

Numeracy

Definitions

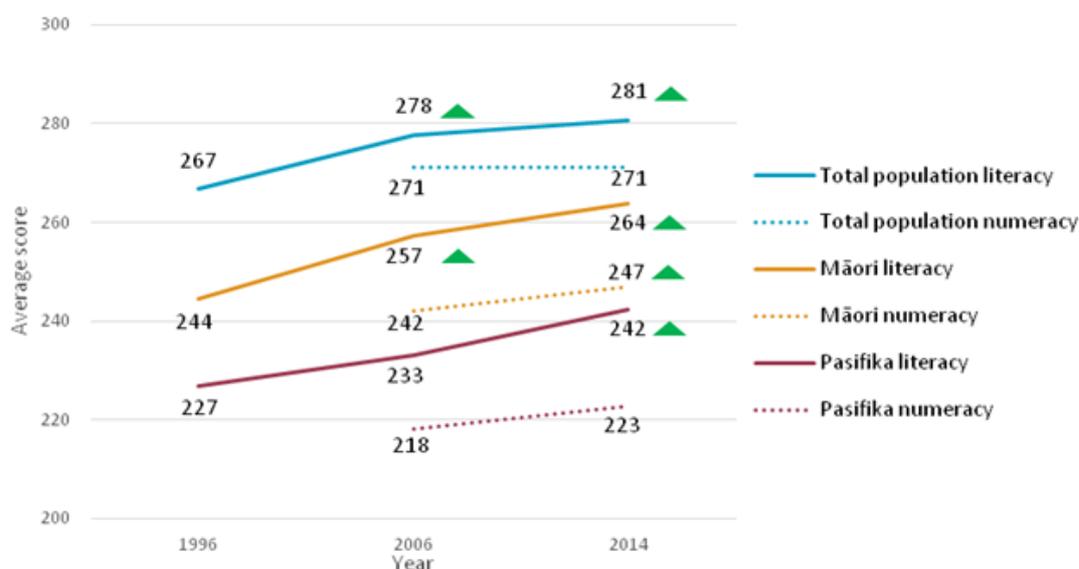
A numerate adult is one who responds appropriately to mathematical content, information and ideas represented in various ways in order to manage situations and solve problems in a real-life context. While performance on numeracy tasks is, in part, dependent on the ability to read and understand text, numeracy involves more than applying arithmetical skills to information embedded in text. (OECD, 2016)¹

To be numerate means to be competent, confident, and comfortable with one's judgements on whether to use mathematics in a particular situation and if so, what mathematics to use, how to do it, what degree of accuracy is appropriate, and what the answer means in relation to the context. (Coben, 2000)²

Highlights from the Survey of Adults (PIAAC) 2014³

- Literacy and numeracy scores have remained relatively static since 2006.
- NZ European have higher scores than Māori and Pasifika, with a greater difference in numeracy than problem solving and literacy.

Figure 1: Skills and ethnicity over time⁴



- Age - the highest scores for literacy and numeracy are in the 35-44 group; and for problem-solving the 25-34 group.

¹ OECD. (2016). *Skills Matter: Further Results from the Survey of Adult Skills*. OECD Skills Studies: OECD Publishing: Paris.

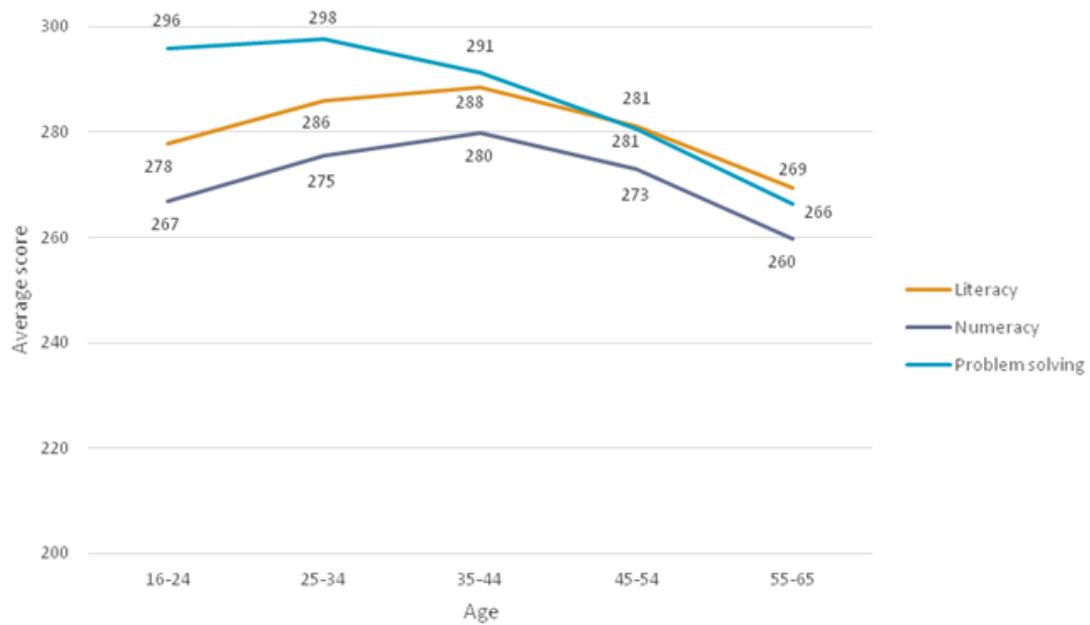
² Cited in Coben, D. (2012). *Numeracy in the workplace*. Presentation at the 2012 Literacy and Numeracy of Adults Symposium.

<http://www.literacyandnumeracyforadults.com/resources/356389>

³ Taken from: Ministry of Education and Ministry of Business, Innovation & Employment. (2016). *Skills in New Zealand and around the world*. Author: Wellington. Ministry of Education and Ministry of Business, Innovation & Employment. (2016). *Skills at work*. Wellington: Author.

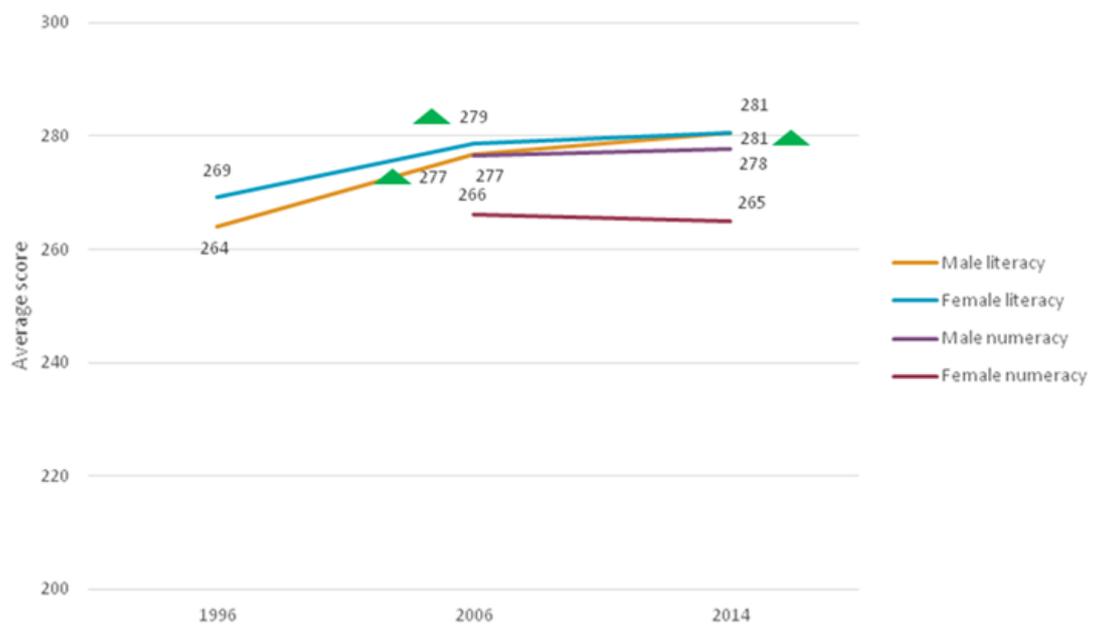
⁴ Numbers marked with a green arrow measure a statistically significant increase from the previous survey. However, some caution should be used when interpreting changes that are still small, as the methodologies used to calculate literacy vary in different surveys.

Figure 2: Skills and Age⁵



- Numeracy varies by gender – males have higher average scores than females.

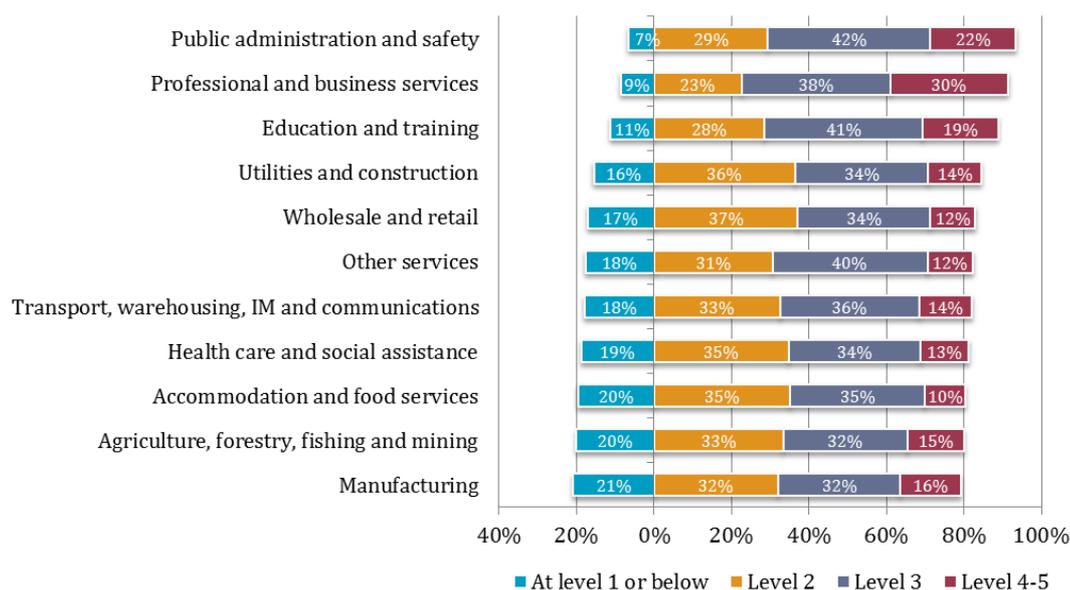
Figure 3: Skills and Gender



⁵ Scale score 226-276 = Level 2 PIAAC / Step 5 ALPs; Scale Score 276-326 = Level 2 PIAAC = Step 5 ALPs.

- Numeracy levels vary by industry.

Figure 4: Numeracy levels and industry



Implications of low numeracy

PIAAC tells us:

- A close relationship between low proficiency in literacy and numeracy, low proficiency in problem solving in technology-rich environments, and limited familiarity with computers.
- Low proficiency in literacy and numeracy can be a significant barrier to using ICT applications to manage information, as poor literacy gets in the way of acquiring basic IT skills.
- If adults have some computer skills, those with poor literacy and numeracy skills will find it difficult to handle many of the information-management and information-processing tasks encountered in online environments.
- Policies to improve adults' ICT competence should focus as much on improving literacy and numeracy skills as on improving access to technology (OECD, 2015).

Analysis of ALL Survey data tells us⁶

- All industries reward higher numeracy. This is in addition to what is paid to people with qualifications, with the exception of agriculture, forestry and fisheries.
- Higher levels of numeracy have a greater positive effect on wages for women than for men. However females earn 13% less than males.

⁶ Earle, D. (2009). *Skills, qualifications and wages: An analysis from the Adult Literacy and Life Skills Survey*. Wellington: Ministry of Education.

- A one standard deviation increase in either prose literacy or numeracy results in just over a 10 percent increase in hourly wages (when holding qualifications constant).
- In construction and education and training numeracy is rewarded over and above educational qualifications.
- Numeracy is most highly rewarded in professional, technical and associate professional and trade worker occupations.

Other research tells us

- Findings from UK longitudinal studies show low numeracy impacts more on women than men in the labour market. The sorts of jobs they are attracted to e.g., managing accounts or using ICT demand numeracy skills.⁷
- Numeracy is important for maintaining employment and gaining opportunities to progress within jobs.⁸
- Low skills in literacy and numeracy also impact on people's financial literacy – i.e. their ability to understand financial matters and products, where to go for advice, and to understand products and services that meet their needs and are value for money. This means they run the risk of, for example, falling in to debt, not being able to keep track of their day-to-day finances.⁹
- Numeracy is linked to financial decision making. People have to make decisions about every day things such as having a mobile phone contract, a car, a credit card.¹⁰
- The research shows women are less likely than men to answer financial literacy questions correctly.¹¹
- However, when other factors are controlled for the biggest influence on financial literacy is strongly correlated to the parents' education (particularly the mother).¹²

Some things to think about for discussion at the Forum

- Implications of the above findings for our work?
 - Do employers realise the numeracy involved in job tasks? What are the ways we could make them more aware? What sorts of conversations do we have with employers about numeracy?
 - Do we pay enough attention to numeracy in our WPLN programmes?
 - The extent to which numeracy underpins digital literacy and financial literacy?
 - The extent to which we have a provider workforce with expertise in numeracy?

⁷ Parsons, S. & Bynner J. (2005). *Does numeracy matter more*. London: National Research and Development Centre.

⁸ *ibid*

⁹ Basic Skills Cymru. (2007). *Raising the level of literacy and numeracy in Wales through the context of financial literacy*. Cardiff: Author

¹⁰ Lusardi, A. (2012). *Numeracy, financial literacy, and financial decision-making*. NBER Working Paper No. 17821. Cambridge, MA: National Bureau of Economic Research.

¹¹ *ibid*

¹² *ibid*