



MINISTRY OF EDUCATION

Te Tāhuhu o te Mātauranga

Literacy skills of young adult New Zealanders
An analysis from the Adult Literacy and Life Skills Survey

This series covers research on teaching and learning in literacy, language and numeracy and analyses of international surveys on adult literacy and numeracy.

Author

Chris Lane, Senior Research Analyst
Email: Chris.Lane@minedu.govt.nz
Telephone: 04-463-7656
Fax: 04-463-8713

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Literacy skills of young adult New Zealanders

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SUMMARY

This report explores how the literacy of young adults (aged 16-24) in New Zealand varies according to a wide range of factors. Literacy here refers to literacy in English only, and the main aspect of literacy considered is document literacy, which refers to the ability to read and interpret non-continuous texts, such as tables, diagrams and maps. To highlight the relationships of the factors with the document literacy scores of young adults, comparisons are made with the effects of the factors in the population aged 25-65.

Key findings

TECHNOLOGY USE

For people aged 16-24, literacy scores increased as number of hours of home computer use increased. Computer use for playing games or online chat made no difference to literacy. Literacy scores were related to computer use for language-related activities e.g. writing, editing, email, and these were predominant uses of home computers.

LANGUAGE AND ETHNICITY

For people aged 16-24, there was no difference in literacy between those born in New Zealand or overseas, or those with or without English as a first language. By way of contrast, these factors made a huge difference for people aged 25-65.

Asians aged 16-24 had comparable English literacy to Europeans, unlike Asians aged 25-65.

The key factor appears to be experience of New Zealand education. Most young Asians had several years of New Zealand education, sufficient to develop better English literacy skills than the older generation. Young Asians also had advantages in family background, tertiary participation and computer use, although they still had a disadvantage in terms of home language use.

OTHER FACTORS

Findings relating to other characteristics were in line with previous research on literacy and on educational achievement.

One such finding was that people who watched television or videos for 5 or more hours per day had lower literacy on average. Another was that those who never used a library had lower literacy than those who used a library even infrequently.

Contribution of this report

The Adult Literacy and Life Skills (ALL) Survey 2006 measured the literacy and numeracy skills of New Zealanders aged 16-65. A series of previous studies of the survey data have shown differences in literacy and numeracy according to a range of individual characteristics, including completed education, age, gender, geographical region, ethnicity, immigrant status, first language, labour force status, occupation and industry.

This report adds to previous work in two ways:

- by highlighting the literacy skills of people aged 16-24, and how they vary according to a wide range of factors
- by analysing the effects of a number of previously under-studied factors, namely:
 - purposes of computer use
 - mobile phone use
 - watching television and videos
 - library use
 - number of books in the home
 - patterns of personal reading

This report complements the report *Factors linked to young adult literacy*, which is also based on the ALL survey.

Limitations of the analysis

Because the analysis is based on survey and not census data, and the sample of young adults is relatively small (1,082), estimates and comparisons are subject to uncertainty (sampling error).

Findings

Technology use

Young adults who made greater use of information and communication technologies tended to have higher document literacy scores. This applied in particular to young adults who used a home computer for 5 or more hours per month (and scores increased with increasing hours of use), as opposed to young adults who used a home computer for fewer hours, or did not have access to a home computer, or had never used a computer.

Young adults who had used a computer at work in the past year tended to have higher document literacy scores than those who had not used a computer at work, or who had not been employed. This was not as strong as the effect for home computer use for young adults, and was not such a strong effect for young adults as it was for people aged 25-65.

Young adults who were frequent users of email tended to have higher document literacy scores, and among those aged 20-24, those who used a computer frequently for writing or editing tended to have higher scores. There was no significant difference in document literacy between those who played computer games frequently and those who did not, nor was there a significant effect for frequency of participation in online discussions.

Young adults who never used a mobile phone tended to have lower document literacy scores, but there were very few young adults in this category.

Literacy-related resources and practices

Document literacy scores tended to be higher among young adults who used a library at least once or twice a year, than among those who never used a library. Document literacy scores also tended to be higher among those who read at least three different types of personal reading matter at least weekly, among those with 25 or more books in the home, and among those who watched television, videos or DVDs for two hours or less per day. Those who watched for five or more hours per day tended to have lower document literacy scores.

When other factors (including main home language, ethnic identification, education, and home computer use) were controlled for, only library use made a difference to document literacy scores (library use may be a good indicator of people who have achieved higher literacy). In particular, the relationship between document literacy and television/video/DVD watching was accounted for by those other variables.

Education

Young adults with greater educational participation tended to have higher document literacy scores. In particular, scores tended to be higher among those who had completed tertiary education, and considerably lower among those whose highest completed level was Year 10 or less. Young adults who had undertaken formal full-time study or training in the past year tended to have higher document literacy than those who had not.

Young adults who had studied at degree level in the past year, or had completed a degree, stood out as having particularly high document literacy scores. There was some evidence that such people tended to have higher literacy before undertaking degree-level study, but this does not mean that degree-level study did not also enhance literacy.

Young adults who reported that they had received good grades in school mathematics tended to have higher document literacy. Mathematics grades can be taken as an indicator of overall school achievement.

Labour force status and employment

Document literacy scores tended to be considerably higher among young adults whose current labour force status was student or employed than among those with other labour force status (unemployed, retired, homemaker or other status).

Young adults with different combinations of employment and study or training undertaken in the past year tended to have different document literacy scores. Those who had been both employed and in study or training had the highest scores, while those who had not been in employment, education or training (NEET) had the lowest scores. However, there were very few young adults in the NEET category in the sample: too few to provide an accurate estimate of numbers in the population.

Among young adults in current employment, document literacy scores tended to be higher among those in white collar occupations (managers, professionals, technicians or clerks), and among those employed in finance, business or community services including education and health.

Demographic characteristics and home background

There was no significant difference in mean document literacy between people aged 16-19 and those aged 20-24. However, the mean document literacy for those aged 16-19 was significantly lower than that for people aged 25-65.

Gender did not make a difference to document literacy scores among the young adults in the ALL survey sample. This is in contrast to the finding of clear gender differences in favour of females in reading literacy in the 2006 PISA (Programme of International Student Assessment) study of 15-year-old students in New Zealand. The sample for PISA was much larger than the sample of young adults in the ALL survey and the greater sensitivity of the PISA study may account for the apparent difference in findings.

Document literacy scores in the ALL survey tended to be higher among young adults whose mothers or fathers had completed tertiary education, especially at bachelors degree level or higher. Scores tended to be considerably lower among those whose mothers or fathers had not completed education beyond Year 10. However, the statistical modelling indicated that the relationship between parental education and document literacy was indirect: young adults' level of education tends to approximately reflect that of their parents, while it is the young adults' own education that relates directly to their literacy.

Document literacy scores tended to be higher among young adults living in areas of low socioeconomic deprivation (as measured by the New Zealand Deprivation Index), and lower in areas of high deprivation.

Auckland, Wellington, Canterbury and Otago (taken together) had a significantly greater percentage of people with higher document literacy than the rest of New Zealand among people aged 25-65, but not among people aged 16-24.

Among people aged 16-24, there was no significant difference in mean document literacy scores between those born in New Zealand and those born overseas, nor was there a significant difference between those whose first language was English or another language. This is in distinct contrast to those aged 25-65, among whom mean document literacy was significantly higher among those born in New Zealand and those whose first language was English.

Document literacy scores tended to be higher among young adults who spoke English most often at home than among those who spoke another language most often.

Among people aged 16-24, those identifying as European or as Asian tended to have higher document literacy scores, while those identifying as Māori or Pasifika tended to have lower scores. This is in line with the results of the 2006 PISA study of 15-year-old students, and in contrast to the ALL survey results for people aged 25-65, among whom those identifying as European tended to have higher scores, while Asians as well as Māori and Pasifika tended to have lower scores.

The factor that appears to make the difference is time spent in education in New Zealand: almost all Asian young adults had spent at least a year in New Zealand education, with a median of five years. According to North American research, typically four years in English-medium education is needed for non-English speaking migrants to start to approach the academic achievements of native English-speaking students, and if they have high levels of academic achievement and literacy in their first language they can then transfer these skills and knowledge into the English-language environment.

Young adults with Asian ethnic identification had a number of advantages in terms of factors linked to higher document literacy scores: a relatively high percentage of their fathers had tertiary education; they had relatively high levels of home computer use; and they had relatively high levels of participation in degree-level study. In contrast, Māori and Pasifika were at a disadvantage in terms of all these factors. The statistical modelling indicates that Asian young adults would have had even higher document literacy scores but for the fact that most had a language other than English as their main home language.

Key factors

The companion report *Factors linked to young adult literacy* (Lane 2011) developed statistical models for the 16-24 and 25-65 age groups, including most of the variables studied in this report, and identified a set of factors which were most strongly associated with document literacy scores for the 25-65 and 16-24 age groups.

The factors most strongly associated with document literacy scores for people aged 16-24 were:

- The language spoken most often at home
- Ethnic identification (among those who spoke English most often at home)
- Participation and achievement in formal education
- Use of a computer at home
- Library use.

The factors most strongly associated with document literacy for people aged 25-65 were:

- The first language learned, and the language spoken most often at home
- Ethnic identification (among those who speak English most often at home)
- Age and gender
- The highest level of education completed
- Use of a computer at work
- Use of a computer at home
- The number of books in the home.

1 INTRODUCTION

This report examines how literacy among people aged 16-24 varies according to a wide range of individual characteristics and behaviours, and compares this age group with people aged 25-65. Literacy here refers to literacy in English only, and the main aspect of literacy considered is document literacy, which refers to the ability to read and interpret non-continuous texts, such as tables, diagrams and maps. It complements an analysis (Lane 2011) of the combined effects of factors associated with document literacy skills in the 16-24 age group. That study, too, compares the 16-24 year olds with the 25-65 age group.

This report is focused on the literacy (and sometimes numeracy) skills of New Zealanders aged 16-24, as measured in the Adult Literacy and Life Skills (ALL) Survey 2006. Of the 7,131 respondents to the ALL Survey, 1,082 were aged 16-24. This is a sufficient subsample to allow detailed analysis of literacy skills in this age group, and also to allow for some comparisons between people aged 16-19 and those aged 20-24. In order to convey how the literacy skills of people aged 16-24 relate to the skills of the wider population, people aged 16-24 are compared in this report with people aged 25-65 as a group.

This report outlines the relationships between literacy and a number of factors which are relevant to variation in literacy and numeracy among younger people in New Zealand. Some of these factors – for instance the purposes of computer and internet use, literacy-related practices (such as library use and books in the home) and television viewing – have not been extensively explored in previous work on the New Zealand ALL Survey data. This report also deals with factors such as age, gender, ethnicity, region, education, labour force status, occupation, industry and computer use, which have been investigated in earlier reports focused on the 16-65 or 25-65 age ranges (including Satherley and Lawes 2008a, 2008b; Satherley, Lawes and Sok 2008; Earle 2009; Lane 2010a, 2010b), in order to see how relevant they are for people aged 16-24.

The analysis in Lane (2011) uses statistical modelling to gauge the relative strengths of association of these factors with document literacy scores, while this report focuses on variation in mean literacy scores according each of these factors taken one at a time.

The respondents in the ALL Survey formed a representative sample of people aged 16 to 65. The analyses in some earlier reports (Lane 2010a, 2010b; Earle 2009b), however, are based only on the data from the subset of people aged 25 to 65. Initial study of the full sample indicated that the key factors related to literacy and numeracy included the highest level of education completed and employment-related factors such as occupation and computer use at work. These factors do not apply to many of the people aged 16 to 24 who are still in education. For the geographical analyses, there is also the issue that people in this age group also tend to be geographically mobile, with many moving between regions for study and work. They are not necessarily in their region of origin and are not necessarily living in their current region of residence on a long-term basis. Accordingly a separate analysis is required for the 16-24 age group.

1.1 The Adult Literacy and Life Skills (ALL) Survey 2006

The Adult Literacy and Life Skills (ALL) Survey was an international survey coordinated by the Organisation for Economic Cooperation and Development (OECD) and Statistics Canada. The main data collection for the New Zealand survey was carried out between May 2006 and March 2007. All survey respondents were interviewed face to face and their skills were directly tested during the interviews: each respondent was asked to complete test booklets in English selected from a bank of test material covering literacy, numeracy and problem-solving. The

survey achieved a representative national sample of 7,131 New Zealanders aged 16 to 65. The survey also collected extensive background information on demographic characteristics, language, education, employment, income, health, literacy and numeracy practices and the use of information and communication technologies. (For more information on the survey, see Chapter 9).

1.2 Literacy and numeracy in ALL

The ALL survey tested skills in English across four domains:

- **Prose literacy** – the ability to read continuous texts, such as news stories and instruction manuals
- **Document literacy** – the ability to read discontinuous texts, such as maps and timetables
- **Numeracy** – the ability to read and work with numeric information
- **Problem solving** – the ability to reason in situations where no routine procedure exists.

The tests were designed to assess skills across the full range of competency, from limited to highly-developed skills. The tests were designed to cover general, cognitive skill levels and did not attempt to assess specialist knowledge and skills (Satherley and Lawes, 2007).

The literacy and numeracy skills measured in the ALL survey are reported either as scores ranging from 0 to 500, or more commonly, in terms of five levels, from Level 1 (very low skills) to Level 5 (very high skills). A detailed description of the levels is given in Chapter 9.

The four skills measured in the ALL survey are highly correlated with one another, as shown in Table 1 for people age 16-24. The strongest correlation was between document literacy and prose literacy. The strongest correlation with numeracy was also with document literacy. The weakest correlations were between prose literacy and numeracy and between numeracy and problem solving.

Table 1

Correlations between skills for people aged 16-24

| | Document literacy | Numeracy | Problem Solving |
|-------------------|--------------------------|-----------------|------------------------|
| Prose literacy | 0.91 | 0.79 | 0.84 |
| Document literacy | | 0.86 | 0.83 |
| Numeracy | | | 0.75 |

Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations

Note: All correlations were significant ($p < 0.001$)

The focus in this report is on document literacy, as in Lane (2011). Of the literacy or numeracy measures, this is the single most representative measure, which provides a good indicator of the literacy and numeracy spectrum. This is not just because document literacy has the highest correlation both with prose literacy and with numeracy, but also because mean document literacy scores tend to fall midway between the prose literacy and numeracy scores for particular population groups, as can be seen in section 1.6 below, and in earlier reports (e.g. Satherley and Lawes 2008a, 2008b; Satherley, Lawes and Sok 2008).

1.3 Statistical models

The effect on document literacy of a number of factors is represented by ordinary least-squares regression models which are detailed in Lane (2011).

The models for document literacy scores in the 25-65 and 16-24 age groups were developed including the following potential explanatory factors:

- demographic and home background factors:
 - age
 - gender
 - ethnic identification
 - first language and main language spoken at home
 - socioeconomic deprivation
 - parents' education
- education factors:
 - level of education completed
 - recent formal or non-formal learning
 - a measure of school achievement
 - experience of New Zealand education
- employment-related factors:
 - labour force status
 - occupation
 - industry
- technology use and literacy-related activities:
 - home and work computer use
 - computer use for writing or editing
 - mobile phone use
 - watching television and videos
 - library use
 - number of books in the home
 - patterns of personal reading.

For the 25-65 age group, previous work (e.g. Lane 2010a) has identified three key factors related to literacy and numeracy:

- language (especially first language learned at home)
- completed education
- computer use (especially at work).

Specific indicators of these three factors were highly statistically significant.

Lane (2011) identifies three additional factors which were also statistically significant and were strongly associated with document literacy for the 25-65 group (when the effects of language, education, computer use and other variables were already accounted for):

- the number of books in the home
- particular combinations of language and ethnic identification (Māori and Pasifika who speak English most often at home, compared with Europeans who speak English most often at home)
- particular combinations of age and gender (older women compared with younger men).

For the 16-24 age group, the factors most strongly associated with document literacy (and significant in a comprehensive statistical model including all the factors listed above) were:

- language spoken most often at home
- Māori or Pasifika ethnic identification (where English is the language spoken most often at home)
- educational participation and achievement
- home computer use
- library use.

Key factors for people aged 16-24

For the 16-24 age group, the full combined model accounted for 39 per cent of the variation in document literacy scores in this age group. A reduced model based on

- main home language
- main home language/ethnic identification
- formal education
- home computer use

accounted for 32 per cent of the variation.

For people aged 16-24, the variables in the reduced model were related to document literacy in the following ways:

- Document literacy scores were negatively associated with speaking a language other than English most often at home (compared with speaking English most often at home).
- Among people who spoke English most often at home, having Māori or Pasifika ethnic identification was negatively associated with document literacy (compared with not having Māori or Pasifika ethnic identification).
- Highest completed education of Year 10 or less was negatively associated with document literacy, while having completed a degree or recently studied at degree level was positively associated with document literacy (compared with having highest completed education of upper secondary).
- Document literacy scores were positively associated with achieving good grades in mathematics at school.
- Document literacy was positively associated with using a computer at home for 5 or more hours per month (compared with using a home computer for fewer hours or not having access to a computer at home).

Each of these associations was highly statistically significant.

Key factors for people aged 25-65

The full combined model for the 25-65 age group accounted for 48 per cent of the variation in document literacy scores in this age group. A reduced model based on the variables with the strongest effects, covering factors of:

- first and main home language
- home language/ethnic identification
- age/gender
- formal education
- work and home computer use
- books in the home

accounted for 45 per cent of the variation.

For people aged 25-65, the variables in the reduced model were related to document literacy in the following ways:

- Document literacy scores were negatively associated with having a language other than English as a first language, or as the language spoken most often at home (compared with having English as a first or main home language).
- Among people who spoke English most often at home, having Māori or Pasifika ethnic identification was negatively associated with document literacy (compared with not having Māori or Pasifika ethnic identification).
- Document literacy scores were negatively associated with being female, especially female aged 45-65, compared with being male aged 25-44.
- Highest completed education of Year 11 or less was negatively associated with document literacy, while having completed a degree or having studied recently at degree level was positively associated with document literacy (compared with having highest completed education of upper secondary).
- Document literacy scores were positively associated with using a home computer at least 5 hours per month (compared with using a home computer for fewer hours or not having home computer access). Document literacy was also positively associated with having used a computer at work in the past year (compared with being employed but not using a computer at work, or not having been employed).
- Having 25 or more books in the home was positively associated with document literacy scores (compared with having fewer than 25 books).

Each of these associations was highly statistically significant.

1.4 Comparisons with PISA

PISA is the Programme for International Student Assessment, a recurring international study of skills in 15-year-old students. PISA measures reading literacy, mathematical literacy and scientific literacy. It is carried out on a three-yearly cycle, with a major focus on one of the three skills each time. The focus in 2006 was scientific literacy, and in 2009, reading literacy.

Reading literacy scores in PISA are generally combined scores for both continuous and non-continuous text, corresponding to combining prose and document literacy in ALL. However,

some of the PISA reports do separate the scores for continuous and non-continuous text, allowing a more direct comparison with prose and document literacy in ALL.

PISA 2006 in New Zealand was based on a survey of a representative sample of 15-year-old students. Data was collected from 4,824 students in 170 schools (Marshall, Caygill and May 2008: 2).

The PISA 2006 sample excluded non-students, students who had received less than one year's instruction in English, and students in Māori immersion classes (Marshall, Caygill and May 2008: 20). These groups were not excluded in the ALL data.

Given the closeness in age, one would expect to find similar, though not necessarily identical results from PISA and from the 16-24 age group in ALL. Accordingly, the ALL results for 16-24-year-olds will be compared with the results from PISA where possible, concentrating on PISA 2006 but with some reference to PISA 2009.

1.5 Structure of this report

The next five chapters explore the relationships between document literacy and a number of key variables, in a way which is guided by the statistical modelling. Chapter 2 considers the extent to which document literacy is associated with the level of education completed, and with recent formal or non-formal study. Chapter 3 explores the associations with labour force status and employment, occupation and industry. Chapter 4 deals with the associations of document literacy with computer, internet and mobile phone use. Chapter 5 outlines the associations with literacy-related practices, namely library use, books in the home, personal reading and television and video viewing. Chapter 6 contains some observations on the relationships between document literacy and gender, socioeconomic status and region. Chapter 7 outlines the associations with first language, main home language and birthplace, and includes an extended discussion of ethnic differences in literacy and numeracy. Chapters 6 and 7 include comparisons with PISA results.

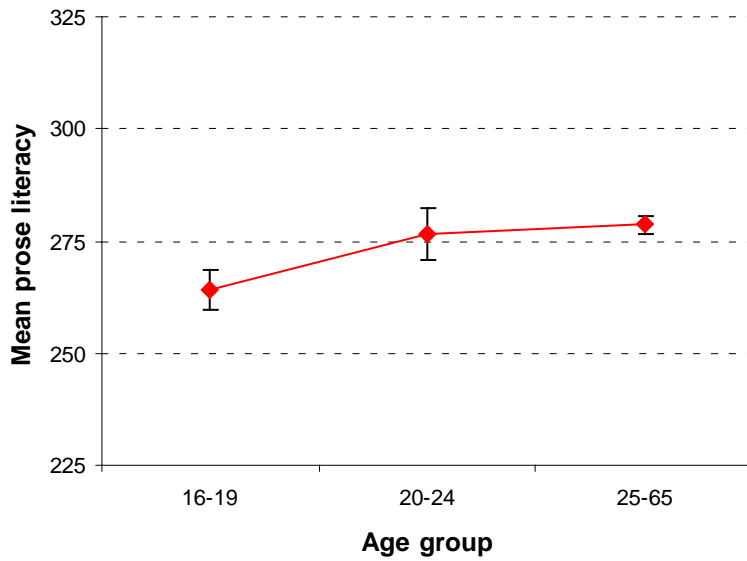
Chapter 8 attempts to crystallise the overall picture, and Chapter 9 provides further in-depth and technical information on the variables and methods used in this study.

1.6 Literacy, numeracy and age

Comparisons between age groups are made in this report in terms of mean literacy (or numeracy) scores, as measured in the ALL Survey. Scores were allocated on a scale from 0 to 500 points. The mean scores of population subgroups cluster around 275 points, which is regarded as the dividing line between Level 2 (scores from 226-275), which indicates relatively limited literacy (or numeracy) skills, and Level 3 (scores from 276-325), which indicates literacy or numeracy skills adequate for functioning in a knowledge economy.

Figure 1 compares age groups in terms of mean prose literacy scores. People aged 16-19 had a significantly lower mean prose literacy score than both those aged 20-24 and those aged 25-65.

Figure 1
Mean prose literacy score by age

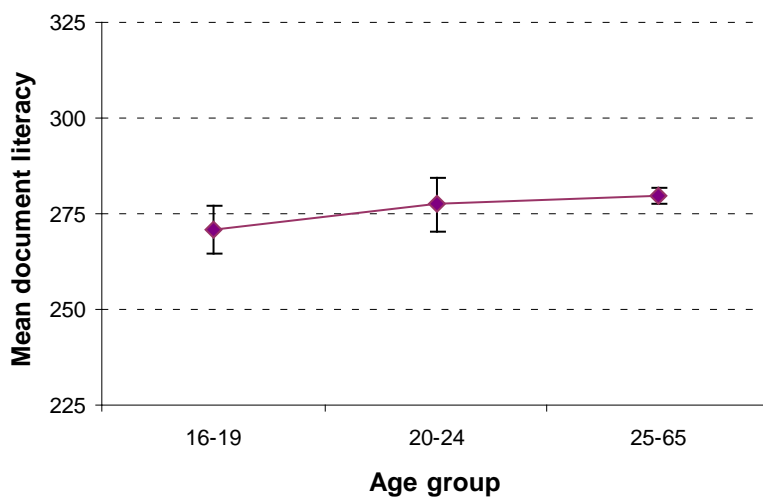


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

Figure 2 shows the comparison of the age groups in terms of mean document literacy scores, while Figure 3 shows the comparison in terms of mean numeracy scores. In both cases, there was no significant difference between those aged 16-19 and those aged 20-24, nor between those aged 20-24 and those aged 25-65, but those aged 16-19 had a significantly lower mean score than those aged 25-65. Mean numeracy scores in general were lower than mean literacy scores.

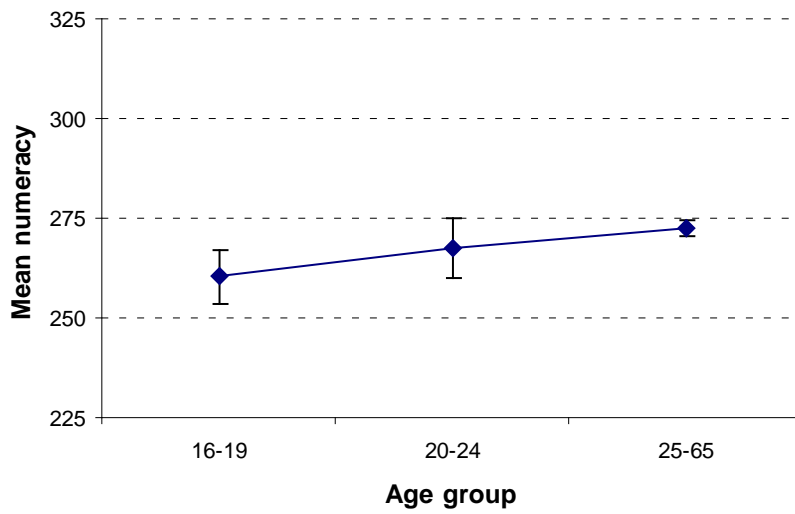
Figure 2
Mean document literacy score by age



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

Figure 3
Mean numeracy score by age



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

In general, document literacy scores are intermediate between prose literacy and numeracy scores. This report focuses on document literacy as a single measure which is reasonably representative of the literacy-numeracy spectrum.

2 EDUCATION

Satherley, Lawes and Sok (2008) have shown for people aged 16-65 in the New Zealand ALL survey, those with higher levels of completed education tended to have higher literacy and numeracy skills, and this has been confirmed (Lane 2010a) for the subgroup aged 25-65.

Literacy and numeracy have also been shown to be related to recent study or training: people aged 25-65 who had undertaken courses of study or training¹ in the past year were more likely to have higher prose literacy or numeracy than those who had not (Lane 2010a).

This chapter considers whether comparable results can be found for people in the 16-24 age group.

In addition, because many people in the 16-24 age group are part way through their formal education, there is further analysis based on level of education either completed at some time in the past, or in progress in the past year.

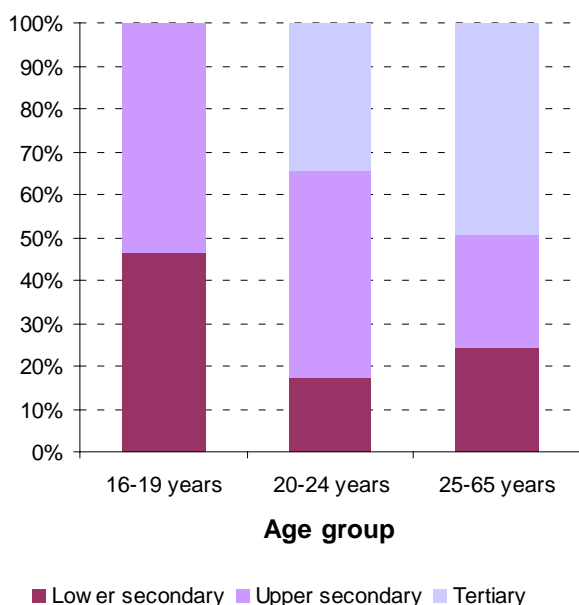
This chapter also examines the relationship between literacy skills and people's self-reported school grades in mathematics, which is the only measure of school achievement available in the ALL survey data.

2.1 Completed education

The way that the highest level of education completed varies across ages reflects the fact that very few people aged 16-19 have been in a position to complete a tertiary qualification, while many people in the 20-24 age group have yet to complete tertiary qualifications. On the other hand, fewer people in the 25-65 age group (especially the subgroup aged 55-65) progressed from lower to upper secondary in the course of their schooling. These differences are illustrated in Figure 4.

¹ Courses of study or training include both formal courses (leading to a qualification) and non-formal courses (which do not lead to a qualification).

Figure 4
Levels of completed education in each age group



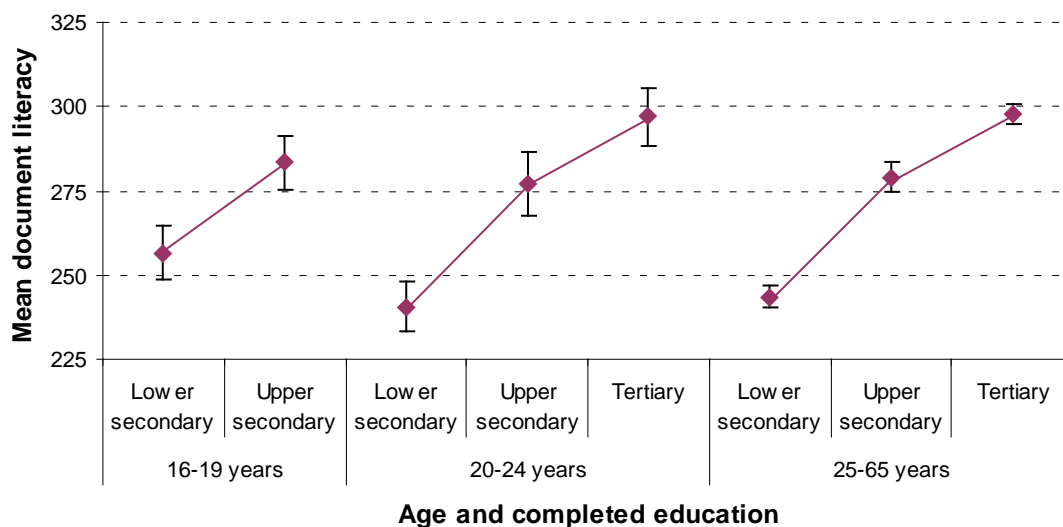
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: Lower secondary refers to all levels of education up to and including Year 11. Upper secondary refers to Year 12-13 or certificate levels 1-3. Tertiary refers to Level 4 and above.

Figure 5 shows the mean document literacy score by level of education completed for people aged 16-19, 20-24 and 25-65. Clearly, for all age groups, higher levels of completed education were associated with significantly higher mean document literacy scores. There were no significant differences between the 20-24 and 25-65 age groups in terms of the mean scores for each level of completed education. However, the mean score for people aged 16-19 whose highest level of completed education was lower secondary was significantly higher than the mean scores for people with lower secondary education in the 20-24 and 25-65 age groups.

A likely explanation for this is that a considerable number of people aged 16-19 were still studying at upper secondary level, and so had only completed lower secondary, but were on course to complete upper secondary and also possibly tertiary qualifications at a later date. These students may well have already had higher literacy than other people aged 16-19 who had left school after lower secondary. In the 20-24 and 25-65 age groups, the people with lower secondary were those left after others had completed upper secondary and possibly tertiary qualifications, and so showed up as a group with lower mean literacy score. If this explanation is correct (although it is not possible to verify it on the basis of the survey data), then it is an indication that the higher mean literacy of people with upper secondary or tertiary is at least partly due to a selection process, in which people who go into upper secondary and tertiary study tend to already have higher literacy than those who do not. This, however, does not rule out the possibility that part of the reason that people with higher qualifications tend to have higher literacy is that further education improves people's literacy. In fact, both selection and improvement are likely to play a part in producing the association between literacy and completed education.

Figure 5
Mean document literacy score, by age and completed education



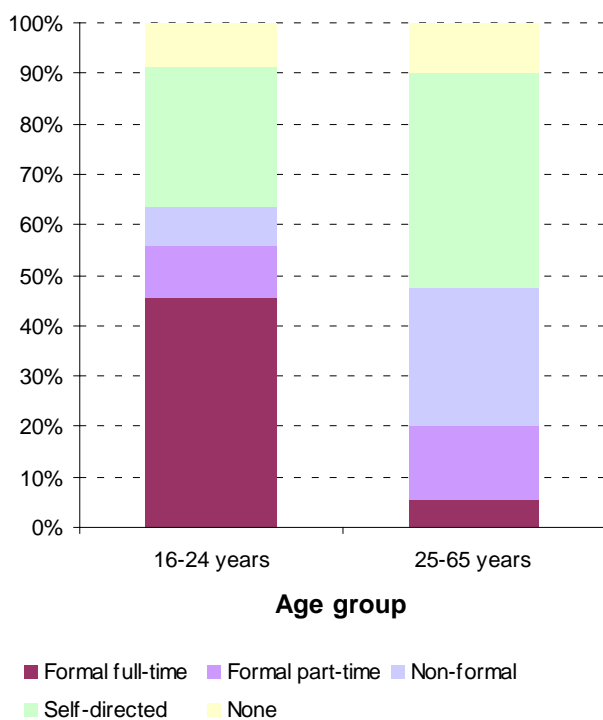
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level). Lower secondary refers to all levels of education up to and including Year 11. Upper secondary refers to Year 12-13 or certificate levels 1-3. Tertiary refers to Level 4 and above.

2.2 Recent study or training

Respondents to the ALL Survey were asked if in the past year they had undertaken formal study or training (courses counting towards a qualification), non-formal study or training (courses not counting towards a qualification) or informal study or training (self-directed learning not organised as a course). Figure 6 shows the distribution of such recent study or training among people aged 16-24 and 25-65. More than half (56 per cent) of people aged 16-24 had undertaken formal study or training, while only a relatively small proportion (20 per cent) of people aged 25-65 had undertaken formal study or training in the past year. On the other hand, greater proportions of people aged 25-65 had undertaken non-formal (27 per cent) or self-directed (43 per cent) study or training.

Figure 6
Types of study or training in the past year in each age group

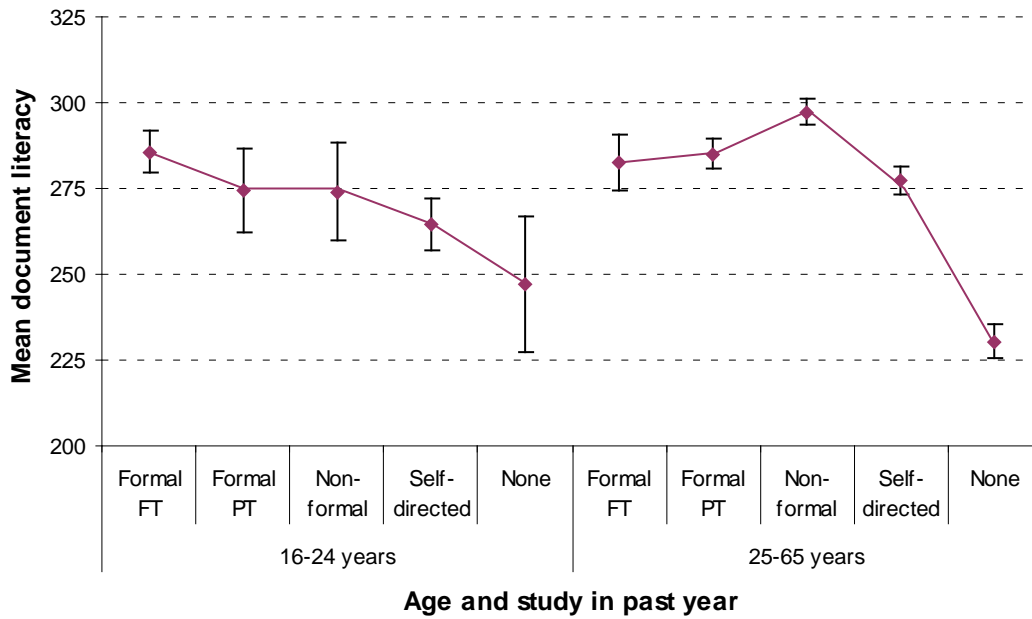


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 7 shows the mean document literacy scores of people aged 16-24 and 25-65 who had undertaken each type of study or training in the past year. Among people aged 25-65, those who had undertaken non-formal study or training (which is often employment-related, see Scott and Lane, 2010) had a significantly higher mean score than those who had undertaken other kinds of study or training or no study or training, while those who had undertaken formal full-time or part time study or training or self-directed study or training had similar mean scores, which were significantly higher than those who had undertaken no study or training. People who had undertaken no study or training had a mean document literacy score which was near the lower end of ALL Level 2, indicating quite limited literacy skills.

For people aged 16-24, there were not such clear differences between mean document literacy scores of those who had undertaken different types of study or training, but it is possible to say that those who had undertaken formal full-time study or training had a higher mean document literacy score than those who had undertaken self-directed study or training, or no study or training.

Figure 7
Mean document literacy score, by age and type of recent study or training

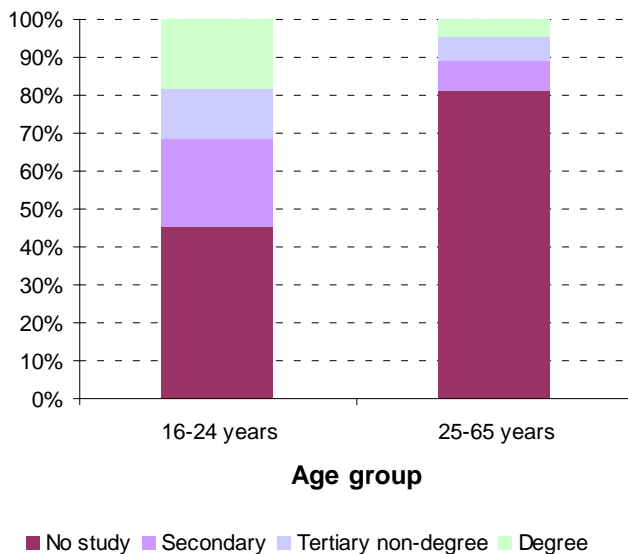


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

Figure 8 is concerned only with formal study or training in the past year, and distinguishes among secondary, tertiary non-degree (certificate or diploma) and degree-level (bachelors or higher) study or training. More than half of people aged 16-24 had been involved in formal study or training in the past year at one of these levels, while less than 20 per cent of people aged 25-65 had been involved in formal study or training.

Figure 8
Recent formal study in each age group

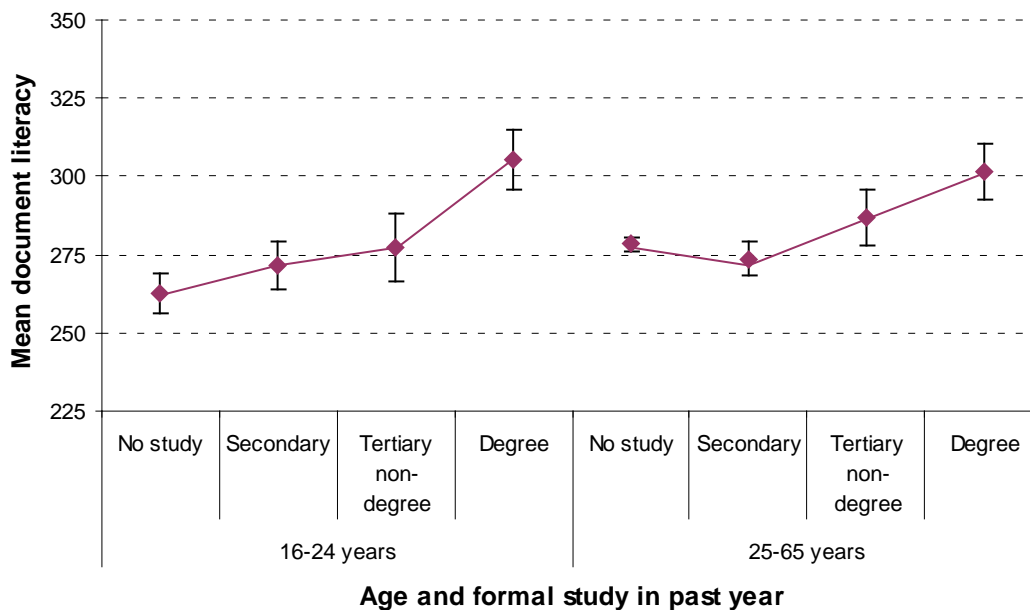


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 9 shows the mean document literacy scores of people aged 16-24 and 25-65 according to level of formal study or training undertaken in the past year. Among the 25-65 age group, those who had undertaken degree-level study had significantly higher mean document literacy than those who had undertaken secondary level study or training or no study or training, but could not be clearly distinguished from those who had studied or trained at a non-degree tertiary level.

Among people aged 16-24, there were no significant differences between people who had not studied or trained or who had undertaken study or training at secondary or non-degree tertiary level. However, those who had studied at degree level had a significantly higher mean document literacy score than the other three groups.

Figure 9
Mean document literacy score, by age and level of recent formal study



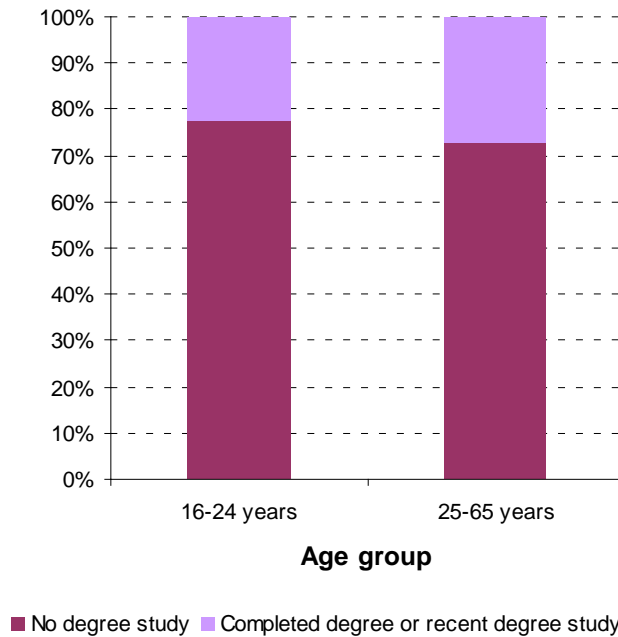
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

2.3 Experience of degree-level study

Given that having completed a degree at some time in the past, or having studied at degree level in the past year were both associated with higher document literacy, it is worth considering the effect of a variable that combines the two measures of experience of degree-level study. Respondents were considered to have experience of degree-level study if they had completed a degree before the past year, if they had studied at degree level but not completed a degree in the past year, or if they had studied at degree level in the past year and consequently completed a degree. This is an approximation, since it misses out people who may have previously studied at degree level, but not studied at this level in the past year and not yet completed a degree. This combined variable provides a way to compare people aged 16-24, many of whom are still in the process of studying for a degree, with people aged 25-65, most of whom have completed their initial study or training. Figure 10 shows that a slightly higher proportion of people in the 25-65 age group than in the 16-24 age group had studied at degree level in the past year or completed a degree at some time in the past.

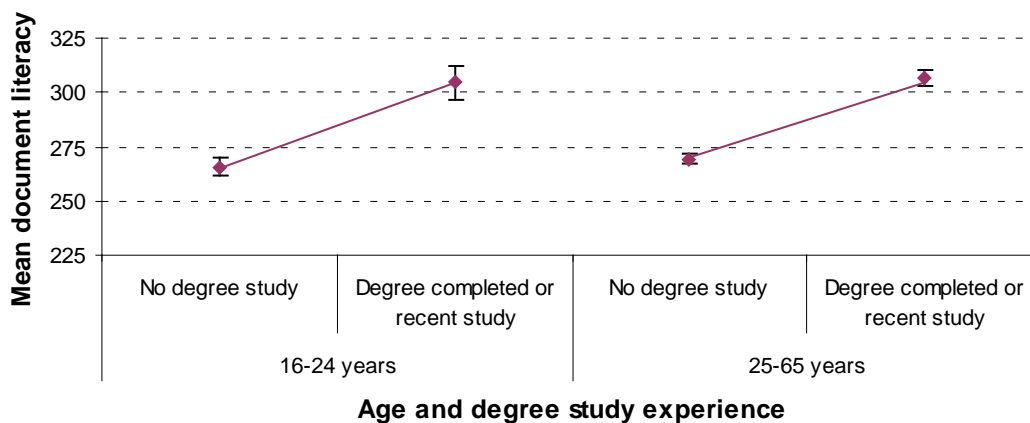
Figure 10
Experience of degree-level study in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

People who had studied at degree level in the past year or had completed a degree had significantly higher mean document literacy scores in both the 16-24 and 25-65 age groups, as shown in Figure 11. In fact, the mean document literacy scores for people with experience of degree-level study were comparable in the two groups, as were the mean document literacy scores of those without degrees or who had not studied at degree-level in the past year. This suggests that many younger people studying at degree level may have already achieved higher document literacy before completing their degrees.

Figure 11
Mean document literacy, by age and experience of degree-level study



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

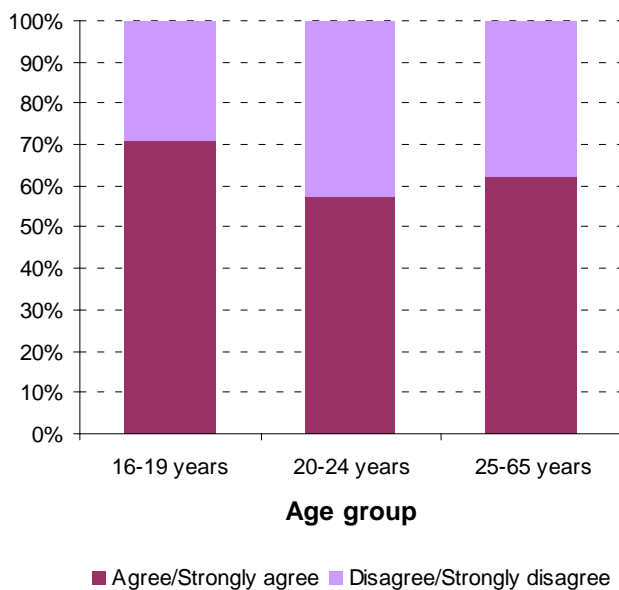
Note: The bars around estimates represent the margins of error (at the 95% confidence level).

2.4 Self-reported performance at school

Respondents were not asked about grades or achievement at school, with the exception that a series of questions about their experience of studying mathematics at school included a question asking respondents if they agreed, strongly agreed, disagreed or strongly disagreed with the statement “I got good grades in maths”. Most respondents agreed or strongly agreed with this statement, and people aged 16-19 were somewhat more likely to agree or strongly agree than those aged 20-24 or 25-65, as shown in Figure 12. This may be partly due to more of the youngest group having studied mathematics only at less advanced levels.

Figure 12

Self-reported school performance: responses to “I got good grades in maths”, in each age group



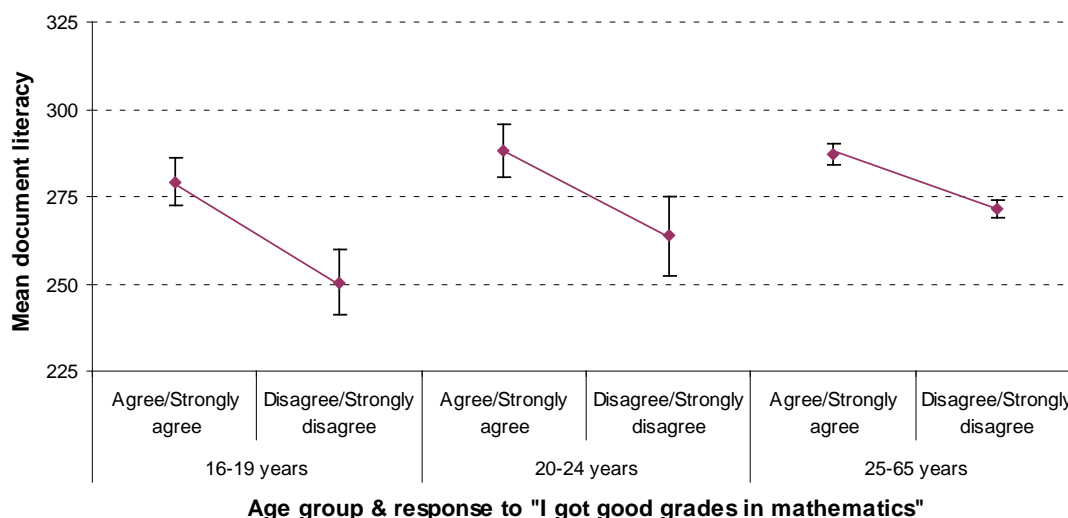
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

This variable is likely to be a reasonable proxy for overall achievement at school, since mathematics achievement is highly correlated with overall achievement (Engler, 2010).

Figure 13 shows that people who agreed or strongly agreed with the statement had significantly higher mean document literacy than those who disagreed or strongly disagreed, and the difference between the means was greater for the 16-19 and 20-24 age groups than for the 25-65 age group.²

² These differences in mean document literacy vary by gender as well as age. For people aged 25-65 the difference was similar for males and females, but for the 16-24 age group, the differences were considerably greater among males than among females.

Figure 13
Mean document literacy, by age and self-reported school grades in mathematics



2.5 Summary

In both the 16-24 and 25-65 age groups, people with higher levels of completed education tended to have higher document literacy.

In the 25-65 age group, people who had undertaken any kind of study or training (including self-directed study or training) in the past year had higher mean document literacy score than people who had not, and people who had undertaken non-formal study or training (often employment-related) had higher mean document literacy than all others. In the 16-24 age group, the only significant difference was a higher mean score for people who undertook formal full-time study or training compared with people who undertook self-directed study or training, or no study or training.

In the 16-24 age group, people who had undertaken degree-level study in the past year had significantly higher mean document literacy than those who had not studied, or who had studied at secondary or tertiary non-degree level. In the 25-65 age group, the relatively small number who had undertaken degree-level study in the past year had a significantly higher mean score than those who had not studied, or who had studied at secondary level.

Combining completed education with study or training undertaken in the past year, people who had either already completed a degree, or had undertaken degree-level study in the past year, had a significantly higher mean document literacy score than those who had not.

People who reported that they had achieved good grades in mathematics at school had a significantly higher mean document literacy score than those who reported poor grades, in all age groups; but the difference in mean scores was greatest for the 16-19 and 20-24 age groups. Self-reported grades in mathematics are likely to be a rough proxy for overall achievement at school.

In terms of the characteristics of each age group, among people aged 25-65, document literacy scores tended to be higher for:

- people who had completed tertiary education
- people who had undertaken non-formal study or training in the past year

- people who had either completed a degree, or studied at degree level in the past year
- people who reported that they had achieved good grades in mathematics at school

And in this age group, document literacy scores tended to be lower for:

- people whose highest level of completed education was lower secondary (up to Year 11)
- people who had undertaken no study or training (formal, non-formal or informal) in the past year
- people who had undertaken formal study or training at the secondary level in the past year
- people who reported receiving poor grades in mathematics at school

Among people aged 16-24, document literacy scores tended to be higher for:

- people who had completed tertiary education
- people who had undertaken formal full-time study or training in the past year
- people who had completed a degree or studied at degree level in the past year
- people who reported that they had achieved good grades in mathematics at school

While document literacy scores tended to be lower for:

- people whose highest level of completed education was lower secondary (especially for people aged 20-24)
- people who had not undertaken full-time formal study or training in the past year
- people who had not completed a degree or studied at degree level in the past year
- people who reported receiving poor grades in mathematics at school

Education in the statistical models

In the comprehensive statistical models for both the 16-24 and 25-65 age groups (discussed in Lane 2011), the variables which had a significant effect on document literacy scores were those based on the highest level of education completed and formal study in the past year, and self-reported grades in mathematics (though the effect of this last variable was considerably stronger in the 16-24 age group).

More specifically, for people aged 25-65, having highest completed education of Year 10 (or less), or Year 11 both had significant negative effects in comparison with completion of upper secondary (meaning Year 12-13 or Level 1-3 certificate), while having completed a degree or studied at degree level in the past year had a significant positive effect. Having completed a non-degree tertiary programme or studied at non-degree tertiary level in the past year did not have a significant effect in comparison with upper secondary completion. Self-reported good grades in school mathematics had a significant positive effect in comparison with poor grades or a neutral response to the question on grades. However, non-formal learning in the past year had no significant effect in comparison with not having taken non-formal courses.

For people aged 16-24, having highest completed education of Year 10 (or less) had a significant negative effect in comparison with completion of upper secondary (meaning Year 12-13 or Level 1-3 certificate), while having completed a degree or studied at degree level in the past year had a significant positive effect. Having completed Year 11, or having completed a non-degree tertiary programme or studied at non-degree tertiary level in the past year did not have significant effects in comparison with upper secondary completion. Self-reported good grades in school mathematics had a significant positive effect in comparison with poor grades or

a neutral response to the question on grades. However, non-formal learning in the past year had no significant effect in comparison with not having taken non-formal courses.

3 LABOUR FORCE STATUS AND EMPLOYMENT

Satherley, Lawes and Sok (2008) have found that for people aged 16-65 in the New Zealand ALL survey data, a majority of people who were employed or were students had higher document literacy (i.e. Levels 3-5), while a minority of those who were unemployed, retired or homemakers had higher document literacy. They have also found that the proportion with higher document literacy was:

- over 55 per cent among people in managerial, professional, technical or clerical occupations,
- close to 50 per cent among service and sales workers, skilled agriculture and fisheries workers, and tradespeople; and
- just over 30 per cent among machine operators and people in elementary occupations.

Satherley, Lawes and Sok (2008) have further found that there was a considerably greater proportion (almost 70 per cent) of people with higher document literacy in the industry categories 'Finance and real estate' and 'Health and education' than in the other industry categories (Agriculture and fisheries, Manufacture, Construction, (wholesale and retail) Trade, and Transport and communications), where the proportion ranged from 45 to 57 per cent.

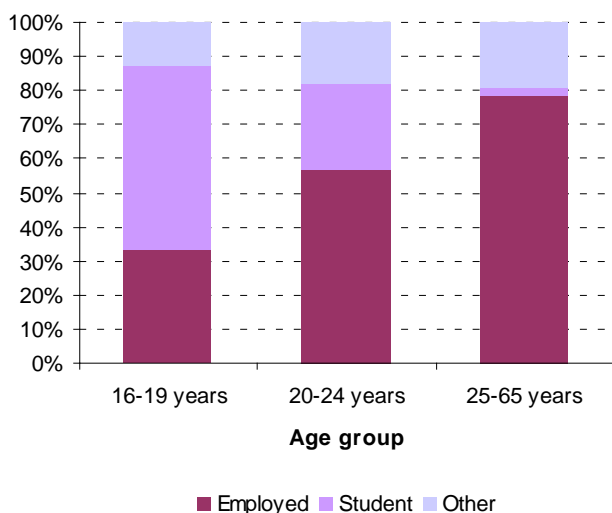
The subgroup aged 25-65 showed similar patterns (Lane 2010a: in terms of prose literacy and numeracy) for labour force status, occupation and industry. People aged 25-65 who had had some employment in the past year were more likely to have higher prose literacy or numeracy than people who had not been employed (Lane 2010a).

This chapter considers whether comparable results can be found for people aged 16-24. Unlike people aged 25-65, a large proportion of people aged 16-24 have 'student' as their main labour force status, and many have either not been employed or have been employed only on a temporary and/or part time status. Hence occupation and industry are only examined for those whose main labour force status is 'employed', while differences between full-time and part-time employment are explored. In addition this chapter includes analysis of the relations between document literacy scores and different combinations of study and employment during the preceding year.

3.1 Current labour force status

Figure 14 shows that the current labour force status of the majority in the 16-19 age group was 'student' while that of the majority in the 20-24 and 25-65 age groups was 'employed'.

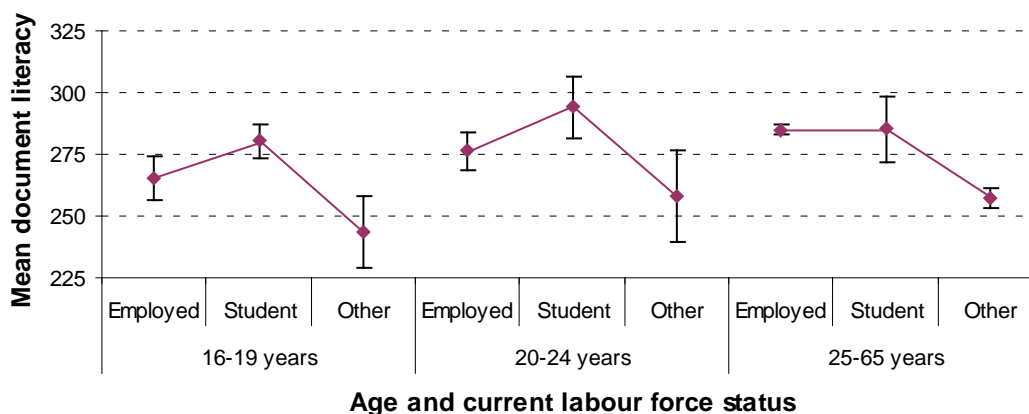
Figure 14
Current labour force status in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 15 shows the mean document literacy scores by current labour force status for people aged 16-19, 20-24 and 25-65. In each age group, there was no statistically significant difference between the mean for those who were students and those who were employed, but the mean for students was significantly higher than the mean for people who were neither students nor employed (that is, unemployed, homemaker, retired or other status).

Figure 15
Mean document literacy, by age and current labour force status



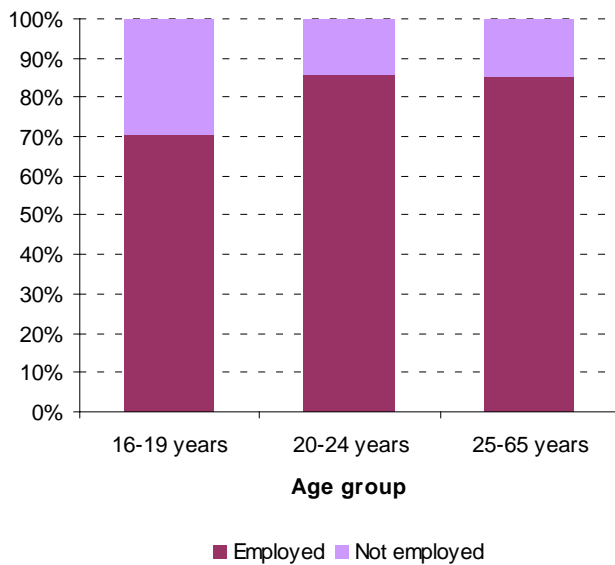
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

3.2 Employment in past year

Most people in all age groups had been employed at some time in the past year, but the percentage who had been employed was higher in the 20-24 and 25-65 age groups than in the 16-19 age group, as shown in Figure 16.

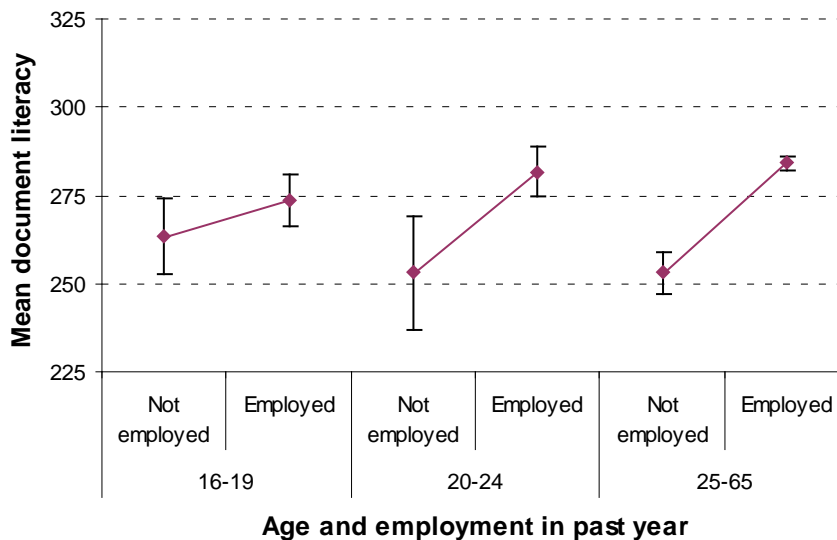
Figure 16
Employment in past year in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 17 shows that people in the 20-24 and 25-65 age groups who had been employed in the past year had significantly higher mean document literacy than those who had not, but the difference was not statistically significant in the 16-19 age group.

Figure 17
Mean document literacy, by age and employment in past year



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

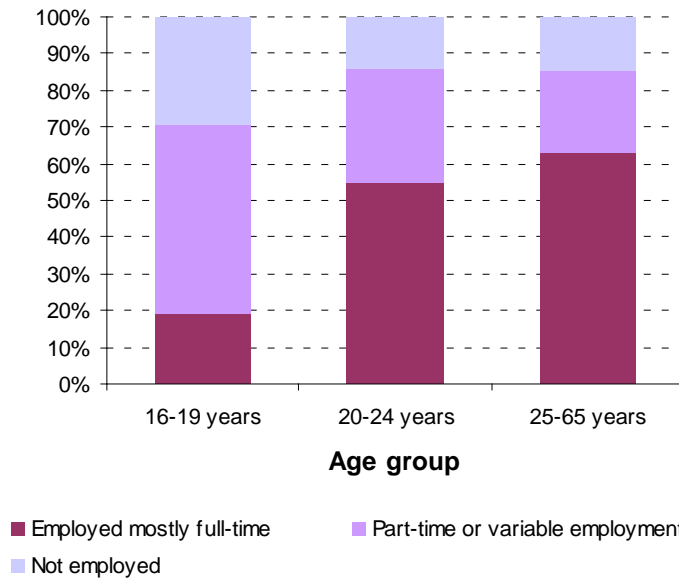
Note: The bars around estimates represent the margins of error (at the 95% confidence level).

If we look at whether employment in the past year was mainly full-time or was part-time or variably full-time or part-time, we see that less than 20 per cent of people aged 16-19 were employed mainly full-time, while about half had part-time or variable employment, as shown in

Figure 18. Many of the people in this age group with part-time or variable employment would be students. Employment in the past year in the 20-24 and 25-65 age groups was mainly full-time.

Figure 18

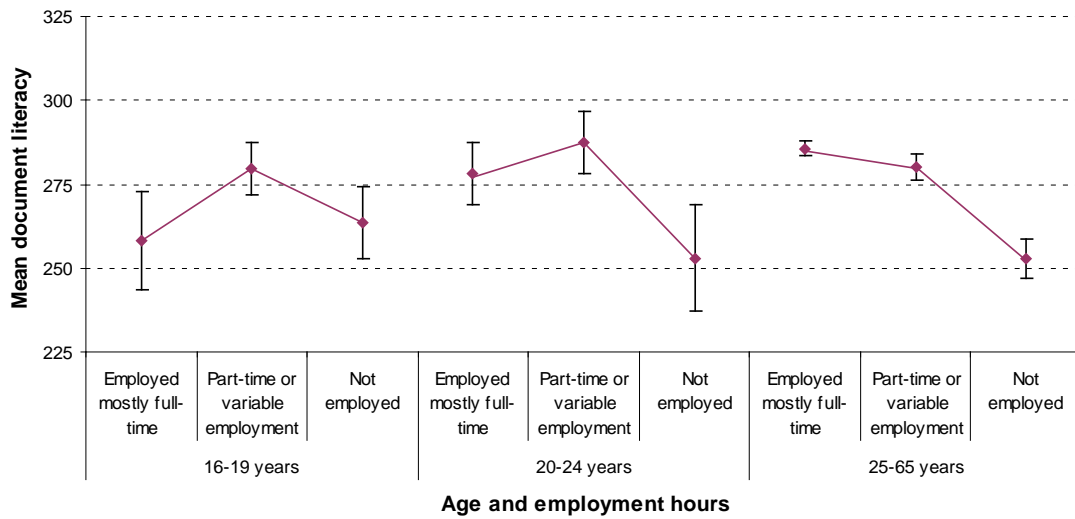
Hours of employment in the past year in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 19 shows the mean document literacy scores of people in the 16-19, 20-24 and 25-65 age groups according to the nature of their employment in the past year. In each age group there was no significant difference between people employed full-time, or variably or part-time, although the estimated means were somewhat higher in the two younger age groups for people who had part-time or variable employment, many of whom would have been students. In the 20-24 and 25-65 age groups, people who were employed full-time, as well as people with part-time or variable employment, had significantly higher mean document literacy than people who were not employed in the past year.

Figure 19
Mean document literacy score, by age and hours of employment in the past year



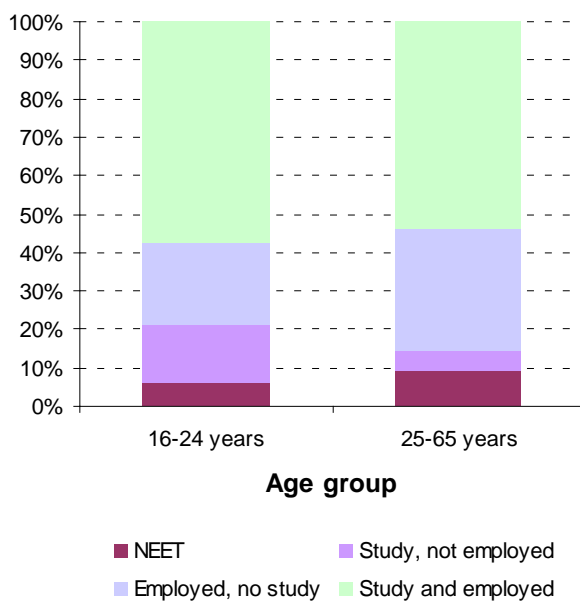
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

3.3 Employment and study or training

The majority of people in both the 16-24 and the 25-65 age groups had been both employed and involved in study or training in the past year, as shown in Figure 20. A greater proportion of people aged 25-65 than aged 16-24 were employed but had not undertaken study or training in the past year. On the other hand, a somewhat greater proportion of those aged 16-24 had been in study or training but not employed. Less than ten per cent of each age group were not in employment or (formal or non-formal) education or training in the past year (NEET).

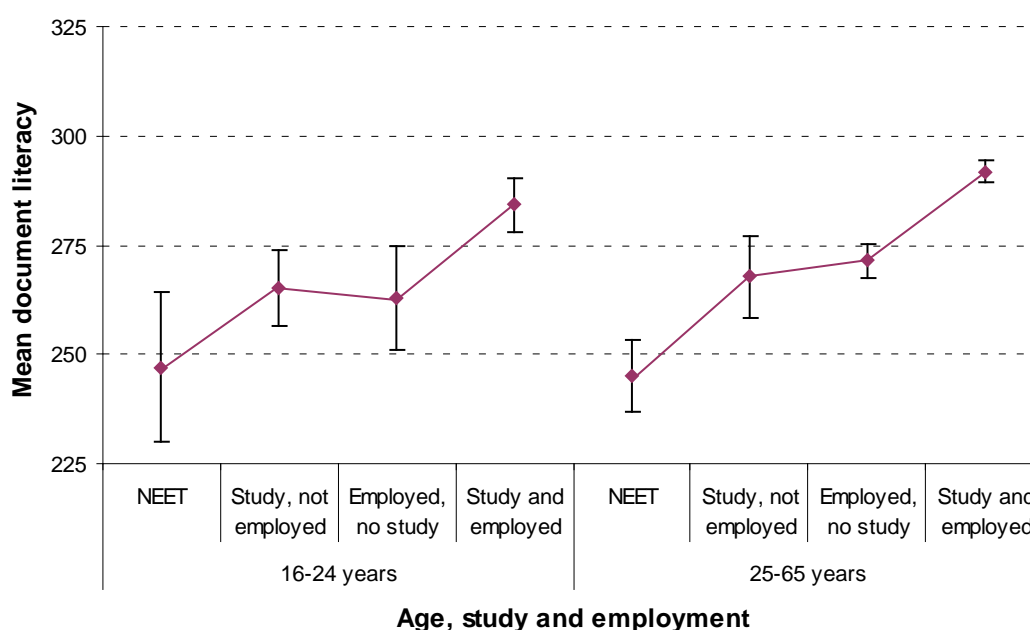
Figure 20
Study and/or employment in past year in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 21 shows the mean document literacy scores for people aged 16-24 and 25-65 by combinations of employment and study or training. In both age groups, people who had been involved in both employment and study or training had significantly higher mean document literacy than those who had been only in employment, or only in study or training. In the 25-65 age group, those who had been employed and/or had undertaken study or training all had significantly higher mean document literacy than those who had not been in employment, education or training. In the 16-24 age group, the estimated mean document literacy of the NEET group was lowest but was not significantly different from the study-only or employed-only groups, because of the large margin of error around the mean for the NEET group, which reflects the small number of respondents in this group (79 out of 1,082 in the age group).

Figure 21
Mean document literacy score, by age, formal or non-formal study in past year, and employment in past year



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

3.4 Occupation

Figure 22 shows the distribution by age of labour force status (student, employed or other³) and of occupation for those whose current labour force status was 'employed'.

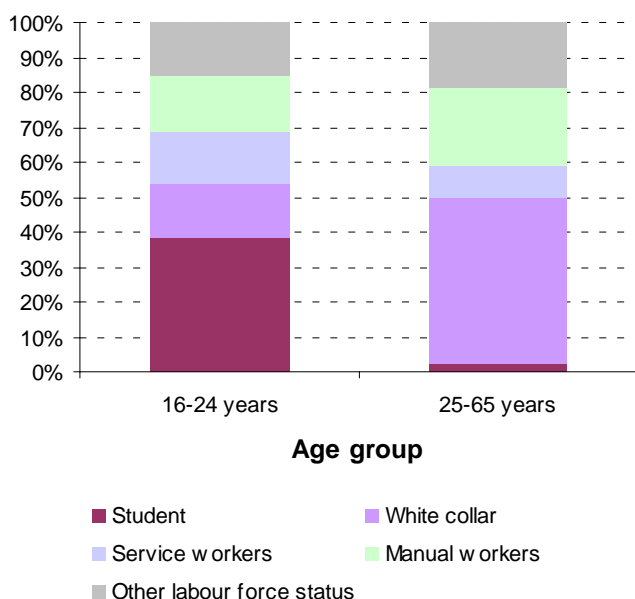
For the purposes of comparison between age groups, occupations are aggregated as white collar (managerial, professional, technical or clerical), service workers, or manual workers (agricultural workers, tradespeople, machine operators and elementary occupations).⁴ While a minority of people aged 16-24 were currently employed, those who were employed were spread evenly across white collar workers, service workers and manual workers. The majority of those people aged 25-65 who were currently employed were white collar workers.

³ 'Other' encompasses unemployed, retired, homemaker or other labour force status: see Chapter 9.

⁴ See Chapter 9 for the detailed classification of occupations.

Figure 22

Labour force status and occupation (if employed) in each age group



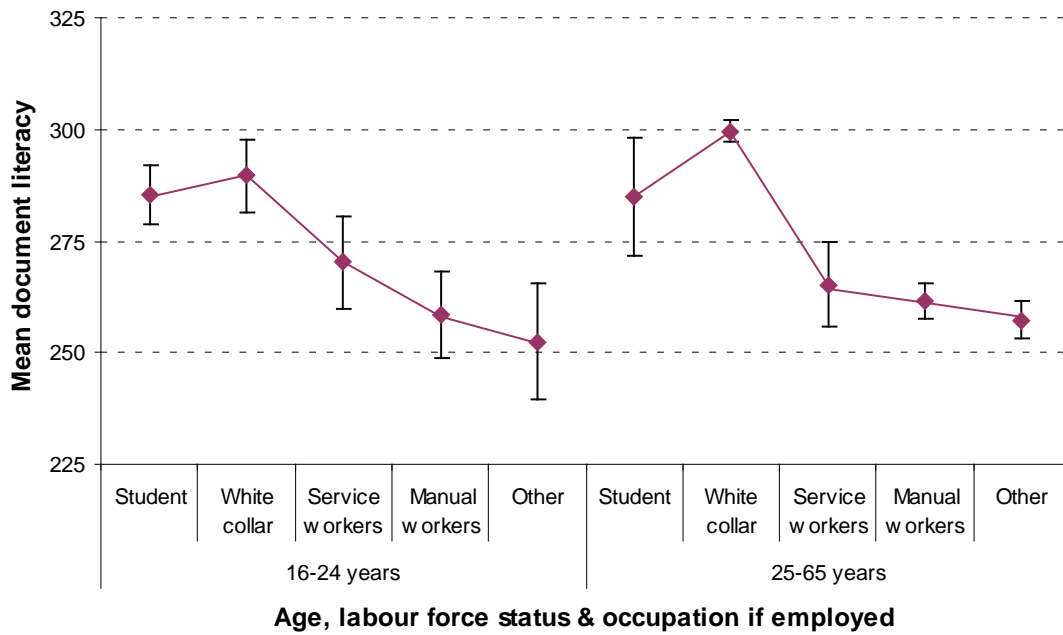
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 23 shows the mean document literacy of people in the 16-24 and 25-65 age groups according to labour force status and occupation (if currently employed). For people in both age groups, white collar workers had significantly higher mean document literacy than service workers, manual workers, or people with other labour force status. Students were not distinguishable from white collar or service workers, for both age groups, but had significantly higher mean document literacy than manual workers or people with other labour force status.

The main difference between the age groups was that the gap in mean document literacy between white collar and other occupations was much greater in the 25-65 age group than in the 16-24 age group. For some people in the 16-24 age group, their occupation would be related to temporary or entry-level employment which did not reflect their literacy skills, while for the 25-65 age group, white collar occupations would tend to select people with higher literacy skills and also to develop and enhance those skills in comparison with people in other occupations.

Figure 23

Mean document literacy score, by age, labour force status, and occupation (if employed)



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

3.5 Industry

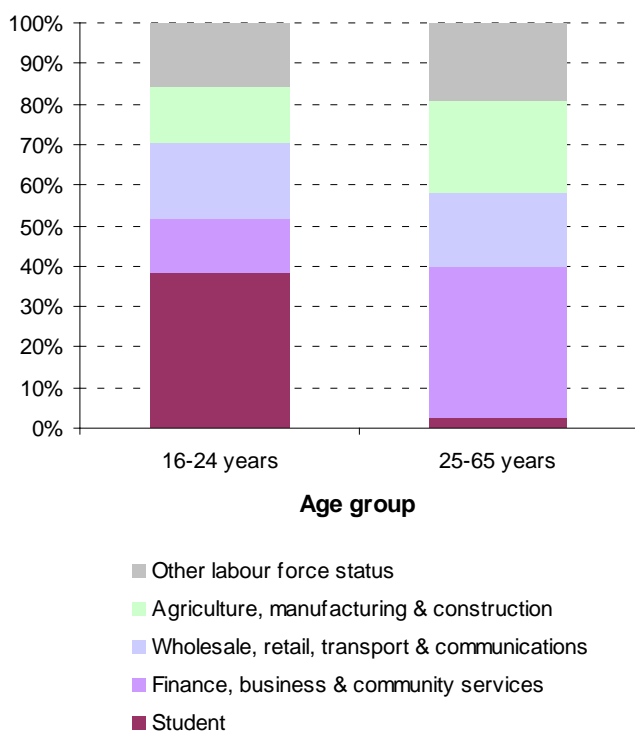
Figure 24 shows the distribution by age of labour force status (student, employed or other) and of industry for those whose current labour force status was employed.

In terms of industry, the largest group of currently employed people in the 16-24 age group were those involved in wholesale, retail, transport and communications. For people aged 25-65, the largest group was those involved in finance, business and community services (which includes education and health services).⁵

⁵ See Chapter 9 for the detailed classification of industries.

Figure 24

Labour force status and industry (if employed) in each age group

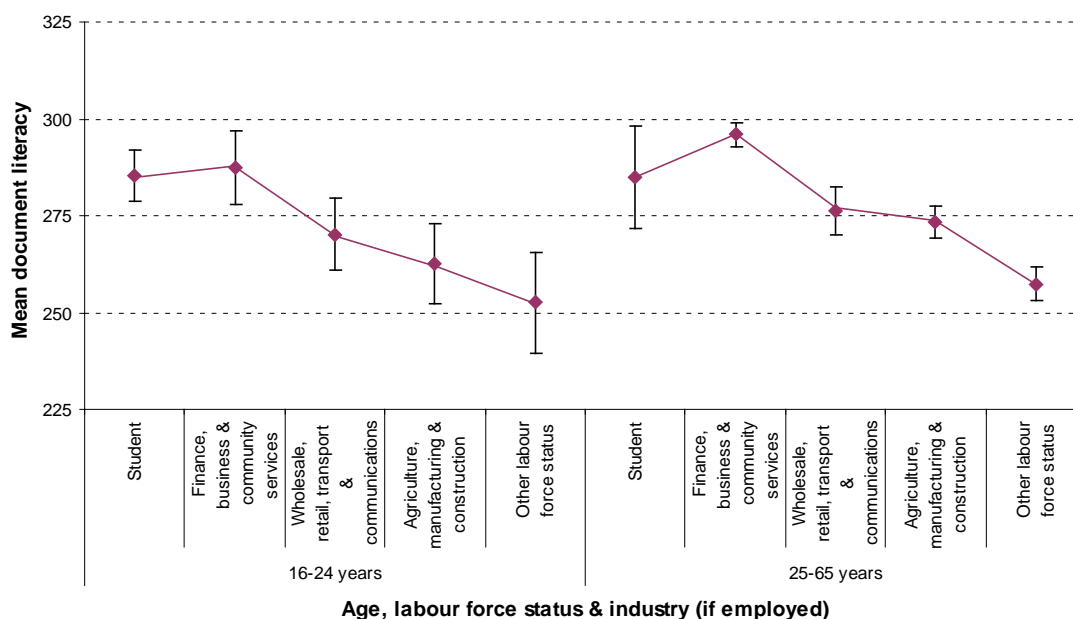


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 25 shows the mean document literacy of people aged 16-24 and 25-65 according to labour force status and industry (if currently employed). In the 25-65 age group, currently employed people in finance, business and community services had a significantly higher mean document literacy score than those in other industries, who in turn had significantly higher mean document literacy than those with 'other' labour force status. The mean document literacy score for students could not be distinguished from that for any of the industry categories of employed people, but was significantly higher than that for people with 'other' labour force status, as already noted in section 3.1.

In the 16-24 age group, the means for the different labour force and industry categories were comparable, with the exception that the mean document literacy scores for students and for people in finance, business and community services was significantly higher than the mean scores for agriculture, manufacturing and construction, and for 'other' labour force status.

Figure 25
Mean document literacy score, by age and industry



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

3.6 Summary

For all age groups, people who were employed or students had comparable document literacy, while students had significantly higher mean document literacy scores than people who were neither employed nor students.

In the 20-24 and 25-65 age groups, people who had been employed at any time in the past year had significantly higher mean document literacy than those who had not, but in the 16-19 age group, there was no significant difference.

When we look at hours of work, there were no significant differences in the 16-19 age group between those who had been employed mainly full-time, those who had been employed part-time or variably full- or part-time, and those who had not been employed. For the 20-24 and 25-65 age groups, people who had had mainly full-time employment or part-time or variable employment had comparable mean document literacy scores, while those who had had part-time or variable employment had significantly higher mean document literacy than those who had not been employed.

There was a combined effect for employment and study or training in the past year. In the 16-24 and the 25-65 age groups, those who had both been employed and involved in formal or non-formal study or training in the past year had higher mean document literacy than those who had undertaken study only, or employment only, or neither. For the 25-65 age group, those who had been involved in any study or training or employment in the past year had significantly higher mean document literacy than those who had been involved with neither. For the 16-24 age group, while those who had not been involved in employment, education or training (NEET) had the lowest estimated mean document literacy, there were very few of them and so the estimate had a very large margin of error. This estimate could consequently not be distinguished from the estimates for the study-only and employed-only groups.

In the 16-24 and the 25-65 age groups, currently employed people in white collar occupations (managerial, professional, technical or clerical) had a significantly higher mean document literacy score than people currently employed in other occupations.

In terms of industries people were currently employed in, people aged 25-65 in finance, business or community services (including education and health services) had significantly higher mean document literacy than other people who were currently employed. In the 16-24 age group, currently employed people in finance, business or community services had significantly higher mean document literacy than those currently employed in agriculture, manufacturing and construction.

In terms of the characteristics of each age group, among people aged 25-65, document literacy scores tended to be higher for:

- people whose current labour force status was student or employed
- people who had been employed in the past year, whether full-time, part-time, or variably full-time or part-time
- especially, people who had been employed in the past year and had also undertaken formal or non-formal study or training in the past year
- currently employed people in white collar occupations (managers, professionals, technicians or clerks)
- currently employed people in finance, business or community services industries

Conversely, in this age group, document literacy scores tended to be lower for:

- people whose current labour force status was other than employed or student
- people who had not been employed in the past year
- people not in employment, (formal or non-formal) education or training in the past year
- currently employed people who were not in a white collar occupation
- currently employed people who were not in finance, business or community services

Among people aged 16-24, document literacy scores tended to be higher for:

- people whose current labour force status was student or employed
- people who had been employed in the past year, whether full-time, part-time, or variably full-time or part-time (20-24 only)
- people who had been employed in the past year and had also undertaken formal or non-formal study or training in the past year
- currently employed people in white collar occupations (managers, professionals, technicians or clerks)
- currently employed people in finance, business or community services industries

Conversely,, document literacy scores tended to be lower for:

- people whose current labour force status was other than employed or student
- people who had not been employed in the past year (20-24 only)
- people who had not been in both employment and (formal or non-formal) study or training in the past year
- currently employed people who were not in a white collar occupation
- currently employed people who were not in finance, business or community services

Note that among people aged 20-24, those who had been employed in the past year had significantly higher mean document literacy than those who had not, but this difference was not significant for the 16-19 age group.

Labour force status, occupation and industry in the statistical models

In Lane (2011), models for document literacy in the 16-24 and 25-65 age groups were constructed based just on labour force status, occupation and industry variables. In these models, all the variables had significant associations with document literacy, apart from whether the labour force status was 'student' or not in the model for the 25-65 age group.

When labour force status, occupation and industry variables were incorporated in the comprehensive statistical models, they were no longer significant, except for one variable in the model for the 25-65 age group: being a machine operator or having an elementary occupation had a significant negative effect in comparison with being a service worker or skilled manual worker, in this age group, when all the other factors were taken into account. The relationships of document literacy with labour force status, occupation and industry appear to be largely accounted for by the effects of other factors, particularly education, technology use and literacy-related practices.

4 USE OF TECHNOLOGY

Among people aged 25-65 in the New Zealand ALL survey data, I have previously (Lane 2010a) identified work computer use, and home computer use for 5 or more hours per month, as factors strongly related to prose literacy and numeracy. Work computer users engaged in a wider range of regular reading, writing and numeracy-related activities at work than those who did not use a computer at work. Those who used a home computer for 5 or more hours per month engaged in a wider range of personal reading than those who used a home computer less than 5 hours per month or did not use a home computer at all. This chapter considers whether similar results can be found among people aged 16-24.

It is not clear from these associations in the ALL survey data whether literacy is a prerequisite for computer use, or computer use promotes literacy (or both) because the ALL data was collected at one point in time.

Aro and Olkinuora (2007) analysed data from a similar literacy survey in Finland (the Second International Adult Literacy Survey, 1998), and found that higher literacy was correlated with more frequent use of computers for searching for information, reading electronic journals, and email, as well as with more frequent use of computers for work or study. On the other hand, use of computers for playing games was not correlated with literacy. Aro and Olkinuora interpret these results as indicating that computers and the internet provide means of literacy practice which can enhance literacy, especially for people with less education. Because the data was collected at one point in time, it is nevertheless open to the alternative interpretation that people who already had higher literacy were more likely to use computers for information search, reading journals, email, work or study.

However, Bynner et al. (2010) have reported results of two longitudinal studies (in Portland, Oregon and London, England) of people who had not completed upper secondary qualifications. Data relating to both the Portland and London samples was available for 2000 and 2004 for literacy, employment and ICT use. Bynner et al. found significant relationships between literacy and ICT use, with ICT use in 2000 predicting literacy in 2004 much more strongly than literacy in 2000 predicted ICT use in 2004. They summarise this relationship (along with the effect of employment) as follows (2010: 9):

Employment and ICT use support the development of literacy proficiency—hence enhancement of literacy proficiency is aided by time spent in employment and exposure to ICT. The evidence of effects in the other direction is much weaker, i.e. of improved literacy proficiency influencing the take-up of ICT or getting employment.

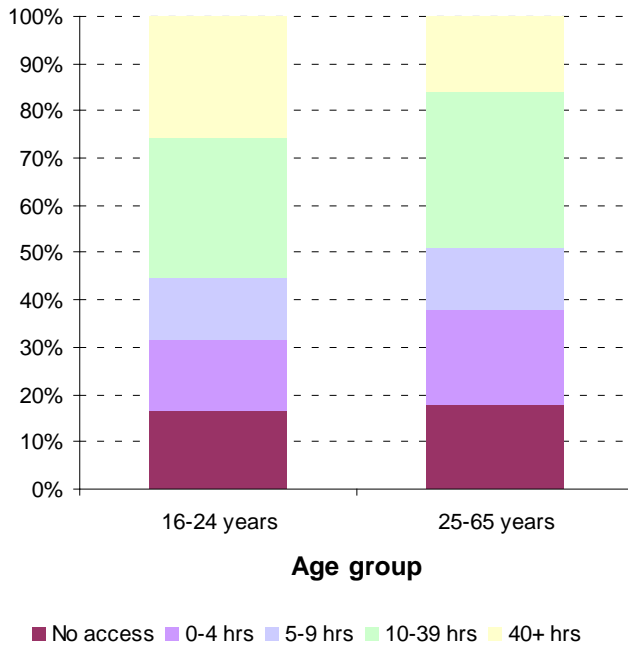
This chapter includes analysis of any relations between document literacy scores and the frequency of home computer use; between document literacy and the frequency of computer use or internet use for particular purposes (writing/editing, computer games, email, online discussions); and between document literacy and mobile phone use.

4.1 Home computer use

In both the 16-24 and 25-65 age groups, a majority of people used a home computer at least 5 hours per month, although a greater percentage of people aged 16-24 than of people aged 25-65 used a home computer 40 or more hours per month, as shown in Figure 26.

Figure 26

Hours per month of home computer use in each age group

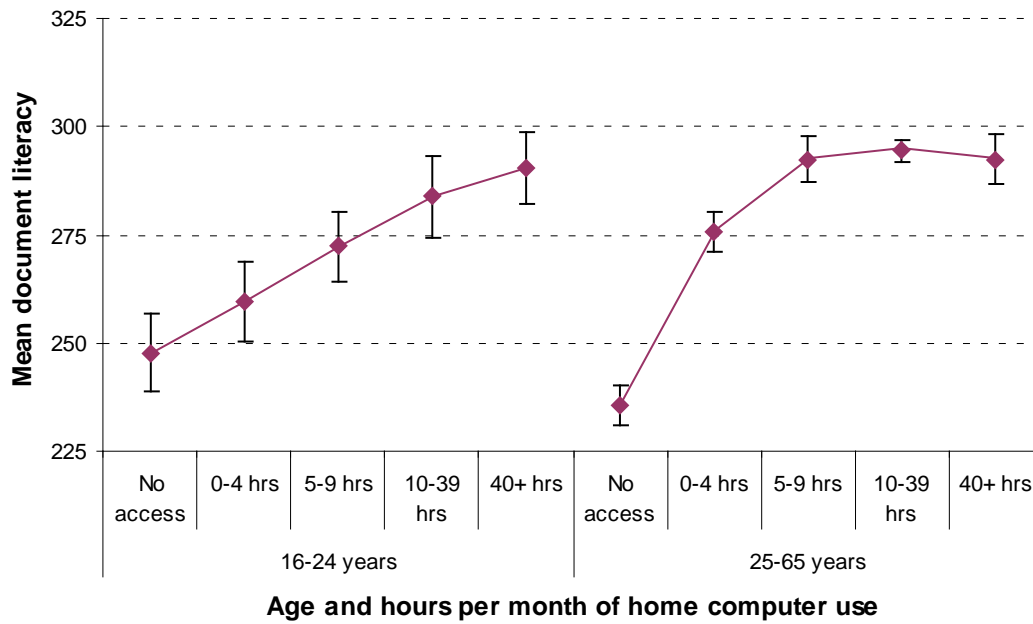


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: 'No access' includes people who had never used a computer as well as those who had used a computer but had no access to a computer at home.

Figure 27 shows the mean document literacy scores of people in the 16-24 and 25-65 age groups according to the number of hours of home computer use per month. For people aged 25-65, there was no significant difference in mean document literacy between people with different hours of use once the usage was at 5 or more hours per month, and people using a home computer for 5 or more hours per month had significantly higher mean document literacy than those who had no access or used a home computer less than 5 hours per month. For people aged 16-24, the mean document literacy increased steadily with increasing hours per month of use: those who had 5 or more hours per month of use had significantly higher mean document literacy than those with no access; those who had 10 or more hours per month of use had significantly higher mean document literacy than those who had no access or less than 5 hours of use, and those who had 40 or more hours per month of use had significantly higher mean document literacy than those who had no access or had less than 10 hours per month of use.

Figure 27
Mean document literacy score, by age and hours per month of home computer use

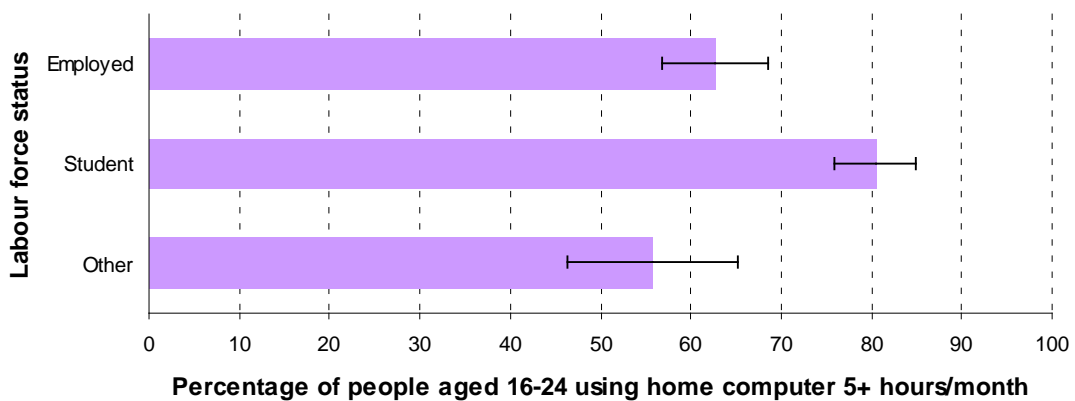


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level). 'No access' includes people who had never used a computer as well as those who had used a computer but had no access to a computer at home.

In the 16-24 age group, students were significantly more likely than people with other current labour force statuses to use a home computer for 5 or more hours per month, as shown in Figure 28.

Figure 28
Percentage of people aged 16-24 using a home computer 5 or more hours per month, by labour force status



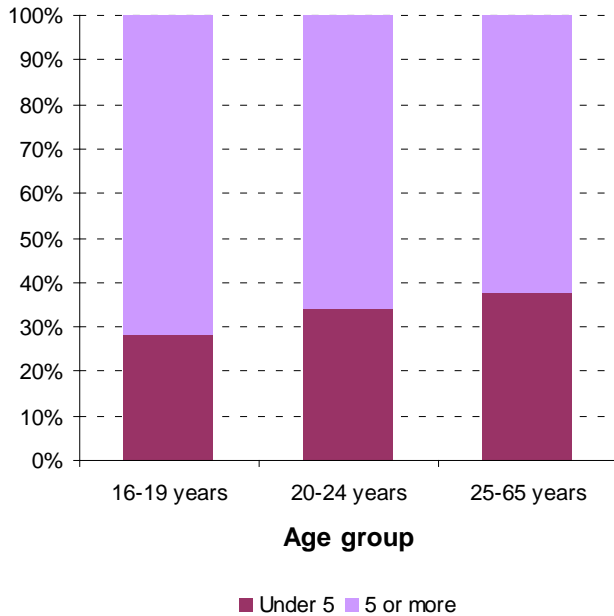
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

Figure 29 compares home computer use among people aged 16-19, 20-24 and 25-65, in terms of whether or not they used a home computer for 5 or more hours per month. The two younger groups were slightly more likely to have 5 or more hours per month of home computer use.

Figure 29

Hours per month of home computer use in each age group (3 age categories)

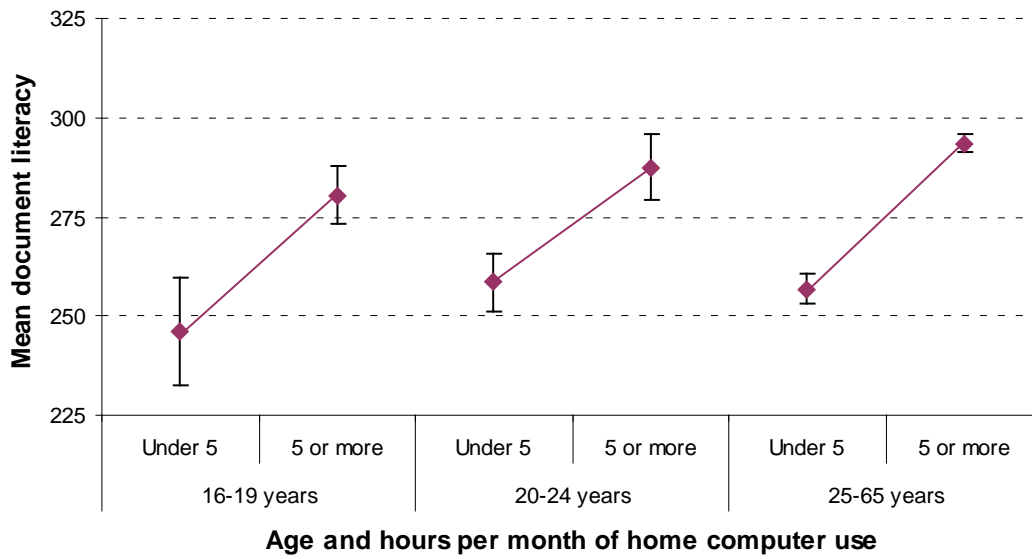


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The category 'Under 5' includes people who had never used a computer, and people who had used a computer but had no access to a computer at home, as well as those with access to a computer at home who used the computer less than 5 hours per month.

Figure 30 shows the mean document literacy scores of people aged 16-19, 20-24 and 25-65 according to whether or not they used a home computer for 5 or more hours per month. There was a large and significant difference within each age group in favour of those who had 5 or more hours per month of home computer use. Across age groups, those with less than 5 hours of use had comparable mean document literacy scores, while among people who had 5 or more hours of use, those aged 25-65 had a significantly higher mean document literacy score than those aged 16-19.

Figure 30
 Mean document literacy, by age (3 categories) and hours per month of home computer use



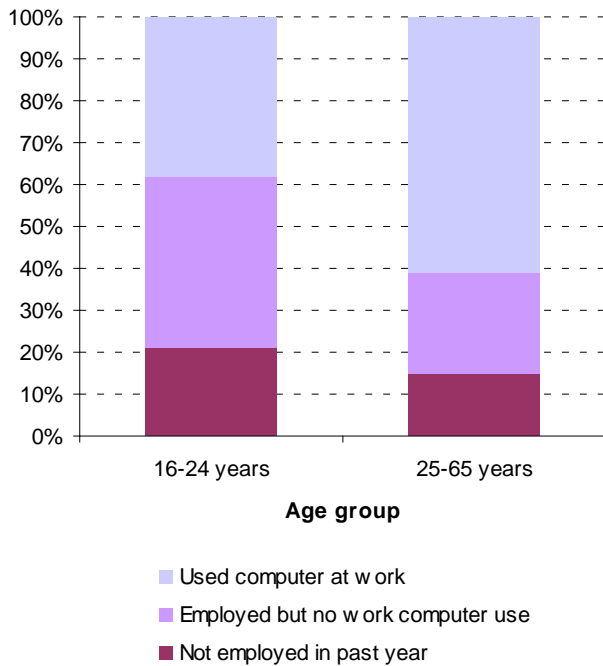
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level). The category 'Under 5' includes people who had never used a computer, and people who had used a computer but had no access to a computer at home, as well as those with access to a computer at home who used the computer less than 5 hours per month.

4.2 Computer use at work

A majority of people in the 25-65 age group had used a computer at work in the past year while only a minority of those in the 16-24 age group had done so, as shown in Figure 31. In fact, the proportion of the 16-24 age group who had been employed but not used a computer at work (41 per cent) was slightly larger than the proportion using a computer at work (38 per cent).

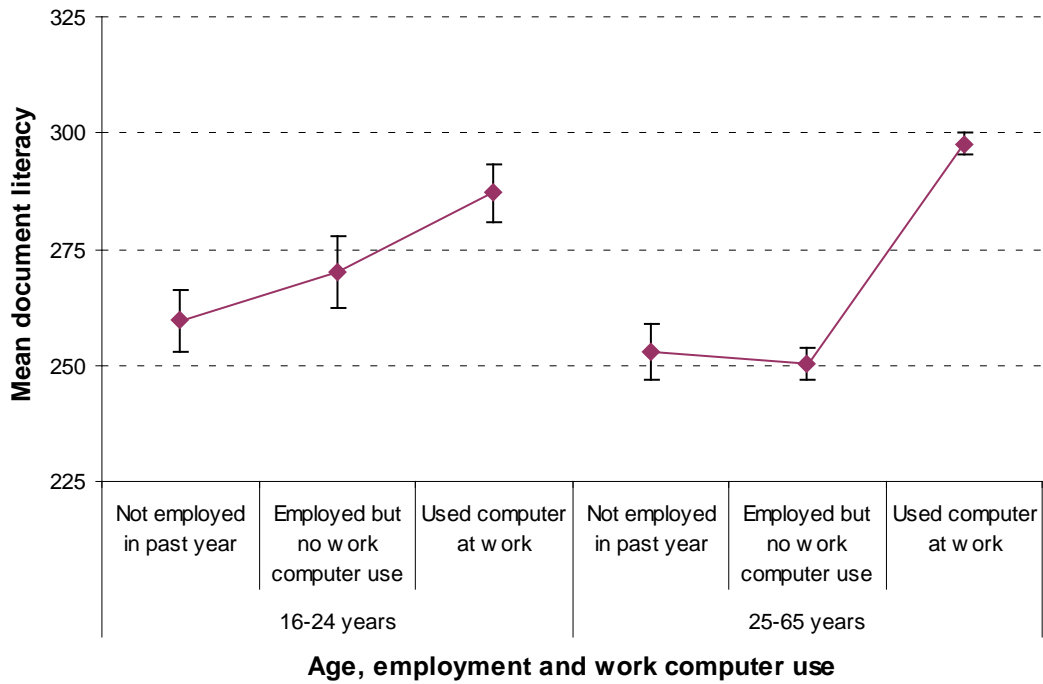
Figure 31
Employment and work computer use in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 32 shows the mean document literacy scores for people aged 16-24 and 25-65 according to whether they were employed in the past year and whether they had used a computer at work. In both age groups, work computer users had significantly higher mean document literacy than those who were either not employed in the past year, or had been employed but not used a computer at work. However, the difference was considerably greater in the 25-65 than in the 16-24 age group, especially between those who had used a computer at work and those who had been employed but not used a computer at work.

Figure 32
Mean document literacy score, by age, employment and computer use at work



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

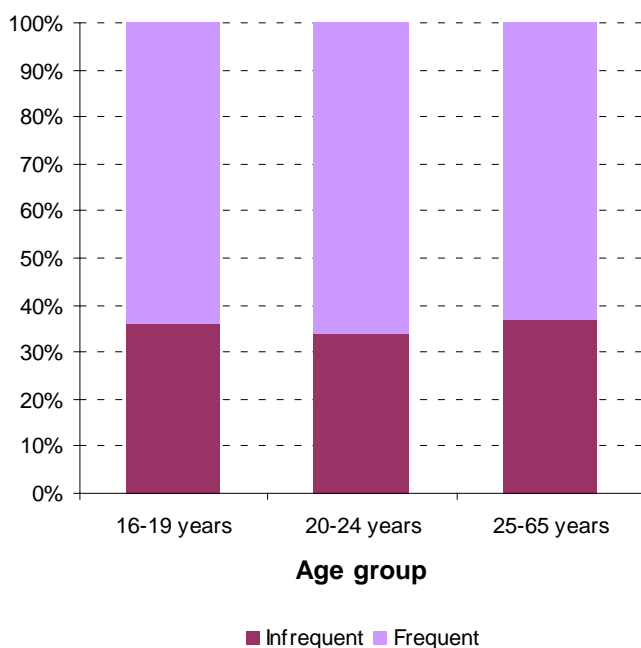
4.3 Purposes of computer use

Writing and editing

Across the three age groups, 16-19, 20-24 and 25-65 there was a similar proportion who used a computer frequently for writing or editing, as shown in Figure 33.

Figure 33

Frequency of writing or editing using a computer among people in each age group



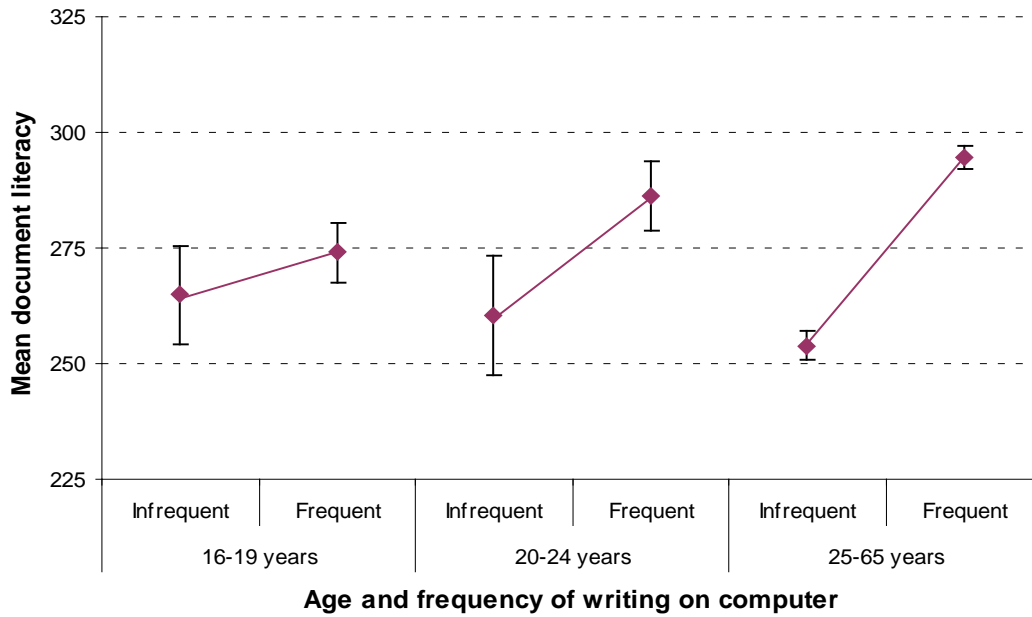
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: People who had never used a computer are included in the 'Infrequent' category. 'Infrequent' also includes the responses 'Never' and 'A few times a month' by people who had used a computer. 'Frequent' combines the responses 'A few times a week' and 'Daily'.

Figure 34 shows the mean document literacy scores of people in the 16-19, 20-24 and 25-65 age groups according to whether or not they were frequent users of computers for writing or editing. Frequent users had significantly higher mean document literacy than infrequent users in the 20-24 and 25-65 age groups but not the 16-19 age group.

There are several possible explanations for this pattern. Using a computer for writing may be more related to being employed in the 20-24 and 25-65 age groups and to being a student in the 16-19 age group, and whether people need to do writing and editing in their employment may depend more on their prior literacy than is the case for the younger students. There could also be a practice effect, with people's literacy improving the longer they are involved in writing and editing on computer.

Figure 34
 Mean document literacy score, by age and frequency of writing or editing using a computer



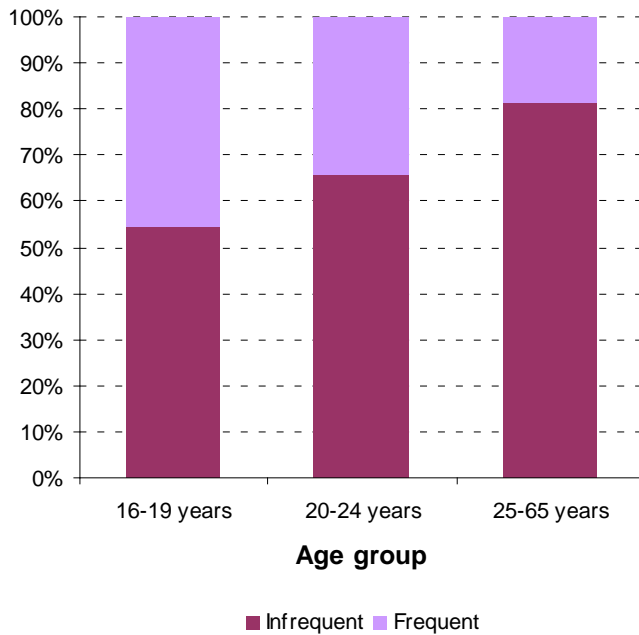
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level). People who had never used a computer are included in the 'Infrequent' category. 'Infrequent' also includes the responses 'Never' and 'A few times a month' by people who had used a computer. 'Frequent' combines the responses 'A few times a week' and 'Daily'.

Computer games

People in the 16-19 and 20-24 age groups were considerably more likely to play computer games frequently than people aged 25-65, as shown in Figure 35, although the majority in all age groups were infrequent computer gamers.

Figure 35
Frequency of playing computer games in each age group

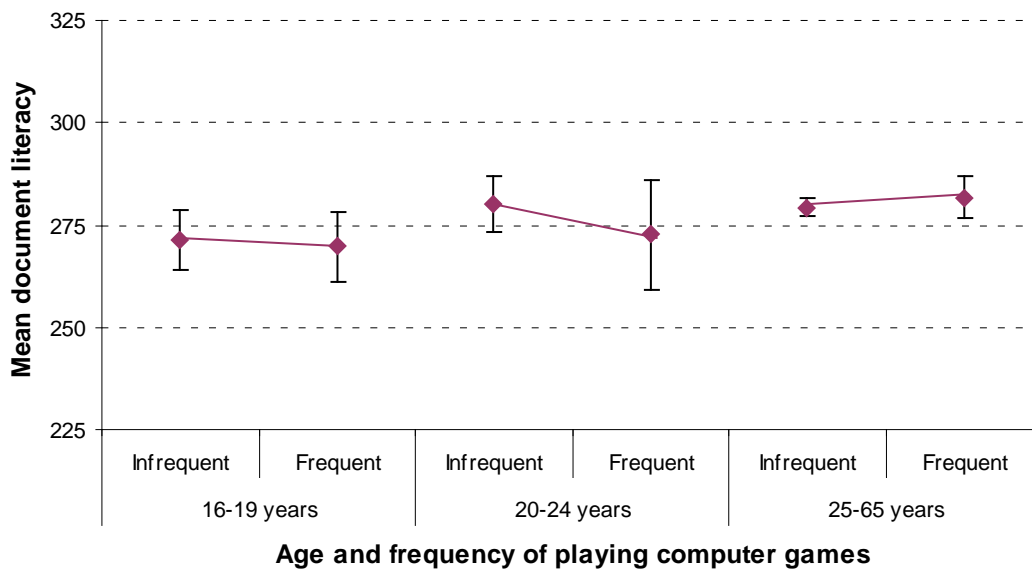


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: People who had never used a computer are included in the 'Infrequent' category. 'Infrequent' also includes the responses 'Never' and 'A few times a month' by people who had used a computer. 'Frequent' combines the responses 'A few times a week' and 'Daily'.

Figure 36 shows the mean document literacy scores of people in the 16-19, 20-24 and 25-65 age groups according to frequency of playing computer games. It can be seen that there were no significant differences in mean document literacy between frequent and infrequent gamers within age groups or indeed across age groups. In other words, frequent gamers were no less literate than infrequent gamers, nor did they gain any advantage in document literacy.

Figure 36
Mean document literacy score, by age and frequency of playing computer games



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

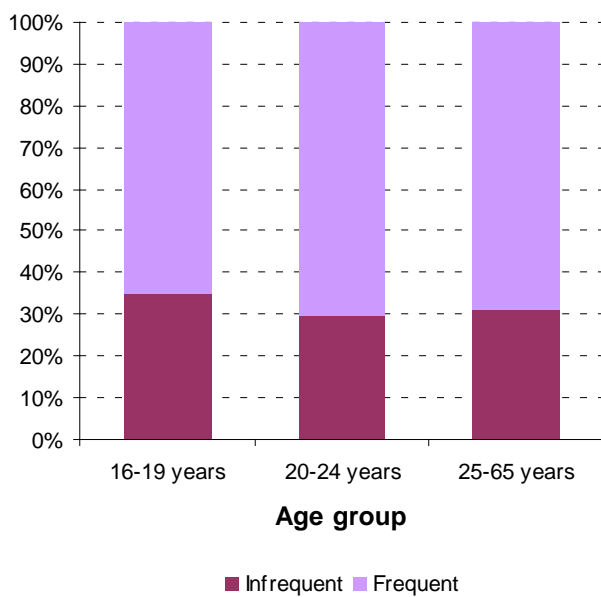
Note: The bars around estimates represent the margins of error (at the 95% confidence level). People who had never used a computer are included in the 'Infrequent' category. 'Infrequent' also includes the responses 'Never' and 'A few times a month' by people who had used a computer. 'Frequent' combines the responses 'A few times a week' and 'Daily'.

4.4 Purposes of internet use

Email

The majority of people in each of the 16-19, 20-24 and 25-65 age groups were frequent users of email, with only a slightly smaller proportion of frequent users in the 16-19 age group than in the other two age groups, as shown in Figure 37.

Figure 37
Frequency of email use in each age group

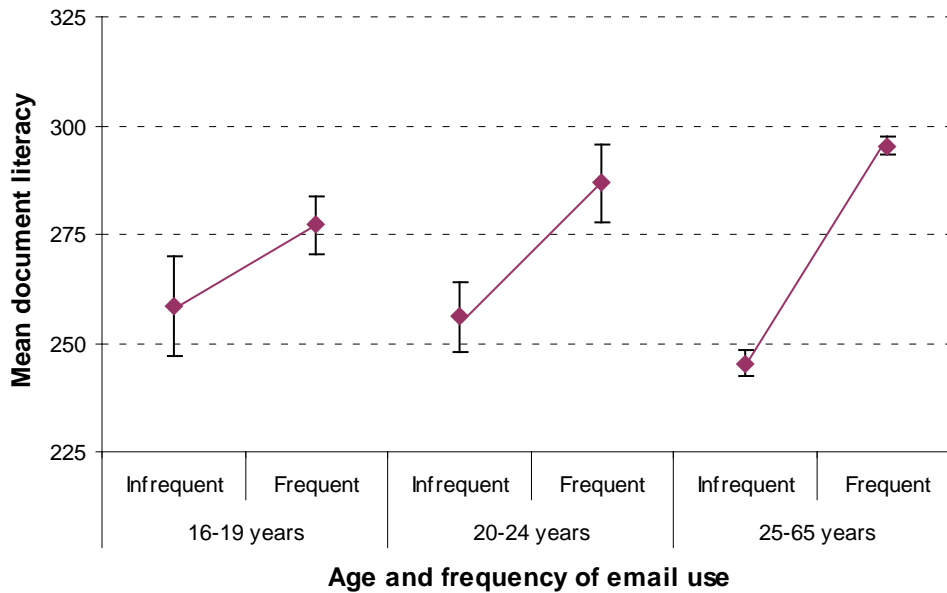


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: People who had never used the internet are included in the 'Infrequent' category. 'Infrequent' also includes the responses 'Never' and 'A few times a month' by people who had used the internet. 'Frequent' combines the responses 'A few times a week' and 'Daily'.

Figure 38 shows the mean document literacy scores of people in the 16-19, 20-24 and 25-65 age groups according to frequency of email use. In each age group, frequent users had significantly higher mean document literacy than infrequent users, but the difference was greater with increasing age.

Figure 38
Mean document literacy score, by age and frequency of email use



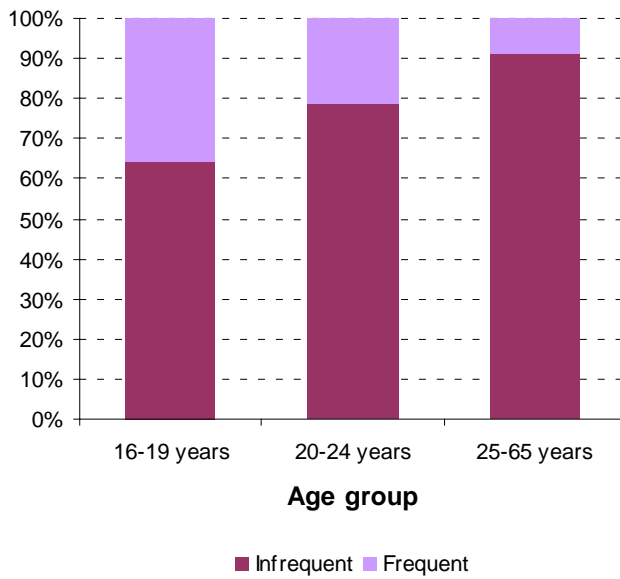
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: People who had never used the internet are included in the 'Infrequent' category. 'Infrequent' also includes the responses 'Never' and 'A few times a month' by people who had used the internet. 'Frequent' combines the responses 'A few times a week' and 'Daily'.

Online discussions

Respondents were asked how frequently they participated in 'chat groups or other on-line discussions'. This is a broad term which could cover a wide range of applications including text-based chat-rooms and forums, as well as discussions using audio and video links. People aged 16-19 and 20-24 were much more likely to participate frequently in online discussions than people aged 25-65, as shown in Figure 39, although the majority in all age groups participated infrequently.

Figure 39
Frequency of participation in online discussions in each age group

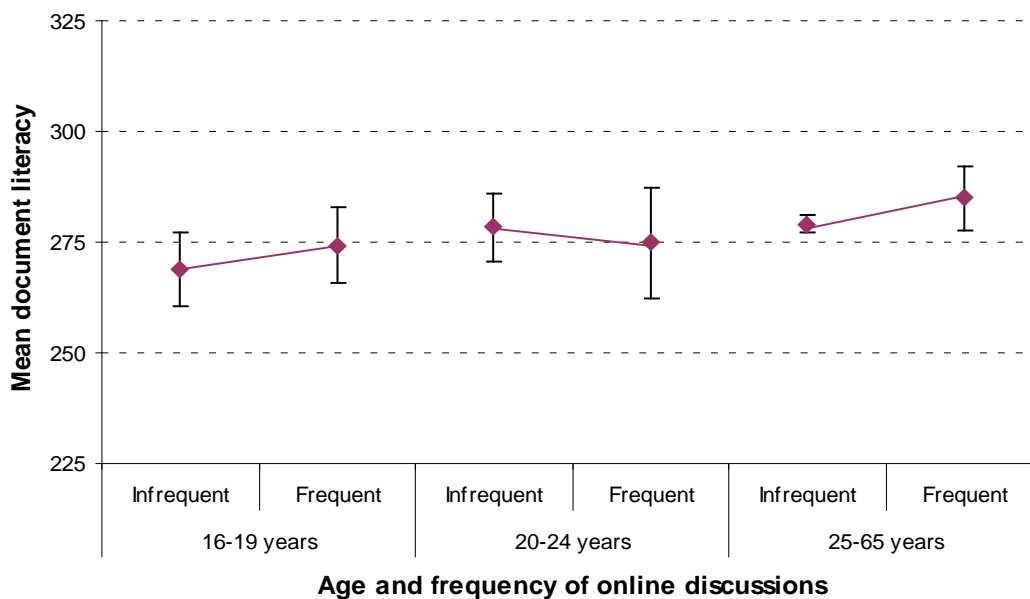


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: People who had never used the internet are included in the 'Infrequent' category. 'Infrequent' also includes the responses 'Never' and 'A few times a month' by people who had used the internet. 'Frequent' combines the responses 'A few times a week' and 'Daily'.

Figure 40 shows the mean document literacy scores of people in the 16-19, 20-24 and 25-65 age groups according to the frequency of their participation in online discussions. There were no significant differences between people with frequent and infrequent participation within or across age groups.

Figure 40
Mean document literacy score, by age and frequency of participation in online discussions



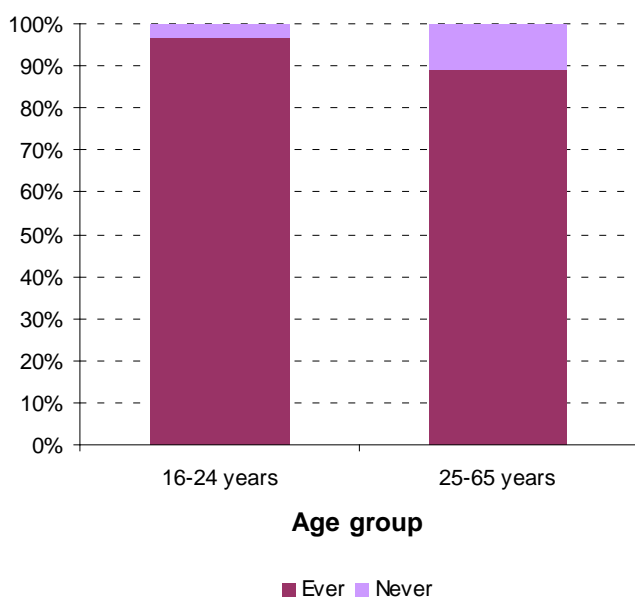
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level). People who had never used the internet are included in the 'Infrequent' category. 'Infrequent' also includes the responses 'Never' and 'A few times a month' by people who had used the internet. 'Frequent' combines the responses 'A few times a week' and 'Daily'.

4.5 Mobile phone use

A very small proportion of people in both the 16-24 and 25-65 age groups never used a mobile phone, as shown in Figure 41, although there was a greater percentage of such people in the older group.

Figure 41
Mobile phone use in each age group



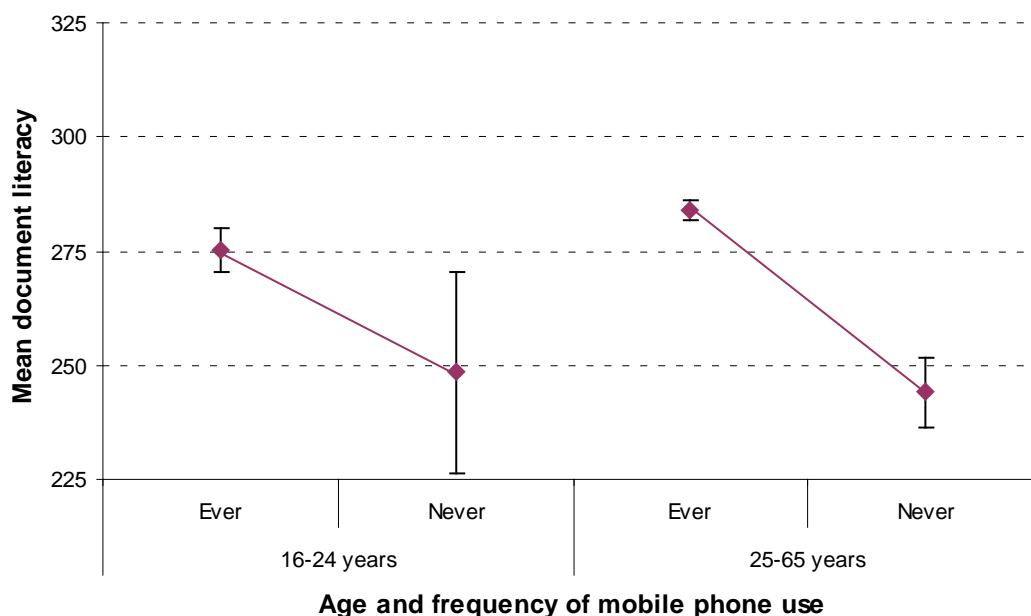
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: 'Ever' aggregates the responses 'daily', 'a few times a week' and 'a few times a month'.

Figure 42 shows the mean document literacy scores of people in the 16-24 and 25-65 age groups according to whether or not they ever used a mobile phone.⁶ In both age groups, those who never used a mobile phone had significantly lower mean document literacy than those who did use a mobile phone, although the difference was clearer in the older group. There is a very large margin of error on the mean document literacy for non-users in the 16-24 age group, reflecting the small number of non-users (48 respondents out of 1,082 in this age group).

⁶ This appears to be the key difference. For those who used a mobile phone, the frequency of use made little difference to document literacy. Aggregating the categories of users helps to reduce the margin of error around the mean document literacy.

Figure 42
Mean document literacy score, by age and frequency of mobile phone use



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: 'Ever' aggregates the responses 'daily', 'a few times a week' and 'a few times a month'. The bars around estimates represent the margins of error (at the 95% confidence level).

4.6 Summary

Use of a computer at home was associated with higher document literacy. In the 25-65 age group, the mean document literacy levelled off once monthly usage reached at least 5 hours. Among people age 16-24, mean document literacy increased as the number of hours of use increased.

In the 16-24 age group, current students were significantly more likely to use a home computer at least 5 hours per month than people with other labour force status.

If home computer users are defined as those with at least 5 hours per month of usage, as opposed to non-users defined as those with less usage or without home computer access, home computer users had significantly higher mean document literacy than non-users in each of the 16-19, 20-24 and 25-65 age groups.

In both the 16-24 and 25-65 age groups, people who used a computer at work in the past year had significantly higher mean document literacy than people who were either employed but had not used a computer at work, or had not been employed in the past year. However, the gap between work computer users and others was much greater in the 25-65 age group than in the 16-24 age group.

Higher document literacy was associated with some uses of computers and the internet and not others.

People who used a computer frequently (i.e. at least several times a week) for writing or editing had significantly higher mean document literacy in the 20-24 and 25-65 age groups, though not in the 16-19 age group.

There was no significant difference in mean document literacy between people who played computer games frequently and those who played games infrequently in any of the 16-19, 20-24, or 25-65 age groups.

Frequent users of email had significantly higher mean document literacy than infrequent users in all of the 16-19, 20-24 and 25-65 age groups, but the difference between frequent and infrequent users was greatest in the 25-65 age group.

There was no significant difference in mean document literacy scores between frequent and infrequent participants in online discussions in any of the 16-19, 20-24 and 25-65 age groups.

If we look at the percentage of people who engaged in these activities frequently we see that even though people in the younger age groups were much more likely than people in the 25-65 age group to frequently play games or participate in online discussions, only a minority of people in each age group was involved frequently in games or online discussions. On the other hand, between 60 and 70 per cent of each of the 16-19, 20-24, and 25-65 age groups frequently used a computer for writing or editing, and 60 to 70 per cent of each of these age groups were also frequent email users.

So we can see that it is the uses of the computer for clearly literacy-related purposes, namely writing/editing and email, that relate to higher document literacy, and that these are major uses for computer users in all age groups. These observations help to make sense of the strong general association of computer use with higher literacy.

Mobile phone users had significantly higher mean document literacy than people who never used a mobile phone, in both the 16-24 and 25-65 age groups, although it was difficult to test this in the younger age group because there was only a very small proportion of this age group that never used a mobile phone.

Thus in both the 16-24 and the 25-65 age groups, document literacy scores tended to be higher for:

- people who used a home computer for 5 or more hours per month
- people who had used a computer at work in the past year
- people aged 20-24 or 25-65 who used a computer frequently for writing or editing
- people who were frequent users of email
- mobile phone users

Conversely, in both age groups, document literacy scores tended to be lower for

- people who used a home computer for less than 5 hours per month, or did not have home computer access, or had never used a computer
- people who had been employed but not used a computer at work in the past year, or had not been employed in the past year
- people aged 20-24 or 25-65 who used a computer infrequently for writing or editing
- people who were infrequent users of email
- people who never used a mobile phone

The one anomaly in these patterns was the fact that people aged 16-19 who used a computer frequently for writing or editing did not have significantly higher mean document literacy score than people in the same age group who used a computer infrequently for this purpose.

Technology use in the statistical models

Of these variables, the ones which had a significant effect in the comprehensive statistical model for the 25-65 age group (see Lane 2011) were:

- using a home computer for 5 or more hours per month
- using a computer at work in the past year
- using a computer frequently for writing or editing
- using a mobile phone

For the 16-24 age group, the only variable which had a significant effect in the statistical model was using a home computer for 5 or more hours per month. This variable is likely to capture the use of a home computer for a range of literacy-related activities (including reading) rather than just the specific use for writing or editing. Only a minority in this age group had used a computer at work, and it is likely that a large number with high document literacy skills had not used a computer at work. Almost all people in the 16-24 age group had used a mobile phone, and so this variable had little chance of differentiating among people in this age group.

5 LITERACY-RELATED PRACTICES

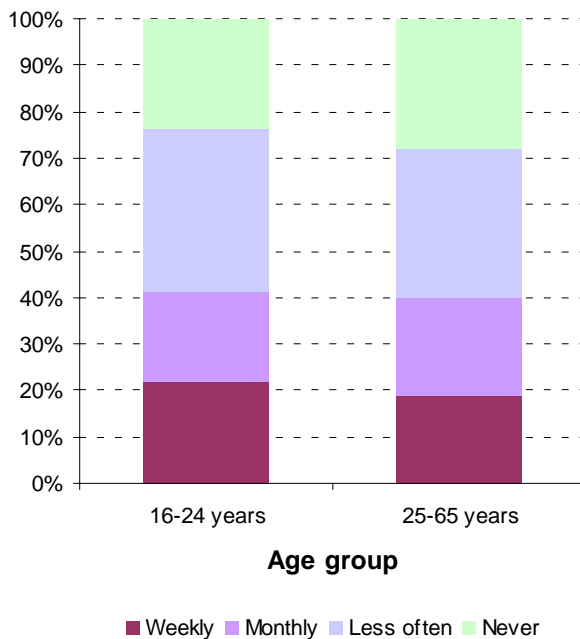
In an earlier analysis (Lane 2010a) I found that people aged 25-65 who engaged in a wider range of types of personal reading on a regular basis (at least weekly) were more likely to have higher prose literacy or numeracy than those who read a narrower range of types of personal reading on a regular basis.

This chapter considers whether a similar result can be found for people aged 16-24, and also considers the relationship between document literacy and a number of other literacy-related practices: library use, number of books in the home, and television viewing.

5.1 Library use

Respondents were asked how often they used a library, and the distribution of responses for people in the 16-24 and 25-65 age groups is shown in Figure 43. People in the 25-65 age group were slightly more likely to respond that they never used a library, but otherwise the frequencies were very similar in the two age groups.

Figure 43
Frequency of library use in each age group (2 age categories)

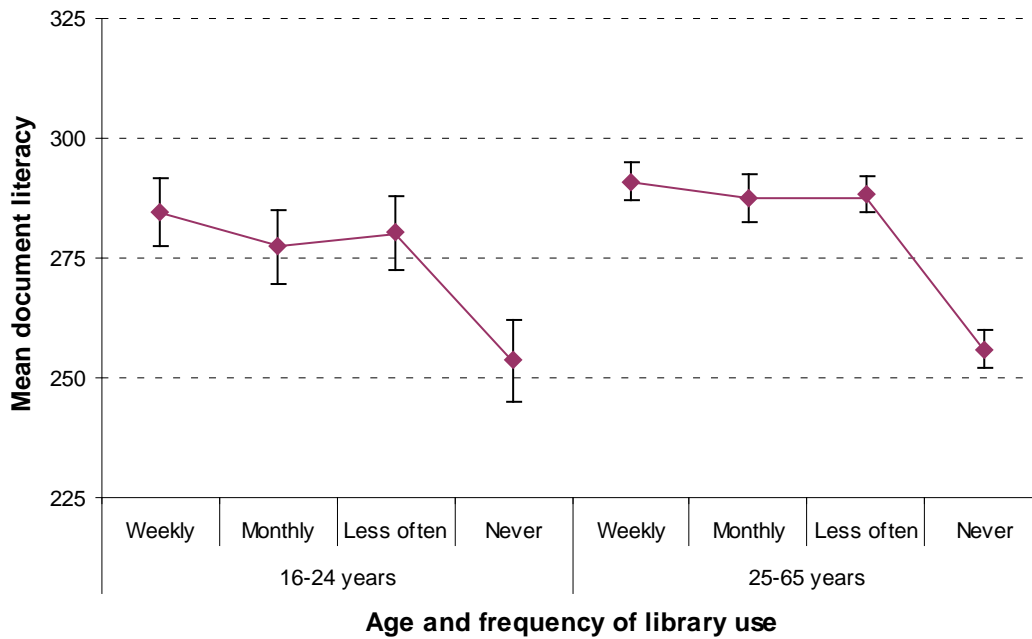


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: 'Less often' combines the responses 'several times during the year' and 'once or twice during the year'.

Figure 44 shows the mean document literacy scores for people in the 16-24 and 25-65 age groups, according to the frequency of library use. In both age groups, people who used a library no matter how often had similar mean document literacy scores, and these scores were significantly higher than people who never used a library.

Figure 44
 Mean document literacy score, by age and frequency of library use

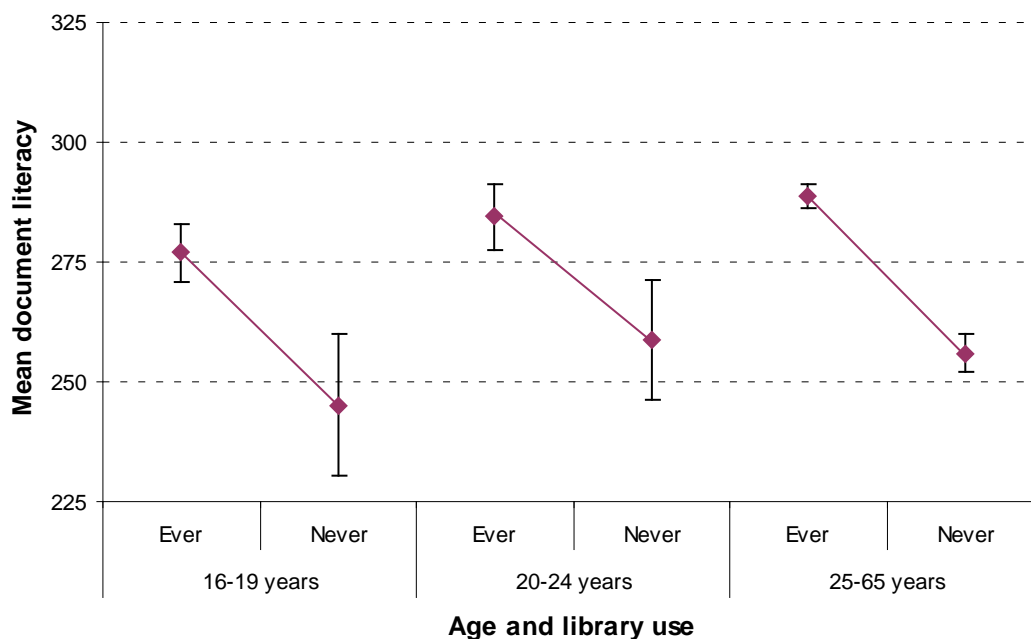


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: 'Less often' combines the responses 'several times during the year' and 'once or twice during the year'. The bars around estimates represent the margins of error (at the 95% confidence level).

Figure 45 shows the mean document literacy scores for people in the 16-19, 20-24 and 25-65 age groups according to whether or not they ever used a library. In each age group, library users had significantly higher mean document literacy than non-users. Across age groups, non-users had comparable mean document literacy scores, while among library users, people aged 25-65 had significantly higher mean document literacy than users aged 16-19.

Figure 45
Mean document literacy, by age and whether ever used library



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: 'Ever' aggregates the responses 'weekly', 'monthly', 'several times during the year' and 'once or twice during the year'. The bars around estimates represent the margins of error (at the 95% confidence level).

5.2 Personal reading

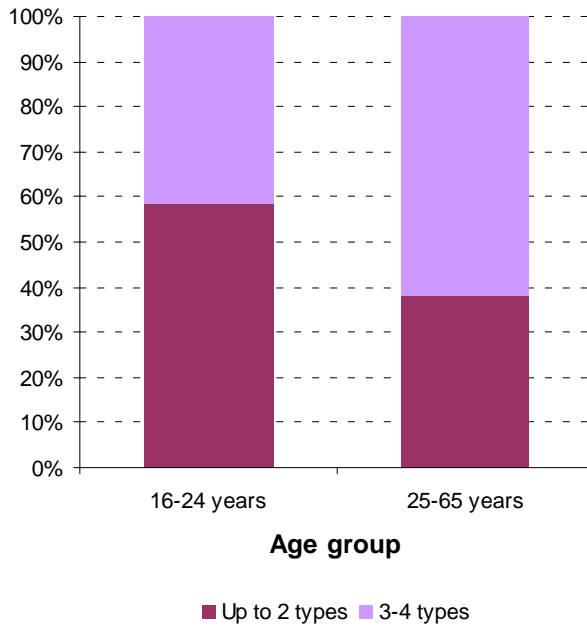
Survey question G3 asked about personal reading habits, that is, reading which is not done for work or study purposes. Question G3 had four sub-questions as shown in Table 2.

Table 2
ALL survey question on personal reading activities

- G3** How often do you read or use information from each of the following sources as part of your daily life? Please don't include time spent as part of your job or schooling. Would you say at least once a week, less than once a week, rarely or never.
- How often do you read or use information from newspapers?
 - How often do you read or use information from magazines or articles?
 - How often do you read or use information from books – fiction or non-fiction?
 - How often do you read or use information from letters, notes, e-mails?

From this question we can construct a scale of the number of types of personal reading activity done on a regular basis, i.e. at least weekly. Figure 46 shows the distribution of people in the 16-24 and 25-65 age groups who read 3 or 4 types of personal reading on a regular basis, as opposed to less than 3. The majority of people in the 25-65 age group had 3 or 4 types of regular personal reading, compared with a minority of the 16-24 age group.

Figure 46
Number of types of regular personal reading in each age group

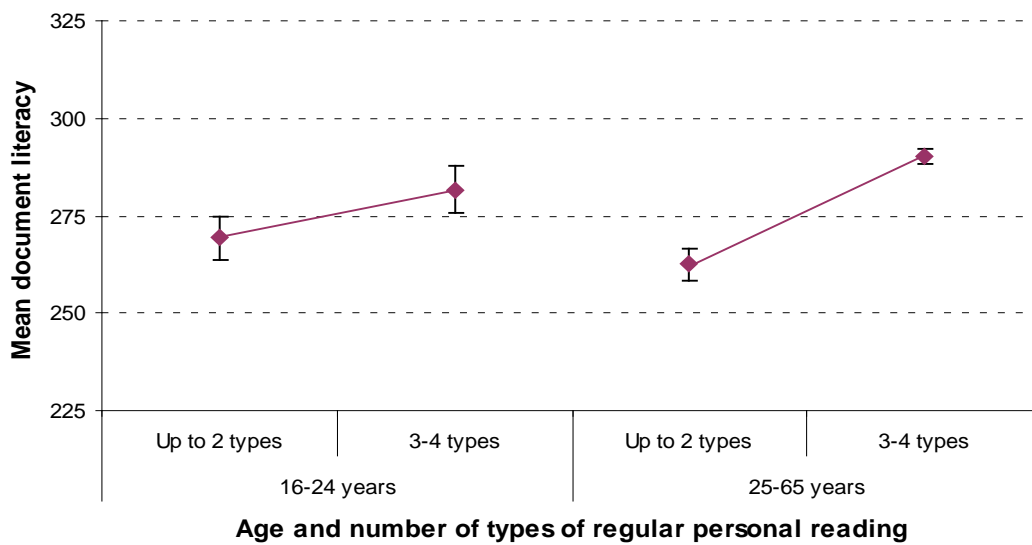


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

Figure 47 shows the mean document literacy scores of people in the 16-24 and 25-65 age groups according to the number of types of personal reading done on a regular basis. In both age groups, people who read 3 or 4 types regularly had significantly higher mean document literacy scores, but the difference was much greater in the 25-65 age group.

Figure 47
Mean document literacy score, by age and number of types of regular personal reading



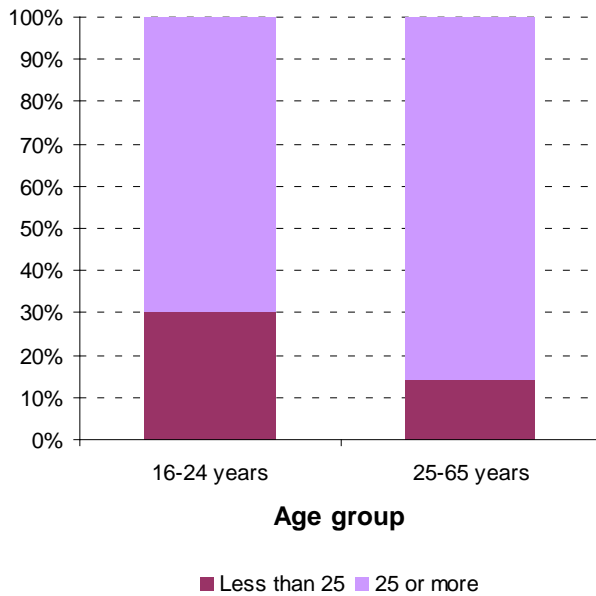
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

5.3 Books in the home

Among people aged 16-24, 30 per cent had fewer than 25 books in the home, a considerably higher proportion than among people aged 25-65 (14 per cent), as shown in Figure 48.

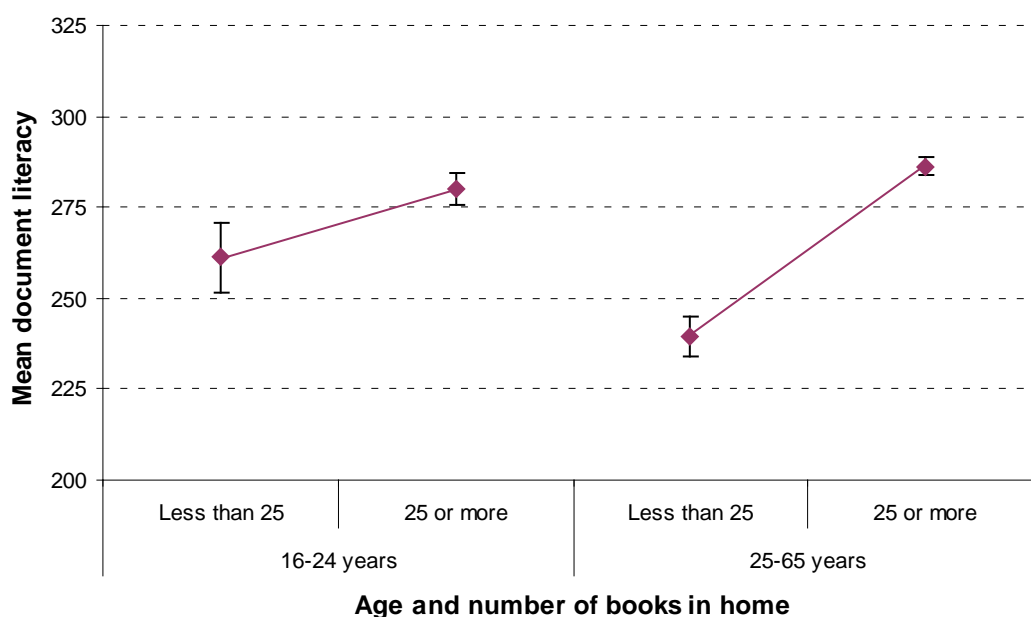
Figure 48
Number of books in the home in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 49 shows the mean document literacy scores for people in the 16-24 and 25-65 age groups, according to the number of books in the home. In both age groups, the mean document literacy score for people with 25 or more books in the home was significantly higher than for people with fewer books, but the difference was much greater for the 25-65 age group.

Figure 49
Mean document literacy score, by age and number of books in the home



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

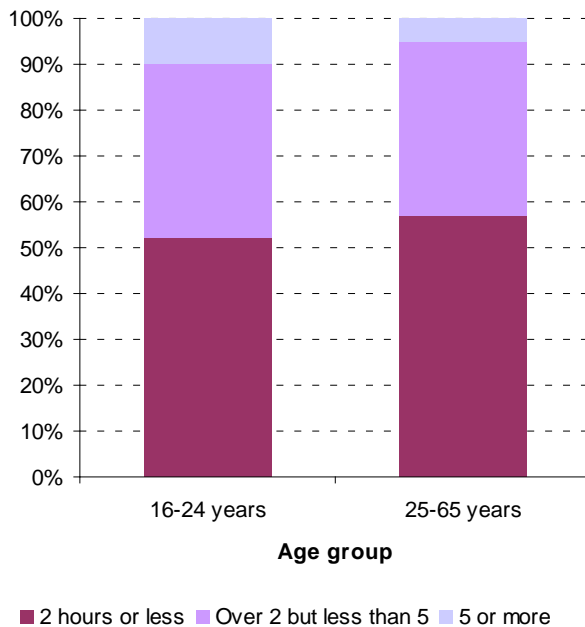
5.4 Television viewing

Biddulph, Biddulph and Biddulph (2003: 43), in a review of factors influencing children’s school achievement, make the following points in summarising studies of the relationship between television viewing and achievement:

- Watching a moderate amount of quality television that is appropriate for a child’s developmental level and associated with family discussion, sharing and enjoyment is related to higher achievement than excessive television viewing. An exception occurs in countries where sub-titles are used frequently. Television can enhance children’s literacy in other languages through sub-titles. Apart from that exception, longer time spent in television watching displaces other child activities and family processes, can detract from sleep and exercise, and can increase young children’s anxiety about the world.
- For older children (aged 10 years) the New Zealand evidence shows more than three hours television viewing per day to be related to markedly lower achievement in science and mathematics, but a little television viewing on average is related to higher achievement at this age than no television viewing.
- Older children are able to make links between their in-school learning and what they learn on television, especially from quality programmes.
- For all but senior secondary children, viewing television/video programmes for more than 4 hours daily puts children’s achievement at risk. A relatively high proportion of Māori and Pasifika children are in this category. It is not evident from the data, however, what factors contribute to some children’s high levels of viewing, although there is the possibility that they model themselves on parents’ viewing habits.

In both the 16-24 and 25-65 age groups, the majority of people watched television or videos for two hours or less per day, as shown in Figure 50. Only a small percentage in each age group watched television or videos for 5 or more hours per day, but people in the younger age group were more likely than people in the older age group to do so.

Figure 50
Hours per day of television viewing in each age group

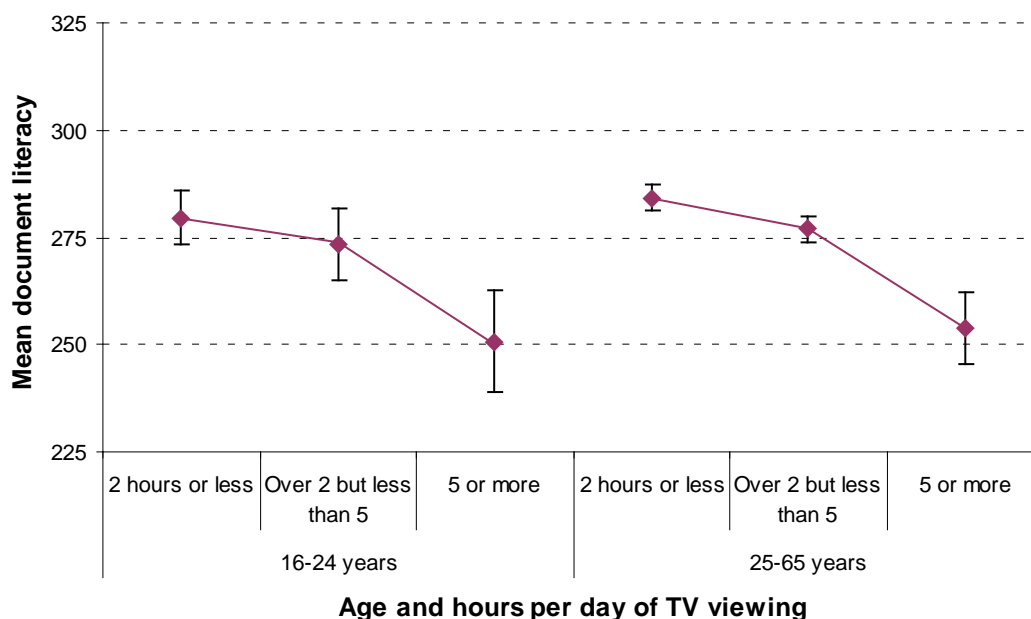


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Number of hours per day watching television or videos was related negatively to mean document literacy in both the 16-24 and 25-65 age groups, as shown in Figure 51. For the 25-65 age group, those who watched for two hours or less had significantly higher mean document literacy than those who watched for between two and five hours, who in turn had significantly higher mean document literacy than those who watched for five or more hours. For people aged 16-24, there was no significant difference between those who watched for two hours or less and those who watched for between two and five hours, but these two groups had significantly higher mean document literacy than those who watched for five hours or more.

From the survey data it is not possible to say for certain that having lower literacy led to people watching more television, or that spending more time watching television left less time for literacy-related activities such as reading and writing. In fact, both could be true at the same time, or the relationship could be indirect in the sense that television viewing is related to other variables which have a relationship with document literacy. Note that television/video viewing is not a significant factor in the statistical models (in Lane 2011) for either the 16-24 age group or the 25-65 age group, which indicates that the variation in literacy associated with television/video viewing is accounted for by the set of other variables in the model.

Figure 51
Mean document literacy score, by age and hours per day of television or video viewing



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

5.5 Summary

In both the 16-24 and 25-65 age groups, library use was significantly related to document literacy. People who never used a library had significantly lower mean document literacy than people who used a library at least once or twice a year. However, there were no significant differences in mean document literacy among library users according to how frequently they used a library. The difference in mean document literacy between people who ever used a library or never used a library was significant for each of the 16-19, 20-24 and 25-65 age groups.

In both the 16-24 and 25-65 age groups, people who regularly (i.e. at least once a week) read at least three of newspapers, magazines, books or letters/emails had significantly higher mean document literacy than people who read two or fewer of these types of reading material regularly. However, the difference in mean scores was greater for the 25-65 age group.

Similarly, in both the 16-24 and 25-65 age groups, people who had 25 or more books in the home had significantly higher mean document literacy than those with fewer than 25 books, although the difference in mean scores was much greater in the 25-65 age group than in the 16-24 age group. A considerably higher proportion (30 per cent) of people aged 16-24 had fewer than 25 books in the home than of people aged 25-65 (14 per cent).

The small group of people who watched television, videos or DVDs for 5 or more hours per day had significantly lower mean document literacy than people who watched less, in both the 16-24 and 25-65 age group. In the 25-65 age group, people who watched more than 2 hours per day of television, videos or DVDs also had significantly lower mean document literacy than those who watched less.

Thus, in both the 16-24 and 25-65 age groups, document literacy scores tended to be higher for:

- people who used a library at least once or twice a year
- people who read at least three types of personal reading at least weekly
- people with 25 or more books in the home
- people who watched television, videos or DVDs for 2 hours or less per day

While document literacy scores tended to be lower for:

- people who never used a library
- people who read 2 or fewer types of personal reading at least weekly
- people with fewer than 25 books in the home
- people who watched television, videos or DVDs for 5 or more hours per day

Literacy-related practices in the statistical models

In the comprehensive statistical model for the 25-65 age group (see Lane 2011), the library use, personal reading and books in the home variables were all highly significant, and books in the home in particular showed one of the strongest effects in the model. However, television and video viewing did not have a significant effect, which indicates that the negative relationship of viewing with document literacy is likely to be an indirect effect which is accounted for by other variables in the model.

In the comprehensive statistical model for the 16-24 age group, only the library use variable was significant, while the other literacy-related practices did not show significance. A large proportion of this age group are students, and students are probably more likely to need to use a library than other people. It is interesting, however, that having a current labour force status of student did not have a significant effect in the comprehensive model once variables reflecting technology use and literacy-related practices were added, and although students in general had relatively high mean document literacy, it may be that library use (along with home computer use) selects more accurately for people with higher literacy skills than student status does.

This does not necessarily mean that library use leads to higher literacy: it may well be that library use is a good indicator of people who already have higher literacy.

6 GENDER, SOCIOECONOMIC STATUS AND REGION

Satherley and Lawes (2008b) have found only slight gender differences in prose and document literacy for people aged 16-65 in the New Zealand ALL survey data, but greater gender differences in numeracy, which they summarise (2008b: 12):

The main gender difference is that a higher proportion of men than women have high numeracy skills.

Similarly, significant gender differences among the 25-65 subgroup in numeracy but not in prose literacy were evident in my earlier analysis of key factors in adult literacy (Lane 2010a).

Satherley and Lawes (2008a) have also found that the gender differences in numeracy are more pronounced in older than in younger age groups, and for document literacy they conclude (2008a: 20) that:

Among 16-24-year-olds, women had substantially higher overall document literacy skills than men; among 25-34 and 35-44-year-olds women and men had approximately the same document literacy skills; and among 45-54 and 55-65-year-olds men had substantially higher document literacy skills than women.

This conclusion is based on the percentages of men and women in each age band who fell into Levels 1, 2, 3 and 4-5. It remains to be seen in this chapter whether similar age and gender differences can be found in analysing mean document literacy scores.

Satherley, Lawes and Sok (2008) report that people aged 16-65 in the two highest income quintiles had significantly higher mean document literacy and numeracy than people in the three lowest income quintiles. Similarly, the percentage of people aged 25-65 with higher prose literacy and higher numeracy increased with increasing income (Lane 2010a).

There is a similar effect for the socioeconomic character of the neighbourhoods people lived in. For people aged 25-65, living in an area of high socioeconomic deprivation had a significant negative association with prose literacy and numeracy scores, even after taking a range of other factors (language, ethnic identification, education, computer use, gender and age) into account (Lane 2010a).

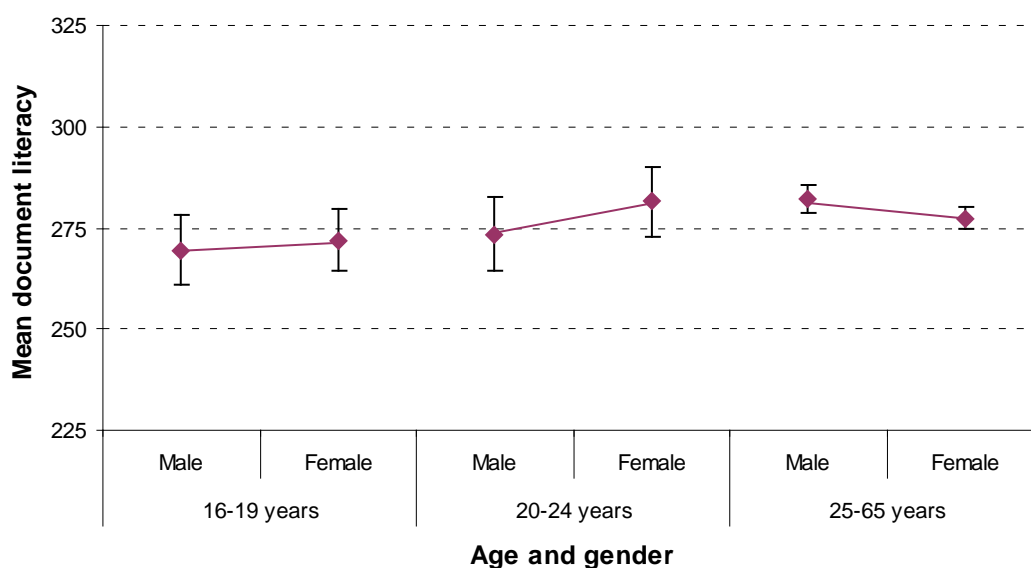
This chapter considers whether similar results can be found for people aged 16-24 in relation to socioeconomic deprivation, and also in relation to parents' education, which is often taken as an indicator of socioeconomic status, at least for younger people.

In my earlier analysis of regional variation in New Zealand (Lane 2010b), there was a greater percentage of people with higher prose literacy or higher numeracy among people aged 25-65 who lived in the grouping of the Auckland, Wellington, Canterbury and Otago Regions than among people who lived in the rest of New Zealand, and these differences were concentrated in the 45-65 age group. This chapter considers whether similar regional differences in mean document literacy scores can be found among people aged 16-24.

6.1 Gender

Figure 52 shows the mean document literacy scores of people in the 16-19, 20-24 and 25-65 age groups according to gender. There were no significant differences between the genders in mean document literacy within or across the age groups.

Figure 52
Mean document literacy score, by age and gender



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

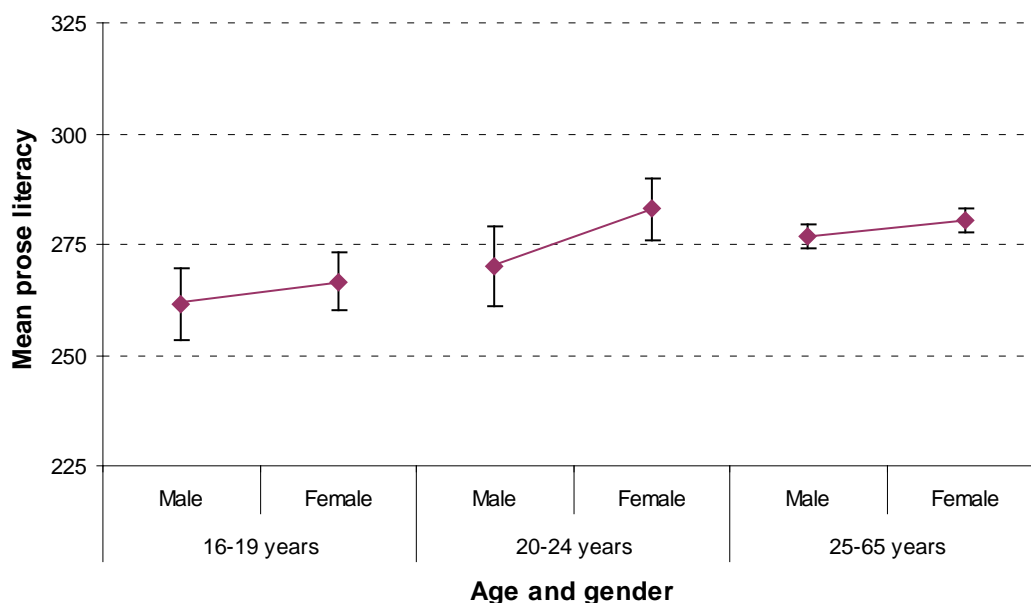
Note: The bars around estimates represent the margins of error (at the 95% confidence level).

If we compare Figure 52 to the gender comparison for reading of non-continuous text in PISA 2009 (OECD 2010: 89), there appears to be a discrepancy between the two sets of results. PISA 2009 in New Zealand showed a significantly higher mean score for girls reading non-continuous text than for boys. However, the two sets of results are not necessarily incompatible. The sample of 15-year-olds in PISA is much larger than the sample of 16-19-year-olds in ALL, and consequently the PISA results have much smaller margins of error and so can discriminate more precisely between the genders than ALL. This is a reminder of the limitations of the sample of young adults in ALL.

Previous studies (Satherley and Lawes, 2008b; Lane, 2010a) have shown different gender effects for prose literacy and numeracy, and so it is worth investigating these measures as well.

Figure 53 shows the mean prose literacy scores of people in the 16-19, 20-24 and 25-65 age groups by gender. Again there was no significant difference between genders within each age group. However, women (but not men) in the 20-24 age group, and both men and women in the 25-65 age group, had significantly higher mean prose literacy scores than either men or women in the 16-19 age group.

Figure 53
Mean prose literacy score, by age and gender



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

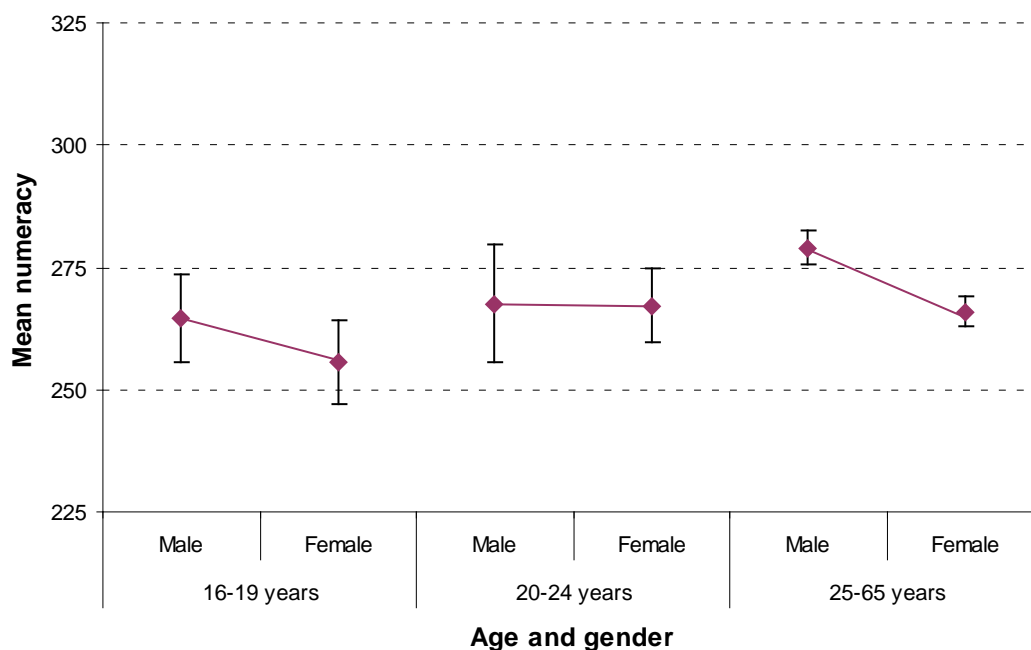
Note: The bars around estimates represent the margins of error (at the 95% confidence level).

As was the case with document literacy, the PISA 2009 results show a significantly higher mean score for girls reading continuous text than for boys in New Zealand (OECD 2010: 88).

Similarly, in PISA 2006 in New Zealand, the overall mean reading literacy score was significantly higher for girls than for boys (Marshall, Caygill and May 2008: 14). In this case, the sample of 15-year-olds in PISA 2006 (4,824) was over ten times the size of the sample of 16-19-year-olds in ALL (480) and consequently PISA had a much better chance of revealing gender differences than the ALL sample of people aged 16-19.

Figure 54 shows the mean numeracy scores of people in the 16-19, 20-24 and 25-65 age groups by gender. There were no significant differences between genders within the two younger age groups, while in the 25-65 age group, men had significantly higher mean numeracy than women. Men in the 25-65 age group had significantly higher mean numeracy than women in the 20-24 age group, and significantly higher mean numeracy than either men or women in the 16-19 age group.

Figure 54
Mean numeracy, by age and gender



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

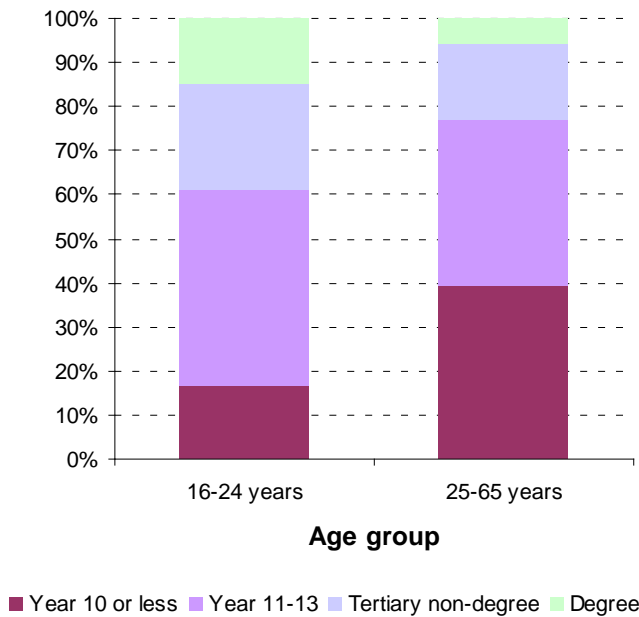
These results are in line with PISA 2009, which showed no significant gender difference in New Zealand in mathematical literacy (OECD 2010: 137), although PISA 2006 had shown an advantage for boys (Caygill, Marshall and May 2008: 14).

Thus in the ALL results, document literacy is neutral with respect to gender, while prose literacy shows some advantage for women, and numeracy some advantage for men, in line with earlier results. However, such differences as there are, are not evident in the 16-19 age group but show up in the older age groups. In the statistical models for document literacy for the 16-24 age group (see Lane (2011)), gender does not have a significant effect once other factors are taken into account (although there is an interaction between age and gender within the 25-65 age group).

6.2 Parents' education

People in the 16-24 age group were much less likely than people aged 25-65 to have mothers whose highest educational qualification was Year 10 or less, and more likely to have mothers with degrees, as shown in Figure 55.

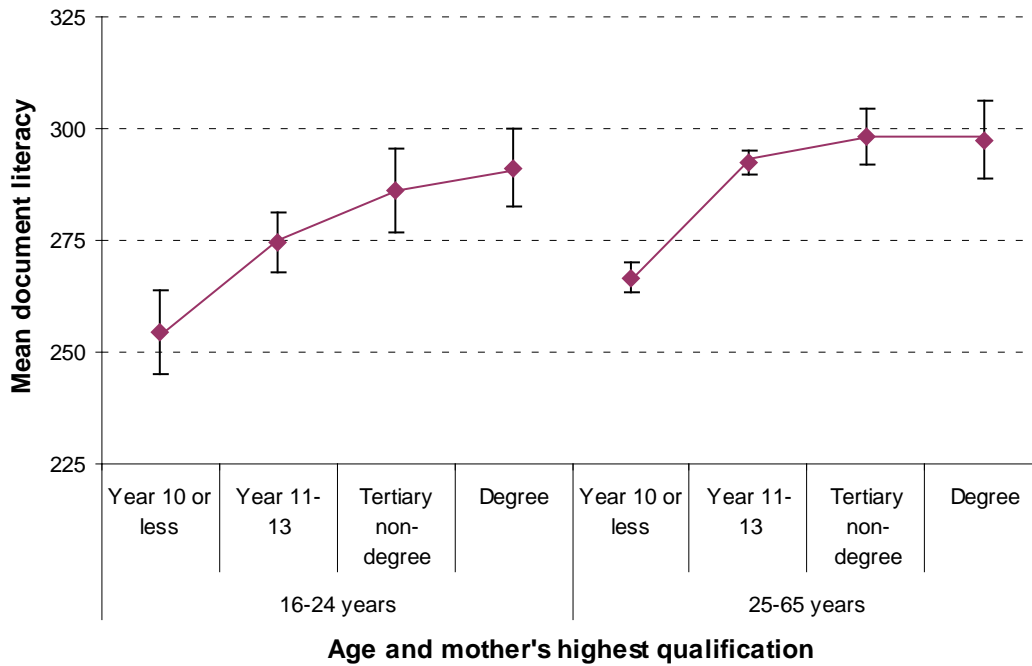
Figure 55
 Mother's highest level of education in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 56 shows the mean document literacy scores of people in the 16-24 and 25-65 age groups, according to their mothers' highest qualifications. In the 25-65 age group, people whose mothers had completed Year 11-13 or tertiary qualifications had comparable mean document literacy scores, which were significantly higher than the mean for people whose mothers had completed year 10 or less. In the 16-24 age group there was more differentiation, with people whose mothers had tertiary qualifications having significantly higher mean document literacy than people whose mothers had completed year 10 or less. People in this age group whose mothers had degrees had significantly higher mean document literacy than people whose mothers had completed only secondary education.

Figure 56
 Mean document literacy score, by age and mother's highest qualification



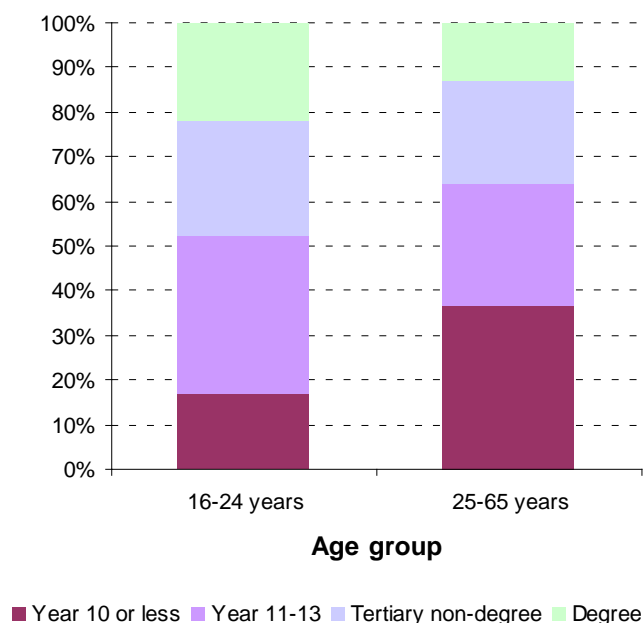
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

Figures 57 and 58 illustrate very similar patterns in relation to fathers' qualifications.

People in the 16-24 age group were much less likely than people aged 25-65 to have fathers whose highest educational qualification was Year 10 or less, and more likely to have fathers with degrees, as shown in Figure 57.

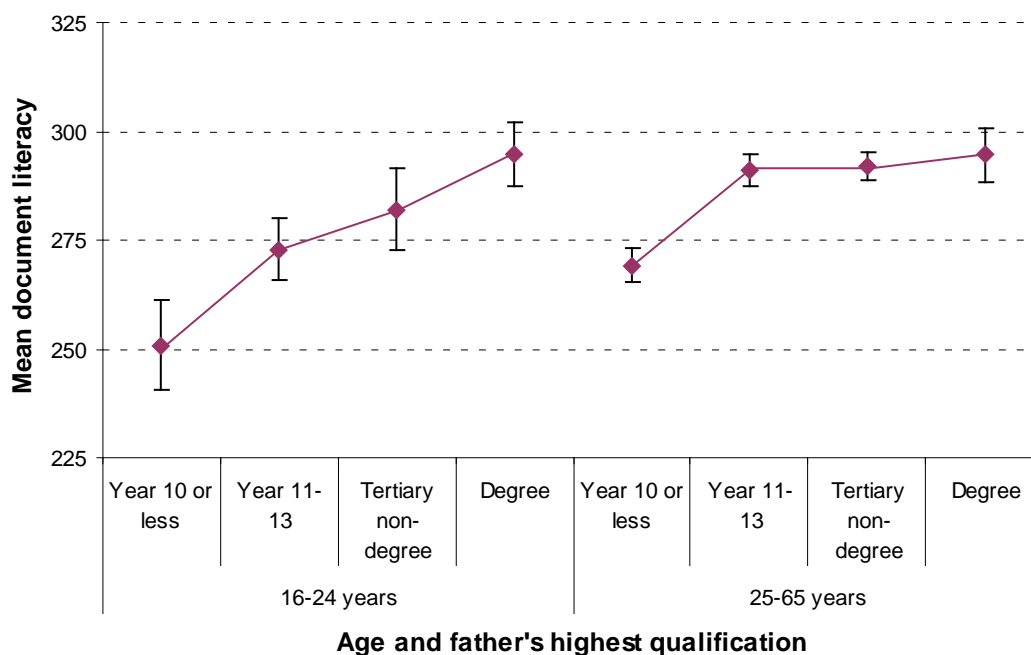
Figure 57
 Father's highest level of education in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 58 shows the mean document literacy scores of people in the 16-24 and 25-65 age groups, according to their fathers' highest qualifications. In the 25-65 age group, people whose fathers had completed Year 11-13 or tertiary qualifications had comparable mean document literacy scores, which were significantly higher than that of people whose fathers had completed year 10 or less. In the 16-24 age group there was a wider range of mean scores than for mothers' qualifications, and people whose fathers had tertiary qualifications or had completed Year 11-13 had significantly higher mean document literacy than people whose fathers had completed year 10 or less. People in this age group whose fathers had degrees had significantly higher mean document literacy than people whose fathers had completed only secondary education.

Figure 58
Mean document literacy scores, by age and fathers' highest qualifications

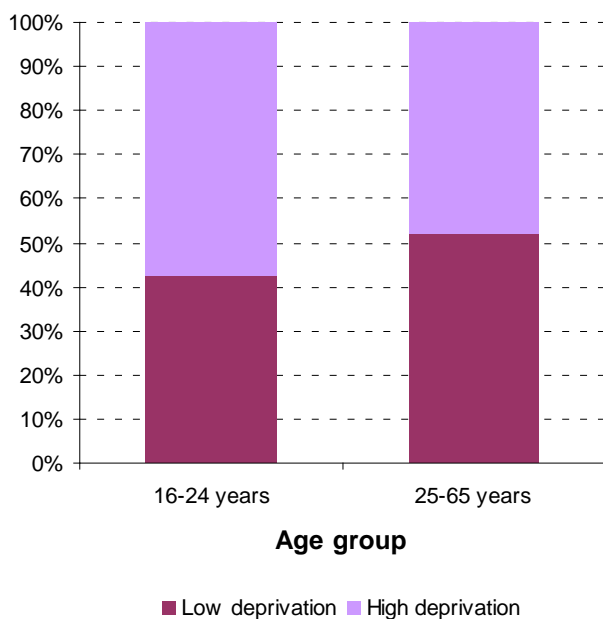


It is possible to make an approximate comparison with the analysis of PISA 2006, which used an index of economic, social and cultural status (ESCS) which included a measure of parental education (along with parental occupations, and access to possessions at home). Reading literacy scores increased on average with increasing ESCS (Marshall, Caygill and May 2008: 24), as did mathematical achievement (Caygill, Marshall and May 2008: 24).

6.3 New Zealand Deprivation Index

The New Zealand Deprivation Index is a measure of the socioeconomic status of an area rather than of an individual person: see Chapter 9 for an explanation of how it is constructed and how it was incorporated in this analysis. For the purposes of this analysis, the New Zealand Deprivation Index deciles are divided into those above the median, i.e. deciles 6-10 ('high deprivation') and those below the median, i.e. deciles 1-5 ('low deprivation'). Figure 59 shows that the majority of people aged 16-24 (58 per cent) lived in high deprivation areas, while slightly less than half the people in the 25-65 age group (48 per cent) lived in high deprivation areas.

Figure 59
Low and high deprivation in each age group

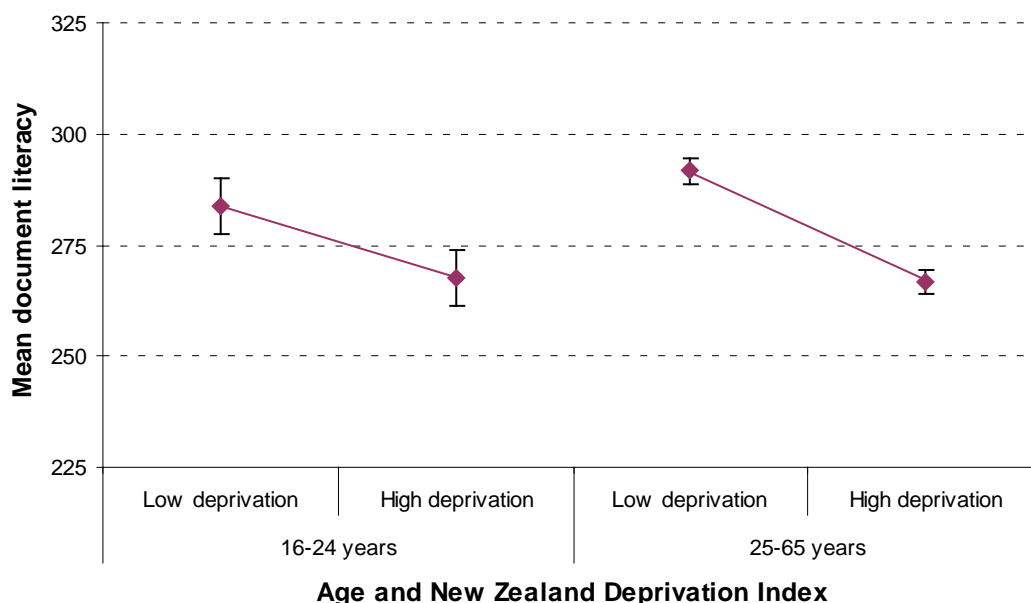


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 60 shows the mean document literacy scores for people in the 16-24 and 25-65 age groups, by high and low deprivation. In both age groups, people who lived in low deprivation areas had significantly higher mean document literacy than those who lived in high deprivation areas, but the difference was greater in the 25-65 age group than in the 16-24 age group.

In the statistical models for document literacy (see Lane (2011)), deprivation is a significant factor in the model for the 25-65 age group, after taking into account education, language, ethnicity, computer use and other variables. In the model for the 16-24 age group, deprivation is not strictly significant but has an effect approaching significance, again after taking other variables into account.

Figure 60
 Mean document literacy score, by age and New Zealand Deprivation Index above and below the median



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

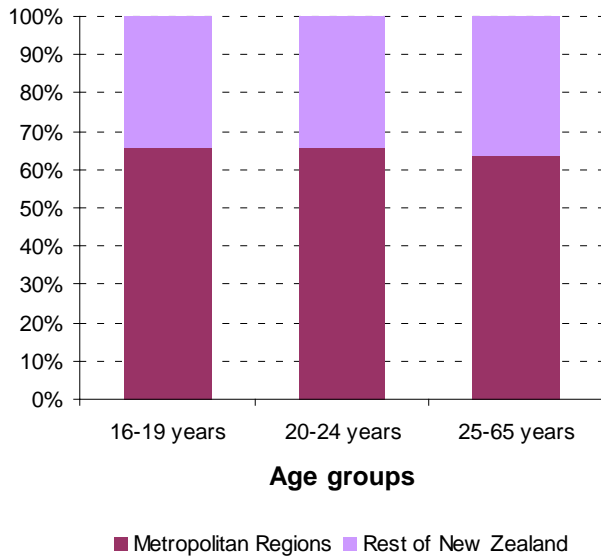
Note: The bars around estimates represent the margins of error (at the 95% confidence level).

6.4 Broad regional grouping

To get some indication of the effect of regional variation, two broad regional groupings are compared here: one consisting of the Auckland, Wellington, Canterbury and Otago Regions ('metropolitan regions'), and the other of the rest of New Zealand. This division was used in Lane (2010b), on the basis that there were overall higher levels of educational qualification in the metropolitan regions than in the rest of New Zealand.

About two-thirds of people in each of the 16-19, 20-24 and 25-65 age groups lived in the metropolitan grouping, as shown in Figure 61.

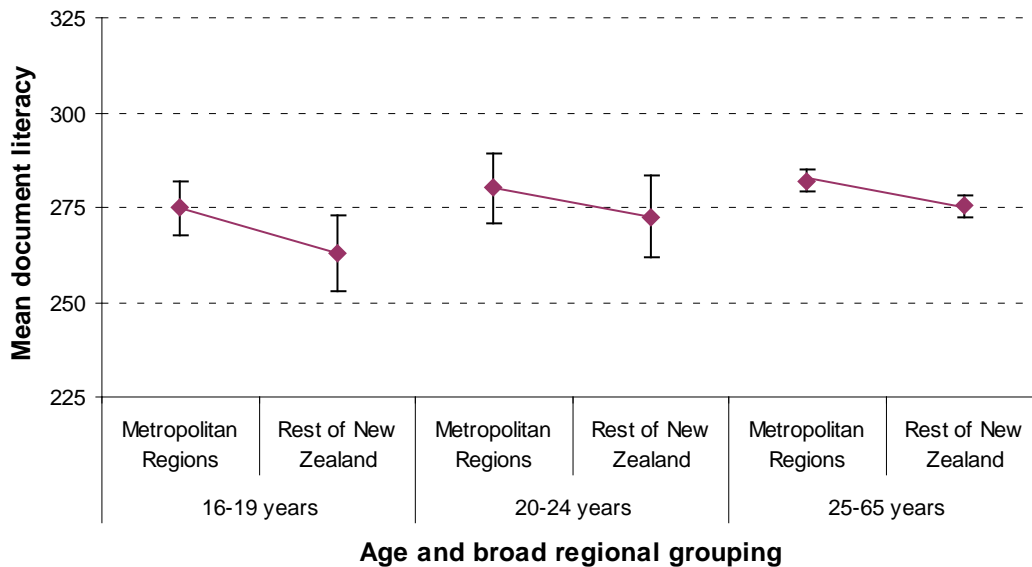
Figure 61
Residence in broad regional groupings in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 62 shows the mean document literacy scores of people in the 16-19, 20-24 and 25-65 age groups according to which broad regional grouping they lived in. Although the estimated means are higher in the metropolitan grouping, they are only significantly higher for the 25-65 age group.

Figure 62
Mean document literacy score, by age and broad regional grouping



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

6.5 Summary

There was no significant difference in mean document literacy between men and women in each of the 16-19, 20-24 and 25-65 age groups. The same was true for mean prose literacy, but there was a difference for numeracy. Men had significantly higher mean numeracy than women in the 25-65 age group, though there was no such difference in the 16-19 and 20-24 age groups.

People in the 16-24 age group were more likely than people aged 25-65 to have mothers or fathers with degrees and less likely to have mothers or fathers whose highest completed education was Year 10 or less. In both the 16-24 and 25-65 age groups, people whose mother's or father's highest completed education was Year 10 or less had significantly lower mean document literacy than those whose mothers or fathers had higher levels of completed education. In the 25-65 age group, there was no significant difference in mean document literacy between people whose mothers or fathers had attained Year 11-13 or tertiary qualifications. In the 16-24 age group, people whose mother's or father's highest completed education was Year 11-13 had significantly lower mean document literacy than people whose mothers or fathers had degrees.

People in the 16-24 age group were somewhat more likely than people aged 25-65 to live in areas of high deprivation in terms of the New Zealand Deprivation Index. In both the 16-24 and 25-65 age groups, people who lived in low deprivation areas had significantly higher mean document literacy than those who lived in high deprivation areas, although the difference was greater in the 25-65 age group.

If New Zealand is divided into two broad regional groupings, consisting of the Auckland, Wellington, Canterbury and Otago Regions ('metropolitan regions') on the one hand, and the rest of New Zealand on the other, about two-thirds of the people in each of the 16-19, 20-24 and 25-65 age groups lived in the metropolitan regions. In the 25-65 age group, people who lived in the metropolitan regions had significantly higher mean document literacy than those who lived in the rest of New Zealand, although the difference was quite small. However, there was no significant difference in mean document literacy between broad regional groupings in either the 16-19 or the 20-24 age groups.

In terms of the characteristics of each age group, in the 25-65 age group, document literacy scores tended to be higher for:

- people whose mothers or fathers had completed education to at least Year 11
- people who lived in low deprivation areas
- people who lived in the Auckland, Wellington, Canterbury or Otago Regions.

Conversely, in this age group, document literacy scores tended to be lower for:

- people whose mothers or fathers had not completed education beyond Year 10
- people who lived in high deprivation areas
- people who lived outside the Auckland, Wellington, Canterbury or Otago Regions.

In the 16-24 age group, document literacy scores tended to be higher for:

- people whose mothers or fathers had completed tertiary education, especially degrees
- people who lived in low deprivation areas

While document literacy scores tended to be lower for:

- people whose mothers or fathers had not completed education beyond Year 10
- people who lived in high deprivation areas

Comparisons with PISA

In contrast with the results summarised above for ALL, PISA 2006 and PISA 2009 showed a significant gender difference in favour of females in reading literacy. This contrast may be simply due to the fact that the sample of 15-year-olds in PISA is much larger than the sample of 16-19-year-olds in ALL, and consequently PISA provides a more sensitive measure of gender differences in literacy.

Analysis of PISA 2006 using an index of economic, social and cultural status (ESCS), which included parental education, showed increasing reading literacy and mathematical literacy with increasing ESCS, in line with the results for parental education and deprivation in ALL.

Gender, socioeconomic status and region in the statistical models

In the comprehensive statistical model for the 25-65 age group (see Lane 2011), there was a significant effect for gender when differentiated by age (25-44 against 45-65 age groups), with a strong negative association between document literacy scores and being female aged 45-65, in comparison with being male aged 25-44. Deprivation also had a significant negative effect in the model, though parental education variables did not.

In the comprehensive model for the 16-24 age group, deprivation was marginally non-significant, while gender and parental education variables did not have significant effects.

The model-building process discussed in Lane (2011) indicates that for both the 16-24 and 25-65 age groups, parents' education was related to document literacy indirectly, because parents' education approximately predicted the respondents' educational characteristics, which were directly associated with document literacy.

7 LANGUAGE, ETHNIC IDENTIFICATION AND BIRTHPLACE

Satherley and Lawes (2008b) have reported that the language spoken most often in the home had a strong relationship with literacy and numeracy scores in the New Zealand ALL survey data. They summarise their findings as follows (2008b: 37-38):

Those who most frequently spoke a language other than English in the home had substantially lower overall English prose literacy skills than those who most frequently spoke English. ...

Those who most frequently spoke a language other than English in the home had substantially lower overall numeracy skills (measure in English) than those who most frequently spoke English.

Earle (2009) has similarly found that among people aged 25-65, those whose first language was not English had lower prose literacy and numeracy than those with English as a first language.

My earlier analysis (Lane 2010a) showed that both first language and language spoken most often in the home had significant associations with prose literacy and numeracy among people aged 25-65. In particular, people with English as a first language were significantly more likely to have higher English prose literacy than those whose first language was not English but who spoke English most often in the home, and these people in turn were significantly more likely to have higher prose literacy than those whose first language was not English and who spoke a language other than English most often in the home. For numeracy, the differentiating variable was first language: those with English as a first language were significantly more likely to have higher numeracy than those whose first language was not English (whether or not English was spoken most often in the home).

This chapter considers the effect on document literacy scores among people aged 16-24 of both first language and main home language.

In my earlier analysis (Lane 2010a), most people aged 25-65 whose first language was not English were born overseas, so that there is a strong association between birthplace and first language. This chapter considers whether there is a difference in mean document literacy scores according to birthplace among people aged 16-24.

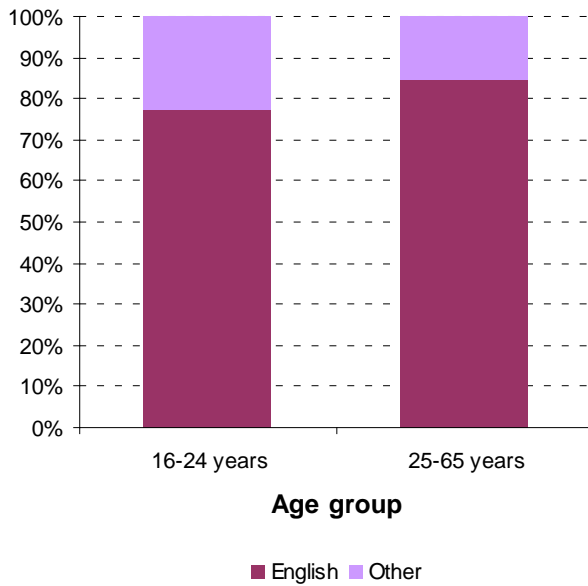
Satherley and Lawes (2008b; 2009) and Lawes (2009) have shown that people age 16-65 with New Zealand European ethnic identification were more likely to have higher literacy or numeracy than people with Māori, Pasifika or Asian ethnic identification. I have found (Lane 2010a) similar comparisons among people aged 25-65 for prose literacy and numeracy.

This chapter considers whether the same comparisons can be made for document literacy among people aged 16-24, and explores the effect on ethnic differences of respondents' education, their parents' education, and respondents' computer use.

7.1 First language

The proportion of people whose first language was not English was greater for the 16-24 age group (23 per cent) than for the 25-65 age group (16 per cent), as shown in Figure 63.

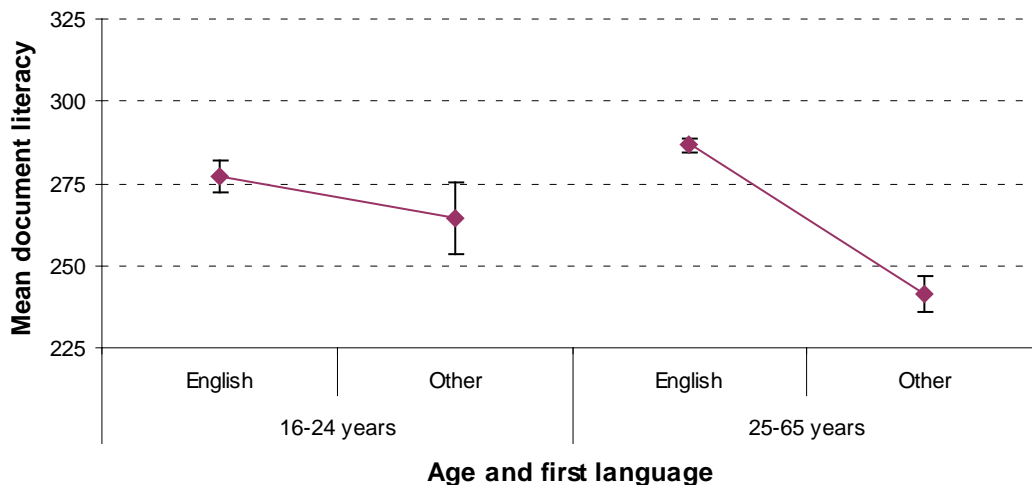
Figure 63
First language in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 64 shows the mean document literacy scores of people in the 16-24 and 25-65 age groups according to first language. In the 25-65 age group, the mean document literacy of people whose first language was English was significantly higher than that for people who did not have English as a first language, and this was a particularly large difference. In contrast, in the 16-24 age group, there was no significant difference in mean document literacy between those with and without English as a first language.

Figure 64
Mean document literacy, by age and first language



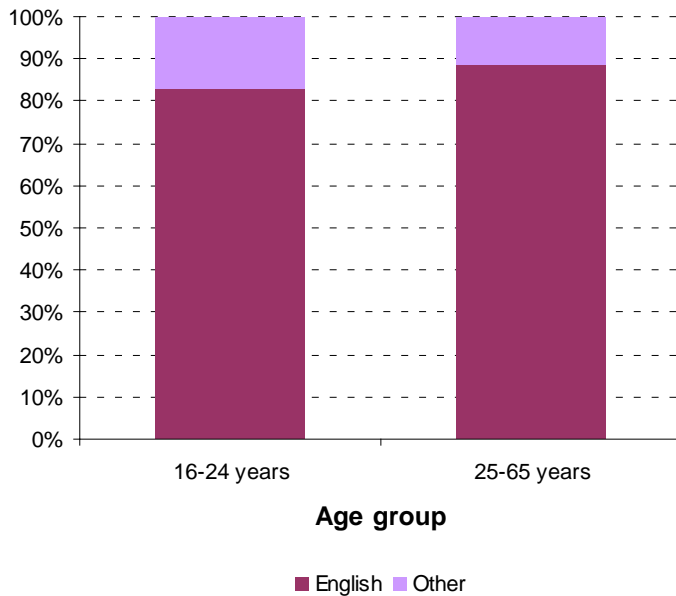
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

7.2 Main home language

The main language spoken in the home showed a similar distribution in the 16-24 and 25-65 age groups as first language, with a higher proportion mainly speaking a language other than English in the home in the younger age group (17 per cent) than in the older age group (11 per cent).

Figure 65
Main language spoken in the home in each age group

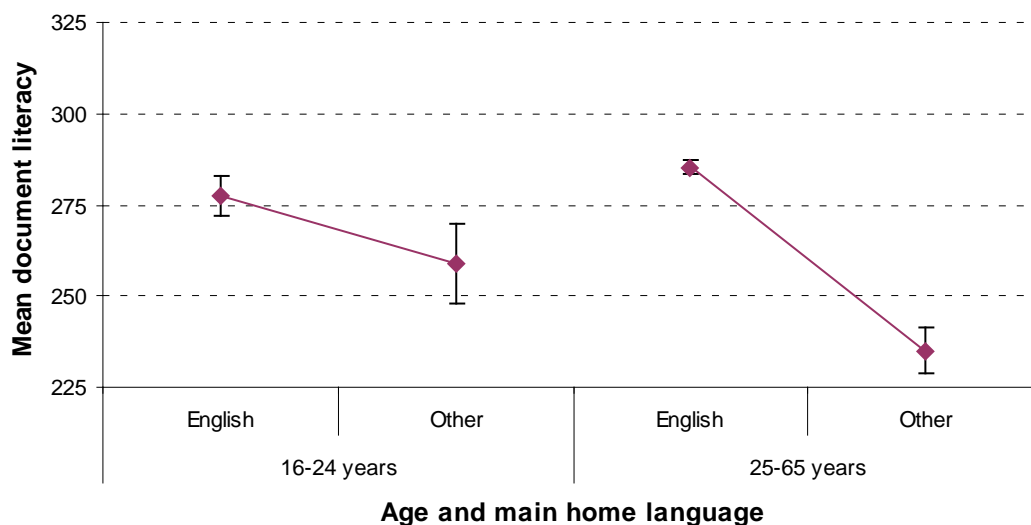


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 66 shows the mean document literacy scores for people in the 16-24 and 25-65 age groups according to main language spoken in the home. In both age groups, people whose main home language was English had significantly higher mean document literacy than those who mainly spoke another language in the home, but the difference was much greater in the 25-65 age group.

There is thus a difference from the first language variable, which did not have a significant effect for people aged 16-24.

Figure 66
Mean document literacy score, by age and main language spoken in the home



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

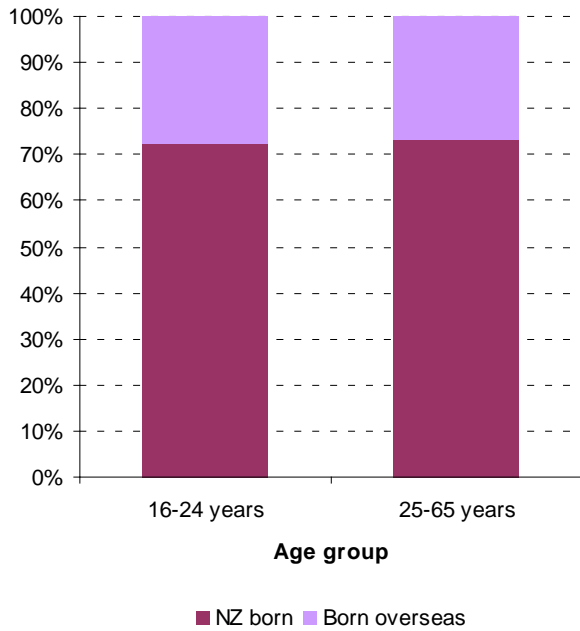
The relationship of document literacy to main language spoken in the home shown here is in line with the results of PISA 2006 for reading literacy. Students in the PISA sample were asked, “What language do you speak at home most of the time?” Those who answered “English” had a significantly higher mean reading literacy score than those who nominated another language (Marshall, Caygill and May 2008: 20-21). Note that there was not a similar difference in PISA 2006 for mathematical literacy (Caygill, Marshall and May 2008: 21).⁷

7.3 Birthplace

A similar proportion of people in the 16-24 age group (28 per cent) and the 25-65 age group (27 per cent) were born overseas, as shown in Figure 67.

⁷ Note that the percentage of people aged 16-24 in ALL whose main home language was not English (17 per cent) was considerably higher than the percentage whose main home language was not English (about 10 per cent) in PISA 2006. This is consistent with the observation that 48 per cent of those aged 16-24 in ALL who were born overseas and whose main home language was not English had arrived in New Zealand after the age of 15.

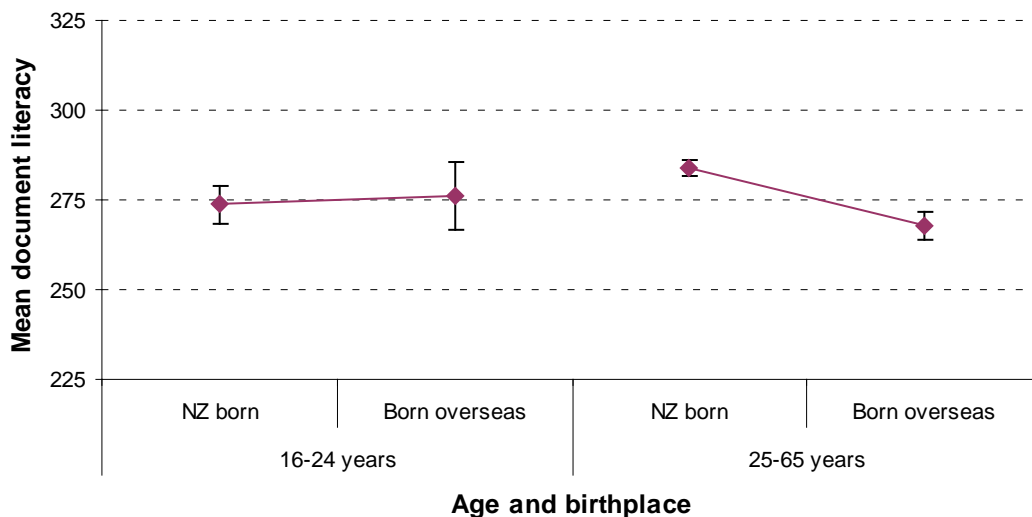
Figure 67
Place of birth in each age group



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 68 shows the mean document literacy scores of people in the 16-24 and 25-65 age groups, according to place of birth. People born in New Zealand had significantly higher mean document literacy than those born overseas in the 25-65 age group, but there was no significant difference by place of birth in the younger age group.

Figure 68
Mean document literacy score, by age and place of birth



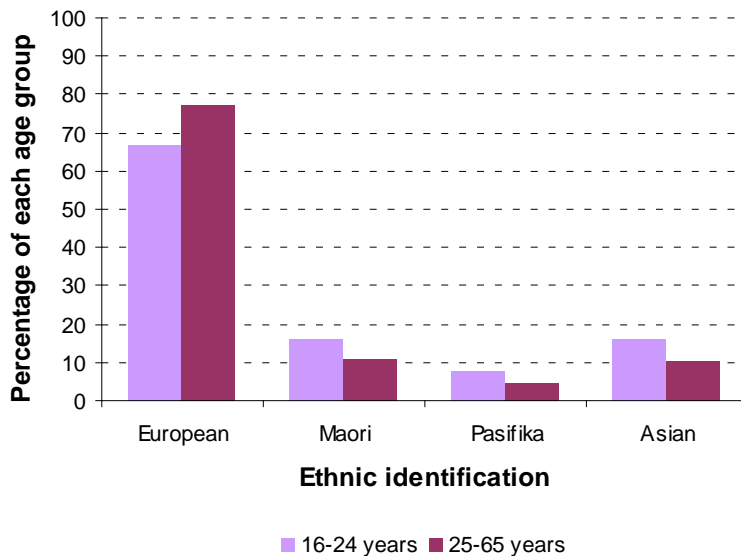
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

7.4 Ethnic identification

Figure 69 shows the proportion of people in the 16-24 and 25-65 age groups identifying with any of four broad ethnic categories. People who identified with more than one ethnicity are counted in the percentages for each of their ethnicities. The 16-24 age group contained higher percentages of people identifying with Māori, Pasifika and Asian ethnicities than the 25-65 age group but a lower percentage identifying as European.

Figure 69
Ethnic identification (total response) in each age group

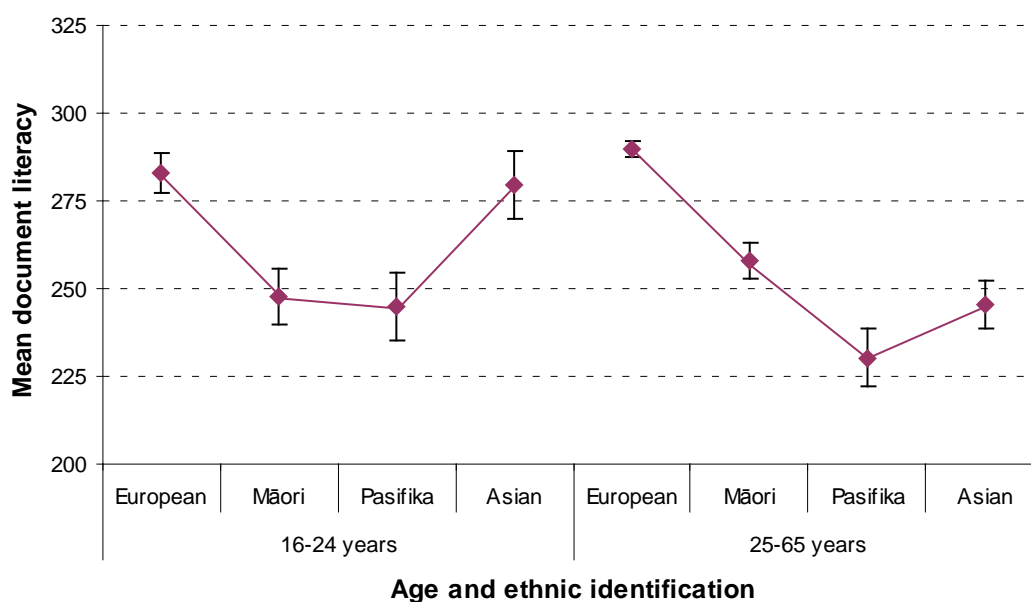


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Figure 70 shows the mean document literacy scores of people in the 16-24 and 25-65 age groups according to ethnic identification. The most striking difference between age groups is in the mean scores for the Asian group, which are relatively low in the 25-65 age group but equal highest with Europeans in the 16-24 age group. Factors related to this difference will be further explored in this chapter.

The differences between the mean scores of the two age groups within the other ethnic categories were not significant.

Figure 70
 Mean document literacy score, by age and ethnic identification (total response)



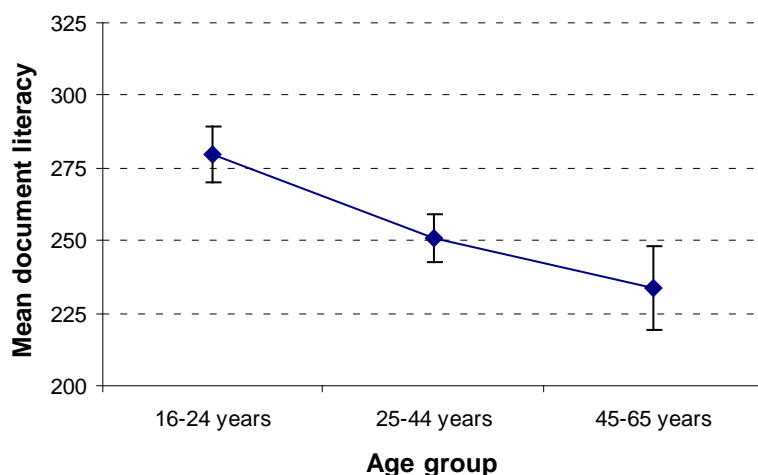
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

PISA 2006 showed the same pattern of mean reading literacy scores for ethnic groups among 15-year-olds as among those aged 16-24 in ALL, namely comparable means for Europeans and Asians, which were significantly higher than the comparable means for Māori and Pasifika (Marshall, Caygill and May 2008: 17).

Figure 71 shows mean document literacy scores in the 16-24, 25-44 and 45-65 age groups just for people identifying as Asian, in order to get a clearer picture of the age differences within this group. Although the estimated mean score for the 25-44 age group is higher than that for the 45-65 age group, the two means are not significantly different once the margins of error are taken into account. On the other hand, the mean document literacy score for the 16-24 age group is significantly higher than those for the 25-44 and 45-65 age groups.

Figure 71
 Mean document literacy by age for people with Asian ethnic identification



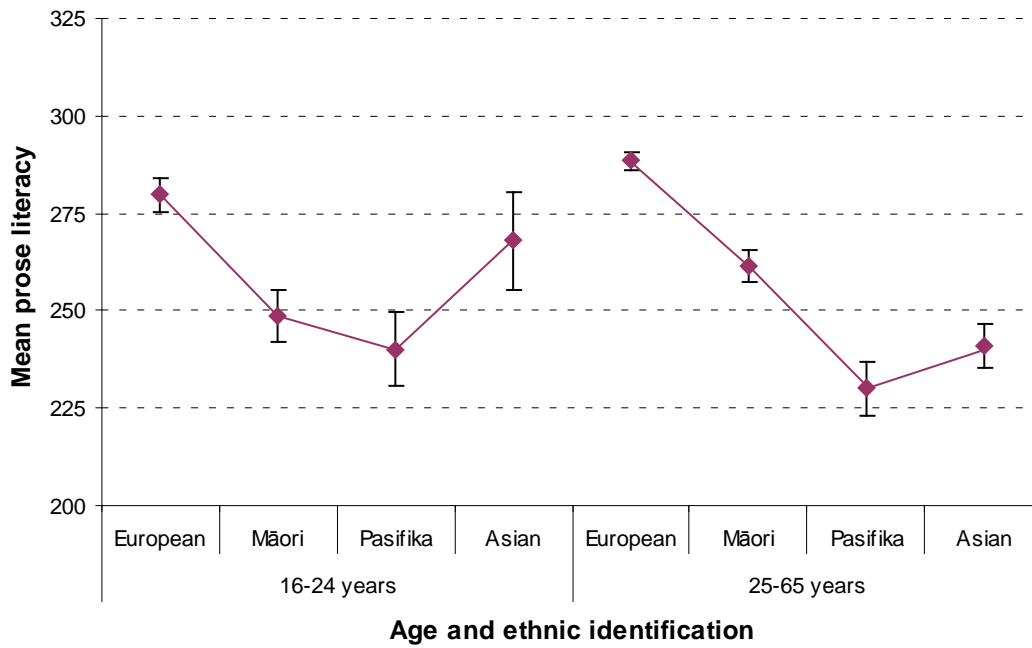
Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

Lane (2010a) noted differences in the ethnic patterns for prose literacy and numeracy in the 25-65 age group, and so it is worth checking if there are such differences in the 16-24 age group.

Figure 72 shows mean prose literacy scores for the 16-24 and 25-65 age groups by ethnic identification. The pattern is similar to that for document literacy with three exceptions. The mean prose literacy scores for Māori and Asians in the 16-24 age group were not significantly different; the mean prose literacy scores for Europeans and Asians in the 16-24 age group were significantly lower than that for Europeans in the 25-65 age group; and the Māori mean for the 16-24 age group was significantly lower than the Māori mean for the 25-65 age group (perhaps reflecting the high percentage of Māori delaying tertiary participation to 25 or older).

Figure 72
 Mean prose literacy score, by age and ethnic identification (total response)

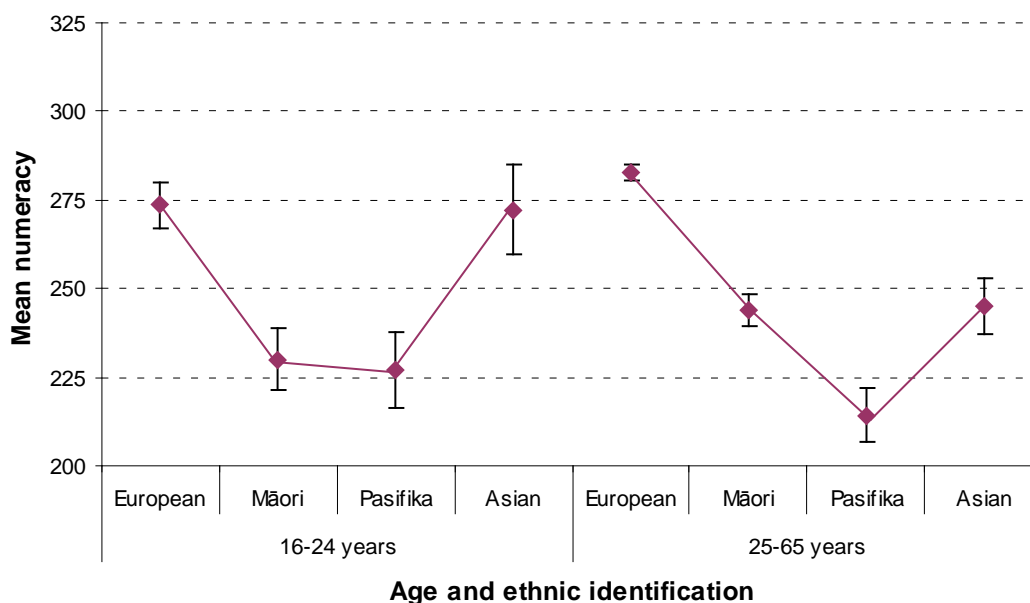


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

Figure 73 shows the mean numeracy scores of people in the 16-24 and 25-65 age groups according to ethnic identification. The mean scores are similar to those for document literacy, with the exception that the mean scores for Māori and Pasifika in the 16-24 age group were significantly lower than the mean scores for Māori people in the 25-65 age group, perhaps again reflecting the impact of delayed tertiary participation among Māori.

Figure 73
Mean numeracy score, by age and ethnic identification (total response)



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

The pattern of mean scores here for the 16-24 age group is very similar to that for mathematical literacy in PISA 2006 (Caygill, Marshall and May 2008: 18).

7.5 Ethnic identification and education

Ethnic identification and education in New Zealand

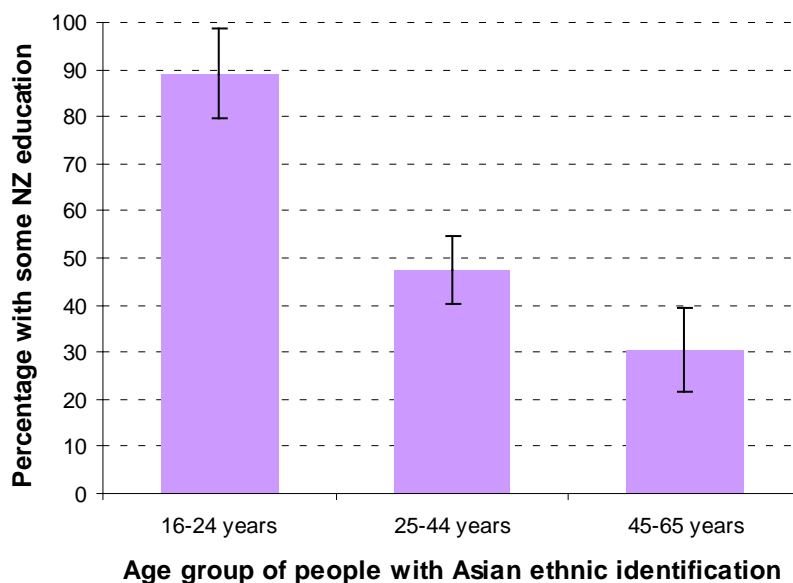
Earle (2009) identified participation in education in New Zealand as a major factor affecting the English literacy and numeracy skills of people aged 25-65 whose first language was not English and who were born overseas. The majority (61 per cent) of this group identified ethnically as Asian. Most people identifying as Asian in both the 16-24 and 25-65 age groups in fact had a first language other than English (83 per cent of the 16-24 age group and 85 per cent of the 25-65 age group) and were born overseas (86 per cent of the 16-24 age group and 93 per cent of the 25-65 age group). For Asians in the 16-24 age group, the median age of arrival in New Zealand was 16, compared with 30 in the 25-65 age group.

Figure 74 shows the percentage of Asian people in the 16-24, 25-44 and 45-65 age groups who had at least one year of education in New Zealand. For these Asian groups with at least one year of New Zealand education, the median number of years in New Zealand education was 5 for people aged 16-24, and 4 for people aged 25-44 or 45-65.

The big difference between the age groups is that the vast majority (between about 80 and almost 100 per cent) of Asian people in the 16-24 age group had experience of New Zealand education, while large proportions of the older age group had not.

Figure 74

Percentage of people identifying as Asian with at least one year of education in New Zealand, by age



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

Research on the learning of academic English by migrants to Canada and the United States whose first language is not English (Cummins and Swain, 1986; Collier, 1987; Collier, 1989; Collier and Thomas, 1995) indicates that although conversational fluency in English may be achieved after about two years in education in the adopted country, four or more years are needed to approach local native English speakers in terms of school academic achievement.

The same research indicates that academic knowledge and cognitive skills developed in a non-English first language can be transferred relatively readily into English. As a result, students who have been successful in education systems in which the medium of instruction is not English can succeed in an English-medium system after four or more years of participation (and sometimes less for specific subjects such as mathematics).

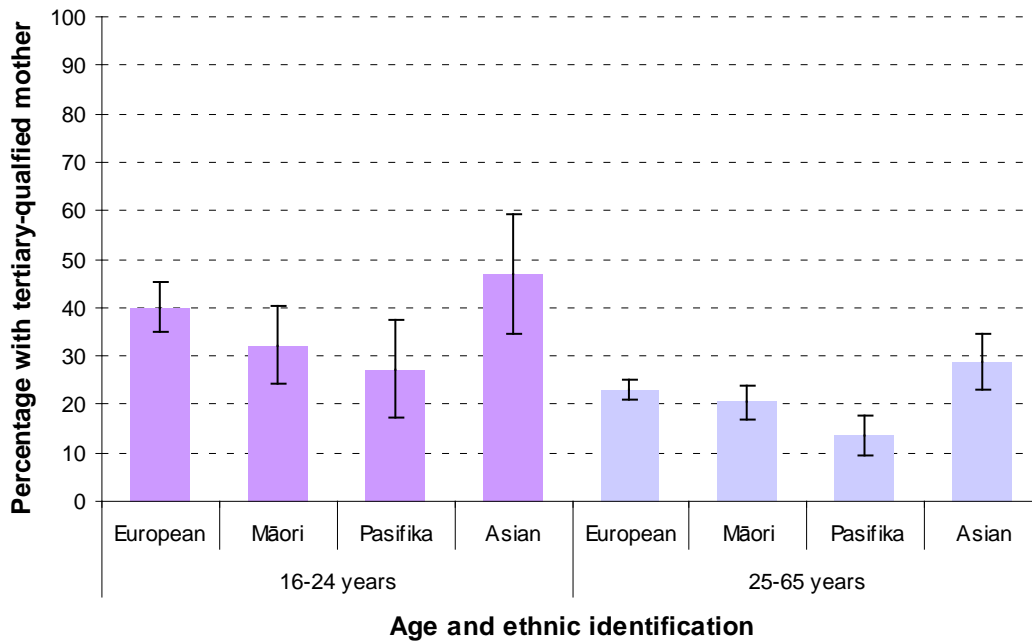
Given that literacy and numeracy as measured in the ALL survey are based on scales of increasing cognitive complexity, this research on academic language proficiency and academic achievement should be relevant to the development of English-based literacy and numeracy scores.

Ethnic identification and parents' education

As noted in the previous chapter, mean document literacy in the 16-24 age group is correlated with the level of parents' qualifications, particularly fathers' qualifications.

Figure 75 shows the percentage of people in the 16-24 and 25-65 age groups whose mothers had a tertiary qualification, by ethnic identification. Although people aged 16-24 with European or Asian ethnic identification had higher estimated percentages, because of the large margins of error, no significant differences could be detected between the ethnic groups in this age group.

Figure 75
 Percentage of people with a tertiary-qualified mother, by age and ethnic identification

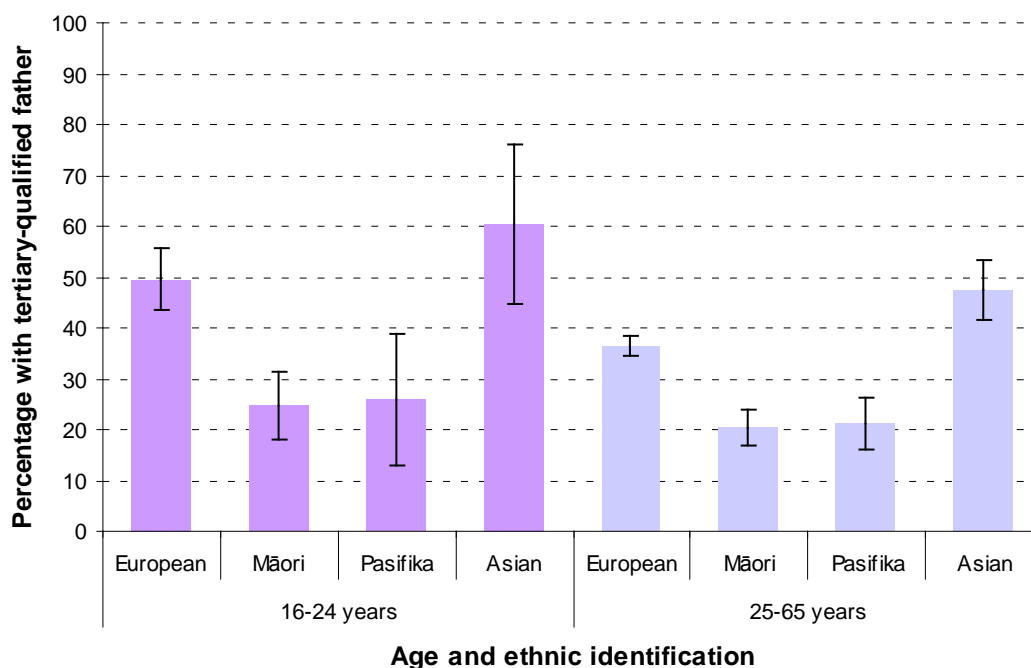


Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

Figure 76 shows the percentage of people in the 16-24 and 25-65 age groups whose fathers had tertiary qualifications, by ethnic identification. Here there were significant differences, with Asians and Europeans in both age groups having significantly greater percentages of fathers with tertiary qualifications than Māori or Pasifika.

Figure 76
Percentage of people with tertiary-qualified fathers, by age and ethnic identification



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

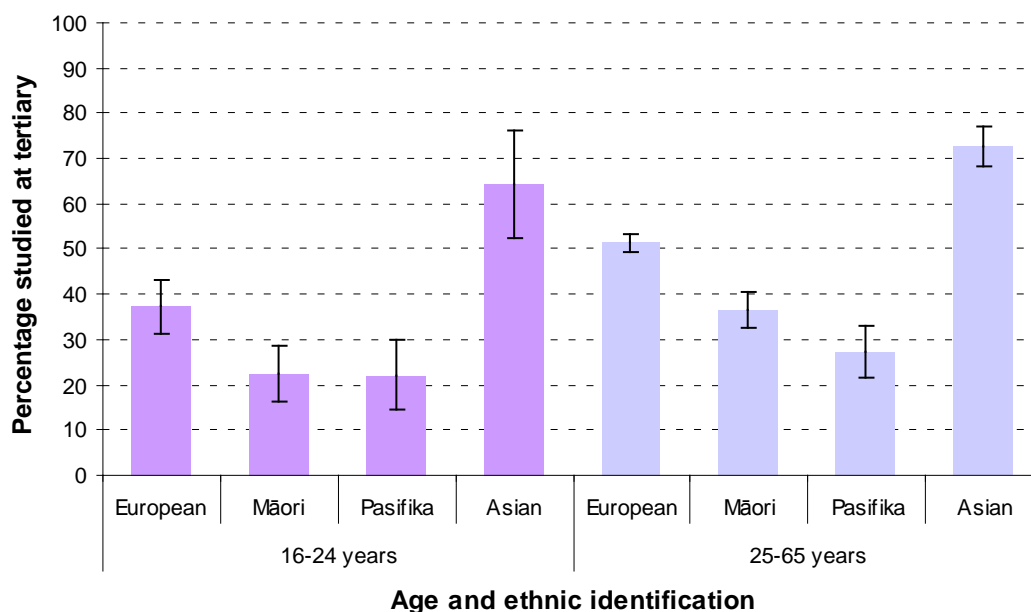
Ethnic identification and respondents' education

We saw in Chapter 2 that people who had participated in tertiary education, especially at degree level, tended to have higher document literacy scores.

Figure 77 compares people in the 16-24 and 25-65 age groups according to their participation in tertiary education, by ethnic identification. Within both age groups, people with Asian identification had a significantly higher percentage than the other groups in terms of people who had completed tertiary education or undertaken tertiary education in the past year, while Europeans had significantly higher tertiary participation than Māori and Pasifika.⁸

⁸ It is known that there are considerable differences in participation between men and women within ethnically-identified groups (see e.g. Callister 2010), and thus it would have been interesting to subdivide the ethnic categories by gender. However, there was insufficient data to do this in the 16-24 age group.

Figure 77
 Percentage of people with recent or completed tertiary study, by age and ethnic identification (total response)



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level). The percentage estimate for Pasifika aged 16-24 is of marginal statistical reliability.

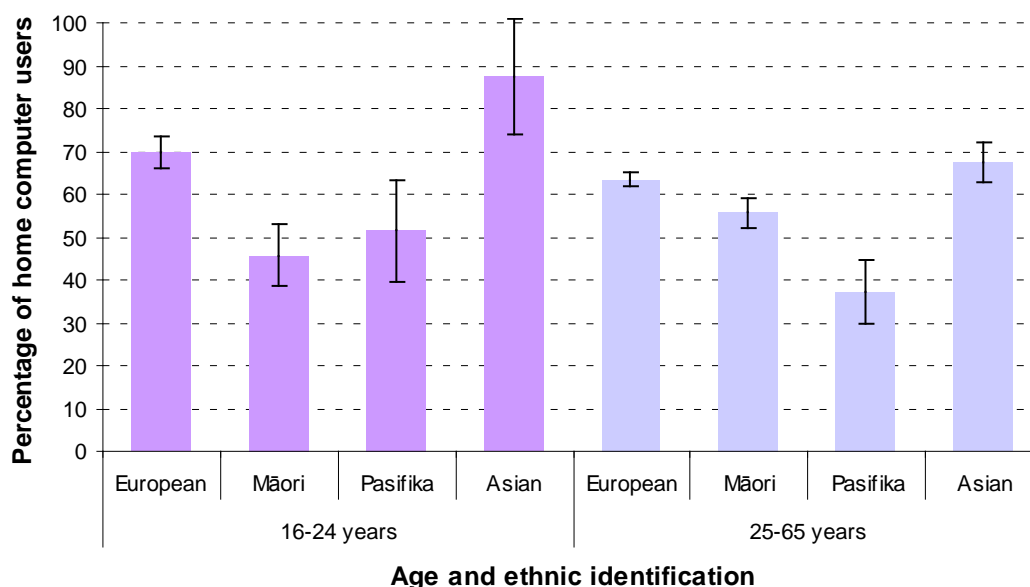
7.6 Ethnic identification and computer use

It was shown in Chapter 4 that higher document literacy was associated with using a home computer for 5 or more hours per month.

Figure 79 shows the percentages of people in the 16-24 and 25-65 age groups using a home computer for 5 or more hours per month, by ethnic identification. Within both age groups, a significantly greater percentage of people identifying as Asian or European used a home computer for 5 or more hours than of people identifying as Māori or Pasifika.

Figure 78

Percentage of people using a home computer 5 or more hours per month, by age and ethnic identification (total response)



Source: New Zealand results of the Adult Literacy and Life Skills Survey. Ministry of Education calculations.

Note: The bars around estimates represent the margins of error (at the 95% confidence level).

7.7 Summary

A greater proportion (23 per cent) of people aged 16-24 than of people aged 25-65 (16 per cent) had a first language other than English. In the 25-65 age group, people with English as a first language had a significantly higher mean document literacy than people with another first language, and the difference was considerable. In the 16-24 age group, in contrast, there was no significant difference in mean document literacy between those with and without English as a first language.

There was a similar pattern in the relationship between document literacy and the main language spoken in the home, except that in this case there was a significant difference in the 16-24 age group. There was a greater proportion of people in the 16-24 age group (17 per cent) than the 25-65 age group (11 per cent) with a language other than English as main home language. In the 25-65 age group, people whose main home language was English had considerably (and significantly) higher mean document literacy than people with another main home language. In the 16-24 age group, people whose main home language was English also had significantly higher mean document literacy than people with another main home language, but the difference was relatively small.

A similar proportion of people in the 16-24 and 25-65 age groups had been born overseas. In the 25-65 age group, people born in New Zealand had a significantly higher mean document literacy than people born overseas, although the difference was not large. There was no significant difference in the 16-24 age group.

Larger proportions of the 16-24 than of the 25-65 age group identified as Māori, Pasifika and Asian, and a smaller proportion as European. In the 25-65 age group, people who identified as European had significantly higher mean document literacy than people with other ethnic identifications, while people identifying as Pasifika and Asian had significantly lower mean

document literacy than both the Māori and European groups. The ethnic pattern in the 16-24 age group was quite different, with people identifying as European or Asian having comparable mean document literacy and having significantly higher document literacy than people identifying as Māori or Pasifika.

Mean numeracy scores in the 16-24 age group showed the same ethnic pattern as for document literacy. The mean prose literacy score for Asians in the 16-24 age group was not quite as high as their mean document literacy score, and could not be distinguished statistically from the mean prose literacy scores of people identifying as European or Māori.

A feature of the prose literacy and numeracy comparisons was that the mean scores for Māori aged 25-65 were significantly higher than those for Māori aged 16-24, and this may reflect the impact of delayed tertiary participation among Māori.

Among people identifying as Asian, when age differences are examined in more detail, there was a significant difference in mean document literacy between the 16-24 and the 25-44 age groups, while there was no significant difference between the 25-44 and 45-65 age groups.

The key difference between these age groups appears to be the fact that between about 80 and 100 per cent of Asians in the 16-24 age group had experienced as least a year of education in New Zealand (with a median of 5 years in New Zealand education), while only about half of Asians aged 25-44, and a minority of those aged 45-64, had done so (in these age groups, among those with some education in New Zealand, the median was 4 years' New Zealand education).

This is consonant with North American research on the development of cognitive/academic English language proficiency by immigrants from non-English speaking backgrounds, which indicates that it takes at least four years in English-medium education for immigrants to approach native-speaker levels of academic achievement.

Asians in the 16-24 age group also stood out in terms of several of the factors associated with higher document literacy. They had relatively advantaged family backgrounds, as indicated by the percentage whose fathers had tertiary education: for Asians, this percentage was on a par with Europeans and significantly greater than Māori and Pasifika. Among people in the 16-24 age group, a significantly greater proportion of Asians than of people with other ethnic identification had completed tertiary education or studied at tertiary level in the past year. The percentage of Asians in this age group who used a home computer at least 5 hours per month was comparable with Europeans and significantly greater than Māori and Pasifika.

In terms of the characteristics of age groups, among people aged 25-65 document literacy scores tended to be higher for:

- people with English as a first language
- people whose main home language was English
- people born in New Zealand
- people who identified as European

While in this age group, document literacy scores tended to be lower for:

- people who did not have English as a first language
- people whose main home language was not English
- people born overseas
- people who identified as Māori, Pasifika or Asian.

Among people aged 16-24, document literacy scores tended to be higher for:

- people whose main home language was English
- people who identified as European or Asian

While document literacy scores tended to be lower for:

- people whose main home language was not English
- people who identified as Māori or Pasifika.

Comparisons with PISA

The relationship of document literacy to main language spoken in the home among people aged 16-24 in ALL was in line with the results of PISA 2006 for reading literacy. Students in PISA whose main home language was English had a significantly higher mean reading literacy score than those with a different main home language (Marshall, Caygill and May 2008: 20-21). Note that there was not a similar difference in PISA 2006 for mathematical literacy (Caygill, Marshall and May 2008: 21).

PISA 2006 showed the same pattern of mean reading literacy scores for ethnic groups among 15-year-olds as among those aged 16-24 in ALL, namely comparable means for Europeans and Asians, which were significantly higher than the comparable means for Māori and Pasifika (Marshall, Caygill and May 2008: 17). The pattern of mean numeracy scores for the 16-24 age group in ALL was also very similar to that for mathematical literacy in PISA 2006 (Caygill, Marshall and May 2008: 18).

Language and ethnic identification in the statistical models

Place of birth was not included in the statistical models discussed in Lane (2011) because it is highly correlated with language and ethnic identification.

For the 25-65 age group, both first language and main home language need to be taken account of in the models, while for the 16-24 age group, only main home language had a significant effect.

For both the 16-24 and 25-65 age groups, among people with English as main home language, having Māori or Pasifika ethnic identification was negatively associated with document literacy in comparison with people who did not identify as Māori or Pasifika.

The statistical models for people aged 16-24 indicate that mean document literacy for people in this age group identifying as Asian would have been higher but for the factor of main language spoken in the home. Having a main home language other than English was negatively associated with document literacy and this was a large and significant effect. Most people identifying as Asian in this age group mainly spoke a language other than English at home.

8 CONCLUSION

The first section of this chapter concentrates on new findings from this research, while the following sections summarise the results of the research relating to people aged 16-24, and the key factors determined in Lane (2011). Comparative information on people aged 25-65 can be found in the individual chapter summaries.

8.1 Key findings

Technology use

For people aged 16-24, literacy scores increased as number of hours of home computer use increased. Computer use for playing games or online chat made no difference to literacy. Literacy scores were related to computer use for literacy activities e.g. writing, editing, email, and these were predominant uses of home computers.

Language and ethnicity

For people aged 16-24, on average there was no difference in literacy between those born in New Zealand or overseas, or those with or without English as a first language. (These factors made a huge difference for people aged 25-65). Asians aged 16-24 had comparable English literacy to Europeans, unlike Asians aged 25-65. The key factor appears to be experience of New Zealand education. Most young Asians had several years of New Zealand education, sufficient to develop better English literacy skills than the older generation. Young Asians also had advantages in family background, tertiary participation and computer use, although they still had a disadvantage in terms of home language use.

Other findings

Findings relating to other characteristics were in line with previous research on literacy and on educational achievement. One such finding was that people who watched television or videos for 5 or more hours per day had lower literacy on average. Another was that those who never used a library had lower literacy than those who used a library even infrequently.

8.2 Comparisons with PISA

There are a number of differences between the sampling used for PISA and for ALL. PISA 2006 is based on data from 4,824 students, compared with 1,082 respondents aged 16-24 in ALL. PISA samples 15-year-old students and excludes students who have had less than a year of English instruction as well as students in Māori immersion programmes. The 16-24 age group in ALL does not have these restrictions; it also includes a considerably higher percentage than PISA of people who mainly speak a language other than English at home, because of the large number of migrants who have arrived in New Zealand after the age of 15.

In spite of these sampling differences, the results of the two studies are similar where they can be compared, which is in relation to gender, socioeconomic status, main home language and ethnicity.

No significant gender differences were found in the 16-19 age group in ALL for prose or document literacy or numeracy (nor were there significant differences in the 16-24 age group). In contrast, PISA 2006 and PISA 2009 showed a significant gender difference among 15-year-olds in favour of females in reading literacy. This contrast may be simply due to the fact that the sample of 15-year-olds in PISA is much larger than the sample of 16-19-year-olds in ALL, and consequently PISA provides a more sensitive measure of gender differences in literacy.

Analysis of PISA 2006 using an index of economic, social and cultural status (ESCS), which included parental education, showed increasing reading literacy and mathematical literacy with increasing ESCS, in line with the results for parental education and deprivation in ALL.

The relationship of document literacy to main language spoken in the home among people aged 16-24 in ALL was in line with the results of PISA 2006 for reading literacy. Students in PISA whose main home language was English had a significantly higher mean reading literacy score than those with a different main home language (Marshall, Caygill and May 2008: 20-21). Note that there was not a similar difference in PISA 2006 for mathematical literacy (Caygill, Marshall and May 2008: 21).

PISA 2006 showed the same pattern of mean reading literacy scores for ethnic groups among 15-year-olds as among those aged 16-24 in ALL, namely comparable means for Europeans and Asians, which were significantly higher than the comparable means for Māori and Pasifika (Marshall, Caygill and May 2008: 17). The pattern of mean numeracy scores for the 16-24 age group in ALL was also very similar to that for mathematical literacy in PISA 2006 (Caygill, Marshall and May 2008: 18).

8.3 Education

People aged 16-24 in ALL with higher levels of completed education tended to have higher document literacy.

There was a significantly higher mean score for young adults who undertook formal full-time study or training in the past year, compared with those who undertook self-directed study or training, or no study or training.

Young adults who had undertaken degree-level study in the past year had significantly higher mean document literacy than those who had not studied, or who had studied at secondary or tertiary non-degree level.

Combining completed education with study or training undertaken in the past year, people who had either already completed a degree, or had undertaken degree-level study in the past year, had a significantly higher mean document literacy score than those who had not.

People who reported that they had achieved good grades in mathematics at school had a significantly higher mean document literacy score than those who reported poor grades. Self-reported grades in mathematics are likely to be a rough proxy for overall achievement at school.

In other words, among people aged 16-24, document literacy scores tended to be higher for:

- people who had completed tertiary education
- people who had undertaken formal full-time study or training in the past year
- people who had completed a degree or studied at degree level in the past year
- people who reported that they had achieved good grades in mathematics at school

While document literacy scores tended to be lower for:

- people whose highest level of completed education was lower secondary (especially for people aged 20-24)
- people who had not undertaken full-time formal study or training in the past year
- people who had not completed a degree or studied at degree level in the past year
- people who reported receiving poor grades in mathematics at school

8.4 Labour force status, occupation and industry

Young adults who were employed or students had comparable document literacy, while students had significantly higher mean document literacy scores than those who were neither employed nor students.

In the 20-24 age group, people who had been employed at any time in the past year had significantly higher mean document literacy than those who had not, but in the 16-19 age group, there was no significant difference.

When we look at hours of work, there were no significant differences in the 16-19 age group between those who had been employed mainly full-time, those who had been employed part-time or variably full- or part-time, and those who had not been employed. For the 20-24 age group, people who had had mainly full-time employment or part-time or variable employment had comparable mean document literacy scores, while those who had had part-time or variable employment had significantly higher mean document literacy than those who had not been employed.

There was a combined effect for employment and study or training in the past year. In the 16-24 age group, those who had both been employed and involved in formal or non-formal study or training in the past year had higher mean document literacy than those who had undertaken study only, or employment only, or neither. While those who had not been involved in employment, education or training (NEET) had the lowest estimated mean document literacy, there were very few of them and so the estimate had a very large margin of error. This estimate could consequently not be distinguished from the estimates for the study-only and employed-only groups.

In the 16-24 age group, currently employed people in white collar occupations (managerial, professional, technical or clerical) had a significantly higher mean document literacy score than people currently employed in other occupations.

In terms of industries people were currently employed in, people, currently employed people in finance, business or community services had significantly higher mean document literacy than those currently employed in agriculture, manufacturing and construction.

To summarise, among people aged 16-24 document literacy scores tended to be higher for:

- people whose current labour force status was student or employed
- people who had been employed in the past year, whether full-time, part-time, or variably full-time or part-time (people aged 20-24, but not 16-19)
- people who had been employed in the past year and had also undertaken formal or non-formal study or training in the past year
- currently employed people in white collar occupations (managers, professionals, technicians or clerks)
- currently employed people in finance, business or community services industries

While document literacy scores tended to be lower for:

- people whose current labour force status was other than employed or student
- people who had not been employed in the past year (people aged 20-24, but not 16-19)
- people not in employment, (formal or non-formal) education or training in the past year

- currently employed people who were not in a white collar occupation
- currently employed people who were not in finance, business or community services

Note that among people aged 20-24, those who had been employed in the past year had significantly higher mean document literacy than those who had not, but this difference was not significant for the 16-19 age group.

8.5 Technology use

Use of a computer at home was associated with higher document literacy. Among people age 16-24, mean document literacy increased as the number of hours of use increased.

Current students were significantly more likely to use a home computer at least 5 hours per month than people with other labour force status.

If home computer users are defined as those with at least 5 hours per month of usage, as opposed to non-users defined as those with less usage or without home computer access, home computer users had significantly higher mean document literacy than non-users in both of the 16-19 and 20-24 age groups.

In the 16-24 age group, people who used a computer at work in the past year had significantly higher mean document literacy than people who were either employed but had not used a computer at work, or had not been employed in the past year.

Higher document literacy was associated with some uses of computers and the internet and not others.

People who used a computer frequently (i.e. at least several times a week) for writing or editing had significantly higher mean document literacy in the 20-24 age group, though not in the 16-19 age group.

There was no significant difference in mean document literacy between people who played computer games frequently and those who played games infrequently in either of the 16-19 or 20-24 age groups.

Frequent users of email had significantly higher mean document literacy than infrequent users in both the 16-19 and 20-24 age groups.

There was no significant difference in mean document literacy scores between frequent and infrequent participants in online discussions in either of the 16-19 or 20-24 age groups.

If we look at the percentage of people who engaged in these activities frequently we see that only a minority of people in each age group was involved frequently in games or online discussions. On the other hand, between 60 and 70 per cent of each of the 16-19 and 20-24 age groups frequently used a computer for writing or editing, and 60 to 70 per cent of each of these age groups were also frequent email users.

So we can see that it is the uses of the computer for clearly literacy-related purposes, namely writing/editing and email, that relate to higher document literacy, and that these are major uses for computer users in both age groups. These observations help to make sense of the strong general association of computer use with higher literacy.

Mobile phone users had significantly higher mean document literacy than people who never used a mobile phone, although it was difficult to test this in the 16-24 age group because there was only a very small proportion of this age group that never used a mobile phone.

Thus in the 16-24 age group, document literacy scores tended to be higher for:

- people who used a home computer for 5 or more hours per month
- people who had used a computer at work in the past year
- people aged 20-24 who used a computer frequently for writing or editing
- people who were frequent users of email
- mobile phone users

Conversely, document literacy scores tended to be lower for:

- people who used a home computer for less than 5 hours per month, or did not have home computer access, or had never used a computer
- people who had been employed but not used a computer at work in the past year, or had not been employed in the past year
- people aged 20-24 who used a computer infrequently for writing or editing
- people who were infrequent users of email
- people who never used a mobile phone

The one anomaly in these patterns was the fact that people aged 16-19 who used a computer frequently for writing or editing did not have significantly higher mean document literacy score than people in the same age group who used a computer infrequently for this purpose.

8.6 Literacy-related practices

In the 16-24 age group, library use was significantly related to document literacy. People who never used a library had significantly lower mean document literacy than people who used a library at least once or twice a year. However, there were no significant differences in mean document literacy among library users according to how frequently they used a library. The difference in mean document literacy between people who ever used a library or never used a library was significant for both the 16-19 and 20-24 age groups.

In the 16-24 age group, people who regularly (i.e. at least once a week) read at least three of newspapers, magazines, books or letters/emails had significantly higher mean document literacy than people who read two or fewer of these types of reading material regularly.

Similarly, in the 16-24 age group, people who had 25 or more books in the home had significantly higher mean document literacy than those with fewer than 25 books. 30 per cent of people aged 16-24 had fewer than 25 books in the home.

The small group of people who watched television, videos or DVDs for 5 or more hours per day had significantly lower mean document literacy than people who watched less.

Thus, in the 16-24 age group, document literacy scores tended to be higher for

- people who used a library at least once or twice a year
- people who read at least three types of personal reading at least weekly
- people with 25 or more books in the home
- people who watched television, videos or DVDs for 2 hours or less per day

While document literacy scores tended to be lower for:

- people who never used a library
- people who read two or fewer types of personal reading at least weekly
- people with fewer than 25 books in the home
- people who watched television, videos or DVDs for 5 or more hours per day

8.7 Gender, socioeconomic status and region

There was no significant difference in mean document literacy between men and women in both of the 16-19 and 20-24 age groups. The same was true for mean prose literacy and numeracy.

In the 16-24 age group, people whose mother's or father's highest completed education was Year 10 or less had significantly lower mean document literacy than those whose mothers or fathers had higher levels of completed education. People whose mother's or father's highest completed education was Year 11-13 had significantly lower mean document literacy than people whose mothers or fathers had degrees.

In the 16-24 age group, people who lived in low deprivation areas (as measured by the New Zealand Deprivation Index) had significantly higher mean document literacy than those who lived in high deprivation areas.

If New Zealand is divided into two broad regional groupings, consisting of the Auckland, Wellington, Canterbury and Otago Regions ('metropolitan regions') on the one hand, and the rest of New Zealand on the other, about two-thirds of the people in each of the 16-19 and 20-24 age groups lived in the metropolitan regions. There was no significant difference in mean document literacy between broad regional groupings in either the 16-19 or the 20-24 age groups.

In the 16-24 age group, document literacy scores tended to be higher for:

- people whose mothers or fathers had completed tertiary education, especially degrees
- people who lived in low deprivation areas

While document literacy scores tended to be lower for:

- people whose mothers or fathers had not completed education beyond Year 10
- people who lived in high deprivation areas

8.8 Language, birthplace and ethnic identification

23 per cent of people aged 16-24 had a first language other than English. There was no significant difference in mean document literacy between those with and without English as a first language.

17 per cent of people aged 16-24 had a language other than English as the main language spoken in the home. People whose main home language was English had significantly higher mean document literacy than people with another main home language, but the difference was relatively small.

There was no significant difference in the 16-24 age group in mean document literacy for people born in New Zealand and people born overseas.

Larger proportions of the 16-24 than of the 25-65 age group identified as Māori, Pasifika and Asian, and a smaller proportion as European. In the 25-65 age group, people who identified as European had significantly higher mean document literacy than people with other ethnic identifications, while people identifying as Pasifika and Asian had significantly lower mean document literacy than both the Māori and European groups. The ethnic pattern in the 16-24 age group was quite different, with people identifying as European or Asian having comparable mean document literacy and having significantly higher document literacy than people identifying as Māori or Pasifika.

Mean numeracy scores in the 16-24 age group showed the same ethnic pattern as for document literacy. The mean prose literacy score for Asians in the 16-24 age group was not quite as high as their mean document literacy score, and could not be distinguished statistically from the mean prose literacy scores of people identifying as European or Māori.

Among people identifying as Asian, when age differences are examined in more detail, there was a significant difference in mean document literacy between the 16-24 and the 25-44 age groups, while there was no significant difference between the 25-44 and 45-65 age groups.

The key difference between these age groups appears to be the fact that between about 80 and 100 per cent of Asians in the 16-24 age group had experienced as least a year of education in New Zealand (with a median of 5 years in New Zealand education), while only about half of Asians aged 25-44, and a minority of those aged 45-64, had done so (in these age groups, among those with some education in New Zealand, the median was 4 years' New Zealand education).

This is consonant with North American research on the development of cognitive/academic English language proficiency by immigrants from non-English speaking backgrounds, which indicates that it takes at least four years in English-medium education for immigrants to approach native-speaker levels of academic achievement.

Asians in the 16-24 age group also stood out in terms of several of the factors associated with higher document literacy. They had relatively advantaged family backgrounds, as indicated by the percentage whose fathers had tertiary education: for Asians, this percentage was on a par with Europeans and significantly greater than Māori and Pasifika. Among people in the 16-24 age group, a significantly greater proportion of Asians than of people with other ethnic identification had completed tertiary education or studied at tertiary level in the past year. The percentage of Asians in the age group who used a home computer at least 5 hours per month was comparable with Europeans and significantly greater than Māori and Pasifika.

Among people aged 16-24, document literacy scores tended to be higher for:

- people whose main home language was English
- people who identified as European or Asian

While document literacy scores tended to be lower for:

- people whose main home language was not English
- people who identified as Māori or Pasifika.

8.9 Key factors

Lane (2011) has developed statistical models for the 16-24 and 25-65 age groups, including most of the variables studied in this report, and identified a set of factors which were most strongly associated with document literacy scores for the 25-65 and 16-24 age groups.

The factors most strongly associated with document literacy for people aged 25-65 were:

- The first language learned, and the language spoken most often at home
- Ethnic identification (among those who speak English most often at home)
- Age and gender
- The highest level of education completed
- Use of a computer at work
- Use of a computer at home
- The number of books in the home

The factors most strongly associated with document literacy scores for people aged 16-24 were:

- The language spoken most often at home
- Ethnic identification (among those who spoke English most often at home)
- Participation and achievement in formal education
- Use of a computer at home
- Library use

9 DATA AND DEFINITIONS

Sampling and weighting for the Adult Literacy and Life Skills Survey 2006

Sampling for the survey was based on Statistics New Zealand's geographical framework, in which the smallest units are called meshblocks. There were over 38,000 meshblocks in 2001. The survey was based on a probability (proportional to size) sample of 896 meshblocks (from the 2001 meshblock classification) in the North and South Islands and Waiheke Island. Within each meshblock a sample of permanent private dwellings was sought, consisting of an initial sample and then a screened sample designed to over-sample Māori and Pasifika. One person usually resident in each sampled dwelling and aged between 16 and 65 was sought. The achieved response rate was 64 per cent.

Each respondent was interviewed face-to-face, the interviewer completed the background questionnaire and the respondent was asked to complete test booklets in English selected from a bank of test material covering literacy, numeracy and problem-solving. The distribution of test material among respondents favoured prose literacy and document literacy, so that these two measures could be estimated with sufficient accuracy for comparison with the International Adult Literacy Survey (IALS) 1996 (which did not include numeracy or problem-solving). This was a consideration in the choice of document literacy as the focus of this report.

A pilot survey was undertaken between July and September 2005 and the main survey took place from May 2006 to March 2007. The pilot data was included in the final data set, which consists of records from 7,131 respondents, of whom 1,082 were aged between 16 and 24.

The sample data was validated against Statistics New Zealand census and household survey data and Ministry of Education statistics.

Each respondent was assigned a weight, which can be thought of as the number of people in the population represented by that respondent. The weight was a product of a probability weight (based on the probability of the respondent being selected in the initial sample), a non-response weight (to adjust for the proportion of the initial sample not interviewed) and a benchmark adjustment (to adjust for different rates of responding in different demographic categories). The benchmark adjustment was based on 2006 Census data for gender, ethnicity and age.

Number and percentage estimates are sensitive to sampling error, which can be thought of as the variation that would arise in estimates if the survey were repeated many times with a new set of geographical areas selected each time and consequently a different set of respondents. Sampling errors were estimated by a process (jackknife variance estimation) which involves assigning a set of weights to each respondent (replicate weights) to approximate repeating the survey multiple times with different samples.

To calculate replicate weights, the 896 meshblocks were divided into 30 groups (each of 29 or 30 meshblocks with a wide geographical spread) and weights recalculated based on deleting one group in turn and readjusting to the benchmarks. Standard errors and 95 per cent confidence intervals (which measure the accuracy of estimates) have been derived from the jackknife variance estimation procedure using these 30 replicate weights.

Differences between proportions and means were considered significant if the 95 per cent confidence intervals did not overlap. This procedure is known to be considerably more conservative than hypothesis testing with $\alpha = 0.05$, and in fact when the standard errors of two estimates are approximately equal (as they generally are within age groups in this report), this procedure approximates a test with $\alpha = 0.01$ (Schenker and Gentleman, 2001). This

conservatism is considered appropriate here given the overall large sample size, and the large number of comparisons of estimates in this report.

Scores in the Adult Literacy and Life Skills Survey

Satherley and Lawes (2007) give an account of the scoring approach in the ALL survey:

To each individual, and for each of the domains, a score from zero to 500 is assigned. Zero indicates extremely low proficiency, and 500 extremely high. In addition, based on this score, one of five 'cognitive levels' is assigned. These cognitive levels are used in national and international comparison, essentially as a benchmark. The following list provides descriptions of typical tasks associated with each cognitive level.

Level 1 (Scores 0–225):

Tasks at this level require the ability to read simple documents, accomplish literal information-matching with no distractions, and perform simple one-step calculations.

Level 2 (Scores 226–275):

This level includes tasks that demand the capacity to search a document and filter out some simple distracting information, achieve low-level inferences, and execute one- or two-step calculations and estimations.

Level 3 (Scores 276–325):

Typical tasks at level 3 involve more complex information-filtering, sometimes requiring inferences and the facility to manipulate mathematical symbols, perhaps in several stages.

Level 4 (Scores 326–375):

A level 4 task might demand the integration of information from a long passage, the use of more complex inferences and the completion of multiple-step calculations requiring some reasoning.

Level 5 (Scores 376–500):

Level 5 tasks incorporate the capability to make high-level inferences or syntheses, use specialised knowledge, filter out multiple distractors, and to understand and use abstract mathematical ideas with justification.

OECD and Statistics Canada (2000) provide the following characterisation of Level 3:

Level 3 is considered a suitable minimum for coping with the demands of everyday life and work in a complex, advanced society. It denotes roughly the skill level required for successful secondary school completion and college entry.

Completed education

Highest level of completed education was derived from responses to questions A4B and A4C of the ALL background questionnaire which asked respectively “What is the highest level of primary or secondary school that you have ever completed?” and “What is the highest level of formal education or training that you have ever completed?” The New Zealand coded responses were used and grouped as shown in Table 3.

Table 3

Broad classification of highest level of education completed

| Broad Grouping | Responses (from A4C) | 16-19 | | 20-24 | | 25-65 | |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| | | Frequency | Weighted Frequency | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Lower secondary | Up to Form 5/Year 11 | 214 | 106,000 | 129 | 48,000 | 1,650 | 515,000 |
| Upper secondary | Form 6 or 7/Year 12 or 13 Level 1, 2 or 3 certificate | 251 | 121,000 | 286 | 134,000 | 1,617 | 566,000 |
| Tertiary | Level 4 certificate Level 5, 6 and 7 certificate or diploma Bachelors degree Professional degree Bachelors degree with honours or postgraduate diploma Masters degree Doctorate | 15 | 6,000 | 187 | 96,000 | 2,782 | 1,043,000 |
| TOTAL | | 480 | 233,000 | 602 | 278,000 | 6,049 | 2,123,000 |

Years in New Zealand education were calculated by subtracting years of formal education completed outside New Zealand (from responses to questions A3A and A3B) from total years of formal education (from responses to question A3).

Study or training in the past year

The number of people who had taken formal courses (which count towards a qualification), non-formal courses (which do not), or self-directed study or training not involving courses, in the 12 months before the interview was determined from responses to questions F1 to F16 in the ALL background questionnaire. The distribution of responses is shown in Table 4.

Table 4

Formal and non-formal study or training in the past year

| | 16-24 | | 25-65 | |
|----------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Formal full-time | 423 | 232,000 | 354 | 118,000 |
| Formal part-time | 124 | 54,000 | 928 | 311,000 |
| Non-formal | 87 | 40,000 | 1,594 | 581,000 |
| Self-directed | 349 | 142,000 | 2,486 | 908,000 |
| No study or training | 99 | 44,000 | 687 | 206,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

The level of formal study or training (if taken) was determined from question F4, which asked “What type of certificate, degree or diploma were you taking this education or training towards?”

If there was more than one, tell me about the most recent one.” The distribution is outlined in Table 5.

Table 5

Level of formal study or training in the past year

| Broad Grouping | Responses (from F4) | 16-24 | | 25-65 | |
|---------------------|----------------------------------------------------------------|-----------|--------------------|-----------|--------------------|
| | | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| No study | | 551 | 232,000 | 4,851 | 1,723,000 |
| Upper secondary | Form 6 or 7/Year 12 or 13 Level 1, 2 or 3 certificate | 255 | 119,000 | 503 | 164,000 |
| Tertiary non-degree | Level 4 certificate Level 5, 6 and 7 certificate or diploma | 112 | 68,000 | 424 | 137,000 |
| Degree | Bachelors degree or higher | 164 | 93,000 | 271 | 100,000 |
| TOTAL | | 1,082 | 511,000 | 6,049 | 2,123,000 |

Experience of degree level study is determined from the responses to questions A4C (on completed education) and F4 (on formal study in the past year), and the distribution of categories is shown in Table 6.

Table 6

Experience of degree-level study

| | 16-24 | | 25-65 | |
|-----------------------------------------------------------------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| No experience of degree-level study | 882 | 398,000 | 4,575 | 1,545,000 |
| Degree-level study in past year or degree completed at any time in the past | 200 | 113,000 | 1,474 | 578,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

Self-reported school performance in mathematics

This variable was derived from responses to question A9C, which asked “Think about learning maths and how you were taught maths while a student at secondary school. Please tell me whether you strongly agree, agree, disagree, or strongly disagree with the following statements: ... c) I got good grades in maths.” The distribution of responses is outlined in Table 7.

Table 7

Responses to “I got good grades in maths”

| Responses (from A9C) | 16-19 | | 20-24 | | 25-65 | |
|----------------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Agree/Strongly agree | 336 | 161,000 | 337 | 159,000 | 3,585 | 1,296,000 |
| Disagree/Strongly disagree | 132 | 65,000 | 256 | 117,000 | 2,313 | 781,000 |
| No opinion/refused | 12 | 7,000 | 9 | 2,000 | 151 | 47,000 |
| TOTAL | 480 | 233,000 | 602 | 278,000 | 6,049 | 2,123,000 |

Labour force status

Current labour force status is based on responses to question D1 in the ALL background questionnaires, which asked “I would now like to talk about your employment status. What is your current work situation?” Respondents were asked to select one option only from the list in Table 8.

Table 8
Classification of current labour force status

| Labour force status | Option as worded in D1 | 16-19 | | 20-24 | | 25-65 | |
|---------------------|---------------------------------------------------------------------------------------------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| | | Frequency | Weighted Frequency | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Employed | Employed or self employed | 151 | 78,000 | 364 | 157,000 | 4,561 | 1,668,000 |
| Student | A student (including work programmes) | 255 | 126,000 | 113 | 71,000 | 144 | 49,000 |
| Other | Not working <u>and</u> looking for work Retired Doing unpaid household work Other, specify ... | 74 | 30,000 | 125 | 50,000 | 1,344 | 406,000 |
| TOTAL | | 480 | 233,000 | 602 | 278,000 | 6,049 | 2,123,000 |

Employment

Employment in the past year was based on responses to question D2 in the ALL background questionnaire, which asked “Did you work at a job or business at any time in the last 12 months ... (regardless of the number of hours per week)?” According to the instructions to the interviewers, ‘the last 12 months’ covered the period up to the month prior to the month of the interview. It needs to be noted that those who were ‘employed’ in terms of employment status in the past year were not necessarily ‘employed’ in terms of current labour force status (and vice versa). The distribution of people who were employed (by hours of work) or not in the past year is outlined in Table 9.

Table 9
Employment and hours of work in the past year

| Employment in past year & hours of work | 16-19 | | 20-24 | | 25-65 | |
|-----------------------------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Employed mostly full-time | 108 | 45,000 | 335 | 153,000 | 3,667 | 1,344,000 |
| Part-time or variable employment | 230 | 120,000 | 167 | 86,000 | 1,362 | 470,000 |
| Not employed | 142 | 68,000 | 100 | 39,000 | 1,020 | 309,000 |
| TOTAL | 480 | 233,000 | 602 | 278,000 | 6,049 | 2,123,000 |

Employment and study or training

This variable was based on a combination of employment in the past year (from D2) and (formal or non-formal) study or training in the past year (from F1-F16), and the distribution of combinations is outlined in Table 10.

Table 10

Employment and study or training in the past year

| Employment and study or training in past year | 16-24 | | 25-65 | |
|-------------------------------------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Not in employment, education or training (NEET) | 79 | 33,000 | 668 | 200,000 |
| Study, not employed | 163 | 75,000 | 352 | 110,000 |
| Employed, no study | 259 | 110,000 | 1,830 | 674,000 |
| Study and employed | 581 | 294,000 | 3,199 | 1,140,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

Occupation and industry

The ALL background questionnaire contains a series of questions (D17 to D43) about the most recent job that the respondent had worked at within the last five years. Occupation and industry categories were assigned on the basis of this job. People who had not been employed in the previous five years were not assigned an occupation or industry.

Occupation

Occupation is coded to the International Standard Classification of Occupation (ISCOR) in the ALL data set. This has been concorded to the New Zealand Standard Classification of Occupation 1999 (NZSCO99). Occupations at level one of this classification have been aggregated for this analysis, as shown in Table 11.

A small number of people with military occupations were included in the survey but these are excluded from the occupational analysis. Because the survey was limited to permanent private dwellings, a large number of military personnel living in military institutional dwellings were not eligible to be surveyed, and so the survey could not fairly represent this occupational category.

Table 11

Classification of occupations

| Group | NZSCO99 | 16-24 | | 25-65 | |
|--------------------------------|-----------------------------------------------------------------------------------------------------|-----------|--------------------|-----------|--------------------|
| | | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| White collar workers | Administrators and managers Professionals Technicians and associate professionals Clerks | 301 | 137,000 | 3,156 | 1,162,000 |
| Service workers | Service and sales workers | 304 | 157,000 | 794 | 270,000 |
| Manual workers | Agricultural workers Trades workers Plant and machinery operators and assemblers Labourers | 327 | 143,000 | 1,620 | 553,000 |
| Other (excluded from analysis) | Military | 3 | 1,000 | 6 | 2,000 |
| No occupation assigned | | 147 | 73,000 | 473 | 136,000 |
| TOTAL | | 1,082 | 511,000 | 6,049 | 2,123,000 |

Industry

Industry is coded in the ALL data set using the International Standard Industry Classification (ISIC). For this analysis, the ISIC has been concorded to the Australia and New Zealand Standard Industry Classification 2006 (ANZSIC06), and industries in the top level of classification have been grouped together, following Pool et al. (2005), as shown in Table 12.

Table 12
Classification of industries

| Group | ANZSIC06 | 16-24 | | 25-65 | |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------|-----------|--------------------|
| | | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Agriculture, manufacturing and construction | A Agriculture, forestry and fishing B Mining C Manufacturing E Construction | 258 | 120,000 | 1,591 | 554,000 |
| Wholesale and retail trade, transport and communications | F Wholesale trade G Retail trade H Accommodation and food services I Transport, postal and warehousing J Information media and telecommunications | 412 | 198,000 | 1,322 | 483,000 |
| Finance, business and community services | D Electricity, gas, water and waste services K Finance and insurance services L Rental, hiring and real estate services M Professional, scientific and technical services N Administrative and support services O Public administration and safety P Education and training Q Health care and social assistance R Art and recreation services S Other services | 262 | 119,000 | 2,650 | 945,000 |
| Other (excluded from analysis) | Military | 3 | 1,000 | 6 | 2,000 |
| No industry assigned | | 147 | 73,000 | 480 | 139,000 |
| TOTAL | | 1,082 | 511,000 | 6,049 | 2,123,000 |

Computer use at home

The variable used in analysis was number of hours per month of home computer use. This variable is based on question H13 in the ALL background questionnaire, which was only asked of people who had answered yes to H2, “Have you ever used a computer?” and yes to H11, “Do you have personal access to a computer in your home (including a laptop you bring home from your work)?”. H13 asked “In a typical month, how many hours did you use a computer at home?” Table 13 outlines the distribution of respondents among the categories of use.

Table 13

Hours per month of home computer use

| Hours per month of home computer use | 16-24 | | 25-65 | |
|-----------------------------------------------------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| No access (never used a computer or no computer access at home) | 260 | 84,000 | 1,319 | 375,000 |
| 0-4 hours | 151 | 77,000 | 1,144 | 428,000 |
| 5-9 hours | 132 | 67,000 | 784 | 282,000 |
| 10-39 hours | 299 | 151,000 | 1,906 | 700,000 |
| 40+ hours | 240 | 131,000 | 896 | 339,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

Home computer use was also analysed using the aggregated categories of use for 5 or more hours per month as opposed to less than 5 hours use, not having home computer access, or never having used a computer, as shown in Table 14.

Table 14

Aggregated home computer use

| Home computer use | 16-19 | | 20-24 | | 25-65 | |
|------------------------------------------------------------------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Used for less than 5 hours per month, or no access, or never used a computer | 158 | 66,000 | 253 | 95,000 | 2,463 | 803,000 |
| Used for 5+ hours per month | 322 | 167,000 | 349 | 183,000 | 3,586 | 1,320,000 |
| TOTAL | 480 | 233,000 | 602 | 278,000 | 6,049 | 2,123,000 |

Computer use at work

The work computer use variable was based on question H7 in the ALL background questionnaire. This question was only asked of people who had answered yes to D2 (see Employment above) and yes to question H2, "Have you ever used a computer?". H7 asked "In the last 12 months, did you use a computer in your job? (If you have more than one job, tell us about the one at which you work the most hours)". Table 15 cross-classifies the responses to H7 and to D2 on employment in the past year.

Table 15

Work computer use or non-use in past year

| Work computer use in past year | 16-24 | | 25-65 | |
|-----------------------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Not employed in past year | 242 | 107,000 | 1,020 | 309,000 |
| Employed but no work computer use | 433 | 208,000 | 1,556 | 516,000 |
| Used computer at work | 407 | 196,000 | 3,473 | 1,298,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

Purposes of computer use

Question H3 asked “In a typical month, how often did you use a computer for the following purposes?” Table 16 shows the distribution of responses for purpose a) “Writing or editing text” (incorporating negative responses to question H2, “Have you ever used a computer?”).

Table 16

Frequency of computer use for writing or editing

| Frequency of use | 16-19 | | 20-24 | | 25-65 | |
|-------------------------------------------------------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Infrequent (A few times a month, never, or never used a computer) | 187 | 84,000 | 235 | 93,000 | 1,895 | 626,000 |
| Frequent (Daily or a few times a week) | 291 | 149,000 | 364 | 183,000 | 3,630 | 1,345,000 |
| TOTAL | 480 | 233,000 | 602 | 278,000 | 6,049 | 2,123,000 |

Table 17 shows the distribution of responses for purpose g) “Playing games”.

Table 17

Frequency of computer use for playing games

| Frequency of use | 16-19 | | 20-24 | | 25-65 | |
|-------------------------------------------------------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Infrequent (A few times a month, never, or never used a computer) | 261 | 127,000 | 400 | 183,000 | 4,905 | 1,727,000 |
| Frequent (Daily or a few times a week) | 219 | 106,000 | 202 | 95,000 | 1,144 | 397,000 |
| TOTAL | 480 | 233,000 | 602 | 278,000 | 6,049 | 2,123,000 |

Purposes of internet use

Question H5 asked “In a typical month, how often did you use the Internet for the following purposes?” Table 18 shows the distribution of responses for purpose a) “Electronic mail (email)” (incorporating negative responses to question H4 “Have you ever used the Internet?”).

Table 18

Frequency of email use

| Frequency of use | 16-19 | | 20-24 | | 25-65 | |
|-----------------------------------------------------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Infrequent (A few times a month, never, or never used internet) | 186 | 81,000 | 228 | 83,000 | 2,133 | 663,000 |
| Frequent (Daily or a few times a week) | 294 | 152,000 | 374 | 195,000 | 3,916 | 1,460,000 |
| TOTAL | 480 | 233,000 | 602 | 278,000 | 6,049 | 2,123,000 |

Table 19 shows the distribution of responses for purpose b) “Participate in chat groups or other on-line discussions”.

Table 19

Frequency of participation in online discussions

| Frequency of use | 16-19 | | 20-24 | | 25-65 | |
|-----------------------------------------------------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Infrequent (A few times a month, never, or never used internet) | 323 | 150,000 | 486 | 218,000 | 5,552 | 1,931,000 |
| Frequent (Daily or a few times a week) | 157 | 83,000 | 116 | 59,000 | 497 | 193,000 |
| TOTAL | 480 | 233,000 | 602 | 278,000 | 6,049 | 2,123,000 |

Mobile phone use

Question H1 asked “In a typical month, how often did you use each of the following?” Table 20 shows the distribution of responses for item a) “A mobile phone”.

Table 20
Frequency of mobile phone use

| Frequency of use | 16-24 | | 25-65 | |
|----------------------------------------------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Ever (Daily, a few times a week, or a few times a month) | 1,034 | 495,000 | 5,321 | 1,896,000 |
| Never | 48 | 16,000 | 728 | 227,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

Library use

This variable is based on question G1A which asked “About how often do you do the following activities whether these activities are done in person or on computer? Would that be weekly, monthly, several times during the year, once or twice during the year or never? ... a) use a library?” Table 21 outlines the distribution of respondents among the frequencies of use.

Table 21
Frequency of library use

| Frequency of library use | 16-24 | | 25-65 | |
|------------------------------------------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Weekly | 222 | 112,000 | 1,140 | 404,000 |
| Monthly | 196 | 98,000 | 1,269 | 441,000 |
| Less often (several times/once or twice during year) | 372 | 181,000 | 1,933 | 691,000 |
| Never | 292 | 120,000 | 1,707 | 588,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

Types of regular personal reading

This variable is based on responses to question G3 as explained in section 5.2. Table 22 outlines the distribution of the aggregated number of types of regular personal reading.

Table 22
Number of types of regular personal reading

| Number of types | 16-24 | | 25-65 | |
|-----------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| 0-2 types | 647 | 299,000 | 2,419 | 811,000 |
| 3-4 types | 435 | 212,000 | 3,630 | 1,312,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

Books in the home

This variable is based on responses to question G6, which asked “How many books do you have in your household? Do not include magazines.” The distribution of responses is outlined in Table 23.

Table 23

Number of books in the home

| Number of books | 16-24 | | 25-65 | |
|-----------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Less than 25 | 366 | 155,000 | 982 | 302,000 |
| 25 or more | 715 | 356,000 | 5,065 | 1,821,000 |
| Don't know | 1 | - | 2 | - |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

Television and video viewing

This variable is based on responses to question G2, which asked “How much time do you usually spend each day watching television, videos or DVDs?” Table 24 shows the breakdown of responses by age.

Table 24

Daily hours watching television, videos or DVDs

| Viewing hours per day | 16-24 | | 25-65 | |
|-------------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| 2 hours or less | 513 | 264,000 | 3,323 | 1,196,000 |
| Over 2 but less than 5 | 425 | 192,000 | 2,284 | 790,000 |
| 5 or more | 135 | 51,000 | 384 | 114,000 |
| No TV or VCR/DVD player | 9 | 4,000 | 58 | 24,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

Age and gender

Respondents were asked their date of birth and whether they were male or female. In each age group there were considerably more female than male respondents, and a correction for this gender imbalance was incorporated in the weighting through the benchmark adjustments, as shown in Table 25.

Table 25

Age and gender distribution

| Gender | 16-19 | | 20-24 | | 25-65 | |
|--------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Male | 226 | 119,000 | 261 | 138,000 | 2,568 | 1,027,000 |
| Female | 254 | 115,000 | 341 | 140,000 | 3,481 | 1,096,000 |
| TOTAL | 480 | 233,000 | 602 | 278,000 | 6,049 | 2,123,000 |

Parents' education

Question C2 asked “What was the highest level of schooling that your mother or female guardian ever completed?” and question C6 was the corresponding question relating to father or male guardian. The distributions of responses are outlined in Tables 26 and 27.

Table 26

Highest completed education of mother or female guardian

| Mother's highest completed education | 16-24 | | 25-65 | |
|--------------------------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Year 10 or less | 183 | 80,000 | 2,225 | 751,000 |
| Year 11-13 | 450 | 211,000 | 1,911 | 709,000 |
| Tertiary non-degree | 212 | 115,000 | 920 | 329,000 |
| Degree | 142 | 71,000 | 287 | 113,000 |
| Don't know/Refused | 95 | 34,000 | 706 | 222,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

Table 27

Highest completed education of father or male guardian

| Father's highest completed education | 16-24 | | 25-65 | |
|--------------------------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Year 10 or less | 200 | 80,000 | 2,076 | 692,000 |
| Year 11-13 | 347 | 166,000 | 1,415 | 518,000 |
| Tertiary non-degree | 240 | 121,000 | 1,229 | 436,000 |
| Degree | 169 | 103,000 | 592 | 245,000 |
| Don't know/Refused | 126 | 41,000 | 737 | 233,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

New Zealand Deprivation Index

The New Zealand Deprivation Index (NZDep) was developed by public health researchers in the Department of Public Health, University of Otago, Wellington, and has since been adopted by the Ministry of Health for a range of purposes including research and the allocation of funding. The index has been calculated on the basis of each Census since 1991 and is a well established measure. The latest index is NZDep2006 (Salmond et al., 2007; White et al. 2008).

The index applies to small geographical areas (not individuals), namely meshblocks and area units as defined by Statistics New Zealand. The index is a measure of the socioeconomic deprivation of people living in each small area, expressed in terms of deciles (decile 1 represents the least deprivation, and decile 10 the greatest deprivation). NZDep2006 was derived from the proportions of people in each small area

- receiving a welfare benefit
- with low household income
- living in a home they do not own
- living in a single parent family
- unemployed
- without educational qualifications
- in overcrowded housing

- without access to a telephone
- without access to a car

The Ministry of Health provides concordance tables matching meshblock numbers with the New Zealand Deprivation Index 2001 and 2006. These were downloaded from the Ministry of Health website and merged with the ALL data set.

Respondents were assigned the NZDep2006 value where it could be matched with the 2001 meshblock number used in the survey design. This could not be done for 727 respondents in the analysis data set because of changes in Statistics New Zealand’s meshblock classification between 2001 and 2006. For all but one of these respondents, a value for New Zealand Deprivation Index could be imputed by assigning the NZDep2001 value. For the subsample of 6404 respondents with assigned values for both NZDep2006 and NZDep2001, the weighted correlation between NZDep2001 and NZDep2006 was 0.87, indicating that this imputation was unlikely to distort the analysis.

The distribution of people in low deprivation (NZDep deciles 1-5) and high deprivation (NZDep deciles 6-10) is shown in Table 28.

Table 28
Distribution of low and high deprivation

| Deprivation | 16-24 | | 25-65 | |
|-------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Low | 385 | 217,000 | 2,838 | 1,102,000 |
| High | 697 | 294,000 | 3,210 | 1,021,000 |
| TOTAL | 1,082 | 511,000 | 6,048 | 2,123,000 |

Broad regional grouping

Table 29 shows the distribution of people in the ‘metropolitan’ regions (Auckland, Wellington, Canterbury and Otago) and the rest of New Zealand.

Table 29
Distribution of people in broad regional groupings

| Grouping | 16-19 | | 20-24 | | 25-65 | |
|--------------------------------------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Auckland, Wellington, Canterbury & Otago Regions | 298 | 153,000 | 353 | 182,000 | 3,626 | 1,344,000 |
| Rest of New Zealand | 182 | 81,000 | 249 | 95,000 | 2,423 | 779,000 |
| TOTAL | 480 | 233,000 | 602 | 278,000 | 6,049 | 2,123,000 |

First language and main language spoken at home

Information on first language(s) was derived from responses to ALL questions B1A and B1B which asked “What is the language that you first learned at home in childhood and still understand?” Respondents could nominate two languages if they were learned at precisely the same time, and 56 did so. Respondents who provided English as a response to one of these questions were categorised as having English as a first language, and all others as not having English as a first language, as shown in Table 30.

Table 30

Classification by first language – English or not

| First language | 16-24 | | 25-65 | |
|-----------------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| English | 697 | 294,000 | 3,210 | 1,021,000 |
| Language other than English | 385 | 217,000 | 2,838 | 1,102,000 |
| TOTAL | 1,082 | 511,000 | 6,048 | 2,123,000 |

Main language spoken at home is based on responses to question B2 in the ALL background questionnaire, which asked “What language do you speak most often at home?” Table 31 shows the distribution of responses in terms of whether the main home language was English or not.

Table 31

Classification of main home language

| Main home language | 16-24 | | 25-65 | |
|-----------------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| English | 924 | 425,000 | 5,397 | 1,885,000 |
| Language other than English | 158 | 86,000 | 652 | 238,000 |
| TOTAL | 1,082 | 511,000 | 6,048 | 2,123,000 |

Birthplace

Birthplace was derived from responses to ALL question A1, which asked “Were you born in New Zealand?” Details of the responses are given in Table 32. No further information relating to birthplace (such as country of birth) is available from the survey data.

Table 32

Distribution of birthplaces

| Responses (from A1) | 16-24 | | 25-65 | |
|---------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| Born in New Zealand | 842 | 369,000 | 4,496 | 1,556,000 |
| Born overseas | 240 | 142,000 | 1,553 | 568,000 |
| TOTAL | 1,082 | 511,000 | 6,049 | 2,123,000 |

Ethnic identification

Ethnic identification is based on questions AA3ZA-AA3ZE of the ALL background questionnaire. This set of questions allows each respondent to nominate up to five ethnic identifications. There were 12 categories of response to the five questions, and these categories were aggregated as total response variables, as set out in Table 33. As noted above, Māori and Pasifika were deliberately over-sampled, but the weighting adjusts the ethnic population estimates so that they correspond with 2006 Census figures.

Table 33

Classification of ethnic identifications (total response)

| Ethnic identification | 16-24 | | 25-65 | |
|-----------------------|-----------|--------------------|-----------|--------------------|
| | Frequency | Weighted Frequency | Frequency | Weighted Frequency |
| European | 688 | 342,000 | 4,425 | 1,641,000 |
| Māori | 251 | 83,000 | 953 | 232,000 |
| Pasifika | 190 | 40,000 | 600 | 104,000 |
| Asian | 116 | 83,000 | 479 | 217,000 |
| Other | 26 | 16,000 | 137 | 54,000 |
| TOTAL RESPONSES | 1,271 | 565,000 | 6,594 | 2,248,000 |

Note: The totals are greater than the total number of people because of the large number of people with multiple ethnic identifications.

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