



## Report on the Fourth Cycle of the Triennial National Assessment Program – Information and Communication Technology Literacy 2014

### Background

The fourth cycle of the triennial National Information and Communication Technology (ICT) Literacy Sample Assessment was conducted in October and November 2014.

The Western Australian sample included 795 Year 6 students from 46 public and private schools and 801 Year 10 students from 50 schools. Across Australia, a random sample of 5622 Year 6 students from 334 schools and 4940 Year 10 students from 315 schools participated in the assessment.

Each student completed four test modules each of 20 minutes duration and the student questionnaire of 10 minutes duration. In 94% of schools the assessments were delivered online.

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#### Key test findings

- Across Australia, ICT Literacy mean performance of students in Year 6 has declined significantly by 22 points (435 to 413 points) since 2011. The 2014 mean was also lower than 2008 but higher than in 2005.
- The percentage of Year 6 students achieving the proficient standard declined significantly between 2011 and 2014 from 62 to 55 per cent.
- The mean performance of Australian Year 10 students was 39 points lower than that of 2011(559 to 520 points) and statistically significantly lower than all previous cycles.
- Fifty-two percent of students in Year 10 achieved the proficient standard – significantly lower than in all previous NAP-ICT Literacy cycles.
- In comparison to 2011, the Western Australian mean score for Year 6 students in 2014 has declined from 424 to 404 points and for Year 10 students from 548 to 539 points. Neither of these declines was statistically significant.
- Western Australia's ranking in 2014 by mean of fifth in Year 6 and first in Year 10 compared to fifth in Year 6 and sixth in Year 10 in 2011.
- Fifty two percent of Western Australia's Year 6 students attained the Year 6 proficient standard – 7% fewer than in 2011. Fifty-seven per cent of Western Australia's Year 10 students attained the Year 10 proficient standard, equal second highest amongst the jurisdictions. Neither of these declines was statistically significant.
- Thus the national trends of declining performance were not as pronounced in Western Australia as in some other jurisdictions.
- While approximately half of young Australians are holding steady in their knowledge of ICT literacy, the remaining half have yet to meet the challenging, but achievable proficiency standard.
- Large differences in performance at both Year 6 and Year 10 were correlated with parental occupation and parental education.
- As in previous cycles, females performed better than male students.
- Metropolitan students performed better than non-metropolitan students.
- The continuing wide gap between Indigenous and non-Indigenous student achievement remains an area of significant concern.

- Investigation of the data, test instrument and test sampling and administration procedures provided no evidence to suggest that the decrease in student performance between 2011 and 2014 was caused by anything other than a decrease in students' ICT literacy.
- Possible interpretations of the Australia-wide decline in performance include:
  - An increased use of mobile technology devices has resulted in less emphasis on skills associated with information management and processing but more emphasis on communication. There is little empirical research into the impacts of the use of tablet devices on teaching and learning.
  - Schools have placed less emphasis on the teaching of skills associated with ICT literacy, with the development of young people's ICT literacy competencies increasingly being taken for granted.

#### **Key student questionnaire findings**

- Between 2011 and 2014 there has been a small decline in the frequency of computer use at home and an increase in the frequency of computer use at school.
- Patterns of computer use differ between home and school, with communications and entertainment applications used more frequently at home than at school.
- Few students were confident in undertaking more complex tasks such as database and website creations.
- A substantial proportion of students did not report (or did not remember) having learned about important ICT topics at school.
- A more comprehensive summary can be found in Appendix 1.

## Appendix 1:

### Additional information – Information and Communication Technology Literacy 2014

The fourth cycle of the triennial National Information and Communication Technology (ICT) Literacy Sample Assessment was conducted in October and November 2014.

The Western Australian sample included 795 Year 6 students from 46 public and private schools and 801 Year 10 students from 50 schools. Across Australia a random sample of 5622 Year 6 students from 334 schools and 4940 Year 10 students from 315 schools participated in the assessment.

In 94% of schools the assessments were delivered online. The remainder were delivered via USB devices attached to school computers.

The assessment for NAP-ICT Literacy included a combination of simulated and authentic software applications, multiple choice and text response items, grouped into nine modules. The six newly-developed modules covered skills such as working with tablet computers, using animation software and collaborating with other students. Each student was allocated four modules and a student questionnaire to complete. The assessment instruments were designed to mirror students' 'real world' use of ICT to determine their levels of confidence, creativity and skill development in the use of information and communication technologies.

Analysis of the questionnaire responses was used in the report to assist in explaining the performance of some groups of students.

The NAP-ICT Literacy scale, established in 2005, has been used for all four assessment cycles. The described scale comprises six proficiency levels that are used to describe the achievement of students both at Year 6 and Year 10. Each level description provides a synthesised overview of the knowledge, skills and understandings that a student working within the level is able to demonstrate.

### Results



Results are considered in terms of mean scores and the distribution of students across five proficiency bands. The Proficiency Standards represent points on the proficiency scale that represent a 'challenging but reasonable' expectation for typical Year 6 and Year 10 students to have reached by the end of each of these years of study. In general, Year 10 students are operating about one proficiency band higher than Year 6 students across the scale.

The Proficient Standard for Year 6 is 409 scale points, which is the boundary between Levels 2 and 3 on the NAP-ICT Literacy scale. The Proficient Standard for Year 10 is 529 scale points, which is the boundary between Levels 3 and 4 on the scale. Year 6 students performing at Level 3 or above and Year 10 students performing at Level 4 or above have met or exceeded their relevant proficient standard.

Level	Cut- point in scale score
Level 6	
Level 5	769
Level 4	649
Level 3	529
Level 2	409
Level 1	289

Cut points for proficiency levels

#### Key:

Year 10 proficient standard   
Year 6 proficient standard 

## Mean score

Across Australia ICT Literacy mean performance of students in Year 6 has declined significantly by 22 points (435 to 413 points) since 2011. The 2014 mean was also significantly lower than 2008 but higher than in 2005. The mean performance of Year 10 students was 39 points lower than that of 2011(559 to 520 points) and statistically significantly lower than all previous cycles.

In comparison to 2011, the Western Australian mean score for Year 6 students in 2014 has declined from 424 to 404 points and for Year 10 students from 548 to 539 points. Neither of these declines was statistically significant.

Western Australia's Year 6 mean score in 2014 was significantly lower than those of Victoria and South Australia and significantly higher than the Northern Territory.

Western Australia's Year 10 mean score was significantly higher than New South Wales, Queensland, South Australia and the Northern Territory.

Western Australia's ranking by mean of fifth in Year 6 and first in Year 10 compared to fifth in Year 6 and sixth in Year 10 in 2011.

## State and territory trends by mean scores and mean differences

### Year 6

	2014	2011	2008	2005	Difference (2014 - 2011)	Difference (2014 - 2008)	Difference (2014 - 2005)
New South Wales	412 (±12.0)	445 (±12.5)	413 (±14.5)	405 (±12.9)	-33 (±19.0)	0 (±23.3)	8 (±23.9)
Victoria	437 (±9.6)	448 (±9.3)	447 (±15.1)	424 (±13.7)	-11 (±15.5)	-10 (±22.5)	13 (±23.2)
Queensland	395 (±13.7)	415 (±14.0)	392 (±11.8)	370 (±12.3)	-21 (±21.0)	1 (±22.6)	24 (±24.4)
Western Australia	404 (±13.2)	424 (±13.5)	403 (±11.5)	379 (±10.8)	-19 (±20.5)	1 (±22.2)	25 (±23.4)
South Australia	421 (±10.3)	436 (±10.3)	439 (±12.5)	412 (±11.4)	-15 (±16.5)	-17 (±21.2)	9 (±22.2)
Tasmania	385 (±15.1)	405 (±12.4)	408 (±16.4)	404 (±19.4)	-19 (±21.0)	-23 (±26.1)	-19 (±29.4)
ACT	429 (±26.0)	466 (±22.8)	472 (±13.9)	428 (±22.1)	-36 (±35.5)	-43 (±32.5)	1 (±37.7)
Northern Territory	361 (±20.5)	367 (±37.5)	364 (±49.8)	346 (±53.7)	-6 (±43.5)	-3 (±55.6)	15 (±59.7)
<b>Australia</b>	<b>413 (±5.7)</b>	<b>435 (±5.7)</b>	<b>419 (±6.9)</b>	<b>400 (±6.3)</b>	<b>-22 (±11.3)</b>	<b>-6 (±16.3)</b>	<b>13 (±18.2)</b>

Confidence intervals are reported in brackets. Statistically significant differences in bold.

Confidence intervals include equating error

### Year 10

	2014	2011	2008	2005	Difference (2014 - 2011)	Difference (2014 - 2008)	Difference (2014 - 2005)
New South Wales	512 (±13.7)	565 (±12.8)	564 (±13.7)	551 (±13.1)	-53 (±20.3)	-52 (±23.7)	-39 (±24.8)
Victoria	532 (±14.3)	568 (±12.5)	569 (±18.1)	565 (±9.8)	-36 (±20.5)	-36 (±26.8)	-33 (±23.6)
Queensland	504 (±16.8)	553 (±9.5)	549 (±14.0)	547 (±11.6)	-49 (±20.9)	-44 (±25.8)	-42 (±26.0)
Western Australia	539 (±11.8)	548 (±10.8)	559 (±12.1)	535 (±11.8)	-10 (±17.8)	-20 (±21.8)	4 (±23.2)
South Australia	532 (±15.8)	552 (±14.8)	560 (±11.5)	547 (±11.0)	-20 (±23.0)	-29 (±23.8)	-16 (±25.1)
Tasmania	514 (±15.6)	534 (±15.5)	539 (±16.3)	538 (±11.8)	-19 (±23.3)	-25 (±26.4)	-24 (±25.3)
ACT	536 (±26.2)	582 (±16.1)	598 (±14.5)	572 (±17.8)	-47 (±31.7)	-62 (±32.9)	-36 (±35.5)
Northern Territory	501 (±19.9)	490 (±49.5)	466 (±71.5)	515 (±28.2)	11 (±53.9)	34 (±75.5)	-15 (±38.1)
<b>Australia</b>	<b>520 (±6.7)</b>	<b>559 (±5.7)</b>	<b>560 (±7.1)</b>	<b>551 (±5.7)</b>	<b>-39 (±11.8)</b>	<b>-40 (±16.8)</b>	<b>-31 (±18.3)</b>

Confidence intervals are reported in brackets. Statistically significant differences in bold.

Confidence intervals include equating error

## Proficient standard

In 2014, across Australia, 55% of Year 6 and 52% of Year 10 students reached or exceeded their respective proficient standards, Levels 3 and 4. This was a statistically significant decline of 6% (2011 to 2014) though significantly higher than in 2005 for Year 6. For Year 10 students there was a statistically significant decline of 13% from 2011 to 2014, as well as the 2008 (-14%) and 2005 (-9%) assessments.

In Western Australia the declines in percentages of students attaining the proficient standard at Year 6 (59 to 52%) and Year 10 (61 to 57%) between 2014 and 2011 were not statistically significant.

The percentage of Western Australia's Year 6 students in Level 1 (16%) is higher than the Australian percentage (14%) and in Level 3 (38%) lower the Australian percentage (42%). In contrast, Western Australia had the lowest percentage of Year 10 students (9%) in Level 2 or below and the highest percentage of students in Level 4.

## State and territory trends by proficient standard

### Year 6

	2014	2011	2008	2005	Difference (2014-2011)	Difference (2014-2008)	Difference (2014-2005)
New South Wales	55 (±4.9)	66 (±4.1)	55 (±5.7)	51 (±6.6)	<b>-11</b> (±6.9)	1 (±9.0)	5 (±10.1)
Victoria	64 (±4.5)	64 (±3.8)	66 (±6.5)	58 (±6.3)	1 (±6.5)	-2 (±9.2)	7 (±9.6)
Queensland	48 (±5.8)	55 (±4.8)	48 (±5.3)	38 (±5.3)	-7 (±7.9)	0 (±8.9)	10 (±9.3)
Western Australia	52 (±4.8)	59 (±5.5)	51 (±4.1)	40 (±5.4)	-7 (±8.1)	1 (±8.6)	12 (±9.8)
South Australia	59 (±4.3)	62 (±4.9)	64 (±5.3)	52 (±5.0)	-3 (±7.1)	-6 (±8.5)	7 (±8.8)
Tasmania	46 (±5.4)	51 (±5.5)	52 (±7.0)	49 (±9.0)	-6 (±8.0)	-6 (±9.8)	-3 (±11.6)
ACT	58 (±10.6)	74 (±8.3)	75 (±6.6)	58 (±12.5)	<b>-15</b> (±13.8)	<b>-17</b> (±13.4)	0 (±17.4)
Northern Territory	43 (±6.3)	42 (±9.2)	42 (±10.6)	36 (±10.0)	0 (±11.4)	1 (±12.9)	7 (±12.6)
<b>Australia</b>	<b>55 (±2.5)</b>	<b>62 (±2.0)</b>	<b>57 (±2.8)</b>	<b>49 (±3.0)</b>	<b>-6 (±4.2)</b>	<b>-1 (±6.1)</b>	<b>7 (±6.9)</b>

Confidence Intervals (1.96\*SE) are reported in brackets.

Because results are rounded to the nearest whole number some total may appear inconsistent.

Statistically significant differences in bold.

### Year 10

	2014	2011	2008	2005	Difference (2014-2011)	Difference (2014-2008)	Difference (2014-2005)
New South Wales	50 (±5.5)	66 (±5.3)	67 (±5.4)	61 (±7.6)	<b>-16</b> (±8.3)	<b>-17</b> (±9.6)	-11 (±11.5)
Victoria	55 (±5.9)	68 (±4.9)	70 (±6.7)	67 (±4.8)	<b>-13</b> (±8.1)	<b>-15</b> (±10.1)	<b>-11</b> (±9.5)
Queensland	47 (±5.6)	63 (±4.3)	62 (±6.2)	60 (±7.4)	<b>-16</b> (±7.5)	<b>-15</b> (±9.7)	<b>-13</b> (±11.0)
Western Australia	57 (±5.8)	61 (±4.0)	65 (±5.9)	56 (±6.1)	-4 (±7.9)	-8 (±10.1)	1 (±10.8)
South Australia	57 (±5.9)	63 (±5.6)	65 (±4.9)	61 (±5.4)	-6 (±8.7)	-7 (±9.3)	-4 (±10.0)
Tasmania	51 (±5.8)	54 (±7.1)	58 (±7.4)	56 (±6.4)	-4 (±9.7)	-7 (±11.0)	-6 (±10.9)
ACT	60 (±9.1)	72 (±7.0)	77 (±6.1)	66 (±11.4)	<b>-12</b> (±11.8)	<b>-17</b> (±11.9)	-5 (±15.5)
Northern Territory	43 (±9.1)	48 (±8.8)	46 (±13.4)	49 (±13.2)	-5 (±13.0)	-3 (±17.4)	-5 (±17.7)
<b>Australia</b>	<b>52 (±2.5)</b>	<b>65 (±2.3)</b>	<b>66 (±3.0)</b>	<b>61 (±3.1)</b>	<b>-13 (±4.5)</b>	<b>-14 (±6.5)</b>	<b>-9 (±7.3)</b>

Confidence intervals (1.96\*SE) are reported in brackets.

Because results are rounded to the nearest whole number some total may appear inconsistent.

Statistically significant differences in bold.

## Background characteristics

As this is a sample assessment, analysis and commentary on the effect of background factors is made at the Australian level only for all factors except for gender. Of the student characteristics that might affect student performance, those with the greatest effects on ICT literacy were socioeconomic group and Indigenous status.

**Parental background:** across Australia, parental occupation shows the same pattern of correlation with attainment of the proficient standard as in 2011. Students whose parents were in the 'senior managers and professionals group' scored between 79 (Year 6) and 70 (Year 10) scale points higher than those whose parents who were in the 'unskilled labourers, office, sales and service staff' group.

A difference of 100 score points in Year 6 and 93 points in Year 10 was evident when the highest level of education ('bachelor degree or above' compared to 'Year 9 equivalent or below') achieved by at least one parent was considered.

**Indigenous status:** as in previous years, the results from 2014 confirm that Indigenous students perform at a much lower level than non-Indigenous students. In Year 6, the difference in mean score is 99 points, and 22% of Indigenous students reached the proficient standard (non-Indigenous 57%). In Year 10, the difference in mean score is 94 points, with only 20% of Indigenous students reaching the proficient standard compared with 53% of non-Indigenous students.

**Gender:** as in previous years, females achieved higher levels of ITC literacy than males, both in terms of mean scores and percentage achieving the proficient standard. Western Australia was one of five states in Year 6 and four states in Year 10 where these differences were statistically significant. While in Year 6 the decreases in performance were similar between males and female, in Year 10 there was a noticeably larger decrease in performance among males (-47) since 2011 than among females (-31).

The national percentages of both males and females attaining the proficient standard declined significantly in both Year 6 and 10. This is despite the higher levels of use of, and stronger interest in, computers by males.

Patterns of computer use vary according to gender.

**Geolocation:** The geographic location of schools has a significant impact on performance in all tests, such that metropolitan students performed better than provincial students, who similarly performed better than students in remote schools.

**Background language and country of birth:** there were no differences in performance between students for whom a language other than English was spoken at home or between students who were born overseas and other students.

## Computer use at home and at school

Across Australia 98% of Year 6 students and 99% of Year 10 students had access to computers at home. NAP-ICTL 2014 showed a small decline in the frequency of computer use at home and an increase in the frequency of use at school since 2011. For both year groups, computers were used more frequently at home than at school, with Year 10 students being more frequent users than Year 6 students.

The proportion of students across Australia with five or more years of computing experience has risen from 62 to 64% (WA – 61%) from 2011 to 2014 for Year 6 students and from 76 to 84% (WA – 81%) for Year 10 students.

Students reported using computer-based entertainment applications more at home than at school. For Year 6 students the highest percentages of frequent use were reported for playing games (62%), downloading or streaming videos, music or podcasts (35%) and listening to music or watching DVDs (32%). The percentages for Year 10 students were – games – 52%, music/DVDs – 52% and downloading/streaming – 46%.

Communication applications were more frequently used at home than at school and by Year 10 students than Year 6 students.

While most students indicated they learnt about a number of ICT topics at school, substantial proportions did not report or did not remember to have learned about many of these topics. Most students reported less than weekly frequencies of computer use for school related purposes.

There are differences in the prevalence of frequent computer use at home (but not school) between metropolitan and non-metropolitan geolocations. These differences are also reflected between Indigenous and non-Indigenous students in Year 10 (not Year 6) as well as between student groups according to parental background.

### **Students' perceptions of using ICT**

Students indicated a high level of interest and enjoyment in using computers, with males more interested than females and Year 6 students more interested than Year 10 students.

The majority of students at both year levels agree that it is important to work with computers (83% in Year 6; 89% in Year 10) or that they like or enjoy using computers.

There was a direct correlation between ICT self-efficacy and ICT literacy, with the relationship stronger in Year 10 than Year 6 and among males than females. Parental occupation had no effect on ICT self-efficacy.

### **Interpreting the decline in achievement**

An investigation of the data, test instrument and test sampling and administration procedures provided no evidence to suggest that the decrease in student performance between 2011 and 2014 was caused by anything other than a decrease in students' ICT literacy.

The performance of students on the tasks used in both 2011 and 2014 showed that at each year level a lower proportion of students correctly responded to each of the tasks in 2014. Possible interpretations of the Australia-wide decline in performance include:

- the increased use of mobile technology devices has resulted in less emphasis on skills associated with information management and processing but more emphasis on communication. There is little empirical research into the impacts of the use of tablet devices on teaching and learning.
- schools have placed less emphasis on the teaching of skills associated with ICT literacy, with the development of young people's ICT literacy competencies increasingly being taken for granted.