

# Skills and Education

Survey of Adult Skills (PIAAC)





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# Introduction

**This is one of three summary reports from the Survey of Adult Skills. This report looks at the relationship between education and skill levels and the barriers to further education.**

## Key findings

- » People with higher qualifications have higher average skills
- » People with bachelors or higher qualifications have similar average skill levels in different countries
- » Māori with higher qualifications have lower average skill levels than New Zealand Europeans with the same qualifications
- » Men have higher average numeracy skills than women, and this difference is greatest among those with higher qualifications
- » Young people with school qualifications have much higher average skills than those with no qualifications
- » Time constraints are the greatest barrier to further study among both men and women

## What is the Survey of Adult Skills?

The Survey of Adult Skills measures the skills of New Zealand adults in literacy, numeracy and problem solving in technology rich environments. It is part of the OECD's Programme for the International Assessment of Adult Competencies (PIAAC). The Survey of Adult Skills provides the first picture of skills for those aged 16 to 65 in New Zealand since 2006. The survey has been run across 32 other countries, making it possible to compare the skills of adults in New Zealand internationally.

Skills are becoming more important in the modern workplace and in everyday life. Higher skills are associated with better jobs, higher income and greater well-being. The Survey of Adult Skills can help answer key questions related to skills in New Zealand, such as:

- » what are the characteristics of the most skilled and least skilled people in New Zealand in terms of education, employment, income, well-being and other characteristics?
- » how do New Zealanders use their skills at work and at home?
- » what areas should we focus on to improve the skills of New Zealand adults?

The survey was undertaken in 2014 with a representative sample of New Zealand households. In total, 6,177 people were surveyed. It was conducted in English and included an extensive background questionnaire covering education, employment, and the use of skills at work and in everyday life. The respondents were then tested on their skills.

The survey measures skills on continuous scales which show the range of abilities from being able to deal with simpler through to more complex tasks. The survey does not measure whether people 'pass' or 'fail' certain standards, nor whether people are 'literate', 'illiterate', 'numerate' or 'innumerate'.

The scales can be divided into levels to group people within similar ranges of ability. These levels help describe the kinds of tasks these groups of people can do. However, the levels, on their own, do not describe benchmarks or thresholds for participation in society and the economy.



## Literacy

Literacy is the ability to understand, evaluate, use and engage with written texts to get everyday things done. The Survey of Adult Skills only measures reading literacy; there is no writing component. Some skills required are:

- » understanding of written words and sentences
- » comprehension of text in charts and diagrams
- » comprehension, interpretation and evaluation of complex texts.

## Numeracy

Numeracy is the ability to use, interpret and communicate mathematical information and ideas in order to engage in and manage the mathematical demands of a range of situations. Some aspects that people are required to understand are:

- » quantity
- » dimension and shapes
- » patterns
- » data and chance
- » visual displays.

## Problem solving in technology rich environments

Problem solving in technology rich environments is the ability to use computers to acquire and evaluate information, communicate with others and perform practical tasks. All tasks are completed on a computer that simulates real-world tasks with standard applications. Some skills required are:

- » completing tasks using different everyday computer applications
- » finding specific information in everyday computer applications
- » using common functions to complete tasks in everyday computer applications.

## Measuring skills over time

Previous surveys allow adult literacy skills in 2014 to be compared to those in 1996 and 2006. Adult numeracy skills in 2014 can be compared to numeracy skills in 2006. Problem solving in technology rich environments has been measured for the first time in the Survey of Adult Skills.

Previous measures of adult skills come from the 2006 Adult Literacy and Life Skills Survey (ALL) and 1996 International Adult Literacy Survey (IALS). The ALL and IALS surveys previously reported literacy as two separate measures: 'document literacy' and 'prose literacy'. These two separate scores have been remodelled into a single score that can be compared to the Survey of Adult Skills. The measures are not strictly the same, so some caution is needed when making comparisons between the 2014 Survey of Adult Skills and previous surveys.

Numeracy scores from the 2006 ALL Survey have been re-calculated to match the measure used in the Survey of Adult Skills. The numeracy scores from 2006 used in this report will therefore differ from those in the Ministry of Education's New Zealand reports from New Zealand ALL data.

## Statistical significance

Differences over time, between groups or between countries are statistically significant if the 95% confidence intervals do not overlap. This means we are at least 95% sure that the ranges within which the true population values lie do not overlap.

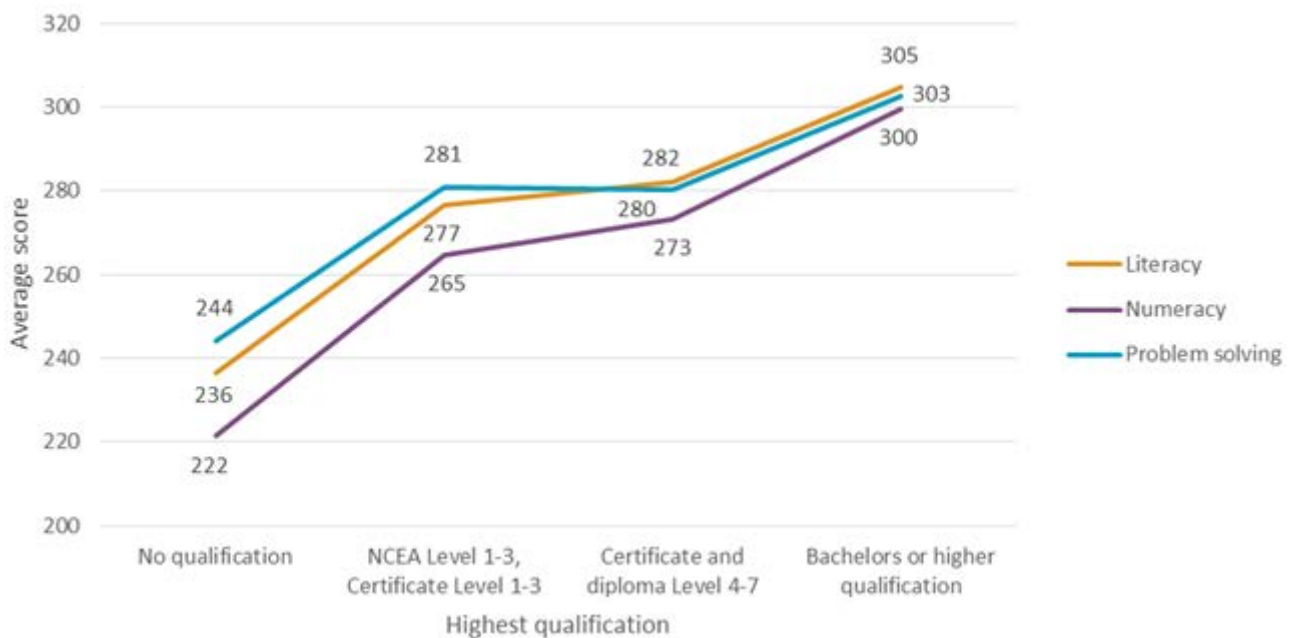
# Skills and qualifications

## People with higher qualifications have higher skills

Adults aged 25 to 65 with bachelors or higher qualifications have much higher average literacy, numeracy and problem solving skills than those with lower or no formal qualifications (Figure 1). The difference in skills between those with a bachelors or higher qualification and those with no qualifications is greatest for numeracy skills and least for problem solving skills. Compared to those with no formal qualifications, people with bachelors or higher qualifications have on average:

- » 29% higher literacy scores
- » 35% higher numeracy scores
- » 24% higher problem solving scores.

**Figure 1: Skills and highest qualification – people aged 25 to 65**

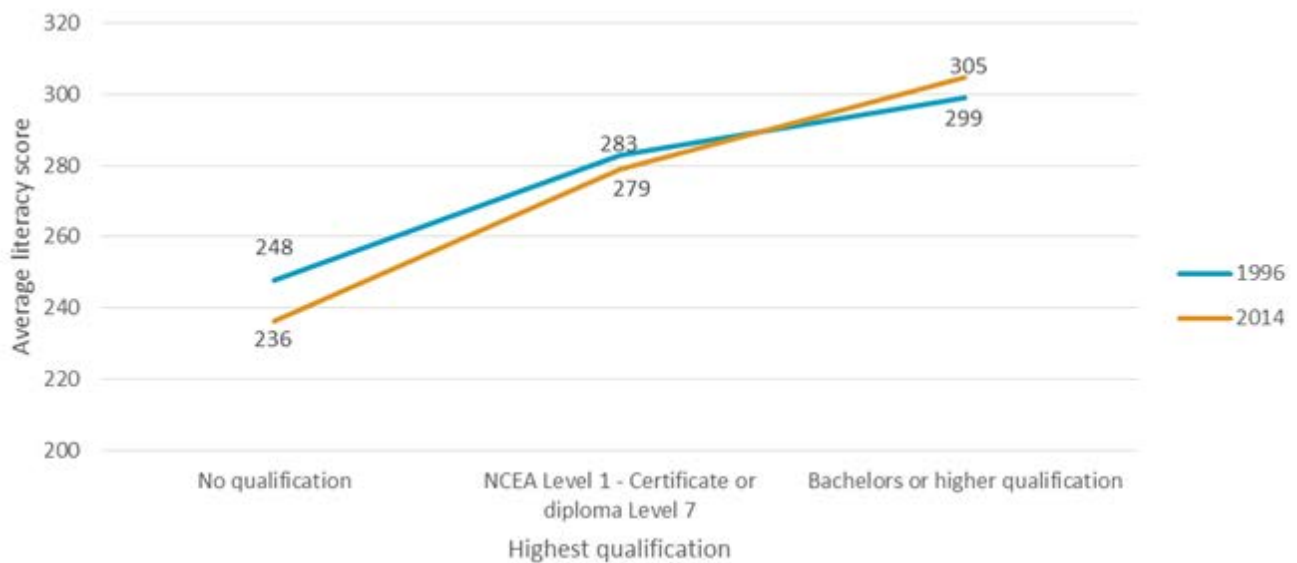


## The difference in literacy skills between the most and least educated has increased

Between 1996 and 2014, the average literacy skills of adults aged 25 to 65 with no qualifications decreased, while the average literacy skills of those with a bachelors or higher qualification increased (Figure 2). Both of these changes are statistically significant. This means the difference in average literacy skills between those with the highest qualifications and those with the lowest qualifications has increased.

- » In 1996, the average literacy score for those aged 25 to 65 with a bachelors or higher qualification was 21% higher than for someone with no qualification.
- » In 2014, the average literacy score for a person aged 25 to 65 with a bachelors or higher qualification was 29% higher than for someone with no qualification.

**Figure 2: Literacy skills and highest qualifications over time – people aged 25 to 65**

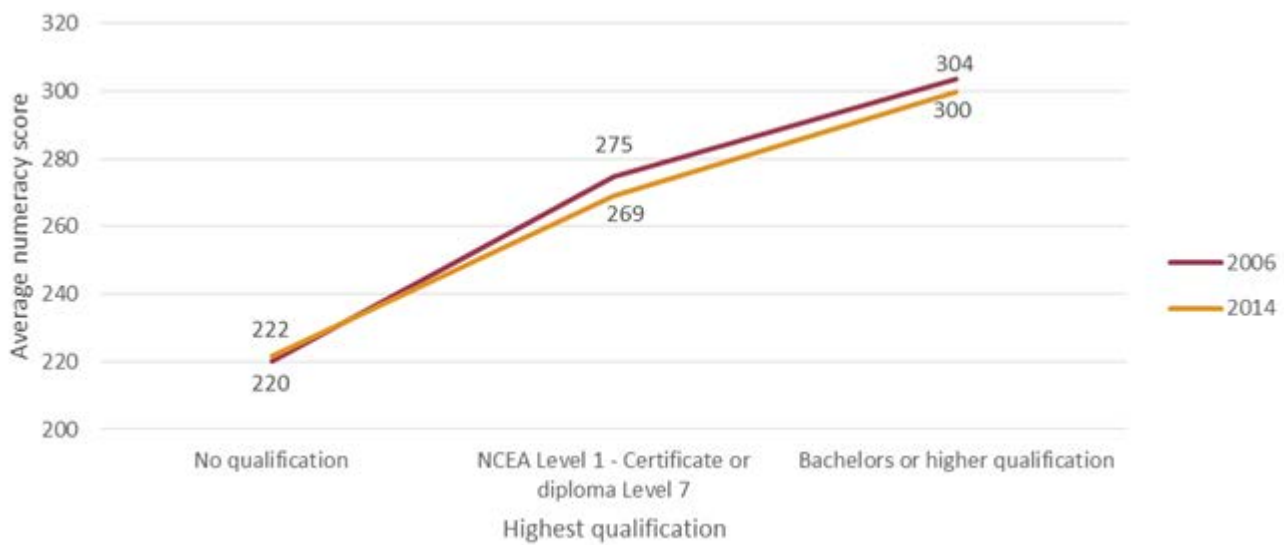


The difference in numeracy skills between those with the highest qualifications and those with no qualification has decreased slightly (Figure 3). The average numeracy score of people aged 25 to 65 with no qualifications increased slightly between 2006 and 2014, but not by a statistically significant amount. Over the same time period, the average numeracy scores of people with bachelors or higher qualifications decreased.

- » In 2006, the average numeracy score of a person aged 25 to 65 with a bachelors or higher qualification was 38% higher than someone with no qualification.
- » In 2014, the average numeracy score of a person aged 25 to 65 with a bachelors or higher qualification in was 35% higher than someone with no qualification.

The difference in average skills between those with the highest qualifications and those with no qualifications is still greater for numeracy skills than for literacy skills.

**Figure 3: Numeracy skills and highest qualifications over time – people aged 25 to 65**



The changing skills of those with no qualifications and those with bachelors or higher qualifications may be related to the changing proportion of people with qualifications at these levels. In the 1996 Census, of those aged 15 to 64:

- » 31% had no qualification
- » 10% had a bachelors or higher qualification.

In the 2013 Census, of those aged 15 to 64:

- » 17% had no qualification
- » 22% had a bachelors or higher qualification.

There is now a smaller proportion of the population with no qualifications and a larger proportion with bachelors or higher qualifications. This may be affecting the skill levels of people at these qualification levels:

- » The smaller proportion of people who do not have any qualifications now may have lower abilities than the larger group who had no qualifications in the past.
- » The larger group of people that now have bachelors or higher qualifications may have lower abilities than the smaller group that had bachelors or higher qualifications in the past.

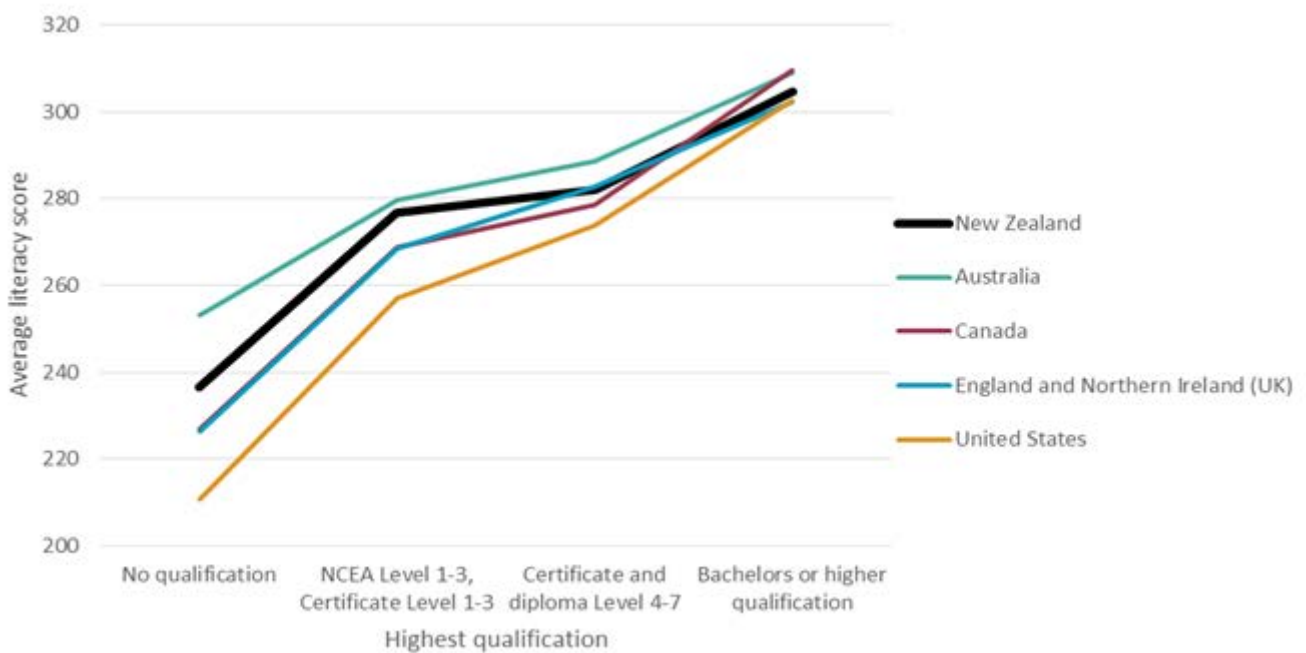


## Across different countries, people with no qualifications have differing skill levels

New Zealanders aged between 25 and 65 with no qualifications have lower average literacy, numeracy and problem solving scores than their counterparts in Australia (Figures 4 to 6). However, their skills in all three skill domains are higher than those of adults aged 25 to 65 with no qualifications in Canada, the United States, and England and Northern Ireland. For adults with no qualifications, the difference between the highest-scoring selected countries in Figures 4 to 6 and the lowest scoring country is on average:

- » 69 points in literacy
- » 52 points in numeracy
- » 33 points in problem solving.

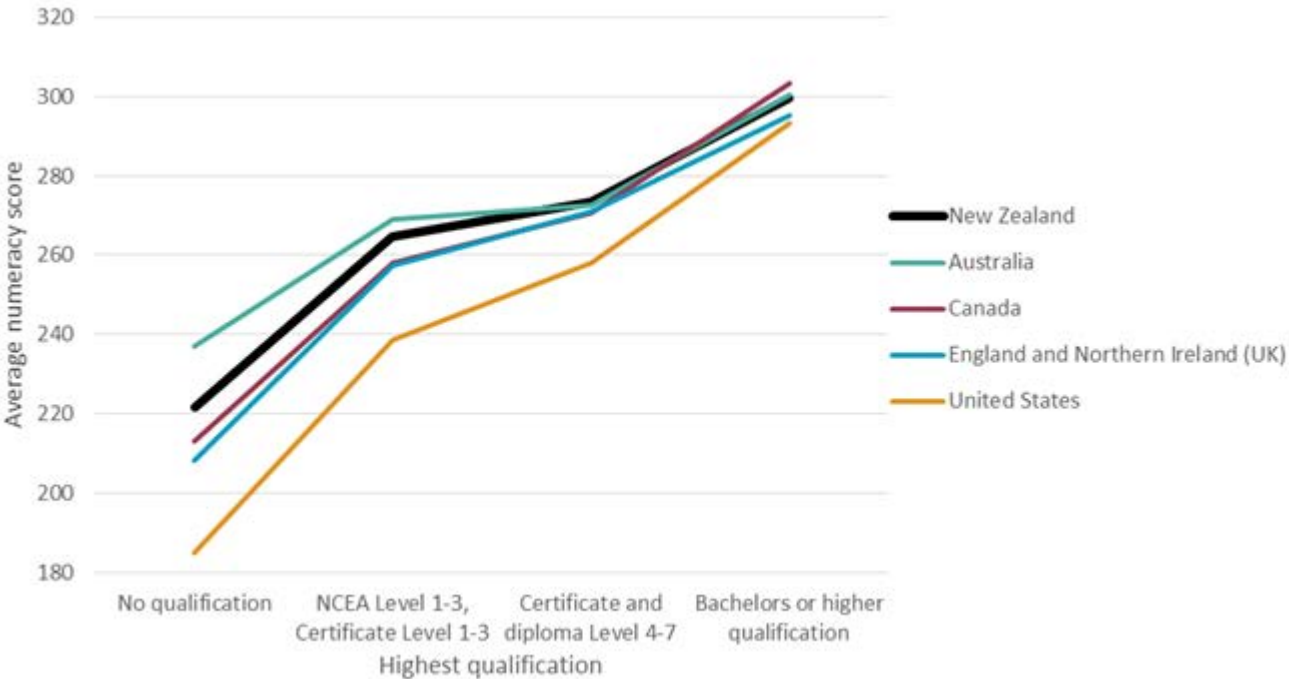
**Figure 4: Literacy skills and highest qualifications<sup>1</sup> in New Zealand and selected countries – people aged 25 to 65**



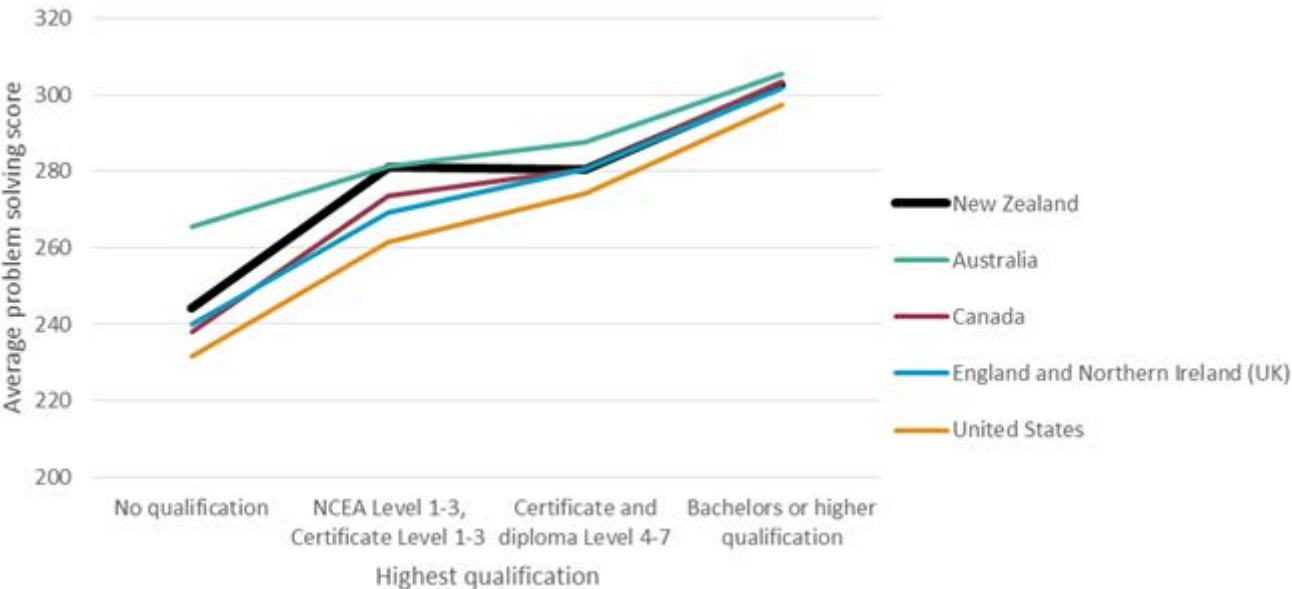
<sup>1</sup> Overseas qualifications have been matched to equivalent New Zealand qualifications



**Figure 5: Numeracy skills and highest qualification<sup>2</sup> in New Zealand and selected countries – people aged 25 to 65**



**Figure 6: Problem solving skills and highest qualifications<sup>2</sup> in New Zealand and selected countries – people aged 25 to 65**

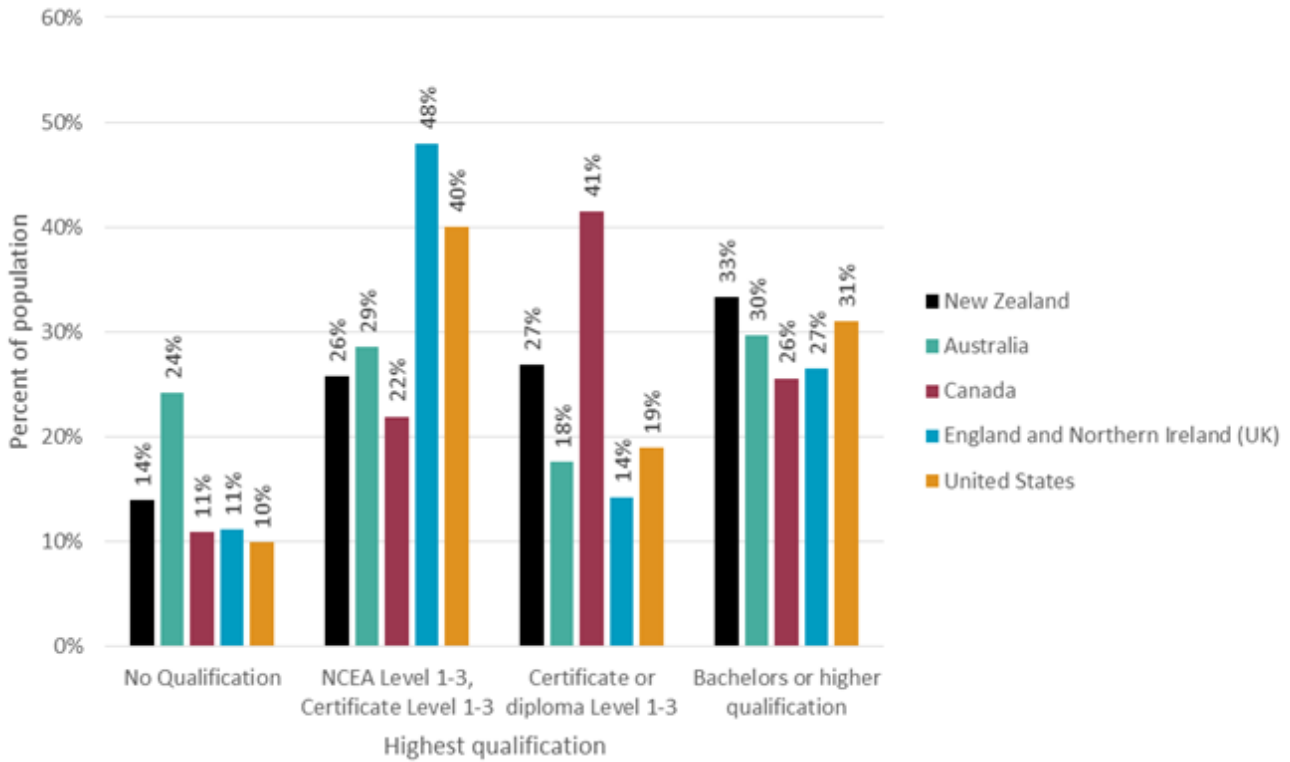


<sup>2</sup> Overseas qualifications have been matched to equivalent New Zealand qualifications



A larger proportion of Australians aged 25 to 65 have no qualifications than in other countries (Figure 7). This may mean Australian adults with moderately low skills are less likely to have secondary school and vocational qualifications than adults in New Zealand and other countries. This could lead to the average skills of Australians with no qualifications being higher than other countries.

**Figure 7: Highest qualification<sup>3</sup> in New Zealand and selected countries – people aged 25 to 65<sup>4</sup>**



### Across different countries, people with bachelors or higher qualifications have similar skill levels

New Zealanders aged between 25 and 65 with bachelors or higher qualifications have similar average literacy, numeracy and problem solving scores to their counterparts in Australia, Canada, the United States, and England and Northern Ireland (Figures 4 to 6). For adults with a bachelors or higher qualification, the difference in average score between the highest-scoring selected countries in Figures 4 to 6 and the lowest-scoring country is:

- » 7 points in literacy
- » 10 points in numeracy
- » 8 points in problem solving.

<sup>3</sup> Overseas qualifications have been mapped to equivalent New Zealand qualifications

<sup>4</sup> People whose highest qualification is a foreign qualifications in each country are excluded from this analysis

# Higher education and skills

## People with a bachelors or higher qualification in all fields of study have higher skills than those without a bachelors degree

The average skills of people with bachelors or higher qualifications vary by their field of study (Figure 8). However, there are no areas of study where people with a bachelors or higher qualification have lower average scores in literacy, numeracy or problem solving skills than the average scores of those with a Level 4 to 7 certificate or diploma as their highest qualification.

Areas of study where graduates have skills that are higher than average by a statistically significant margin are:

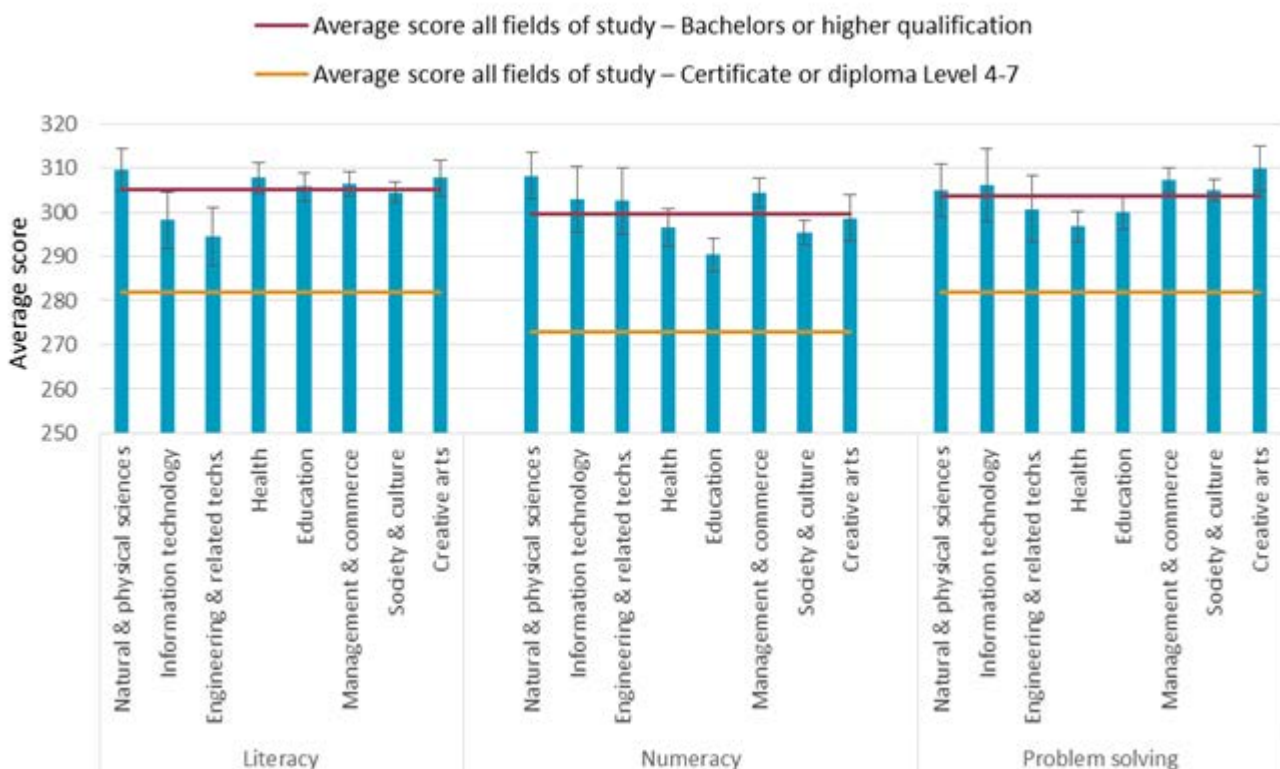
- » management and commerce graduates, who have higher numeracy and problem solving skills
- » natural and physical sciences graduates, who have higher numeracy skills
- » creative arts graduates, who have higher problem solving skills.

Areas of study where graduates have skills that are lower than average by a statistically significant margin are:

- » engineering and related technologies graduates, who have lower literacy skills
- » education graduates, who have lower numeracy skills
- » society and culture graduates, who have lower numeracy skills
- » health graduates, who have lower problem solving skills.

While New Zealanders who studied education have lower than average numeracy scores on average, a large number of those graduates will not have a teaching qualification and will not be working as primary or secondary teachers. People who are working as primary or secondary teachers have an average numeracy score of 300, which is equivalent to the average across all fields of study.

**Figure 8: Skills and main field of study for people with bachelors or higher qualifications**



# Qualifications, ethnicity, gender and skills

## Ethnic differences still exist among the highest qualified

New Zealand Europeans aged 25 to 65 with a bachelors or higher degree have higher average literacy, numeracy and problem solving skills than Māori of the same age and qualification level by a statistically significant margin (Figures 9 to 11). Māori have lower average literacy and numeracy skill levels than New Zealand Europeans at all qualification levels. However, the average difference between New Zealand Europeans and Māori scores has reduced at all qualification levels since 2006.

Unfortunately, the sample in the Survey of Adult Skills is too small to look at the skills of Pasifika and Asian people by qualification level.

The skills gap between Māori and New Zealand Europeans is greatest in numeracy (Figure 10). The average numeracy skills of Māori with a bachelors or higher qualification are not statistically significantly higher than New Zealand Europeans with a Level 4 to 7 certificate or diploma.

The difference in average skill levels between New Zealand Europeans and Māori is smallest in problem solving (Figure 11). For those with no qualifications and Level 4 to 7 certificate or diploma, the difference between the two ethnic groups is not statistically significant.

More research is required on the causes of ethnic disparity at different qualification levels. It may be partly due to different choices in fields of study. In 2014, 6% of people graduating with a bachelors or higher qualification in natural and physical sciences were Māori, while 14% of creative arts graduates were Māori.

**Figure 9: Literacy skills and ethnicity by highest qualification – people aged 25 to 65**

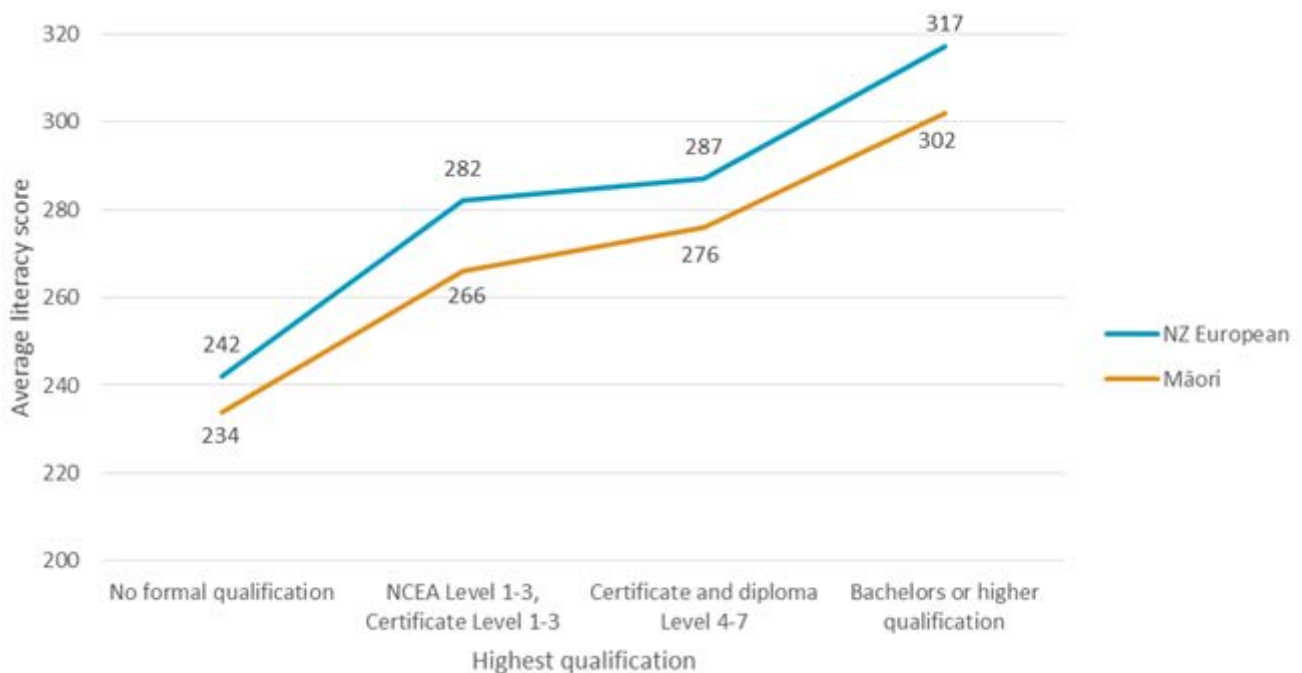
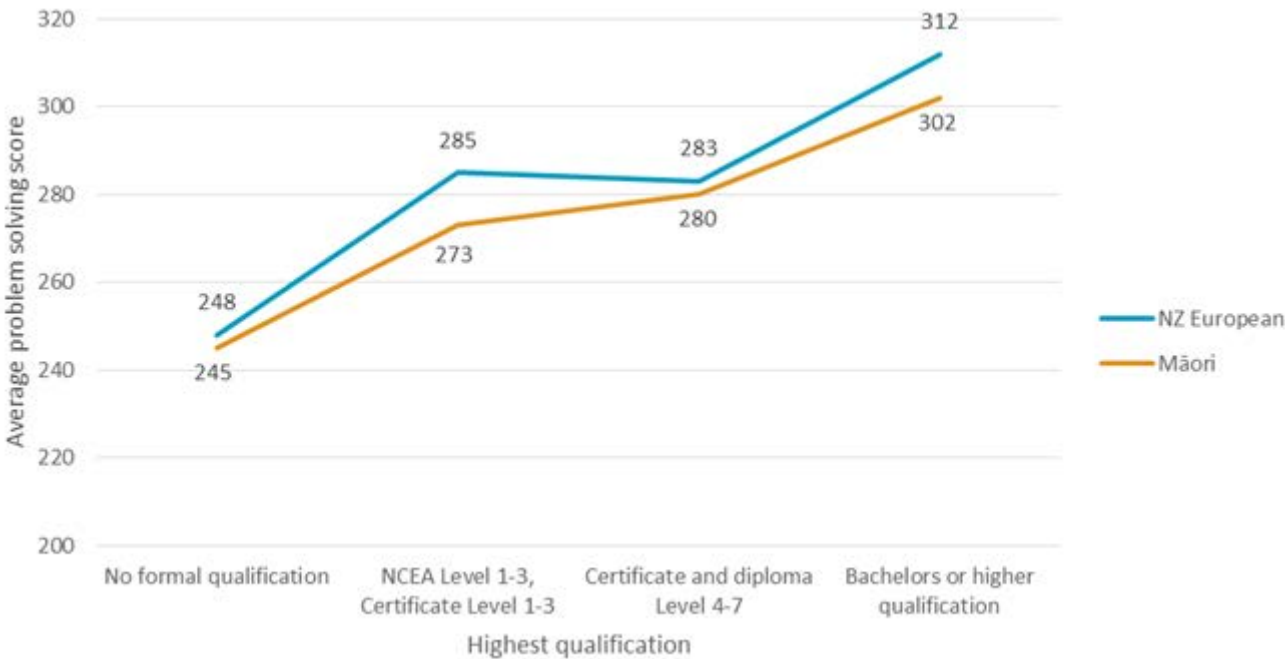




Figure 10: Numeracy skills and ethnicity by highest qualification and ethnicity – people aged 25 to 65



Figure 11: Problem solving skills and ethnicity by highest qualification and ethnicity – people aged 25 to 65

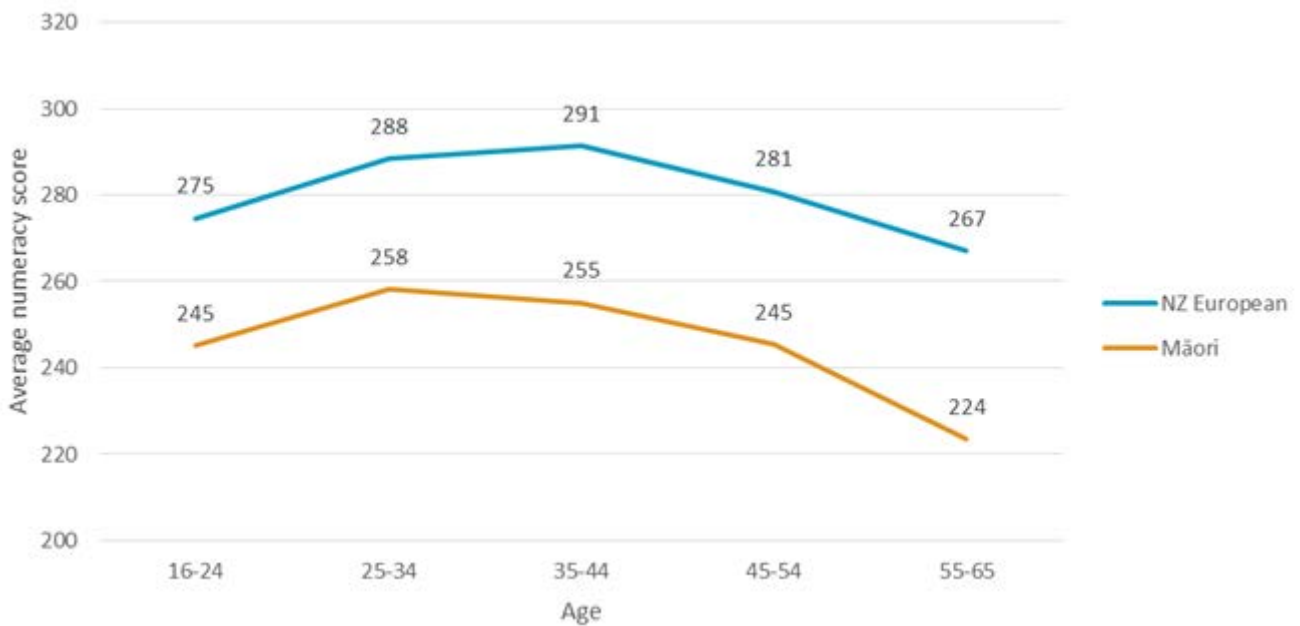


## Skill differences in numeracy between Māori and NZ Europeans are smaller among the young

The difference in average skills between older Māori and New Zealand Europeans may reflect differing experiences of education that existed in the past. Looking at the difference in skills between younger Māori and New Zealand Europeans indicates whether Māori getting qualifications more recently also have had differing experiences in education.

Māori have lower average literacy and numeracy scores than New Zealand Europeans in all age groups. For numeracy skills, the difference is least among youth (Figure 12). This could result from more recent improvements in schooling. However, Literacy skills do not have the same relationship with ethnicity and age. The difference in average youth literacy scores between Māori and New Zealand Europeans is similar to the difference in older age groups.

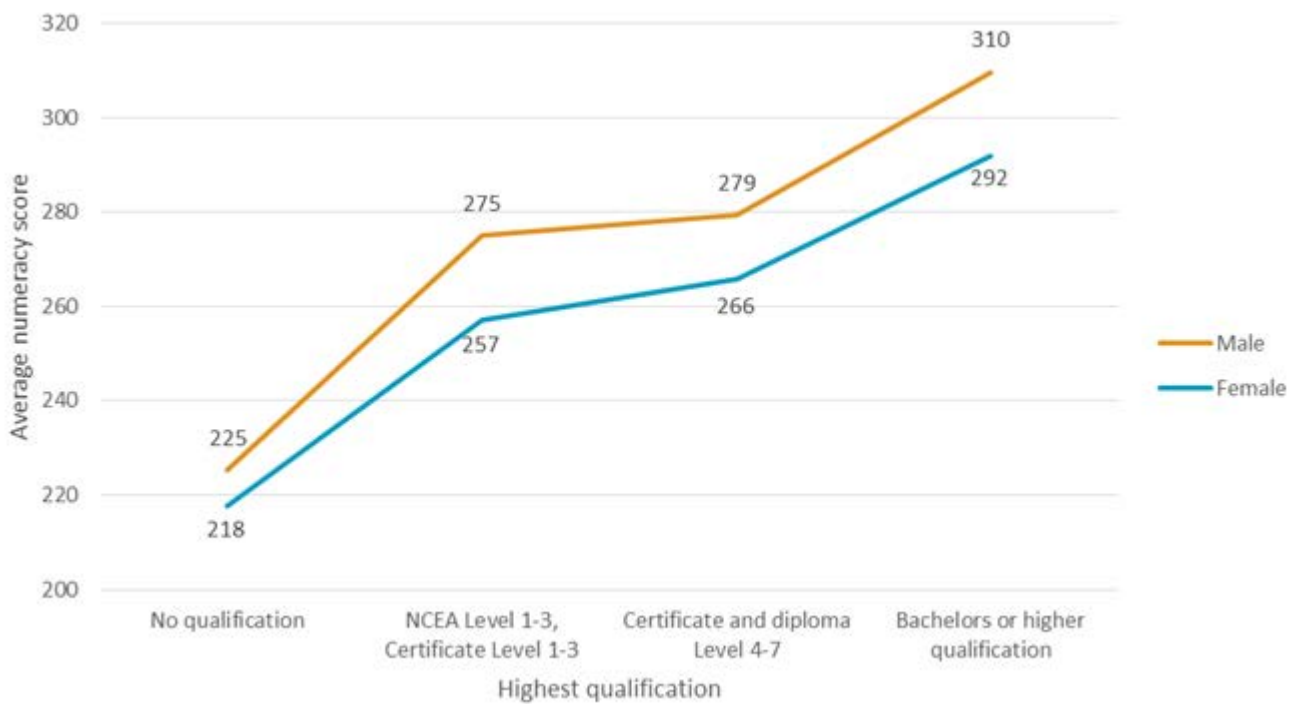
**Figure 12: Numeracy skills and age – Māori and NZ Europeans**



## Gender differences in numeracy are largest among the most educated

Males aged 25 to 65 with no qualifications have numeracy scores 3% higher on average than females of the same age and qualification level (Figure 13). However, males aged 25 to 65 with a bachelors or higher qualification have numeracy scores 6% higher on average than females of the same age with the same qualifications.

**Figure 13: Numeracy skills and gender by highest qualification – people aged 25 to 65**



Males aged 25 to 65 who have NCEA or a Level 1 to 3 certificate as their highest qualification have higher average literacy scores than females with the same qualification level. At all other qualification levels, the differences between males and females are not statistically significant.

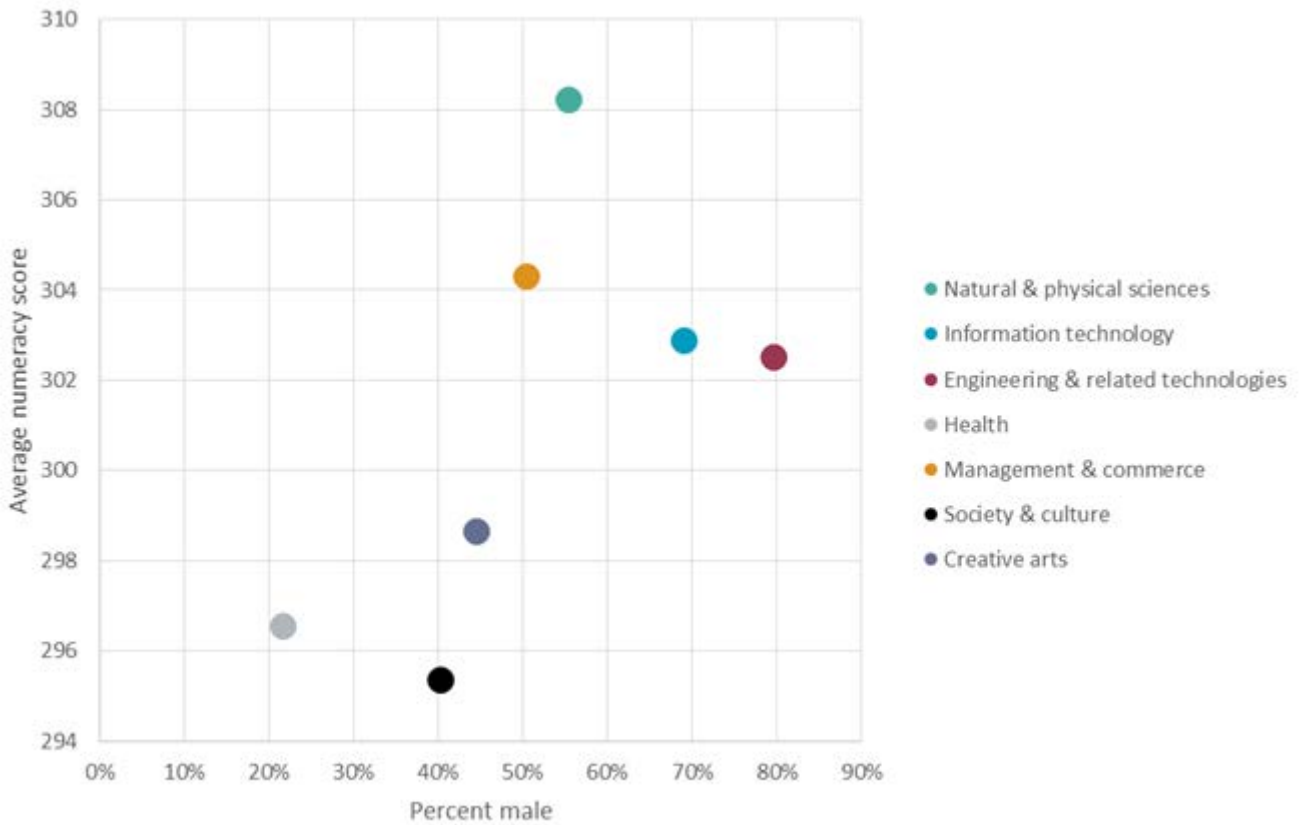




The difference in average numeracy scores for males and females with bachelors or higher qualifications may be related to the different areas men and women tend to study (Figure 14). Graduates of fields of study that are more than half male tend to have higher numeracy scores than subjects with fewer male graduates. There are a number of possible reasons for this and more research is needed to discover which is correct.

- » Men have higher numeracy skills before they undertake higher education, and more numerate people are attracted to fields of study with higher numeracy requirements. Studying at bachelors or higher levels does not increase men’s numeracy compared to women’s.
- » Men and women who undertake higher education do not have different numeracy skills before they study. Men are attracted to fields of study with higher numeracy requirements for a reason other than already having high numeracy. Studying at bachelors or higher levels increases the difference between men’s and women’s numeracy.

**Figure 14: Average numeracy skills and proportions of males – people with a bachelors or higher qualification by field of study**



# School qualifications and skills

## Young people with school qualifications have much higher skill levels than those with no qualifications

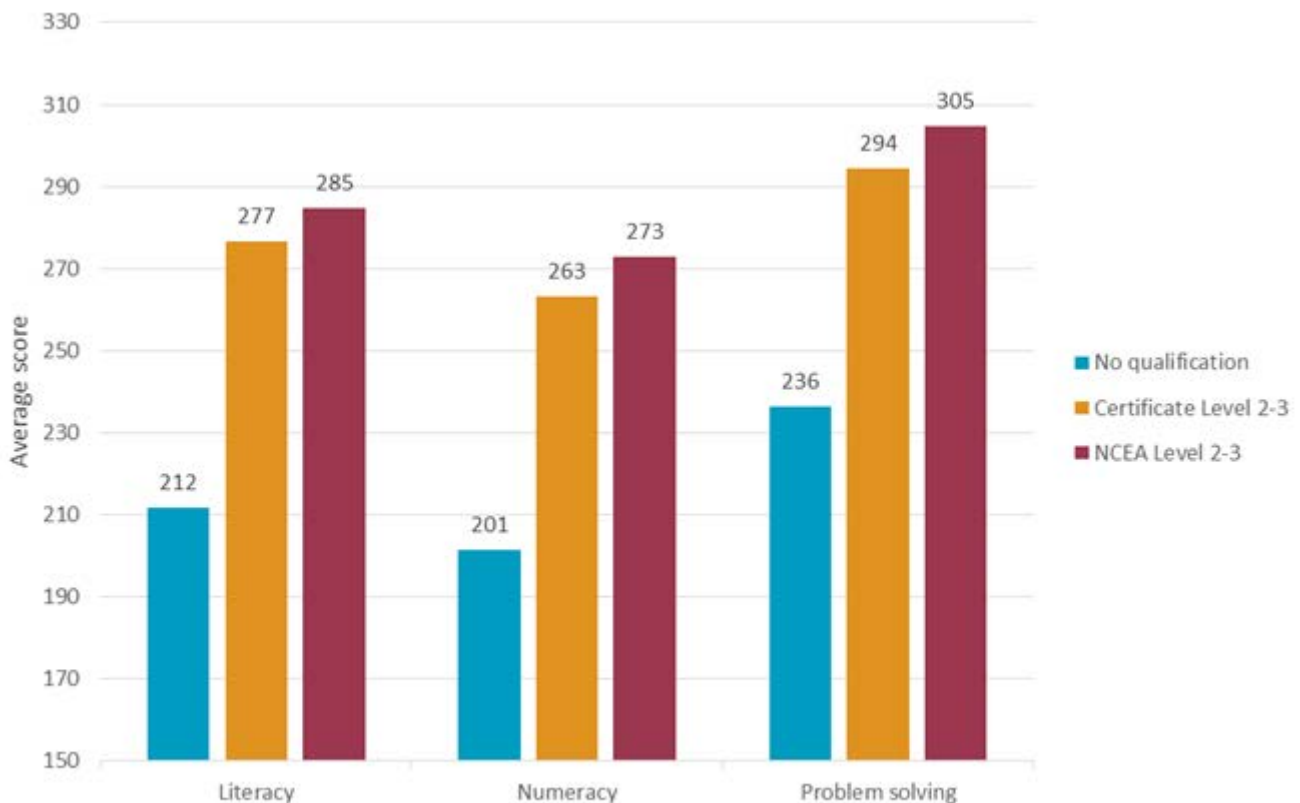
Figure 15 looks at whether young people with NCEA Level 2 to 3 and a Level 2 to 3 certificate have higher average skills than those without any qualifications. Many people who gain these qualifications go on to further study which will have increased their skills. People who have gone on to further study have been excluded from Figure 14 to isolate how school qualifications relate to skill levels. Accordingly, Figure 15 includes people who:

- » are aged 16 to 25
- » obtained their qualifications since 2010
- » are not currently studying for a further qualification
- » do not have a qualification higher than NCEA Level 3 or a Level 3 Certificate.

Overall, young people with NCEA Level 2 to 3 have slightly higher average skill levels than young people with Level 2 to 3 certificate. Both of these groups have much higher average skills than young people with no qualifications.

Looking at numeracy as an example, young people with NCEA Level 2 to 3 as their highest qualification have scores 5% higher on average than those with a Level 2 to 3 Certificate and 33% higher on average than those with no qualifications.

**Figure 15: Skills and highest qualification – young people aged 16 to 25**



# Further training and study

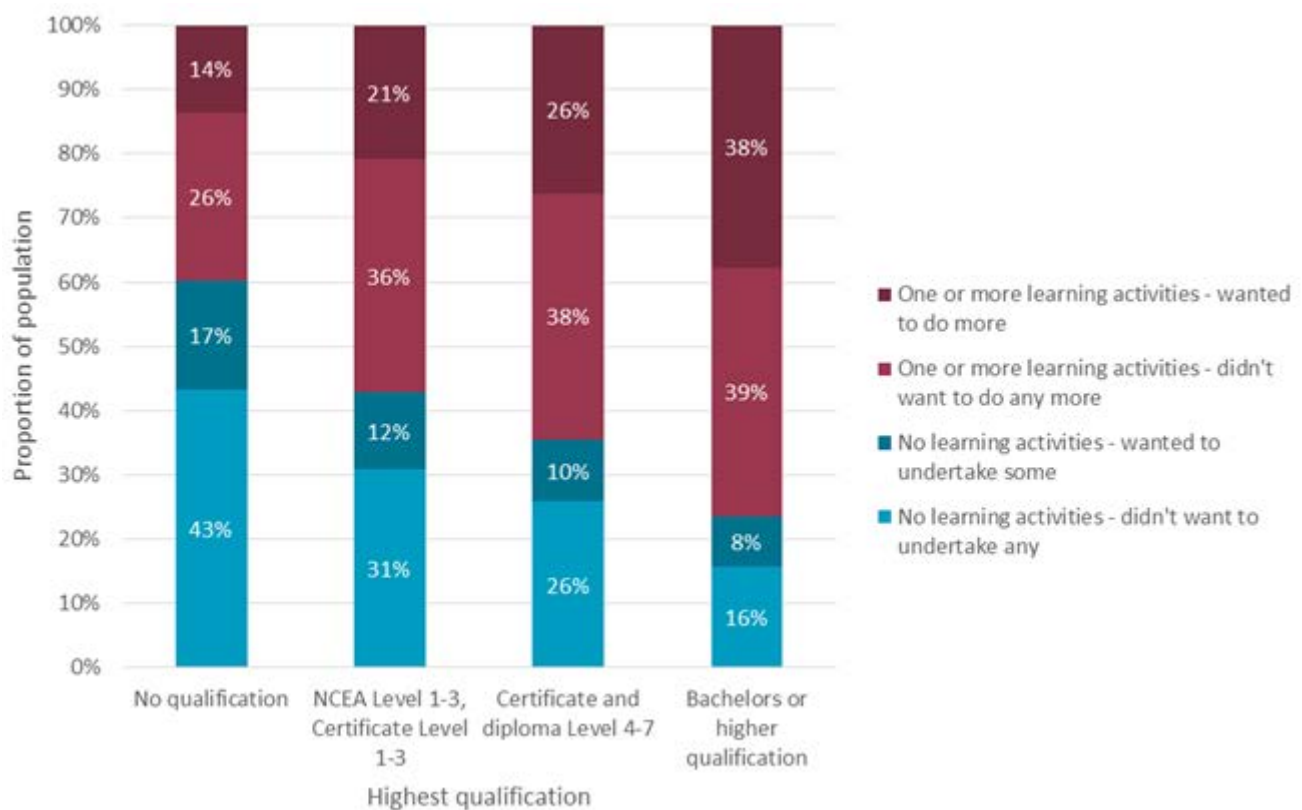
## People with no qualifications are least likely to undertake learning activities

The Survey of Adult Skills asked each participant in the survey whether they had undertaken various work related learning activities over the previous year. They are asked whether they had attended any:

- » open or distance education
- » on the job training
- » seminars and workshops
- » private lessons.

People with lower qualifications are less likely to undertake these learning activities. Of New Zealanders aged 25 to 65 with no qualifications, 60% undertook no learning activities within the last year (Figure 16). Of those with a bachelors or higher qualification, 24% did not undertake any learning activities and 76% undertook at least one learning activity. Also, of those with no qualifications, 43% undertook no learning activities and did not want to undertake any. This compares to 16% of those with a bachelors or higher qualification.

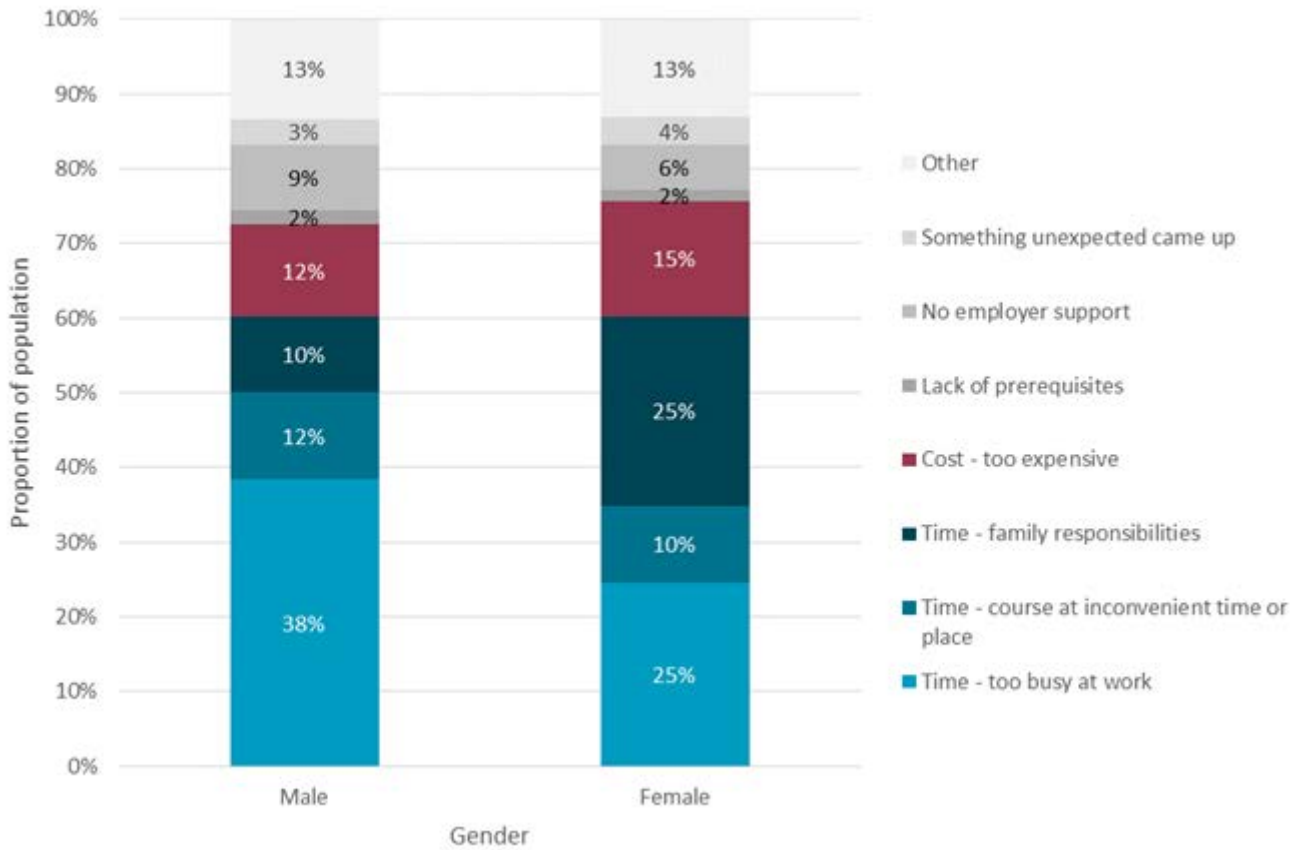
**Figure 16: Learning activities in the last year and desire to do more learning activities by qualification – people aged 25 to 65**



## Time is main barrier to further education and training for men and women

For both men and women aged 25 to 65 who are not currently studying and want to undertake further study, 60% say time is the major factor preventing them (Figure 17). Women in this group are more likely than men to say they are too busy with family responsibilities and men are more likely to say they are too busy at work. Cost is stated as the main barrier to study for 12% of men and 15% of women.

**Figure 17: Main reasons for not undertaking further study and gender<sup>5</sup>**



<sup>5</sup> Includes all people who wanted to do further study





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