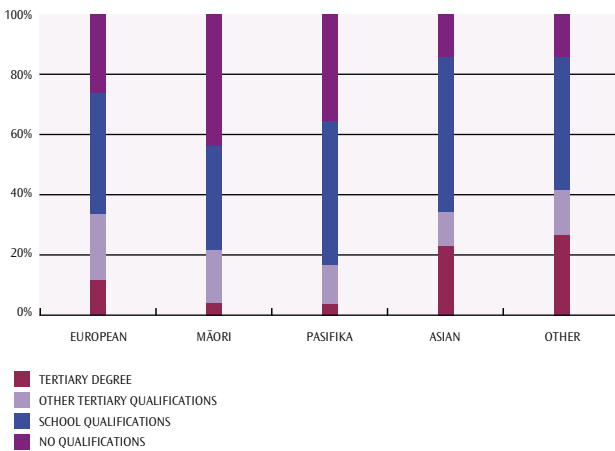
FIGURE 4.5: PERCENTAGE OF POPULATION WITH DIPLOMA-LEVEL QUALIFICATIONS BY AGE GROUP 2002



Source: OECD, *Education at a Glance: OECD Indicators 2004*.

There are differences between ethnic groups in the qualification attainment levels of the population. In 2001, the proportion of adults of European ethnicity with no qualifications was 26 percent, for Māori it was 44 percent, for Pasifika it was 36 percent, and for Asians it was 16 percent. Likewise, the proportion of adults of European ethnicity who had a bachelors degree or higher was 12 percent, for Māori it was 5 percent, for Pasifika 4 percent, and for Asians 23 percent.

FIGURE 4.6: DISTRIBUTION OF POPULATION AGED 15 AND OVER BY HIGHEST QUALIFICATION LEVEL AND ETHNIC GROUP 2001



Note: Ethnic group is compiled on a total response basis.

Source: Statistics New Zealand, *Census of Population and Dwellings, 2001*.

In terms of ethnicity, those people most likely to have post-school qualifications were in the 'other' ethnic group (40.8 percent). This compared with 34.1 percent for those of European ethnicity and 34.2 percent for those in the Asian ethnic groups. Those people of Māori and Pasifika ethnicity were less likely to have post-school qualifications (21.2 percent and 17.0 percent respectively).

LABOUR MARKET OUTCOMES

The attainment of tertiary level qualifications has a positive impact on the likelihood of a person gaining employment. In the key area of employment, the likelihood of being in paid employment increases for individuals with higher level qualifications.

Data from the 2001 Census illustrates this relationship.

FIGURE 4.7A: MALE UNEMPLOYMENT RATE BY AGE GROUP AND QUALIFICATION LEVEL 2001

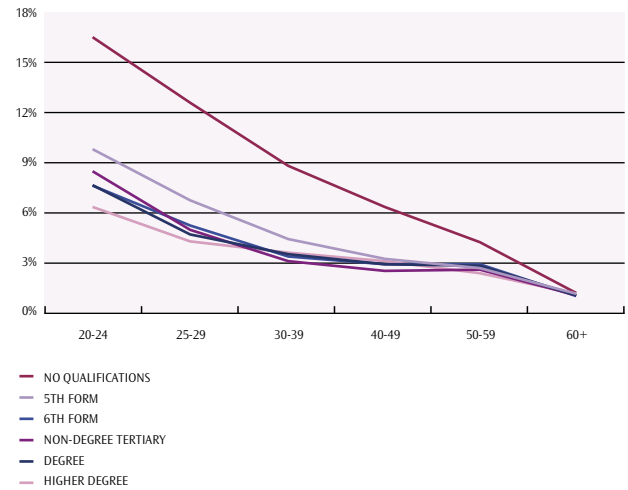
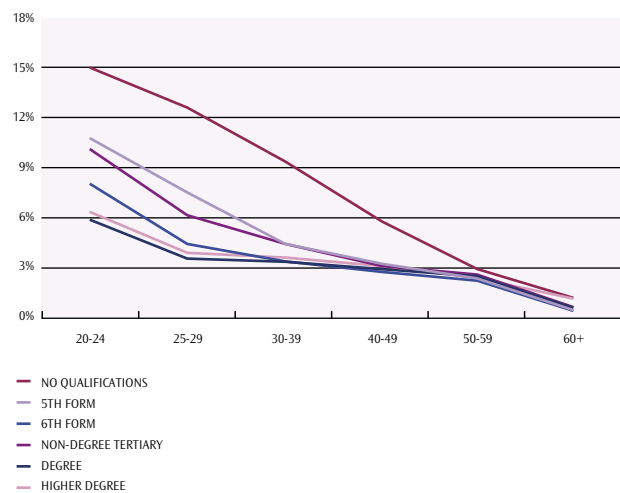


FIGURE 4.7B: FEMALE UNEMPLOYMENT RATE BY AGE GROUP AND QUALIFICATION LEVEL 2001



Source: Ministry of Education unpublished report, *What Can the Population Census Tell Us About Education?* Data from the *Census of Population and Dwellings, 2001*.

People with no qualifications at all had an unemployment rate of 11.1 percent, those with school qualifications 7.0 percent, and those with higher degrees 3.6 percent.

Female unemployment rates for those over the age of 25 were the same as, or higher than, those for males across all qualification levels.

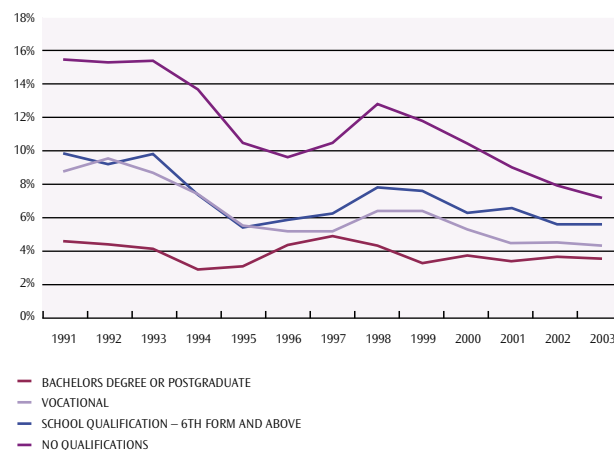
When non-degree tertiary qualifications are examined in more detail, men with basic vocational qualifications were more likely to be unemployed than those with either a school qualification of at least year 12 level⁴ or another non-degree qualification. This applies particularly to men aged 25 or above.

That pattern does not hold for women, and especially for younger women, where additional qualifications bring increases in the probability of being employed. While those with a tertiary qualification were a little more likely to be employed than those with a school qualification, the main difference is between women with a qualification and those without a formal qualification.

⁴ The standard year 12 qualification at that time was Sixth Form Certificate which was replaced by the National Certificate of Educational Achievement (NCEA) level 2 in 2003.

The HLF5 data displays the high qualification/low unemployment rate relationship over time. It is noticeable that the unemployment rate for those with degrees or postgraduate qualifications was more stable over the economic cycle than for those with other qualifications, and especially for those with no qualifications. In addition, the gap between the unemployment rate for those with vocational qualifications and those with degree-level qualifications, which was significant in the early 1990s, had narrowed to less than one percentage point by 2003.

FIGURE 4.8: UNEMPLOYMENT RATE OF THE POPULATION AGED 15 AND OVER BY HIGHEST QUALIFICATION 1991-2003

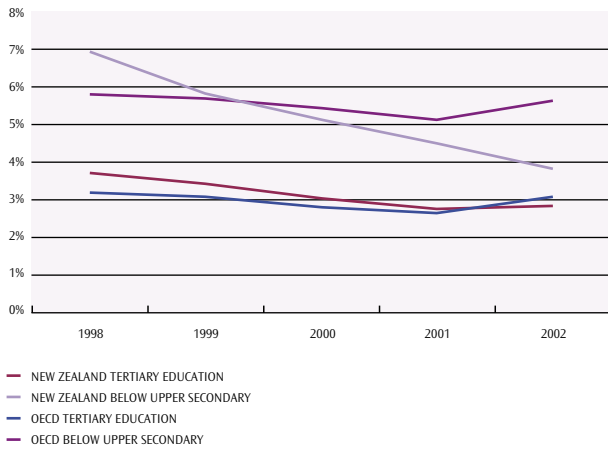


Note: The figures are for the June quarter in each year.

Source: Statistics New Zealand, *Household Labour Force Survey*.

The OECD's publication *Education at a Glance 2004* reported a similar trend of a lower unemployment rate for people with higher-level educational qualifications. In 2002, the unemployment rate for people in New Zealand aged between 25 and 64 years with a tertiary education was 2.8 percent, compared with an unemployment rate of 3.8 percent for those with education below upper secondary level. The unemployment rate for those with a tertiary education has shown a gradual improvement relative to the OECD country mean since 1998, with the rate falling below the OECD mean in 2002.

FIGURE 4.9: UNEMPLOYMENT RATE OF THE POPULATION AGED 25-64 BY HIGHEST QUALIFICATION LEVEL 1998-2002



Source: OECD, *Education at a Glance: OECD Indicators 2004*.

Another evident trend is that the difference in the unemployment rate between those with a tertiary qualification and those with an education below upper secondary level has been narrowing in New Zealand since 1998, whereas, for the OECD country mean, this gap has remained constant.

INCOME

In general, income level increases with the level of qualification. However, both the HLFs and the Census show that the average income of those with tertiary qualifications below degree level is no higher than the average income of those with year 12 or year 13 school qualifications⁵. On average, university graduates in full-time employment receive an income about 70 percent higher than those with no more than School Certificate⁶.

THE RELATIONSHIP BETWEEN THE LEVEL OF QUALIFICATIONS AND INCOME

According to the 2001 Census, 8.2 percent of those without qualifications received an income of over \$40,000 in the year to March 2001, compared with 15.3 percent for those whose highest qualification was at school level. Those who took educational qualifications beyond school level were more likely to receive higher incomes: 34.2 percent of those with post-school qualifications received an income of over \$40,000. Men with

⁵ In addition, many of those who complete sub-degree qualifications in the tertiary sector have no school qualifications.

⁶ School Certificate was replaced by the National Certificate of Educational Achievement (NCEA) level 1 in 2002.

post-school qualifications were more likely to receive higher incomes than women. Over two fifths (45.2 percent) of men with post-school qualifications received an income of over \$40,000, compared with 23.0 percent of women.

The following graphs trace the percentages of men and women with different qualifications in different age bands receiving incomes of \$20,000 or more and \$50,000 or more.

FIGURE 4.10A: PERCENTAGE OF MALE POPULATION 15 AND OVER EARNING \$20,000 OR MORE BY AGE GROUP 2001

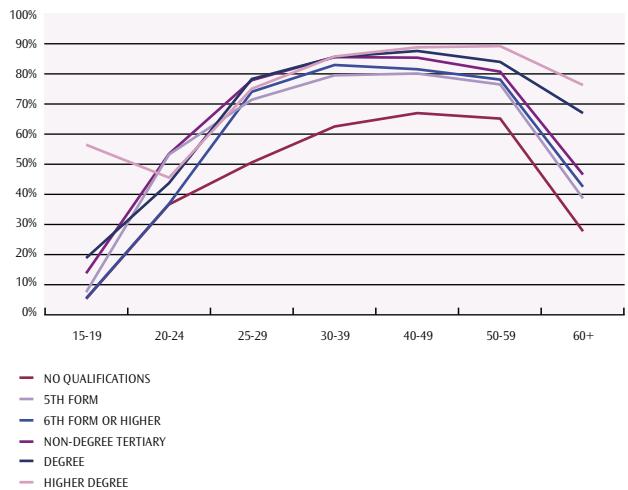


FIGURE 4.10B: PERCENTAGE OF FEMALE POPULATION 15 AND OVER EARNING \$20,000 OR MORE BY AGE GROUP 2001

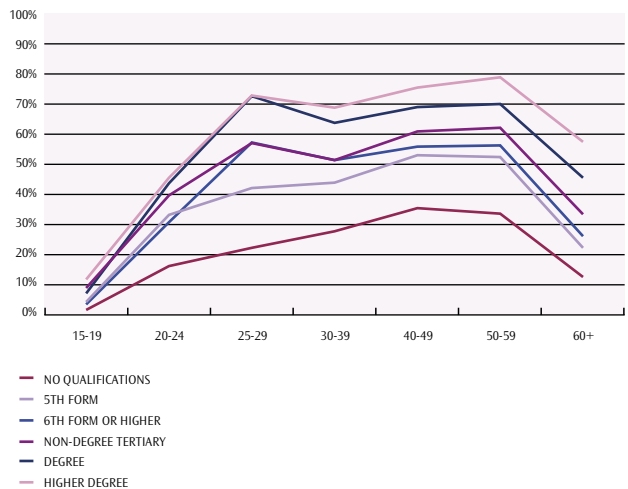


FIGURE 4.11A: PERCENTAGE OF MALE POPULATION 15 AND OVER EARNING OVER \$50,000 BY AGE GROUP 2001

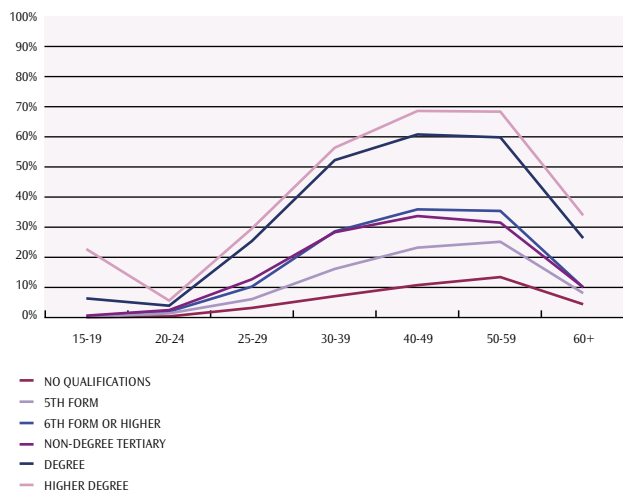
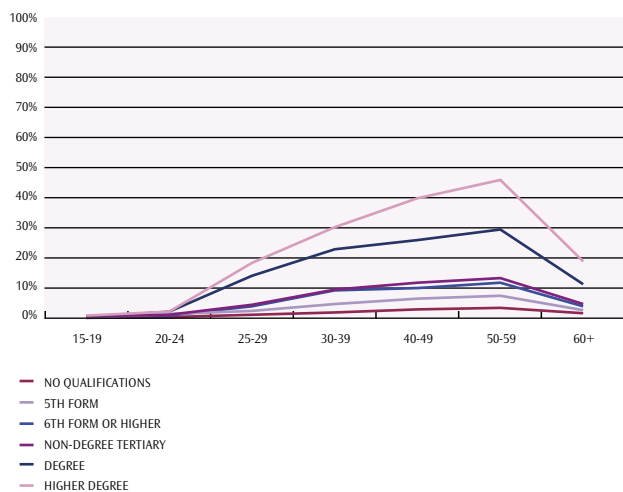


FIGURE 4.11B: PERCENTAGE OF FEMALE POPULATION 15 AND OVER EARNING OVER \$50,000 BY AGE GROUP 2001



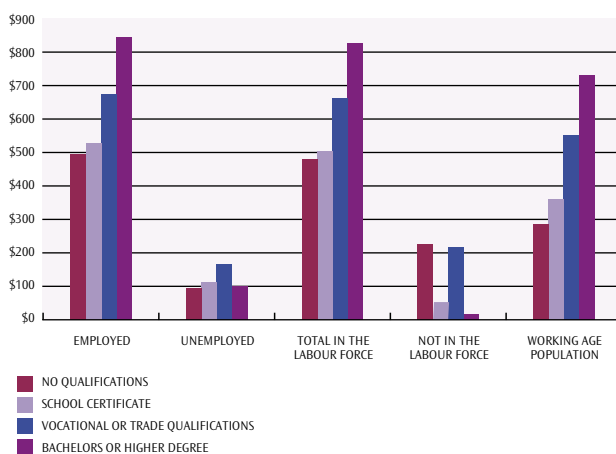
Source: Ministry of Education unpublished report, *What Can the Population Census Tell Us About Education?* Data from the *Census of Population and Dwellings, 2001*.

These findings are supported by data from the *New Zealand Income Survey (NZIS)*⁷. NZIS data shows that there are significant income differentials by level of qualification. For the employed, those in the labour force, and those in the working age population, higher qualifications led to higher median income.

⁷ *New Zealand Income Survey (NZIS)* is a supplement to the HLFSS, which is run every June quarter.

In June 2003, the median weekly income for the working age population was \$401⁸. The median for those with no qualifications was \$285, while for those with a bachelors degree or higher the median was \$729.

FIGURE 4.12: MEDIAN WEEKLY INCOME FOR THE WORKING AGE POPULATION BY HIGHEST QUALIFICATION AND LABOUR FORCE STATUS 2003



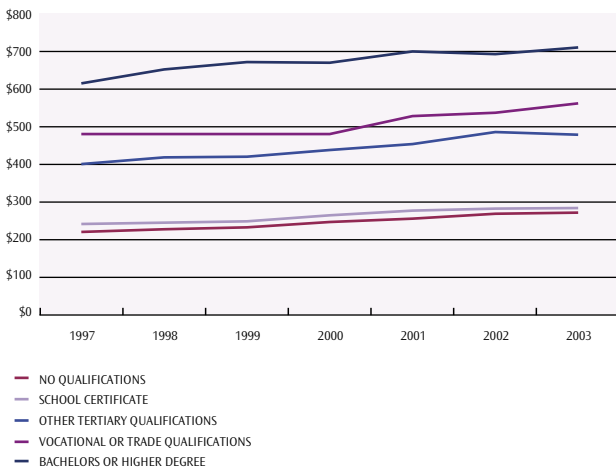
Source: Statistics New Zealand, *New Zealand Income Survey (NZIS)*.

Figure 4.13 shows the weekly median income from all sources (excluding investment income) for the population aged 15 and over, by highest educational qualification, between 1997 and 2003. The relationship between higher qualifications and higher incomes is once again evident. People with a highest qualification of a bachelors or higher degree received the highest median income (\$710 in 2003), followed by vocational and trade (\$560), and other tertiary qualifications (\$480). People with no qualifications received the lowest median income (\$270).

Although the gap in median income between those with tertiary education qualifications and those without has remained relatively constant over time, there was a tendency for the gap to widen slightly in recent time periods. Between 2002 and 2003, the median income for people with a bachelors degree or higher increased by 2.7 percent, and vocational or trade qualifications by 4.3 percent, while those with other tertiary qualifications had a fall in median income of 0.6 percent. This compares with the median income for those without qualifications that remained unchanged.

⁸ The term 'median' income is the sum that is greater than half of all incomes and that is less than half of all incomes.

FIGURE 4.13: MEDIAN WEEKLY INCOME FOR THE POPULATION AGED 15 AND OVER FROM ALL SOURCES BY HIGHEST QUALIFICATION 1997-2003



Note: Data excludes investment income.

Source: Statistics New Zealand, *New Zealand Income Survey*.

FINDINGS ABOUT TERTIARY EDUCATION OUTCOMES FROM THE INTEGRATED DATASET ON STUDENT LOAN SCHEME BORROWERS

An individual's employment prospects and income are influenced by a number of factors in addition to the level of educational qualifications. Factors such as past work experience, motivation, attitudes, and the level of innate ability will also impact on income levels. In other words, while there is a clear association between higher qualifications and higher incomes, this relationship does not mean that we can attribute *all* of the increased income to the higher qualifications. Some of the effect on income derives from higher qualifications and some from innate ability and other qualities. In order to gain some measure of separation of the effects of the qualification from the effects of innate ability, it is useful to compare the incomes of those people who completed a specific type of qualification with those who attempted that type of qualification, but who abandoned study without completing it.

The integrated dataset on Student Loan Scheme borrowers was used to conduct this analysis. This dataset comprises information on people who have drawn down a student loan to help finance their tertiary studies. It matches their tertiary education details with their student loan borrowings, their demographic characteristics, their post-study income and their student loan debt⁹.

⁹ Further information on the integrated dataset can be found in the Student Loan Scheme Annual Report to 30 June 2004, found at www.minedu.govt.nz/goto/tertiaryanalysis. Further information is available on the Statistics New Zealand website www.stats.govt.nz.

An analysis of the median earned¹⁰ income in 2000 of people who successfully completed qualifications in 1997, compared with that of people who studied the same qualifications but did not complete, showed that there were significant gains in income from successfully completing higher qualifications. Analysis of the earnings in 2000 of those who last borrowed and studied in 1997 shows that the median earnings of those who successfully completed a bachelors degree was 1.4 times the median income of those who left study without completing successfully. For men, the median earnings were \$37,130 if they completed, compared with \$26,890 if they did not complete and for women the median incomes were \$34,420 and \$25,240, respectively.

A comparison of the median earned income¹¹ received by people who completed a bachelors degree with that of people who did not complete showed there were significant gains for all ethnic groups. The data showed that the disparity between ethnic groups was much less for those who did complete successfully. For those who completed successfully, there was an insignificant difference in median earnings across ethnic groups, whereas there were significant disparities between the earned incomes of those of different ethnic groups who did not complete successfully: the median earnings of Asians who did not complete were 1.2 times that of Māori who did not complete.

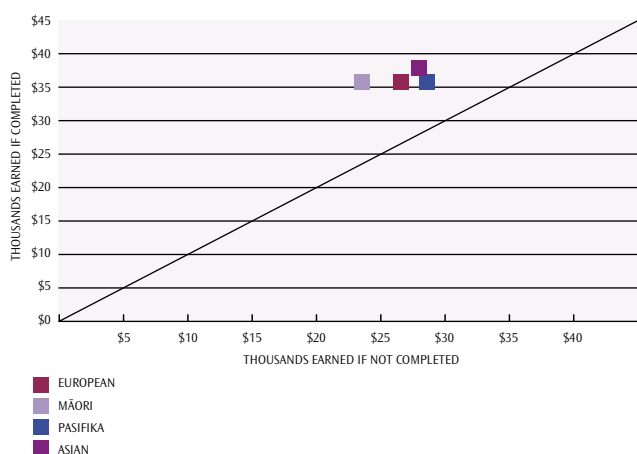
Māori had the highest gain in earnings from successfully completing a bachelors degree. The median earned income for Māori who successfully completed at this level was \$35,460, compared with \$23,520 for Māori who studied but did not complete.

These results imply that successful completion of a higher-level qualification is associated with a reduction in the disparity of income between different ethnic groups.

¹⁰ Earned income excludes benefit income.

¹¹ In the succeeding paragraphs all references to income are taken to mean earned income.

FIGURE 4.14: BENEFITS ACCRUING TO COMPLETION OF A QUALIFICATION THREE YEARS FOLLOWING COMPLETION OF STUDY AT THE BACHELORS AND ADVANCED DIPLOMA LEVEL BY ETHNIC GROUP



Notes:

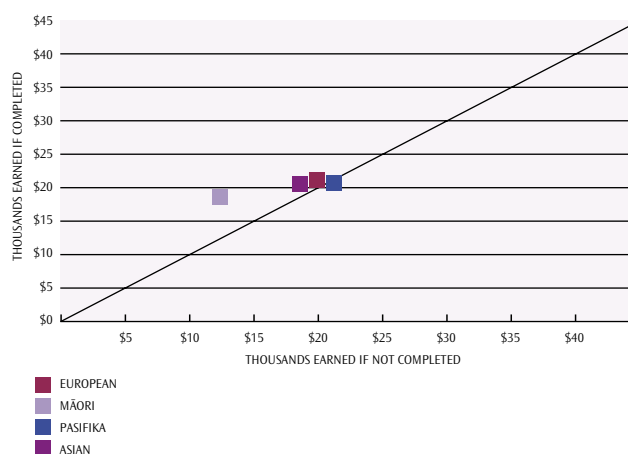
- ¹ This study was of those Student Loan Scheme borrowers who last borrowed and studied in 1997.
- ² The graph records median earned income in 2000.

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

At the tertiary certificate level, the gain in median income from successful completion was minimal for the European, Asian and Pasifika ethnic groups. However, for Māori there was a relatively large gain to be made from successful completion. Completion of a certificate was thus also associated with a reduction in disparities in earnings. The median income for Māori who successfully completed a certificate-level qualification was \$18,310, compared with \$12,390 for Māori who did not complete.

The median earnings of people of European ethnicity who studied at the certificate level but did not complete was 1.6 times the median earnings of Māori who did not complete. Among those who did complete, the median earnings of people of European ethnicity were 1.1 times those of Māori.

FIGURE 4.15: BENEFITS ACCRUING TO COMPLETION OF A QUALIFICATION THREE YEARS FOLLOWING COMPLETION OF STUDY AT THE CERTIFICATE LEVEL BY ETHNIC GROUP



Notes:

- ¹ This study was of those Student Loan Scheme borrowers who last borrowed and studied in 1997.
- ² The graph records median earned income in 2000.

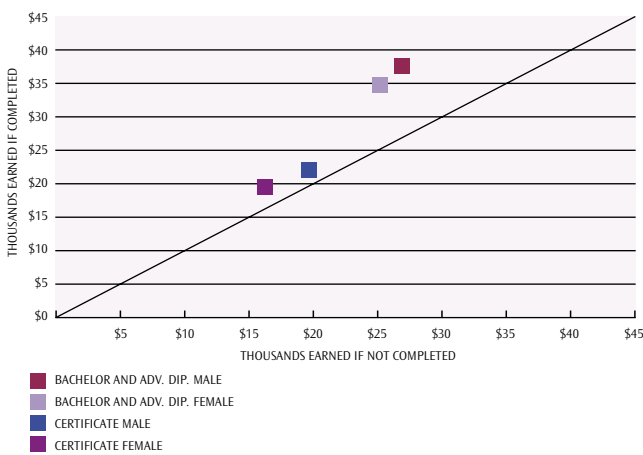
Source: Statistics New Zealand and Ministry of Education, *Integrated Dataset of Student Loan Scheme Borrowers*.

A further finding from this study of the integrated dataset is that the median earnings of those who studied at the bachelors level, whether they completed or not, were higher than those who successfully completed a certificate. The median earnings of men who successfully completed a bachelors degree were \$37,130, 1.7 times the median earnings of men who successfully studied at the certificate level. For men who did not successfully complete a bachelors degree, their median earnings were still 1.2 times those of a man who had successfully completed certificate-level study. For women, the corresponding values were 1.8 times and 1.3 times, respectively.

Because those who studied at bachelors level were more likely to have completed senior secondary school, this finding reinforces the evidence that completion of a sub-degree tertiary qualification did not lead to higher income, relative to those who had upper secondary school qualifications.

In addition, the data showed that the higher the level of qualification, the higher were the person's earnings¹². For example, the median earnings of women who completed a certificate level qualification were \$19,320 and for men \$21,920, which were significantly lower than the median earnings for successfully completing a bachelors degree/advanced diploma qualification.

FIGURE 4.16: BENEFITS ACCRUING TO COMPLETION OF A QUALIFICATION THREE YEARS FOLLOWING COMPLETION OF STUDY BY GENDER FOR SPECIFIC LEVELS



Notes:

¹ This study was of those Student Loan Scheme borrowers who last borrowed and studied in 1997.

² The graph records median earned income in 2000.

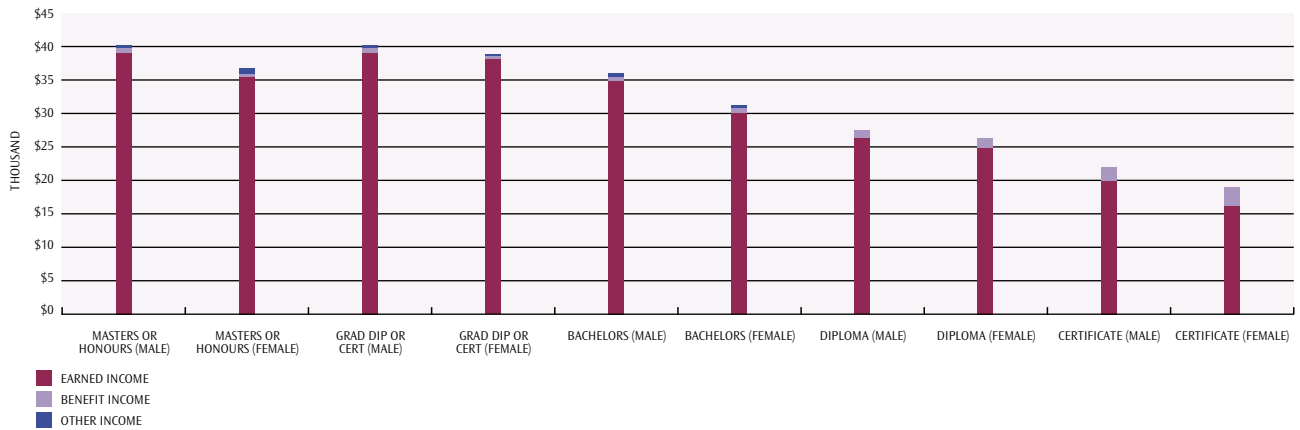
Source: Statistics New Zealand and Ministry of Education, *Integrated Dataset of Student Loan Scheme Borrowers*.

THE RELATIONSHIP BETWEEN TERTIARY EDUCATION AND BENEFIT INCOME

The integrated dataset also showed that completion of a tertiary-level qualification influenced the proportion of income that was sourced from benefits. For those who did not complete, benefit income was a higher proportion of mean total income. In addition, the higher the level of the qualification attempted, the lower was the proportion of benefit income, reflecting the relationship between higher qualifications and lower unemployment. This trend held for those who did not complete the qualification as well as for those who did.

¹² This was evident whether a person successfully completed a qualification or not.

FIGURE 4.17: SOURCES OF TOTAL INCOME IN 2000 BY QUALIFICATION LEVEL FOR PEOPLE WHO LAST BORROWED AND STUDIED AND COMPLETED IN 1997



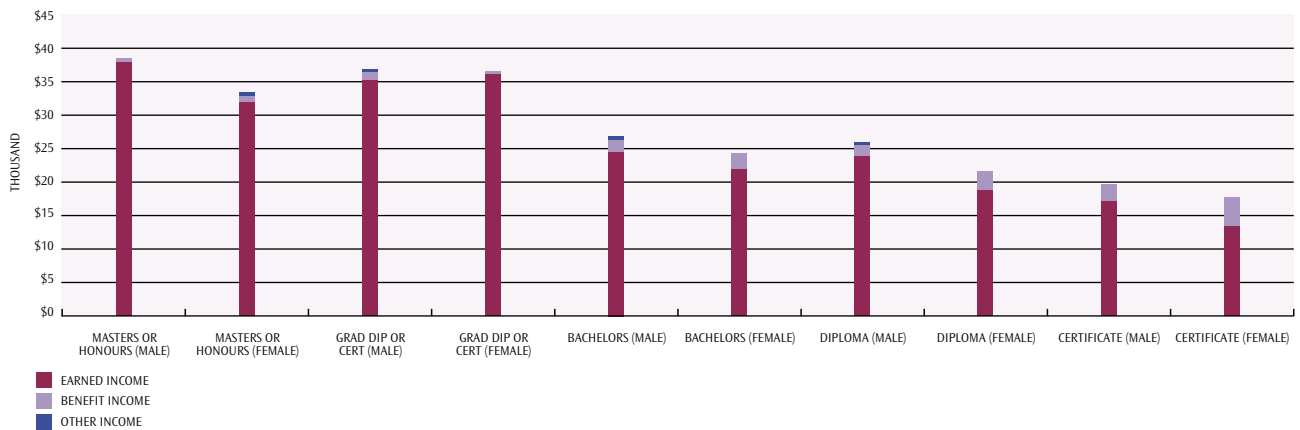
Notes:

¹ The study was of those Student Loan Scheme borrowers who last borrowed and studied in 1997.

² The data is for individuals with non-zero total income.

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

FIGURE 4.18: SOURCES OF TOTAL INCOME IN 2000 BY QUALIFICATION LEVEL FOR PEOPLE WHO LAST BORROWED AND STUDIED IN 1997 BUT DID NOT COMPLETE



Notes:

¹ The study was of those Student Loan Scheme borrowers who last borrowed and studied in 1997.

² The data is for individuals with non-zero total income.

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

FINDINGS FROM THE HOUSEHOLD LABOUR FORCE SURVEY INCOME SUPPLEMENT

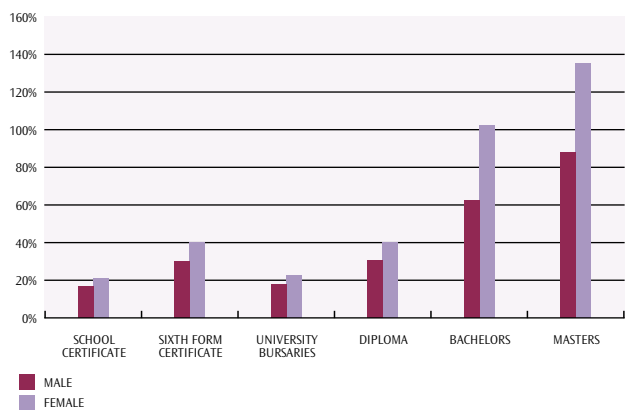
The University of Auckland economist Dr Sholeh Maani has in the past explored the relationship between income and educational qualifications. Dr Maani conducted detailed analyses of data on income and qualifications for the Census years 1981 to 1996. Those studies quantified the relationship between the level of education and the level of total income¹³. The results established the relationship between education and income and showed that expenditure on gaining a tertiary education had a positive and significant return. Moreover, the benefits of higher education to the individual became more pronounced over time. Maani showed that the benefits of education were higher in 1996 than in 1981 and 1986¹⁴. This finding was significant because, over the years covered by Maani’s research, the number of people in the workforce with higher level tertiary qualifications was rising. However, the increased supply of people with higher level qualifications did not appear to have the effect of lowering the return on qualifications.

A new study¹⁵ by Dr Maani, in collaboration with Dr Tim Maloney, used statistics from the HLFS Income Supplement over the period from 1997 to 2002, to analyse the impact of higher education qualifications on earned income¹⁶. The advantage of using HLFS data over the Census was that it allowed Maani’s previous work to be extended by analysing the relationship between education and income using a variety of measures of income. Whereas the Census allows an analysis of total annual income, the HLFS Income Supplement records total income and earned income and reports these on a weekly basis and an hourly basis. It also records the hours of work¹⁷. In each of these measures, the

authors found a significant percentage gain in income for people attaining higher educational qualifications, confirming previous findings using Census data. An additional advantage of using the HLFS data was that, for people with several educational qualifications, the impact of each of the qualifications on income could be analysed, not just the highest qualification.

An analysis of the return on weekly earned income from a person’s highest qualification is presented in the following graph.

FIGURE 4.19: PERCENTAGE GAIN IN WEEKLY EARNINGS BY HIGHEST QUALIFICATION COMPARED WITH A PERSON WITH LESS THAN SCHOOL CERTIFICATE



Notes:

¹ The dataset comprises people aged 25 to 59.

² The analysis uses pooled data for the period between 1997 and 2002.

Source: Maani S.A. and T. Maloney (2004), *Returns to Post-School Qualifications: New Evidence Based on the HLFS Income Supplement (1997-2002)*, Department of Labour.

Figure 4.19 compares the weekly earned income of people with various qualifications with that for those people without qualifications. For both men and women, the return on earned income for high-level tertiary qualifications was significantly greater than for lower-level tertiary or school qualifications. At each qualification level, the return for women was higher than the return for men. This does not mean that women earn more than men: rather, it implies that higher qualifications have the effect of reducing the disparities that exist between the earnings of men and women. Maani and Maloney’s study found that the mean weekly earnings of men whose highest qualification was a bachelors degree were 1.4 times those of a woman with a bachelors degree as a highest qualification. That compared with a ratio of 1.5 times for those without qualifications.

¹³ Maani’s studies used Census data on total income. Total income includes income from salaries, wages, benefits, self-employment and investments.

¹⁴ Maani, S.A. (1999), *Private and Public Returns to Investments in Secondary and Higher Education in New Zealand Over Time: 1981-1996*. Research Report commissioned by the New Zealand Treasury. www.treasury.govt.nz/workingpapers/default.htm.

¹⁵ Maani, S.A. & T. Maloney, (2004), *Returns to Post-School Qualifications: New Evidence Based on the HLFS Income Supplement (1997-2002)*. Report to the Labour Market Policy Group, Department of Labour, New Zealand.

¹⁶ The length of time analysed (six years) is relatively short, and with a turnover rate in the labour market of approximately 2 percent per annum, the results need to be treated with a degree of caution.

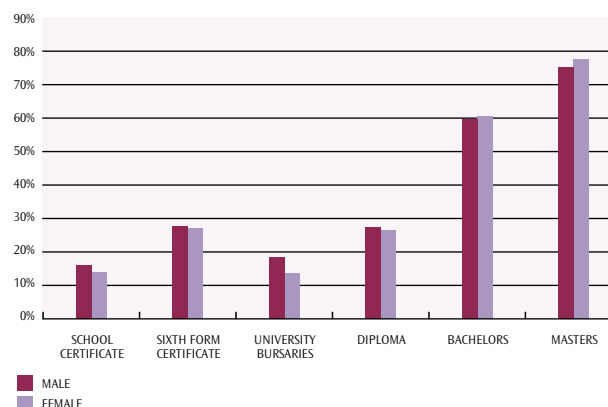
¹⁷ Using earned income, as opposed to total income, which may include an unearned component, allows for a truer indication of the return on income from a higher qualification.

The greatest gain was for an individual with a masters degree. For men with a masters qualification, the gain in income was 86.5 percent, compared with men with less than School Certificate. For women the gain was 134.0 percent. This compared with a diploma-level qualification where the gain for men was 29.6 percent and the gain for women 39.1 percent. People whose highest qualification was a year 12 school qualification¹⁸ had a similar gain compared with people who had a diploma as a highest qualification. Compared with other school-level qualifications, the year 12 qualification provided the greatest gain in income for both men and women¹⁹.

Part of the explanation for the higher percentage gain in income for women compared with men lies in the impact that the number of hours worked per week had on these results. For men, analysis of the impact of higher tertiary qualifications on number of hours worked found no significant relationship. However, for women, higher educational qualifications led to a higher percentage gain in the number of hours worked. For example, women with a bachelors degree worked 25.6 percent more hours than women with no qualifications. Therefore, the higher returns in weekly earnings were partly due to the fact that women with higher qualifications tended to work more hours.

By analysing the effects of higher qualifications on hourly wages, Maani and Maloney were able to isolate the impact of the number of hours worked from weekly earned income. The results of this analysis showed that the return on hourly wage earnings was similar for men and women, though women still retained a slight edge²⁰.

FIGURE 4.20: PERCENTAGE GAIN IN HOURLY WAGE BY HIGHEST QUALIFICATION COMPARED WITH PEOPLE WITH LESS THAN SCHOOL CERTIFICATE



Notes:

¹ The dataset comprises people aged 25 to 59.

² The analysis uses pooled data for the period between 1997 and 2002.

Source: Maani S.A. and T. Maloney (2004), *Returns to Post-School Qualifications: New Evidence Based on the HLFS Income Supplement (1997-2002)*, Department of Labour.

Because the HLFS is an interviewer-administered survey with a comprehensive set of questions, the Income Supplement data also allowed an analysis both of the impact different types of qualifications have on income and of how multiple tertiary-level qualifications influence income²¹. The percentage gain in the hourly wage for people with various types of vocational tertiary qualifications, compared with those without post-secondary qualifications, is presented in the following graph.

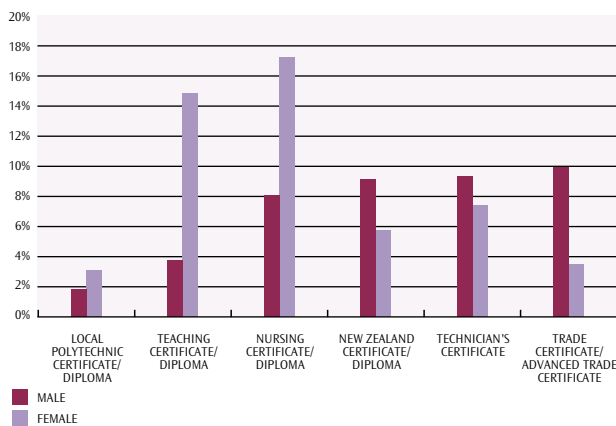
¹⁸ Such as Sixth Form Certificate.

¹⁹ A reason for this result might be that the University Bursaries qualification does not provide a 'sheepskin' or credentialing effect in its own right. Added to the extra year that a person would be studying, this might well partly explain the higher return of Sixth Form Certificate.

²⁰ Remembering that female wages come from a lower base than those for men.

²¹ Earlier studies of returns to tertiary education – such as Maani's studies referred to elsewhere in this chapter – used aggregations of categories of qualifications. Because there are so many different types of tertiary qualifications at the sub-degree level, that aggregation may have introduced distortion.

FIGURE 4.21: PERCENTAGE GAIN IN HOURLY WAGE FOR PEOPLE WITH VOCATIONAL TERTIARY QUALIFICATIONS COMPARED WITH PEOPLE WITHOUT POST-SECONDARY SCHOOL QUALIFICATIONS



Notes:

¹ The dataset comprises people aged 25 to 59.

² The analysis uses pooled data for the period between 1997 and 2002.

Source: Maani S.A. and T. Maloney (2004), *Returns to Post-School Qualifications: New Evidence Based on the HLFIS Income Supplement (1997-2002)*, Department of Labour.

A wide variation in the returns to different types of vocational qualifications was evident, especially for women. Trade certificate qualifications provided the highest percentage gain in hourly wage for men (9.9 percent), and nursing qualifications for women (17.2 percent)²². The lowest return for both women and men was from a polytechnic local sub-degree qualification. The percentage gain in that case was 3.1 percent for women and 1.8 percent for men.

With an increasing number of people attaining multiple tertiary qualifications, Maani and Maloney analysed how each of an individual's post-school qualifications impacted on the rate of return, not just the one at the highest level. They found that each qualification did have an impact on the percentage gain in income. One example of this described by Maani and Maloney was the case of men with a teaching qualification combined with bachelors and postgraduate qualifications. A man who had a teaching qualification, bachelors degree, and also a postgraduate qualification had a percentage gain in income of 21.0 percent, compared with a man with no post-secondary qualifications. However, men with a bachelors degree along with a postgraduate qualification but no teaching qualification, had a percentage gain of 41.8 percent, compared with a man with no post-secondary qualifications.

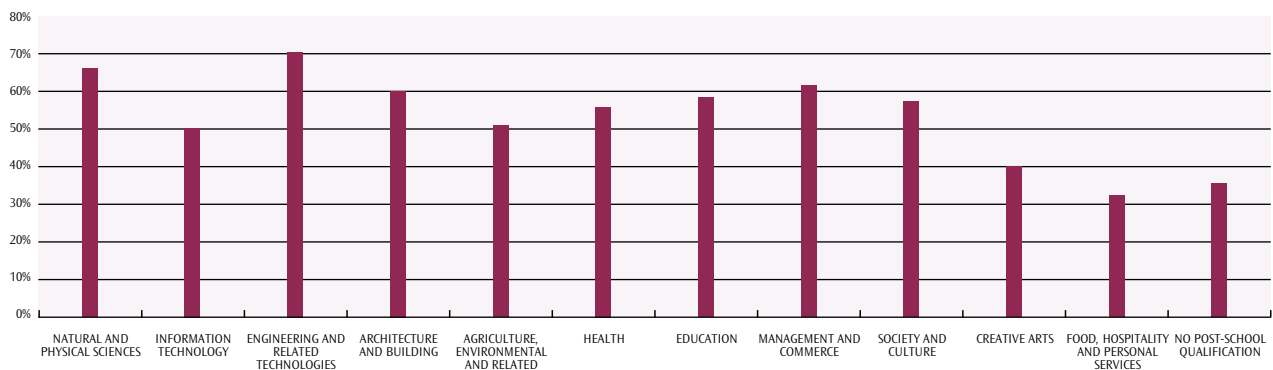
²² The percentage gain is compared with an individual without post-school qualifications.

THE RELATIONSHIP BETWEEN FIELD OF STUDY AND INCOME

According to Census 2001 data, the fields of study that had the highest proportion of graduates earning annual incomes greater than \$50,000 were 'natural and physical sciences' (36.4 percent of those with post-school qualifications in this subject who completed the income question), 'management and commerce' (32.8 percent), and 'engineering and related technologies' (31.8 percent). The fields of study that had the highest proportion of graduates earning annual incomes of \$20,000 or less were 'creative arts' (40.9 percent), 'food, hospitality and personal services' (40.0 percent), and 'information technology' (31.6 percent). The proportion of people with no post-school qualification earning greater than \$50,000 per annum was just 10.3 percent.

The field of study that had the highest proportion of male graduates receiving an annual income greater than \$50,000 was 'health' at 58.1 percent of those who specified an income. The equivalent figure for female graduates was 13.5 percent. For graduates earning income greater than \$50,000, the field of study that had the highest proportion of women was 'natural and physical sciences' at 20.4 percent, with the equivalent figure for men being 48.1 percent. The field of study that had the highest proportion of male graduates earning income of \$20,000 or less was 'creative arts' at 32.4 percent and the equivalent figure for female graduates in this field of study was 46.1 percent. 'Food, hospitality and personal services' was the field of study that had the highest proportion of female graduates earning income of \$20,000 or less (52.1 percent), while the equivalent figure for male graduates was 24.1 percent.

FIGURE 4.22: PERCENTAGE OF POPULATION AGED 15 AND OVER WITH A POST-SCHOOL QUALIFICATION EARNING MORE THAN \$30,000 BY FIELD OF STUDY 2001

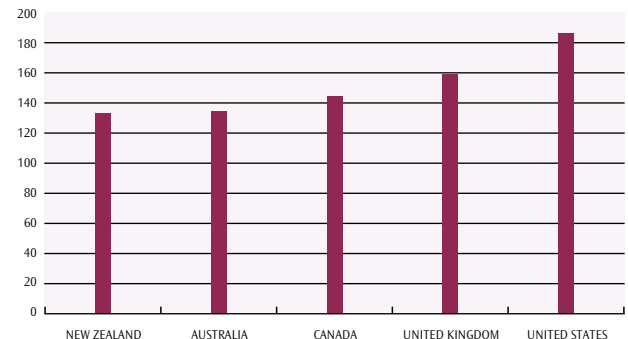


Source: Statistics New Zealand, *Census of Population and Dwellings, 2001*.

INTERNATIONAL COMPARISONS

The OECD publication *Education at a Glance 2004* also reported on returns to education. The OECD indicator reports on the earnings of workers with different educational attainment, and relates those earnings to the cost of acquiring qualifications. In New Zealand, tertiary education enhanced earnings relative to secondary education slightly more for women than for men. In the 25 to 64 age group, the earnings of men with any tertiary education was 1.3 times the earnings of men with no more than upper secondary education. The OECD shows this as a standardised earnings score of 130, compared with 100 for men with upper secondary education. For women, the standardised scores for any tertiary qualification and upper secondary education were 136 and 100 respectively²³. The relative standard earnings score of all the population with any tertiary education for age groups between 25 and 64 in New Zealand was 133, compared with 133 for Australia, 186 for the United States, 159 for the United Kingdom and 143 for Canada.

FIGURE 4.23: RELATIVE EARNINGS SCORE OF THE POPULATION AGED 25 TO 64 WITH INCOME FROM EMPLOYMENT FOR PEOPLE WITH A TERTIARY EDUCATION 2001



Notes:

¹ The standardised earnings score for the population with upper secondary education = 100.

² United States data is for 2002.

Source: OECD, *Education at a Glance: OECD Indicators 2004*.

²³ In the same age group, men educated to below upper secondary level earn comparatively less than men educated to upper secondary level (76 compared with 100). Women in the 25 to 64 age group, educated to below upper secondary level, have a relative earnings score of 72 compared with 100 for women educated to upper secondary level.

The OECD reported that, although men and women with higher education earned more, men still earned considerably more than women with the same educational attainment. In New Zealand, in the 30 to 44 age group, women with an educational attainment level of less than upper secondary had average annual earnings of 59 percent of men's earnings. The corresponding percentages were 61 percent for upper secondary and post-secondary non-tertiary education and 68 percent for tertiary education. This finding reinforces the observation that the gender earnings gap diminishes with higher qualifications²⁴. Across all levels of educational attainment, women in New Zealand earned 62 percent of what men earned. In general, the differences are explained by career and occupational choices, the amount of time that men and women spend in the labour force, and the relatively high incidence of part-time work among women.

EDUCATION AND ECONOMIC GROWTH

In addition to the returns that higher education brings to the individual, there are returns to an economy as a whole from an increase in the level of a nation's human capital²⁵. There are also economic and social benefits to a community from the presence of tertiary education because many tertiary education providers are substantial employers and their presence has a significant impact in the region where they are located. The wages paid to staff of a tertiary provider and the flow-on effects of their spending can make a major contribution to the economic activity of a region, especially in provincial areas. Some examples of the benefits of tertiary education to the New Zealand economy and wider community at large are discussed below.

A study²⁶ by the New Zealand Institute of Economic Research (NZIER), *Ka Awatea Tuarua*, analysed the impact of Te Wānanga o Aotearoa (TWOA) on the New Zealand economy in 2003. The analysis of TWOA was important for two reasons. Firstly, enrolments at TWOA have grown rapidly since 2000, to the stage where TWOA is now the largest tertiary provider in New Zealand²⁷.

Secondly, much of the growth of TWOA since 2000 has been from a segment of the population that typically has not participated in tertiary education and that has had poor outcomes in the labour market. For those reasons, participation in tertiary education by that group has the potential to add significant value.

The researchers considered the increased level of skills of those who studied at TWOA and looked at the likelihood that those people would either gain employment or move to higher levels of employment. The study also looked at productivity improvements that would result from those extra skills. The researchers then calculated the value added by the education delivered at TWOA by estimating the increase in wages that would result from these additional skills, along with the associated flow-on impacts (the multiplier effect). The value to the economy of upskilling this group of people was estimated at 1 percent of New Zealand's Gross Domestic Product (GDP) or \$1 billion²⁸. To put this sum in context, the study noted that the \$1 billion gain is equivalent to the value added each year of the forestry or fishing sector in New Zealand.

Some additional benefits to the economy were identified in the NZIER report but were not measured. An example is the potential for the inter-generational effect of welfare dependency to be broken by exposure to tertiary education. Therefore, the total contribution to the New Zealand economy could potentially exceed the \$1 billion estimate.

In addition to the value created by enhanced human capital, the study calculated the gains to the economy from the direct expenditure on wages and operations, and noted that this expenditure took place in some centres that are non-traditional locations for tertiary providers. Operational expenditure at TWOA in 2002 totalled \$81.0 million and capital expenditure totalled \$22.3 million. This spending was spread through campuses located in Te Awamutu, Te Kuiti, Manukau, Palmerston North, Porirua, Huntly, Hamilton, Rotorua, Tokoroa and Gisborne.

²⁴ This is due in part to higher qualifications being associated with greater access to the labour market for women, so that those with higher qualifications tend to work more hours.

²⁵ This is an example of the so-called externalities of higher education.

²⁶ NZIER (2003), *Ka Awatea Tuarua*, NZIER, Wellington.

²⁷ Government-funded EFTS places totalled 1,498 in 2000, 6,089 in 2001, 20,763 in 2002, and 34,280 in 2003.

²⁸ This is the 'net benefit' to the economy. The value of the educational grants to TWOA has been removed from the analysis.

Using Gisborne as an example, TWoA had total expenditure of \$3.2 million at the Whirikoko campus in 2002. There were the equivalent of 59 full-time staff employed, making it a significant employer in the Gisborne region. Gisborne is also served by Tairāwhiti Polytechnic. In 2002, Tairāwhiti Polytechnic had a total expenditure of \$12.3 million and employed 163 equivalent full-time staff. When one adds to TWoA's activities in Gisborne the expenditure of Tairāwhiti Polytechnic, the presence of public tertiary education providers makes a very significant contribution to the economic activity of a small regional economy like Gisborne²⁹.

A similar study of the economic impact of tertiary education on a regional community was conducted over 2000 and 2002 in Invercargill. The study, conducted by Infometrics Consulting, was commissioned by the Invercargill business community to assess the impact of the zero fees scheme introduced by the Southern Institute of Technology (SIT) in 2001. In 2000, the year before the introduction of the zero fees scheme, SIT produced an operating surplus of 1.1 percent of total institutional income. In the period since the introduction of zero fees the financial performance of SIT has improved markedly. Surpluses of 3.7 percent on income were reported in 2001, 10.1 percent in 2002 and 11.3 percent in 2003.

Before the introduction of the zero fees scheme, a survey by Infometrics³⁰ predicted that the potential benefits of the scheme would be an additional \$11.5 million in business turnover and a \$6.7 million increase in Invercargill's GDP. These benefits were expected to arise from the additional spending by students new to Invercargill on accommodation and other items, and hence an associated increase in business activity. The success of the zero fees scheme in attracting students to the Invercargill region meant those initial predictions underestimated the actual outcome. Between 2000 and 2003, the number of equivalent full-time students enrolled at SIT increased by 163.6 percent. In its 2002 study³¹, Infometrics found that the actual gains to the community were an extra \$25 million in additional business turnover and a \$13.9 million increase in Invercargill's GDP in 2001³².

²⁹ In addition, there are several smaller private tertiary providers in the Gisborne area.

³⁰ Infometrics Consulting (August 2000), *Economic Impact of SIT's Proposed Zero Fees Policy*, Wellington.

³¹ Infometrics Consulting (August 2002), *Economic Impact on Invercargill of SIT's Zero Fees Policy*, Wellington.

³² It should be noted that to some extent Invercargill's gains might have come at the expense of other regions if students switched providers.

International students are a major source of export earnings for New Zealand. A study by Infometrics³³ estimated the contribution to the New Zealand economy of international students by analysing expenditure on tuition fees and living costs, along with the impact of a multiplier effect. For international students studying at public tertiary providers, the contribution to the New Zealand economy was estimated to be \$214.7 million in 2000. Strong growth in international student numbers since then has seen the value of this contribution rise to an estimated \$988.0 million in 2003³⁴.

Internationally, a number of studies have focused on the impact of education on an economy. One such study by the OECD³⁵ analysed the causes of economic growth in member countries for the period between 1990 and 2000. One specific area of this study investigated the role of human capital in driving economic growth³⁶.

A key finding was that increases in labour productivity accounted for at least half of the growth in per capita GDP in most OECD countries over the period between 1990 and 2000. For New Zealand, the relatively modest average annual growth rate of 1.1 percent in per capita GDP was driven largely by labour productivity increases which contributed 0.7 percent of the growth rate³⁷. The remaining effects came from minor demographic changes and increased employment levels.

The OECD study found that improvements in human capital, as measured by the average number of years spent in formal education, partly explained the increases in labour productivity³⁸ in the majority of OECD member countries, in particular the United Kingdom and Portugal. However, in New Zealand during the 1990s the rising employment levels meant that many of the newly employed people possessed lower educational qualifications, and hence had fewer years in formal education. This has the effect of masking the true contribution of human capital improvements to labour productivity growth in New Zealand.

³³ Infometrics Consulting (October 2000), *Economic Impact Analysis of Foreign Fee-Paying Students*, Wellington.

³⁴ Education New Zealand (2004), www.educationnz.org.nz/facts_stats/key_facts.html.

³⁵ OECD (2003), *The Sources of Economic Growth in OECD Countries*, OECD, Paris.

³⁶ For the purposes of this study the aggregate stock of physical capital was kept constant.

³⁷ The increase in labour productivity was of a low level in comparison with other OECD member countries. For example, Australia's rate of labour productivity increase was 1.9 percent, the United Kingdom 1.8 percent, and the United States 1.8 percent.

³⁸ Measured as output per employed person.

Recent research has suggested that literacy rates appear to be a much better predictor of economic performance than measures such as years of participation in formal education³⁹. A study by Statistics Canada and Ottawa University economists⁴⁰ used literacy scores from the 1994 International Adult Literacy Survey to estimate the human capital of the population of 14 countries over a time period from 1960 to 1995. The results of their analysis showed that a country able to increase literacy scores by 1 percent relative to the international average will achieve a 2.5 percent relative rise in labour productivity and a 1.5 percent relative rise in per capita GDP. The three countries with the fastest growth in literacy levels between the oldest and youngest generations had the fastest growth in output per worker, whereas, in the three countries in which literacy levels grew the slowest – of which New Zealand was one – growth was slower.

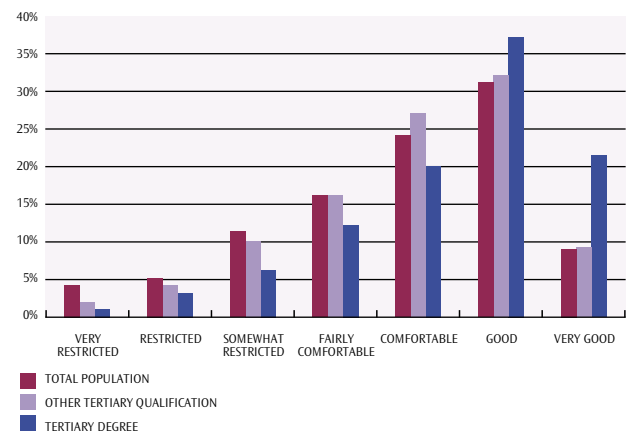
SOCIAL AND FAMILY OUTCOMES

In 2002, the Ministry of Social Development released a report, *Living Standards 2000*, which provided a broad description of the living standards of New Zealanders. A new social measurement tool, the Economic Living Standard Index (ELSI), was developed in order to consolidate large amounts of information about different aspects of economic wellbeing into a single score.

The ELSI scale comprises seven bands which describe the living standards of the New Zealand population from 'very restricted' to 'very good'. The following graph shows the percentage of all New Zealanders in each of these seven bands compared with the percentage for those with tertiary qualifications.

Analysis of the effects of education on the ELSI index clearly shows how increased education has a positive effect on living standards. Overall, 20 percent of the total population fell into the bottom three categories of 'very restricted', 'restricted', or 'somewhat restricted', compared with only 10 percent of those with tertiary degrees. Whilst 58 percent of those with tertiary degrees fell into the top two categories of 'good' or 'very good', only 40 percent of the total population were in these two categories.

FIGURE 4.24: LIVING STANDARDS OF NEW ZEALANDERS 2000



Source: Ministry of Social Development (2002), *New Zealand Living Standards*.

³⁹ One explanation offered for this was that literacy scores may be more comparable across countries than years in formal education.

⁴⁰ Coulombe, S., J-F Tremblay and S. Marchand (2004), *Literacy Scores, Human Capital and Growth Across 14 OECD Countries*, Statistics Canada and Human Resources and Skills Development Canada, Ottawa.