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Chapter 4: Outcomes of tertiary education

The New Zealand population is becoming more skilled as more adults become tertiary qualified, with increasing numbers holding a bachelors degree or higher-level qualification. In 2007, about one in every two New Zealanders held a tertiary qualification – the proportion with a bachelors degree or higher rose from 15 percent in 2006 to 18 percent in 2007. Ten years earlier, people with a bachelors degree or higher-level qualification comprised 9.2 percent of New Zealand's adult population.

The proportions of Māori and Pasifika peoples holding a bachelors or higher-level qualification are steadily increasing, although they remain considerably lower than the national average. The difference in the proportion of males and females holding a bachelors or higher-level qualification has narrowed in all ethnic groups and females with tertiary qualifications increased at a greater rate than males. In the younger age groups – those under 40 years of age – proportionately more women than men held a bachelors or higher degree. On the other hand, more young men than women held a non-degree tertiary qualification.

Strong economic growth coupled with tight labour markets continued in 2007 and this narrowed the gap in the unemployment rate between those with bachelors or higher-level qualifications and those holding a non-degree tertiary qualification. Also, the labour force participation rate increased in 2007 for those with only a school qualification or without any qualification. Consequently, the proportion of the labour force with a tertiary qualification fell slightly in 2007.

People with higher-level tertiary qualifications continued to show a significant earnings advantage over those with a lower-level qualification or no qualification. The median hourly earnings premium increased in 2007 for those with non-degree tertiary qualifications and school qualifications, compared with those with no qualification. This increase suggests a weakening of the labour market for people with no qualifications.

In 2007, the proportion of people aged 15 to 19 years not in employment or formal and informal study decreased slightly, while it increased for people aged 20 to 24 years.

The educational inheritance of New Zealanders is discussed later on in this chapter in an article that analyses data from the Adult Literacy and Life Skills Survey held in 2006. That study shows that adults whose parents had undertaken tertiary education were more likely to have a tertiary education. However, compared with 10 years earlier, people whose parents had only lower secondary education were more likely to have a tertiary education. In fact, an index of educational opportunity shows that educational opportunity has increased, not narrowed, since 1996.

A second article, also based on data from the Adult Literacy and Life Skills Survey, discusses how higher-level education is associated with greater skills. Also presented in this chapter is an article that looks at recent literature on the link between tertiary education and productivity and possible reasons why labour productivity has not grown as fast as may be expected given the growth in tertiary qualifications. Finally, the results of a study of the relationship between education and wellbeing are presented; these suggest that education can provide improvements in wellbeing but that skills and income are more important predictors of wellbeing.

2008 year

Given the slowdown of the New Zealand economy in the March 2008 quarter, the labour market is likely to weaken somewhat. The slight rise in the unemployment rate to 3.9 percent in the June 2008 quarter reinforced the earlier slowing. On the other hand, the labour market participation rate increased slightly in the June 2008 quarter. However, in view of the slowing economy we may see a rise in the unemployment rate in the short term, especially for those with lower-level qualifications.

The Schools Plus policy, developed to achieve the goal of having all young people actively engaged in education that is relevant to their needs and abilities until the age of 18 years, suggests that the rate of youth inactivity will decrease among those aged 15 to 19 years in the foreseeable future. This may also lift the participation rate in the tertiary education sector, adding more skilled human resources to the economy.

MORE TERTIARY-QUALIFIED PEOPLE

Survey data shows that the proportion of the New Zealand working-age population holding a tertiary qualification increased steadily over the last five years and, in 2007, one in every two New Zealanders was tertiary qualified.

The proportion of the working-age population with a bachelors degree or higher has increased substantially since 2002, while the proportion without a qualification has remained flat in recent years.

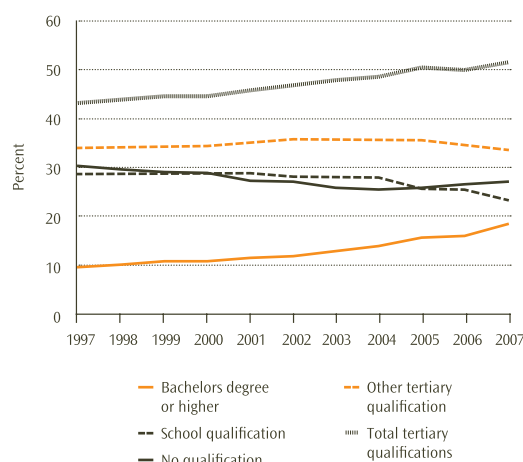
The proportions of the working-age population with a tertiary qualification in 2007:

Total tertiary qualifications	51%	(46% in 2002)
Bachelors degree or higher ¹	18%	(11% in 2002)
Other tertiary qualification ²	33%	(35% in 2002)
School qualification	23%	(27% in 2002)
No qualification	27%	(27% in 2002)

Note: The proportion with a tertiary qualification from the *Household Labour Force Survey* is based on a sample and it is higher than the figure from the 2006 census. While the census is based on the entire population not everyone completed the census question on qualifications and as a result the proportion with a tertiary qualification from the census is lower.

Source: Statistics New Zealand (2007), *Household Labour Force Survey*.

Figure 4.1: Working-age population (June quarter) by highest qualification



HIGHER QUALIFICATIONS AND AGE

The proportion of the population with a bachelors degree or higher qualification increased from 15 percent in 2006 to 18 percent in 2007.

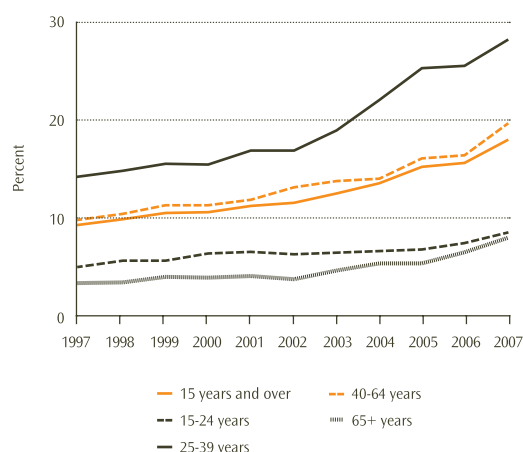
The proportion aged 25 to 39 years with a bachelors-level or higher qualification has risen strongly over the last five years, reaching 28 percent in 2007.

The proportions of the working-age population with a bachelors degree or higher qualification in 2007:

15 years and over	18%	(11% in 2002)
15-24 years	8.1%	(6.0% in 2002)
25-39 years	28%	(17% in 2002)
40-64 years	19%	(13% in 2002)
65 years and over	7.6%	(3.5% in 2002)

Source: Statistics New Zealand (2007), *Household Labour Force Survey*.

Figure 4.2: Working-age population (June quarter) with a bachelors degree or higher qualification by age group



OTHER TERTIARY QUALIFICATIONS AND AGE

The proportion of the working-age population holding other tertiary qualifications has been steady at around 33 percent in recent years.

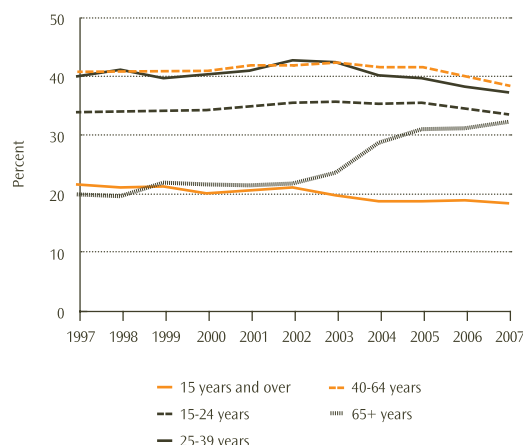
In the various age groups, the proportions have been declining – except for an offsetting increase in other tertiary qualifications gained by those aged 65 years and over, reflecting higher participation in lower-level qualifications by older people since 2002.

The proportions of the working-age population with other tertiary qualifications in 2007:

15 years and over	33%	(35% in 2002)
15-24 years	18%	(20% in 2002)
25-39 years	37%	(42% in 2002)
40-64 years	38%	(42% in 2002)
65 years and over	32%	(21% in 2002)

Source: Statistics New Zealand (2007), *Household Labour Force Survey*.

Figure 4.3: Working-age population (June quarter) with other tertiary qualifications by age group



1. 'Bachelors degree or higher' qualifications include postgraduate degrees, certificates and diplomas.

2. 'Other tertiary' qualifications include university, teaching and nursing certificates and diplomas, New Zealand certificates and diplomas, technician's certificates, local polytechnic certificates and diplomas, and trade certificates and advanced trade certificates.

TERTIARY QUALIFICATIONS AND ETHNIC GROUP³

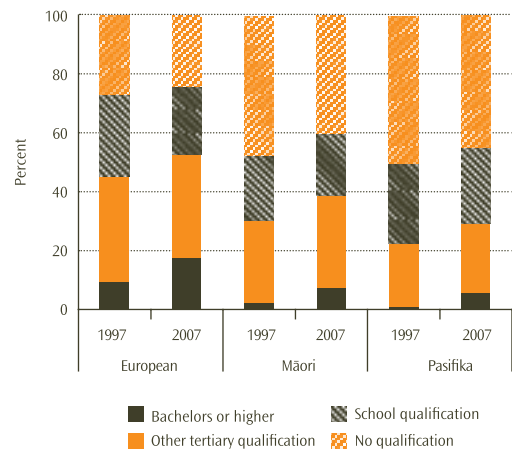
The proportions of the working-age population with a bachelors-level or higher qualification that identified with the Māori and Pasifika ethnic groups increased significantly between 1997 and 2007. However, the proportions of Māori and Pasifika with degree qualifications were significantly lower compared with the European ethnic group.

The proportions of the working-age population with tertiary qualifications by ethnic group in 2007:

	Bachelors degree or higher		Other tertiary qualification	
	1997	2007	1997	2007
	%	%	%	%
European	9.4	17.6	35.6	35.1
Māori	2.0	7.1	28.1	31.6
Pasifika	0.9	5.6	21.7	23.6
Other	23.5	30.5	21.3	25.4

Source: Statistics New Zealand (2007), Household Labour Force Survey.

Figure 4.4: Working-age population (June quarter) by highest qualification and ethnic group



TERTIARY QUALIFICATIONS AND GENDER

The difference in the proportions of men and women in the working-age population with a bachelors-level or higher qualification narrowed in 2007 to only one percentage point.

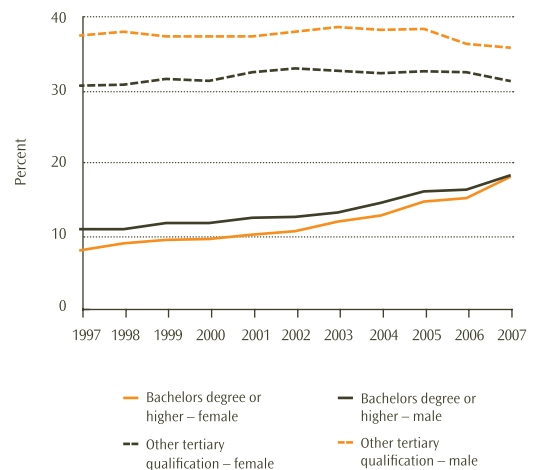
Females with qualifications increased at a greater rate than males.

The proportions of the working-age population with a tertiary qualification by gender in 2007:

Bachelors degree or higher – female	17%	(10% in 2002)
Bachelors degree or higher – male	18%	(12% in 2002)
Other tertiary qualification – female	31%	(32% in 2002)
Other tertiary qualification – male	35%	(38% in 2002)

Source: Statistics New Zealand (2007), Household Labour Force Survey.

Figure 4.5: Working-age population (June quarter) with a tertiary qualification by gender



LOWER UNEMPLOYMENT FOR THE TERTIARY QUALIFIED

Although people with a higher-level tertiary qualification had a lower unemployment rate than people with a lower-level tertiary qualification, the gap between them continued to narrow in 2007.

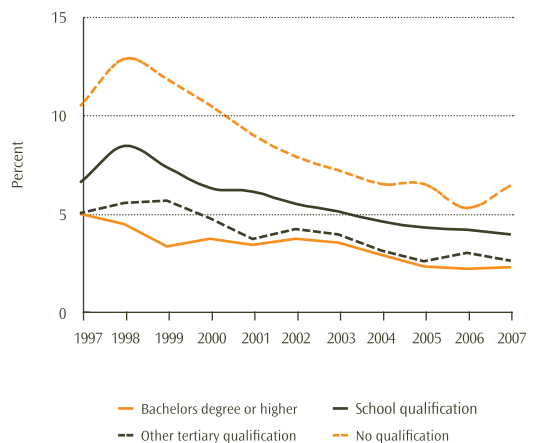
For those with no qualifications, the unemployment rate increased from 5.2 percent in 2006 to 6.3 percent in 2007.

The unemployment rate of the working-age population by highest qualification in 2007:

All qualification levels	3.5%	(5.1% in 2002)
Bachelors degree or higher	2.2%	(3.6% in 2002)
Other tertiary qualification	2.5%	(4.1% in 2002)
School qualification	3.8%	(5.4% in 2002)
No qualification	6.3%	(7.8% in 2002)

Source: Statistics New Zealand (2007), Household Labour Force Survey.

Figure 4.6: Unemployment rates (June quarter) for the working-age population by highest qualification



3. The sampling errors for the smaller ethnic groups such as Māori and Pasifika are generally larger, which requires caution to be exercised in interpreting changes in this data over time.

LABOUR FORCE PARTICIPATION

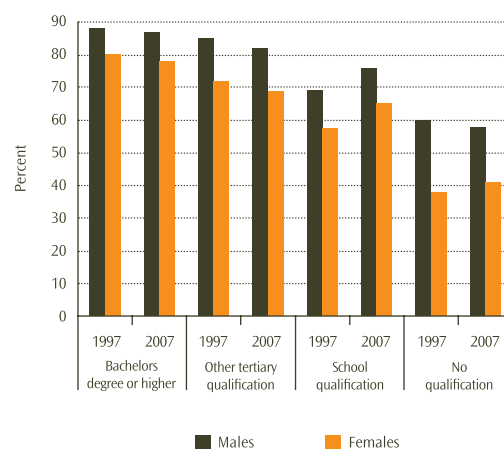
From 2006 to 2007, the rates of participation in the labour force increased for those with only a school qualification and those without a qualification. The participation rates for those with tertiary qualifications have fallen slightly.

The labour force participation rates of the working-age population by highest qualification:

	Females		Males	
	1997	2007	1997	2007
	%	%	%	%
Bachelors degree or higher	80	78	88	87
Other tertiary qualification	72	69	85	82
School qualification	57	65	69	76
No qualification	38	41	60	58

Source: Statistics New Zealand (2007), Household Labour Force Survey.

Figure 4.7: Labour force participation rates (June quarter) by qualification level and gender



HIGHER EARNINGS FOR THE TERTIARY QUALIFIED

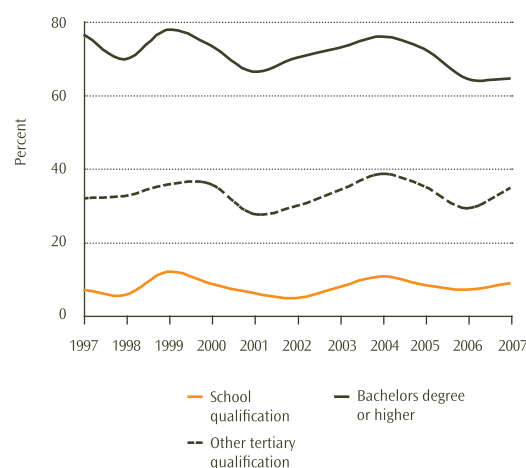
The median hourly earnings premium increased from 29 percent in 2006 to 34 percent in 2007 for those with other tertiary qualifications compared with those with no qualifications. This increase may suggest a weakening of the labour market for people with no qualifications compared with those with tertiary qualifications. Over the same period, the premium for those with a school qualification increased slightly, while for those with a bachelors degree the premium remained unchanged.

Median hourly earnings premiums by highest qualification compared with no qualification in 2007:

Bachelors degree or higher	63.9%	(76.2% in 1997)
Other tertiary qualification	33.8%	(31.5% in 1997)
School qualification	8.2%	(6.6% in 1997)

Source: Statistics New Zealand (2007), Household Labour Force Survey.

Figure 4.8: Median hourly earnings premiums (June quarter) by highest qualification compared with those with no qualification



YOUTH INACTIVITY⁴

The proportion of the youth population not in employment or formal/informal study or in a caregiving role decreased for 15 to 19 year-olds and increased for 20 to 24 year-olds in 2007.

The proportion of women aged 20 to 24 years not in employment, not in formal/informal study and not in a caregiving role has declined since 2004, while the proportion of men in this category has increased.

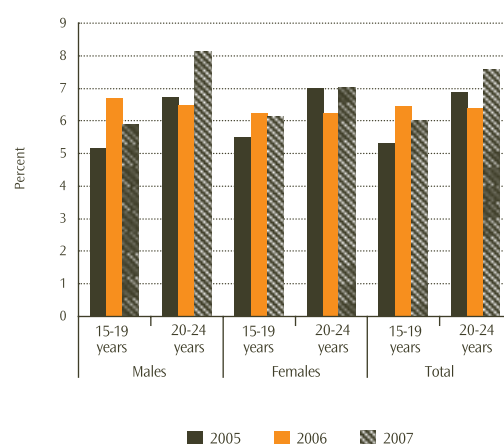
The proportion of youth not in employment, not in formal study and not in a caregiving role:

	Males			Females			Total		
	2004	2006	2007	2004	2006	2007	2004	2006	2007
15-19 years	6.1%	6.7%	5.9%	6.4%	6.3%	6.2%	6.2%	6.5%	6.0%
20-24 years	6.0%	6.5%	8.1%	9.4%	6.3%	7.0%	7.6%	6.4%	7.6%

Note: Data for previous years has been revised.

Source: Statistics New Zealand (2007), Household Labour Force Survey.

Figure 4.9: The proportion of youths not in employment or formal/informal study, or in a caregiving role, by gender and age group



4. The sampling errors for the smaller age groups such as 15 to 19 years and 20 to 24 years are larger than for the larger groups. Therefore caution should be exercised in interpreting changes in this data over time.

The educational inheritance of New Zealanders

How much does the education level of parents influence that of their children? How has that influence changed over time as the population of New Zealand has become better qualified? Are the children of those with a lower level of education less likely to undertake tertiary education?

Have our literacy skills risen due to the increase in the level of study of parents? The Adult Literacy and Life Skills Survey gives insights into these questions.

Key findings of the 2006 Adult Literacy and Life Skills Survey

- **Among adults who have undertaken tertiary study, just under half were likely to have a father with a tertiary education. In contrast, among adults with only lower secondary education, only 20 percent had a father with a tertiary education.**
- **Compared with 10 years earlier, in 2006, adults whose parents had only lower secondary education were more likely to undertake tertiary education. (At the same time, census data showed that the proportion of New Zealanders with a tertiary qualification increased from 25 percent to 40 percent.)**
- **The proportion of New Zealand adults with fathers with a tertiary education increased from 23 percent in 1996 to 38 percent in 2006. One-third of New Zealand adults had fathers with only lower secondary schooling in 2006 and 29 percent of New Zealand adults had fathers with only upper secondary schooling.**
- **The proportion of New Zealand adults with mothers with a tertiary education increased from 16 percent in 1996 to 26 percent in 2006. Thirty-nine percent of New Zealand adults had mothers with only upper secondary schooling in 2006 and 35 percent had mothers with only lower secondary schooling.**
- **Looking at the younger generation, almost two-thirds of under-25-year-olds with a tertiary education had fathers with a tertiary education and half of them had mothers with a tertiary education. As would be expected, in the older age groups a smaller proportion had parents with a tertiary education. About one-third of New Zealand adults aged 55 to 65 years with a tertiary education had fathers with a tertiary education.**
- **People whose parents had higher levels of education had slightly higher skills. The difference was somewhat greater when the mother's skill level was higher. However, people's skills increased substantially with their own level of education.**

About the Adult Literacy and Life Skills Survey

The 2006 survey was conducted with a representative sample of New Zealand adults aged between 16 and 65 years living in private households. The survey was conducted over the period starting in May 2006 through to March 2007.

The survey measures literacy and life skills in the adult population at national and international levels. It measures **prose literacy** (which covers continuous text found, for example, in books and newspapers), **document literacy** (which covers discontinuous text such as graphs, charts and tables), **numeracy** (which covers mathematical and numerical information) and **problem-solving** (which covers analytical thinking, reasoning and logic).

Note: An article on the skill levels of the New Zealand population is provided in chapter 5.

The intergenerational influence

In 1996, approximately half of New Zealand adults whose parents had undertaken tertiary education were likely to have a tertiary education. The proportion in 2006 was very similar.

People whose parents only had lower secondary education were, however, more likely to get a tertiary education in 2006, compared with 10 years earlier. In 2006, two-thirds of New Zealand adults with parents with only lower secondary education were likely to have a tertiary education. This compares to one-quarter in 1996.

New Zealand is one of a number of countries where the proportion of tertiary-educated people in the population has risen, increasing the chance of people whose parents had only lower secondary education to get a tertiary education. In 2006, three out of four people in the United States of America and three out of five people in Canada were likely to have a tertiary education if their parents had only lower secondary education. These findings show that there is a reasonable level of educational mobility in the United States, New Zealand and Canada. That is, in these countries, having parents with a lower level of education does not restrict people to low education.

One way of measuring the changes in the influence of a parent's education level on the education level of their children is to calculate the ratio of the likelihood of undertaking tertiary study if at least one parent has a tertiary education to the likelihood of undertaking tertiary study if neither parent completed secondary school. This measure is known as the 'intergenerational education gap' (Foley, 2005). This measure was estimated at 0.64 for New Zealand in 2006, suggesting that there was a relatively high probability that someone with parents with only lower secondary education would undertake tertiary education. Ten years earlier, New Zealand's intergenerational education gap was larger at 1.89. This means that people with parents with a tertiary education were almost twice as likely to get a tertiary education in 1996 than people with parents with only lower secondary education.

This change in the indicator is largely due to the higher participation rate of New Zealanders in tertiary education in the last decade. Also the proportion of the adult population with a tertiary education whose fathers have only lower secondary education is diminishing. In 1996, 15 percent of adults with a tertiary education had a father with only lower secondary education and in 2006 this proportion had decreased to 12 percent.

Levels of educational participation measured in the Adult Literacy and Life Skills Survey

Upper secondary education refers to individuals who have completed form 6 or 7 (year 12 or 13). Upper secondary education also includes study of level 1 to 3 certificates, including trade certificates.

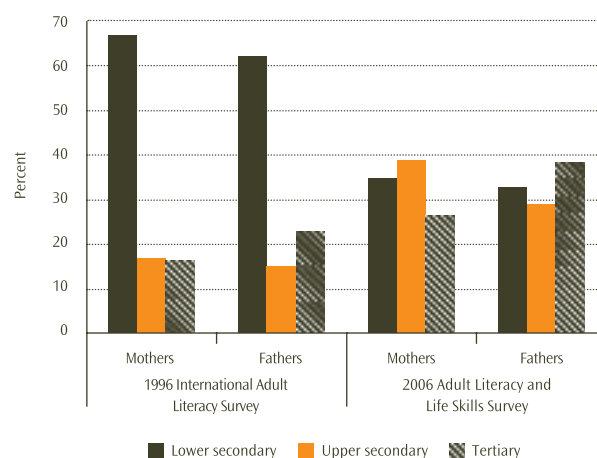
Tertiary education referred to here covers study of level 4 certificates, level 5 to 7 certificates and diplomas and bachelors or higher-level study.

Note also that lower secondary education refers to basic programmes at level 2 of the International Standard Classification of Education.

The educational inheritance of New Zealand adults

The Adult Literacy and Life Skills Survey found that in 2006 an estimated 46 percent of New Zealand adults participated in tertiary education, 46 percent in only upper secondary education and 8.3 percent in only lower secondary education. The differences in participation between men and women were small: 48 percent of men had studied at tertiary level compared to 45 percent of women; 47 percent of women and 44 percent of men had studied only at upper secondary level.

Figure 4.10: New Zealand adults by level of study of their parents



The data from the survey also provides insight into the level of study of our parents. It showed that the proportion of New Zealand adults with fathers who had participated in tertiary education had increased to 38 percent in 2006, compared to 23 percent in 1996. Over the same period, New Zealand adults with fathers whose highest education was upper secondary school had increased by 15 percentage points to 30 percent. Consequently, the proportion with fathers whose education was limited to only lower secondary school fell between 1996 and 2006 by 30 percentage points to 32 percent.

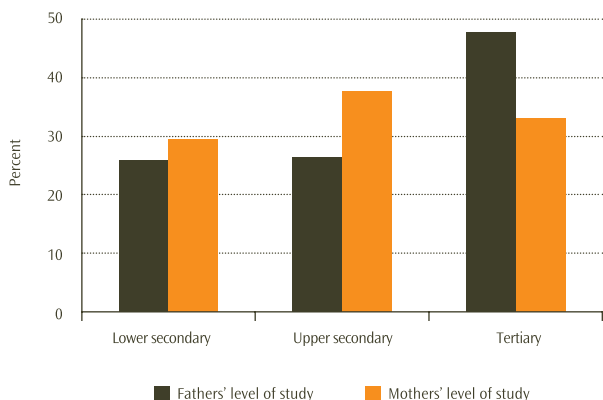
In 2006, only 26 percent of New Zealand adults had mothers with a tertiary education. While the proportion who had mothers with only upper secondary school education was considerably larger at 39 percent, there were still 35 percent of New Zealand adults who had mothers with only lower secondary education. This finding reflects women's low participation in tertiary education in previous generations.

Comparing the New Zealand adults who had studied at tertiary level with those who had participated only in lower secondary education shows that there were significant differences in the level of study of their parents (see Figures 4.11 and 4.12). This supports the findings of many studies on education inheritance.

Nearly half of New Zealand adults with a tertiary education had fathers with a tertiary education. In contrast, looking at New Zealand adults with only lower secondary education only 20 percent had fathers with a tertiary education while the proportion of their fathers with only lower secondary education was as high as 60 percent. In keeping with this pattern, less than 30 percent of New Zealand adults with a tertiary education had parents with only lower secondary schooling. These relationships between the educational attainment of parents and children suggest that New Zealand adults with a parent with a tertiary education are more likely to undertake tertiary education themselves than those whose parents have a lower level of education. A similar result was found in the Competent Children study completed by the New Zealand Council for Educational Research, which found that mothers' education was influential in predicting their children's school performance.

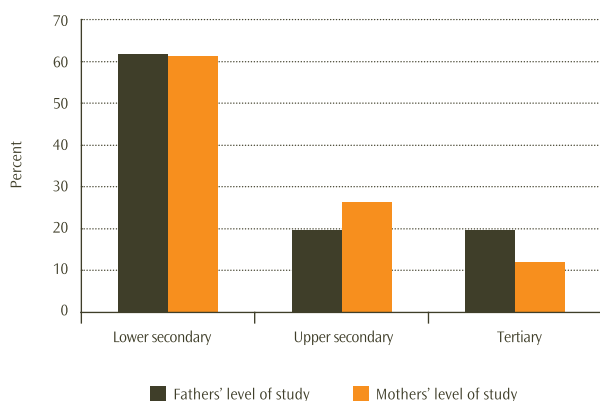
While those whose parents had a higher level of education had a greater propensity to undertake higher-level study, the results of the Adult Literacy and Life Skills Survey also suggest that New Zealand adults move quite readily into tertiary education even when their parents do not have education at this level.

Figure 4.11: New Zealand adults with a tertiary education by level of study of their parents



The pattern of educational inheritance was less strong for New Zealand adults with only upper secondary education. In this group, the fathers were virtually split equally across the three levels of education. This more uniform distribution, especially of fathers, at every education level suggests that the education level of parents did not create a barrier to moving from lower to upper secondary education. On the other hand, there was also a substantial proportion of New Zealand adults (15 percent) with upper secondary education who did not undertake tertiary education even though their parents did.

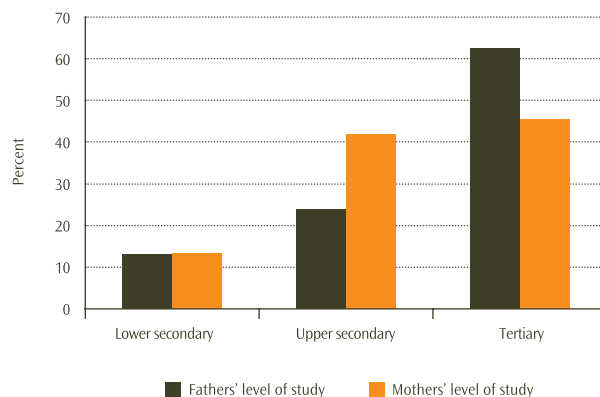
Figure 4.12: New Zealand adults with only lower secondary education by level of study of their parents



Different educational inheritance for different age groups

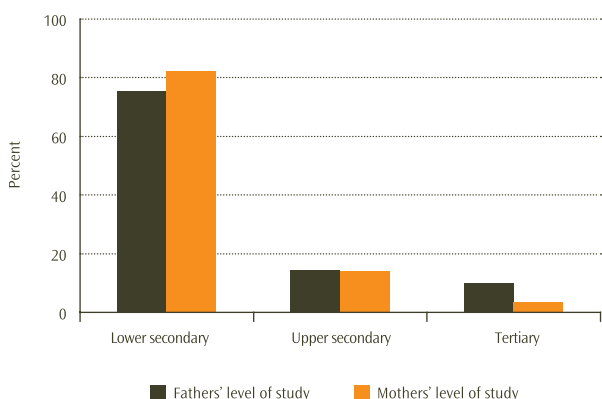
Comparing the youngest New Zealand adults who participated in the survey – those aged 16 to 24 years – with those aged 55 to 65 years shows that there were significant differences in the education levels of their parents. As would be expected, young New Zealand adults had the higher proportion of fathers and mothers who had participated in tertiary education. This was because their parents were younger and the participation rate of New Zealanders in tertiary education has risen over time. Of those with a tertiary education in this age group, 63 percent had fathers with a tertiary education and 45 percent had mothers with a tertiary education. Of those with only upper secondary education, 45 percent had fathers with a tertiary education. Of the remaining 8 percent of young New Zealand adults who had only lower secondary schooling, almost one-third of their parents were, in fact, tertiary educated. Approximately one-third of the young New Zealanders with only lower secondary education would be under the age of 18 and probably still attending secondary school. These young adults are in the early stage of their educational development.

Figure 4.13: New Zealand adults aged 16-24 years with a tertiary education by level of study of their parents



The parents of New Zealand adults aged 55 to 65 years were of a generation when tertiary education was less common. Of those with tertiary education in this age group, 37 percent had fathers with tertiary education while in the case of mothers the proportion was lower at 20 percent. Of New Zealand adults aged 55 to 65 years with only upper or lower secondary education, only 18 percent and 10 percent, respectively, had fathers with a tertiary education and the proportions with mothers with tertiary education were lower still at around 5 percent (see Figure 4.14).

Figure 4.14: New Zealand adults aged 55-65 years with only lower secondary education by level of study of their parents

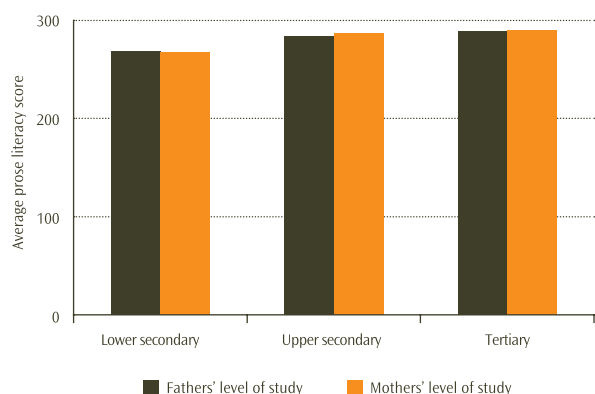


Parents' education level and their children's skills

The Adult Literacy and Life Skills Survey showed that people's skills were slightly higher where the levels of education of their parents were higher. However, people's skills were considerably higher when their own level of education was higher.

In 2006, the average prose literacy score of New Zealand adults was slightly higher when the levels of education of their parents were higher. For example, New Zealanders with a mother with tertiary education achieved an average prose literacy score of 290 and this compared to an average score of 267 for those with mothers with lower secondary schooling. There was, however, less than six points' difference in the average scores of New Zealand adults whose parents had a tertiary education and adults whose parents had only upper secondary-level education. This difference was smallest in the case of the mothers and not statistically significant. For fathers this difference was slightly greater and was statistically significant.

Figure 4.15: Average prose literacy scores of New Zealand adults by level of study of their parents



Improved educational mobility in New Zealand

Summing up, educational mobility has improved in New Zealand since 1996 – having parents with a lower level of education does not restrict people to low participation in education. The likelihood of New Zealand adults with parents with only lower secondary education getting a tertiary education has improved; and there are now fewer people with parents with only lower secondary education. The likelihood of people with parents with a tertiary education getting a tertiary education has remained stable. Strong educational relationships continue to exist – those with a tertiary education are twice as likely to have a father with a tertiary education than a father with only lower secondary schooling.

The Adult Literacy and Life Skills Survey shows that there was also a significant group of New Zealand adults with a tertiary education whose parents had only upper secondary schooling. This suggests that New Zealand adults move reasonably readily into tertiary education even when their parents do not have education at this level.

The survey also shows that there is a strong relationship between adults' skills and their level of education. People with a tertiary education scored higher, on average, than those with only a lower secondary school education in all the competencies measured by the survey. Even the differences between those with a tertiary education and those with only upper secondary schooling were statistically significant although these differences were much smaller. These findings confirm that investing in people's tertiary education leads not just to a more educated workforce but also to a more skilled workforce. Parents with a tertiary education are more likely to have children with a tertiary education and, in turn, these children will, on average, have higher skills.

A recent study by Foley (2005), entitled *Culture and intergenerational mobility in education*, found that certain cultures value education differently. The study also found that certain cultures may encourage parents to sacrifice relatively more for their children's education. However, the study predicted that an increase in the value a society places on education and an increase in income inequality in the parents' generation would decrease intergenerational educational mobility. The influence of culture on the cost-benefit ratio of education had unpredictable effects because high-income parents may consume less than low-income parents. Interestingly, the Adult Literacy and Life Skills Survey shows that the intergenerational educational mobility remained very similar for New Zealand adults whose parents had undertaken tertiary education, while the participation rate of New Zealanders in tertiary education increased. Also, intergenerational educational mobility improved for New Zealand adults whose parents only had lower secondary education.

The Foley study also found that the effect of policy changes or changes in the returns to education had an ambiguous effect because, at very low levels of consumption, a change in the value of education had a large effect on the education cost-benefit ratio of individuals.

The 2006 Adult Literacy and Life Skills Survey provides evidence of the existence of relationships between parents' education and the education of their children. Differences in people's educational opportunity have persisted despite increases in the returns from education and the considerable expansion in educational participation in New Zealand.

References:

Foley, K.E. (2005) *Culture and intergenerational mobility in education*, Vancouver: Department of Economics, University of British Columbia.

Maani, S.A. (2006) Parental income and the choice of participation in university, polytechnic or employment at age 18: a longitudinal study, *Research in Economic Inequality*, Vol. 13, pp 217-248.

Smyth, E. (2003) *Gender, education and labour market outcomes*, Comparative analyses of intergenerational 'inheritance', Report 5, Dublin: Economic and Social Research Institute.

Van de Werfhorst, H.G., de Graaf, N.D. & Kraaykamp, G. (1999) Intergenerational resemblance in field of study in the Netherlands, *European Sociological Review*, Vol. 17, No. 3, pp 275-293.

Higher-level education is strongly associated with greater skills

The Adult Literacy and Life Skills Survey gives insight into how literacy, numeracy and problem-solving skills are distributed across the New Zealand adult population.

Key findings of the 2006 Adult Literacy and Life Skills Survey

- **New Zealand adults with greater literacy and numeracy skills were more likely to have higher levels of education. For example, the average prose literacy score of individuals with a tertiary education was 65 points higher than for adults with only lower secondary schooling.**
- **There was less variation in skill among individuals with higher levels of education. For example, the 5th to 95th percentile range of the document literacy scores for adults with only secondary schooling was 191 points. The comparable range for those with only upper secondary education was lower at 160 points, while for the tertiary educated the range was 151 points.**
- **There is a small proportion of New Zealand adults with only lower secondary education whose skill level is above the average score for those with a tertiary education. Also around 20 percent of adults with upper secondary education had a skill level above the average score for those with a tertiary education.**

Literacy skills

The Adult Literacy and Life Skills Survey showed that the average prose literacy scores of New Zealand adults increased as the education level of individuals increased (see Figure 4.16). Prose literacy is the ability to read and understand continuous texts (such as news stories, editorials, brochures and instruction manuals). The prose literacy scores of New Zealand adults with a tertiary education ranged from 219 points (5th percentile) to 359 points (95th percentile). This compared with a range for those with only lower secondary schooling starting at 129 points (5th percentile) through to 303 points (95th percentile).

The distribution of prose literacy scores of adults with only upper secondary schooling overlapped substantially with that of adults with a tertiary education. Nevertheless, the average prose literacy score of people with only upper secondary schooling was 25 points lower than for those with a tertiary education and this difference was statistically significant.

Interestingly, the higher performers in prose literacy among those with only lower secondary schooling had scores slightly above the mean score for adults with a tertiary education, suggesting that these adults would be capable of undertaking tertiary education.

About the Adult Literacy and Life Skills Survey

The 2006 survey was conducted with a representative sample of New Zealand adults aged between 16 and 65 years living in private households. The survey was conducted over the period starting in May 2006 through to March 2007.

The survey measures literacy and life skills in the adult population at national and international levels. It measures **prose literacy** (which covers continuous text found, for example, in books and newspapers), **document literacy** (which covers discontinuous text such as graphs, charts and tables), **numeracy** (which covers mathematical and numerical information) and **problem-solving** (which covers analytical thinking, reasoning and logic). For information on the survey's five 'cognitive levels' refer to: www.educationcounts.govt.nz/publications/tertiary_education/13101

Each individual was assigned a score from zero to 500. Zero indicates extremely low proficiency and 500 extremely high.

Note: A detailed report on the skills of the New Zealand population by education level titled *The Adult Literacy and Life Skills (ALL) Survey: education, work and literacy* is available on the Education Counts website.

Key for Figures 4.16 to 4.19

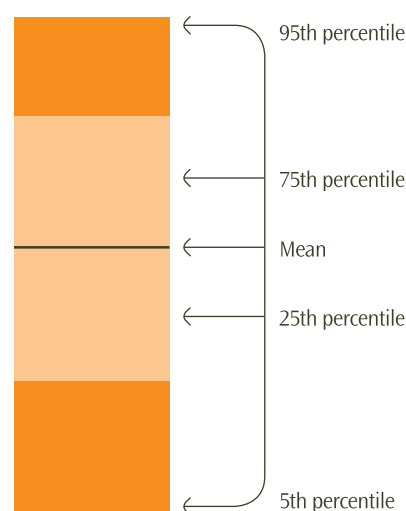


Figure 4.16: Prose literacy scores of New Zealand adults by level of study



Note: Lower secondary education refers to basic programmes at level 2 of the International Standard Classification of Education (ISCED 1997) and includes people with schooling below secondary level. Upper secondary covers level 3 of the classification and tertiary covers ISCED 4 through to ISCED 6.

Document literacy, numeracy and problem-solving skills

The 2006 Adult Literacy and Life Skills Survey also measured people's competency in document literacy, numeracy and problem-solving. Again, as would be expected, people with higher levels of education had higher skills than adults with only lower or upper secondary schooling (Figures 4.17 to 4.19).

The average scores of people with a tertiary education, when compared with those of adults with only lower secondary schooling, were higher by 72 points for document literacy, by 77 points for numeracy and by 65 points for problem-solving.

Comparing the skill levels in document literacy, numeracy and problem-solving of people with a tertiary education with those of people with only upper secondary schooling showed that the gap in skill level was reasonably narrow. That is, the mean scores achieved for these competencies by people with only upper secondary schooling were each less than 30 points lower than for adults with a tertiary education. However, as was the case for prose literacy, these differences were nevertheless statistically significant for each competency. This finding suggests that, in general, additional education is associated with greater skills.

The survey scores for document literacy – the ability to read and understand, for example, charts, maps, tables and timetables – have been graphed in Figure 4.17 by level of study.

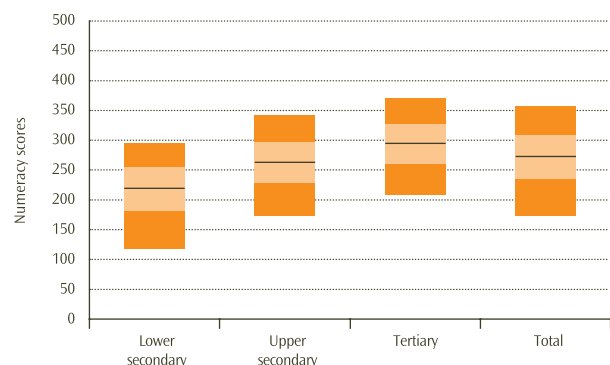
Figure 4.17: Document literacy scores of New Zealand adults by level of study



The document literacy scores of New Zealand adults varied widely across the education levels of individuals. For example, the 5th percentile for adults with only lower secondary schooling was 113 points and the 95th percentile for adults with a tertiary education was 369 points. In addition to confirming that people with higher levels of education had higher skills, the survey also showed that people's skill competency varied less among adults with higher levels of education. For example, the 5th to 95th percentile range of the document literacy scores for people with only lower secondary schooling was 191 points, and the comparable range for those with only upper secondary education was lower at 160 points. For the tertiary educated this range was 151 points.

Again, it is noteworthy that in each area of skill measured in the survey, there is a small proportion of New Zealand adults with only lower secondary schooling whose skill level is above the average score for tertiary educated New Zealand adults. Similarly, there is a considerable number of adults with upper secondary education whose skill level is above the average score for those with tertiary education.

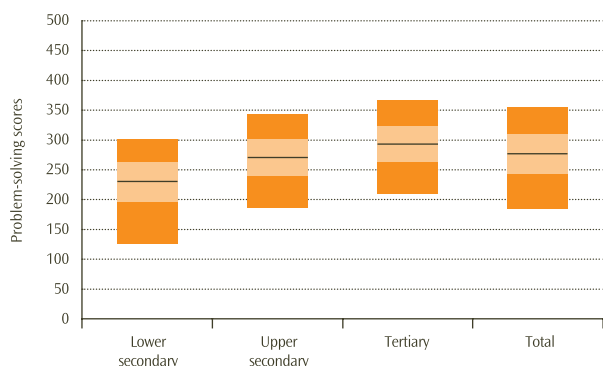
Figure 4.18: Numeracy scores of New Zealand adults by level of study



The numeracy scores of New Zealand adults also varied widely across the education levels of individuals. For example, the 5th percentile for adults with only lower secondary schooling was 119 points and the 95th percentile for adults with a tertiary education was 371 points. The skill competency among adults with higher levels of education varied less but the differences were smaller than for document literary skills. The 5th to 95th percentile range of the numeracy scores for people with only lower secondary schooling was 178 points and the comparable range for those with only upper secondary education was, again, lower at 169 points. For those with a tertiary education this range was 162 points.

The problem-solving scores of New Zealand adults varied across the education levels of individuals as follows: the 5th percentile for adults with only lower secondary schooling was 126 points and the 95th percentile for adults with a tertiary education was 365 points. Looking at the score variation within education levels, the 5th to 95th percentile range of the problem-solving scores for people with only lower secondary schooling was 176 points, on average, and the comparable range for those with only upper secondary education was lower at 156 points. People with tertiary education had the same problem-solving score range (156 points) as those with only upper secondary education but their scores were 12 to 20 points higher.

Figure 4.19: Problem-solving scores of New Zealand adults by level of study



Tertiary education and productivity

Over the last 10 years there has been major growth in the proportion of New Zealanders with a tertiary education qualification. The proportion with a bachelors degree or higher has doubled. At the same time, New Zealand's labour productivity has not grown as fast as that of its main competitors. The government has identified raising productivity growth as a key economic challenge for the country.

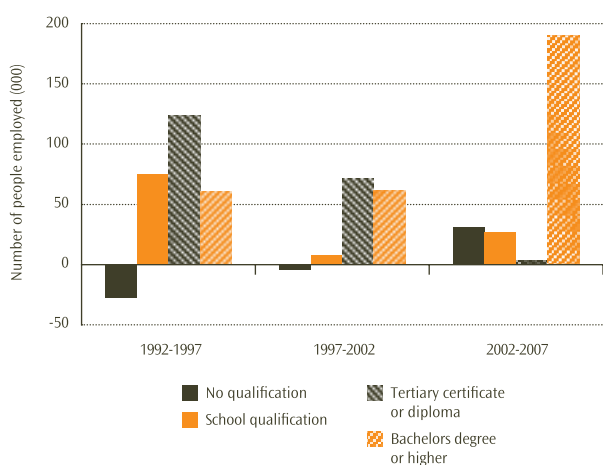
This article explores recent literature on the link between tertiary education and productivity and possible reasons why labour productivity has not grown as fast as may be expected given the growth in tertiary qualifications.

High growth in tertiary education attainment

Over the last 15 years, the proportion of employed New Zealanders with higher-level educational qualifications has increased. From 1992 to 2007, the proportion of employed people with a bachelors degree or higher qualification increased from 10 percent to 22 percent. The total proportion of employed New Zealanders with post-school qualifications increased from 49 percent in 1992 to 59 percent in 2007 and the proportion with no educational qualifications decreased from 26 percent to 18 percent.⁵

As the labour market has gone through various changes, so have the characteristics of the additional employees changed. In the period 1992 to 1997, when there was high unemployment, the balance of new employees was towards people with school qualifications and tertiary certificates and diplomas. As unemployment fell during the period from 1997 to 2002, the increased demand was for people with tertiary-level qualifications. The last five years has seen a different situation, where the majority of the increase has been in people with bachelors and above, while there has also been increased employment of people with no qualifications or school qualifications only.

Figure 4.20: Change in the number of people employed by qualification level



Source: Statistics New Zealand, *Household Labour Force Survey* (June quarters).

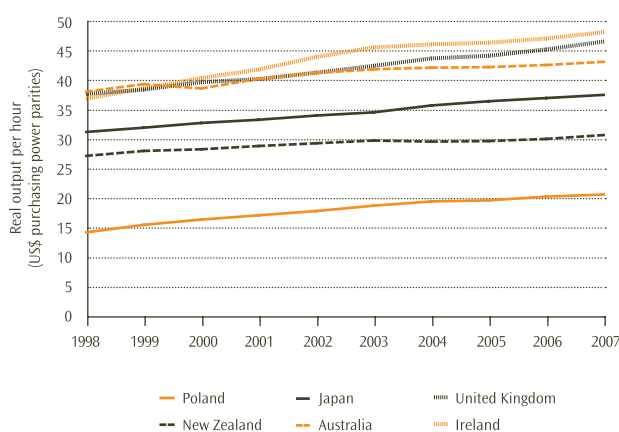
Low growth in productivity

Labour productivity measures the value of goods and services produced for a certain amount of labour effort. It is closely related to incomes and living standards.

Economic growth over the last two decades in New Zealand has been driven both by increases in the number of people employed and by growth in labour productivity. Labour productivity growth has been in the range of 1 to 2 percent per annum since the early 2000s (The Treasury, 2008).

New Zealand's labour productivity levels are low in comparison with our international competitors, with growth slowing relative to other countries over the last four years. New Zealand also has lower capital investment relative to many of its trading partners (Mason and Osbourne, 2007).

Figure 4.21: Long-term labour productivity levels



Source: The Conference Board and Groningen Growth and Development Centre (2008).

5. Figures are taken from Statistics New Zealand's *Household Labour Force Survey*, using June quarters.

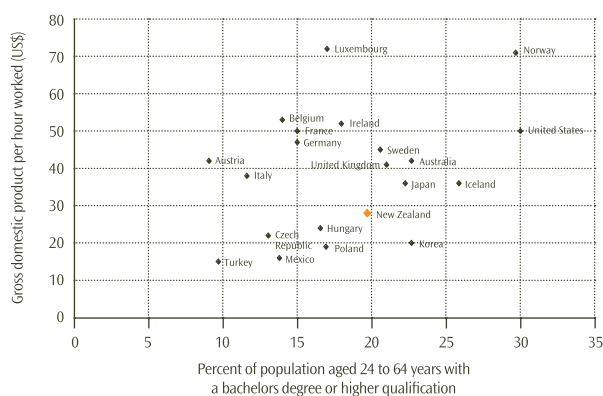
New Zealand and the OECD – education and productivity

In New Zealand, the proportion of 25 to 64 year-olds with a bachelors degree or higher qualification is close to the OECD average. New Zealand ranks in the upper half of the OECD countries on this measure, but is somewhat below Australia and the United Kingdom (OECD, 2007).

However, in terms of labour productivity, New Zealand is in the lower third of the OECD countries, performing somewhat ahead of the Eastern European countries but well behind Japan, Australia, the United States and Western Europe.

This situation raises the question about what contribution increased educational attainment has made to productivity and why the effect appears to be so limited.

Figure 4.22: Comparison of productivity and tertiary education attainment for selected OECD countries



Sources: OECD, *Education at a glance: 2007 OECD indicators*, and *Fact book 2007*.

Education and labour productivity

Razzak and Timmins (2008a) looked at the effect of educational qualifications, as a proxy for human capital and skill levels, on economic output per person. They found that increases in the proportion of employees with bachelors degrees and above and increases in the average gross domestic product per person were highly positively correlated. Thus, there has been a general benefit from increased tertiary education to the economy as a whole.

They also found that the combination of increased private investment in research and development, together with an increased proportion of the workforce with bachelors degrees and above, had a strong positive effect on gross domestic product per capita.

Their models suggest that a 10 percent increase in the share of degree-educated workers results in a 0.5 to 1.0 percent increase in gross domestic product per capita. This effect is higher in industries that have a lower proportion of degree-qualified employees.

A smaller effect on gross domestic product was found for increasing the proportion with below-degree-level tertiary qualifications.

Skill shortages and skill premiums

Razzak and Timmins (2008b) went on to look at skill shortages and skill premiums in New Zealand. The skill premium is the wage paid to skilled workers relative to unskilled workers.

They conclude that the New Zealand economy has been experiencing a strong upward shift in the demand for skilled labour and a significant equal increase in the supply of skilled workers. A major driver has been the adoption of new technology, which drives up the demand for skills and also motivates workers to upskill, increasing the supply of skills.

The increase in premiums paid for higher skills has been small, as the increase in demand has only been slightly higher than the increase in supply of people with those skills. Using qualifications as a measure of labour skill, they estimate that demand has been about 2 percent ahead of supply annually.

They found significant differences in patterns across industries. Demand for skills was relatively higher in service industries (such as finance, insurance, real estate, business services and community, social and personal services) which are more dependent on information technology.

Does quality matter in labour input?

Szeto and McLoughlin (2008) looked at whether the increase in qualifications levels across the workforce, along with increased labour force participation, migration and demographic changes, had resulted in improvement to the quality of labour input. Quality of labour input was examined using a combination of qualifications, as a proxy for skills, and age, as a proxy for experience.

They found that increased qualification levels, particularly at degree level and above, as well as a more experienced workforce, had contributed to a large rise in labour quality since 1988. It was stronger in the period 1988 to 1997 and dampened from 1997 to 2005 by more low-skilled people entering the workforce.

They estimated that around a third of the growth in labour input over this period came from increased labour quality. Around 30 percent of the quality increase could be attributed to demographic changes and the remaining 70 percent to rising qualification levels.

The annual rise in labour quality was similar to that experienced in Australia, the United States and Europe. However, once labour productivity had been adjusted for improvements in quality, the annual growth in New Zealand was much less than comparable growth rates in Europe, the United States and Australia.

Productivity, capital intensity and labour quality – comparing New Zealand with the United Kingdom

Mason and Osborne (2007) compared productivity, capital intensity and labour quality between New Zealand and the United Kingdom across 21 different 'market sectors'. Their analysis showed that while New Zealand compares unfavourably with the United Kingdom on average labour productivity, there is considerable sectoral variation.

The paper points out that there is a clear link between the relatively low gross domestic product per capita in New Zealand and weak labour productivity. The authors found that in 2002 the average value added per hour of work in New Zealand was 77 percent of that in the UK. This was down from 82 percent in 1995. They confirmed that New Zealand had achieved faster growth in labour input through job creation. However, this has been at the cost of average labour productivity.

The paper reports that while New Zealand's productivity is lower than that of the United Kingdom overall, there are some sectors where New Zealand performs better than the United Kingdom. The five areas where there is higher productivity in New Zealand are all in the service industries. The areas where New Zealand does not perform so well are characterised by low physical capital intensity relative to the United Kingdom, such as manufacturing and construction. Part of the difference between the two countries can also be explained by the greater proportion of the New Zealand workforce in lower value-added sectors, such as agriculture.

Variations in earnings and composition of workforce

While not looking specifically at the question of qualifications and skills, Maré and Hyslop (2008) examined the impact of the economic expansion from 1999 to 2007 on earnings and the composition of the workforce. They found that workers entering the workforce during this period had 19 percent lower earnings than the average worker while firms that started up during this period paid 8 percent lower than average. They also found that more hours were being worked by lower-paid workers. Their analysis confirms the idea that economic expansion has brought an increased number of lower-skilled workers into the workforce, thus lowering average productivity. In addition, they showed that the expansion has also resulted in more new firms being established, which may also have lower initial productivity.

Linking qualifications, skills and productivity

The set of papers reviewed in this article confirm that the increased levels of qualifications in the workforce have fed through to improved quality of labour and contributed to labour productivity. However, this contribution has been dampened by the expansion of the workforce to include more low-skilled workers and the establishment of new firms.

With a limited supply of new employees to support further expansion, there is a need to look at how to achieve increased productivity from the existing workforce. Formal educational qualifications are one source of skills for employees. Skills are also attained through experience and the development of knowledge on the job. Increasing the number of people with a fuller range of skills is one part of improving productivity in the workplace. Other factors include the extent to which skills are applied in the workplace, investment in capital, technology and research, improvement to management practices and scope for innovation in processes, products and services.

References:

- Maré, D.C. & Hyslop, D.R. (2008) *Cyclical earnings variation and the composition of employment*, Wellington: Statistics New Zealand.
- Mason, G. & Osborne, M. (2007) *Productivity, capital intensity and labour quality at sector level in New Zealand and UK*, Working Paper 07/01, Wellington: The New Zealand Treasury.
- OECD (2007) *Education at a glance: 2007 OECD indicators*, Paris: Organisation for Economic Co-operation and Development.
- Razzak, W.A. & Timmins, J. (2008a) Education and labour productivity in New Zealand (forthcoming), *Applied Economics Letters*.
- Razzak, W. A. & Timmins, J. (2008b) A macroeconomic perspective on skill shortages and skill premium in New Zealand, *Australian Economic Papers*, 47(1), pp 74-91.
- Szeto, K.L. & McLoughlin, S. (2008) *Does quality matter in labour input? The changing pattern of labour composition in New Zealand*, Working Paper 08/01, Wellington: The New Zealand Treasury.
- The Conference Board and Groningen Growth and Development Centre, Total Economy Database (January 2008) <http://www.conference-board.org/economics>
- The Treasury (2008), *New Zealand's Productivity Performance*, Productivity Paper 08/02, Wellington: The New Zealand Treasury.

Healthy and wise – does education improve wellbeing?

It is well known that education improves people's earning prospects and their ability to contribute to the economy. It is equally important to look at the non-financial outcomes of education.

Wellbeing – the physical, mental or emotional health of people – is an important outcome for society. Wellbeing can be measured in various ways. For example, the proportion of the population that is obese is one way of measuring physical wellbeing (Ministry of Social Development, 2007) and another is by using summary statistics of the self-assessed health of individuals (Ministry of Health, 2008).

Two Ministry of Education researchers, Elliot Lawes and Ian Schagen, used the results of the Adult Literacy and Life Skills Survey to analyse the relationship between New Zealanders' education level and their assessment of their own wellbeing. The research analysed whether the relationship differed when considering physical wellbeing, as opposed to mental or emotional wellbeing. It also looked into the questions of whether the relationship changed when controlling for literacy skills, income and other factors. This article presents a summary of the key findings of the studies.

The Adult Literacy and Life Skills (ALL) Survey was used by the researchers to measure wellbeing. The survey was conducted in New Zealand in 2006 and also in 12 other countries. A representative sample of New Zealand adults aged between 16 and 65 years living in private households participated in the survey, which was conducted between May 2006 and March 2007.

The ALL Survey measured the proficiency of respondents in several types of literacy skills and also put questions about a number of factors – including respondents' self-assessment of their health, education level, income, employment, gender and ethnicity. This enabled the researchers to examine the relationship between literacy and health (Satherley and Lawes, 2007, Lawes and Schagen, forthcoming).

In their analysis of the relationship between education, literacy and wellbeing, Lawes and Schagen used a variety of statistical methods. A factor analysis provided the summary measurements of wellbeing, while regression was used to determine the relative strengths of the factors related to wellbeing.

The statistical analysis was done in three stages:

1. excluding literacy skill and income as potential explanatory factors
2. including literacy skill but excluding income as a potential explanatory factor, and
3. including both literacy skill and income.

Wellbeing and its measurement

The items in the survey background questionnaire that addressed the respondents' assessment of their wellbeing are listed in Table 4.1 below. The first 12 items form an internationally accepted assessment of the Medical Outcomes Study Short Form 12, commonly known as the SF-12.⁶ The 13th item sought to measure the general affect dimension of quality of life.

From the responses to these items, two scales were derived – one measuring physical wellbeing and the other measuring mental and emotional wellbeing.

Table 4.1: Items contributing to wellbeing

How does the respondent feel about life?
What is the respondent's general health?
Is the respondent limited in moderate activities?
Is the respondent limited in climbing stairs?
Has the respondent accomplished less (in a physical sense)?
Is the respondent limited in the kind of work performed (physical)?
Has the respondent accomplished less (in an emotional sense)?
Is the respondent limited in the kind of work performed (emotional)?
Has pain interfered with work?
Is the respondent feeling calm and peaceful?
Does the respondent have lots of energy?
Is the respondent downhearted and sad?
Has health interfered with the respondent's social activities?

6. The SF-12 was developed by the Quality Metric Corporation and is widely used internationally to measure self-assessed health.

Wellbeing is linked to education level, income and literacy skill

The first part of the study looked at the relationships between education level, income and literacy – regardless of wellbeing. Analysis of the survey data showed that there are strong links between education level and literacy skills and between income and literacy skill (Satherley et al, 2008b). The link between education level and income is shown in Table 4.2, where people’s incomes were ranked and divided into five equal groups called quintiles. For the population at each education level, the figure gives the percentage of that population in the income quintile. Those with higher levels of education have greater representation in the higher income quintiles.

Table 4.2: Proportional estimates of education level by income

	Income quintile					Total
	1 = lowest income 5 = highest income	1	2	3	4	
Education level						
Lower secondary or less	26.1	30.5	19.5	15.8	8.1	100
Upper secondary	25.7	23.1	21.9	17.6	11.7	100
Tertiary	12.8	14.9	18.0	23.5	30.8	100

Source: Adult Literacy and Life Skills Survey.

The study provided evidence that education level, income and literacy skill are linked to wellbeing. Physical wellbeing, as reported by survey respondents, is lower at lower levels of education, and mental and emotional wellbeing is higher at higher education levels. Figures 4.24 and 4.25 show physical and mental and emotional wellbeing graphed against education level. In these figures, education level is classified as lower secondary or less, upper secondary, or tertiary.

For each of the wellbeing figures that follow, mean values are indicated by diamonds and 95 percent confidence intervals for the mean indicated by vertical bars.

Figure 4.23: Physical wellbeing by education level

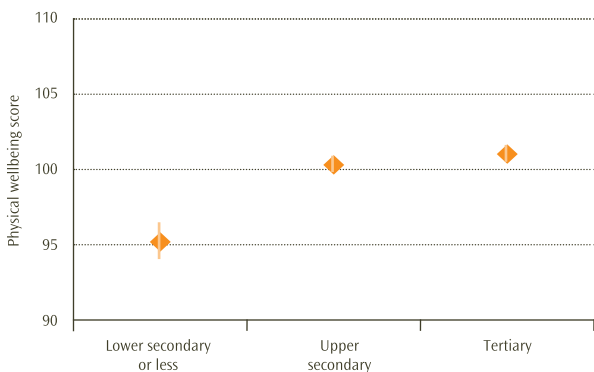
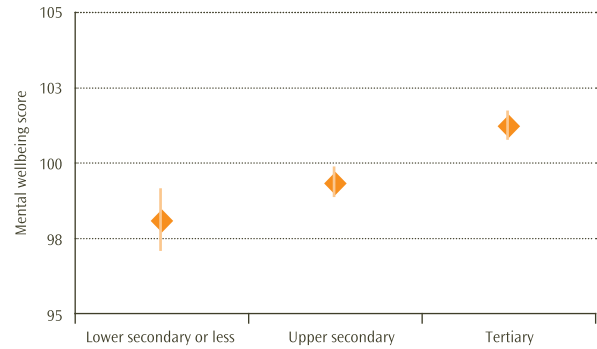


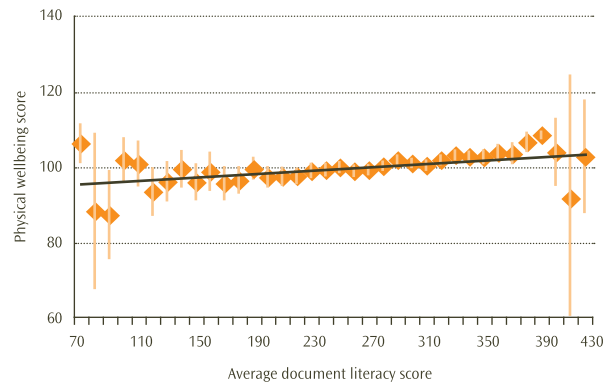
Figure 4.24: Mental and emotional wellbeing by education level



Adding in literacy and income

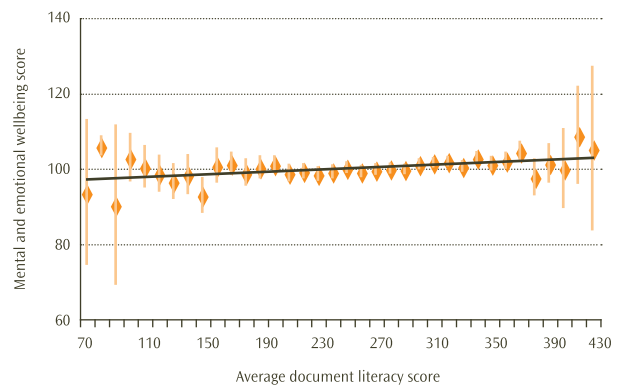
An important workplace skill is document literacy, or the ability to read discontinuous text such as charts, tables and figures. Figures 4.25 and 4.26 show the data from the physical and mental and emotional wellbeing factors graphed against average document literacy skill together with a line of best fit (Satherley et al, 2008b). Physical and mental and emotional wellbeing are higher at higher levels of literacy skill.

Figure 4.25: Physical wellbeing by average document literacy score



Note: There is greater variation in wellbeing at the extremes of the document literacy scores due to the smaller number of respondents with these scores.

Figure 4.26: Mental and emotional wellbeing by average document literacy score



Higher income was associated with higher reported wellbeing. In particular, people in income quintiles 1 and 2 (together representing the lowest 40 percent of incomes) reported lower physical and mental and emotional wellbeing. Those in income quintiles 4 and 5 (together representing the highest 40 percent of incomes) reported that they have better physical and mental and emotional wellbeing (Figures 4.27 and 4.28).

Figure 4.27: Physical wellbeing by income

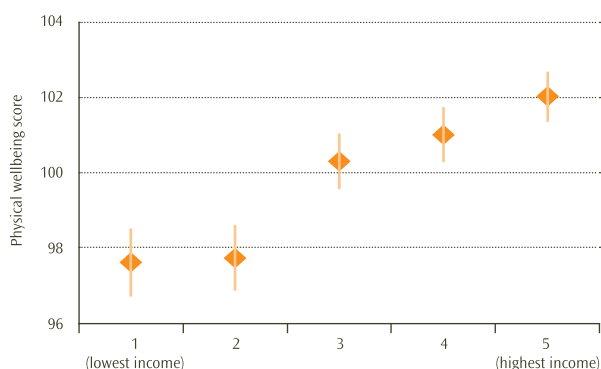
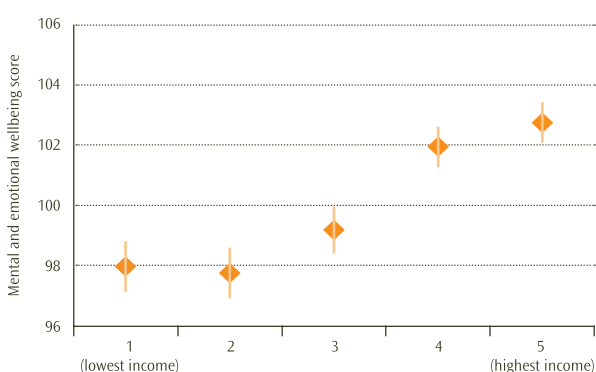


Figure 4.28: Mental and emotional wellbeing by income



To summarise, the study found that there are strong links between education level, income and literacy skill, and strong links between each of these and wellbeing.

Further questions that arise are:

- When controlling for factors such as gender and ethnicity, does education level continue to be positively related to New Zealanders' assessment of their wellbeing?
- When also controlling for skill level, does education level continue to be positively related to New Zealanders' assessment of their wellbeing?
- When also controlling for skill level and income, does education level continue to be positively related to New Zealanders' assessment of their wellbeing?

These questions were explored by Lawes and Schagen – their findings are summarised as follows.

Further influences on wellbeing

A number of background variables related to wellbeing were selected for further analysis. The variables were chosen because they are demographic factors often related to education level. Linear regression was used to explore the relationship between the explanatory variables and each of physical and mental and emotional wellbeing. The variables were:

- *gender* – measures the relationship between wellbeing and being female
- *urban* – measures the relationship between wellbeing and living in an urban community as opposed to a rural community
- *English as an additional language* – measures the relationship between wellbeing and having English as an additional language
- *foreign born* – measures the relationship between wellbeing and being born outside of New Zealand
- *Māori* – measures the relationship between wellbeing and identifying as Māori
- *Pasifika, Asian and the Other ethnic group* – measures the relationship between wellbeing and identifying as an ethnic group (the default identification is New Zealand European). A single respondent can identify with several ethnic groups
- *education level* – measures the relationship between wellbeing and highest level of education
- *age of completion of education* – measures the relationship between wellbeing and leaving education before age 17 years; and between wellbeing and leaving education after age 24 years
- *having remedial reading while at school and attitude to mathematics while at school* – measures the relationship between wellbeing and having remedial reading at school, and between wellbeing and attitude to mathematics while at school
- *employment* – measures the relationship between wellbeing and being employed
- *age* – measures the relationship between wellbeing and age
- *literacy* – measures the relationship between wellbeing and literacy. Here literacy is measured as the average of all the values for prose literacy, document literacy, numeracy and problem-solving (Satherley et al, 2007), and
- *income* – measures the relationship between wellbeing and income.

The interaction between employment and age was also examined. The regression was again carried out in three stages:

1. excluding literacy skill and income as potential explanatory factors
2. including literacy skill but excluding income as a potential explanatory factor, and
3. including both literacy skill and income.

The percentages of the variance explained by the model for physical wellbeing were 9.4 percent at stage 1 of the model, 9.7 percent at stage 2 of the model and 10.6 percent at stage 3 of the model.

The percentages of the variance explained by the model for mental and emotional wellbeing were 6.9 percent at stage 1 of the model, 6.9 percent at stage 2 of the model and 7.8 percent at stage 3 of the model.

Education, literacy and income influence wellbeing differently

Physical wellbeing and mental and emotional wellbeing were measured against the factors discussed earlier.

When controlling for other factors, education level is positively related to New Zealanders' assessment of their physical wellbeing. However, when also controlling for literacy skill, or for literacy skill and income, education level is not related to New Zealanders' assessment of their physical wellbeing.

The analysis also showed that education level is not related to New Zealanders' assessment of their mental and emotional wellbeing nor does this change when also controlling for literacy skill or literacy skill and income.

Further key findings of the study:

- When literacy skill and income are included in the model, they are both positively related to physical wellbeing to a significant extent.
- Physical wellbeing is positively related to being currently employed, and to having had a positive attitude to mathematics at school. When literacy skill is included in the model, physical wellbeing is also positively related to having English as an additional language.
- Physical wellbeing is negatively related to age, to having remedial reading at school, and to identifying as Māori ethnicity (but not when literacy skill is included).
- Physical wellbeing is negatively related to having completed education at age 24 years or over, but not when income is included in the model. In other words, those who completed their education at age 24 years or over tend to have a lower income. A lower income is more strongly associated with lower physical wellbeing than is educational completion age.

- Physical wellbeing is negatively related to identifying with Māori, but not when literacy skill is taken into account. In other words, those who identify with Māori tend to have lower literacy and having a lower literacy skill is more strongly associated with lower physical wellbeing than is identifying with Māori.
- There are no significant relationships between physical wellbeing and gender, being born outside New Zealand, living in an urban community, leaving education before age 17 years, or identifying with Pasifika, Asians or the Other ethnic group.
- Literacy skill and income do not have a non-significant relationship to mental and emotional wellbeing when included in the model.
- Mental and emotional wellbeing is positively related to being currently employed, and to having had a positive attitude to maths at school.
- Mental and emotional wellbeing is significantly lower for females, those who live in urban communities, those completing education at age 24 years or over, and those who had remedial reading at school.
- There are no significant relationships between mental and emotional wellbeing and being born outside New Zealand, leaving education before age 17 years, having English as an additional language, or identifying with Māori, Pasifika, Asians or the Other ethnic group.

Conclusion

Internationally, there is evidence that, in developed countries, full participation in society and the labour market is linked to the capacity to accumulate knowledge and to develop and maintain a broad range of skills. Knowledge and skills are acquired through the education system.

The Adult Literacy and Life Skills Survey is a powerful tool that enables international comparisons as well as trend analysis. The most recent ALL Survey builds on the International Adult Literacy Survey, which was undertaken in 24 countries – including New Zealand – in 1996. Comparisons provide a picture of some of the changes that may have occurred, both nationally and internationally, over the previous decade.

Some of the findings of the study by Lawes and Schagen suggest that education can provide improvements in wellbeing. The study indicates that:

- there are positive relationships between both physical and mental and emotional wellbeing and each of education level, literacy skill and income

- when controlling for factors such as gender, age and ethnicity, education level is positively related to New Zealanders' assessment of their physical wellbeing but not to their assessment of their mental and emotional wellbeing, and
- when controlling for level of literacy skill, or for level of literacy skill and income, education level is not related to New Zealanders' assessment of either their physical or mental and emotional wellbeing.

References:

Lawes, E. & Schagen, I. (forthcoming) *Analysis of Adult Literacy and Life Skills (ALL) Survey data to investigate relationships between education, age, income and wellbeing for New Zealand adults*, Working Paper, Research Division, Wellington: Ministry of Education.

Ministry of Health (2008) *A portrait of health: key results of the 2006/07 New Zealand Health Survey*, Wellington: Ministry of Health.

Ministry of Social Development (2007) *The social report*, Wellington: Ministry of Social Development.

Satherley, P. & Lawes, E. (2007) *The Adult Literacy and Life Skills (ALL) Survey: an introduction*, Wellington: Ministry of Education.

Satherley, P., Lawes, E. & Sok, S. (2008a) *The Adult Literacy and Life Skills (ALL) Survey: overview and international comparisons*, Wellington: Ministry of Education.

Satherley, P., Lawes, E. & Sok, S. (2008b) *The Adult Literacy and Life Skills (ALL) Survey: education, work and literacy*, Wellington: Ministry of Education.

