National Assessment Program

ICT Literacy 2025

Technical Report

acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY

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List of acronyms

Acronym	Full form
AC	Australian Curriculum
ACARA	Australian Curriculum, Assessment and Reporting Authority
ACER	Australian Council for Educational Research
AI	artificial intelligence
AMS	ACER Marking System
ASGS	Australian Statistical Geography Standard
BYOD	bring your own device
CFA	Confirmatory Factor Analysis
CI	confidence interval
DIF	differential item functioning
DT	Digital Technology[1]
EFA	Exploratory Factor Analysis
ICT	information and communication technology
IEA	International Association for the Evaluation of Educational Achievement
IRT	item response theory
JRR	jackknife repeated replication
KPM	key performance measure
LBOTE	Language background other than English
MCEETYA	Ministerial Council on Education, Employment, Training and Youth Affairs
NAP	National Assessment Program
NAEP	National Assessment of Educational Progress
NAPLAN	National Assessment Program – Literacy and Numeracy
NAP–CC	National Assessment Program – Civics and Citizenship
NAP–ICT Literacy	National Assessment Program – Information and Communication Technology Literacy
NAP—SL	National Assessment Program – Science Literacy

[1] The use of the acronym "DT" in this report refers to the Digital Technology module content referenced in the NAP–ICT Literacy 2025 Assessment Framework. It is distinct from the Australian Curriculum: Digital Technologies subject. The former is always referred to in the singular (Digital Technology), while the latter is always used in plural form (Australian Curriculum: Digital Technologies).

Acronym	Full form
OARS	Online Assessment and Reporting System
OECD	Organisation for Economic Co-operation and Development
PISA	OECD's Programme for International Student Assessment
PCA	principal component analysis
POS	point-of-sale application
PMRT	Performance Measurement and Reporting Taskforce
SBD	student background data
SEIFA–IEO	Socio-Economic Indexes for Areas – Index of Education and Occupation
SCO	School Contact Officer
SQL	Structured Query Language
STEM	Science, Technology, Engineering and Mathematics
STSO	School Technical Support Officer
TA	Test Administrator
TIMSS	Trends in International Mathematics and Science Study
VR	virtual reality
WLE	weighted likelihood estimate

Terms used in this report

Term	Definition
AI tools	Refers to generative AI (e.g. ChatGPT, Microsoft Copilot) used by students for study or content creation.
Assessment platform	ACER's Online Assessment and Reporting System (OARS) enables the online delivery of the NAP–ICT Literacy assessment. The assessment platform is ISO/IEC 27001 certified and has qualified to be part of the Safer Technologies 4 Schools (ST4S) product badge program.
Block coding	Programming environments where code is constructed by dragging and dropping blocks, rather than writing text-based code (e.g. Scratch, Blockly).
Constructed response item	An assessment item that requires students to generate their own written answer, rather than selecting from provided options. This item type allows for the assessment of students' ability to articulate knowledge, reasoning or explanations in their own words.
Confidence interval	An estimate derived from a sample is subject to uncertainty because the sample may not reflect the population precisely. The extent to which this variation exists is expressed as the confidence interval. The 95% confidence interval is the range within which the estimate of the statistic based on repeated sampling would be expected to fall for 95 of 100 samples that might have been drawn. Confidence intervals are provided in each of the data tables in this report.
Correlation coefficient	A statistical measure that indicates the degree to which 2 variables are related. The values range between -1.0 (a perfect negative correlation) and 1.0 (a perfect positive correlation). A coefficient of 0.0 shows no linear relationship between the 2 variables being studied.
Dichotomous item	An assessment item that is scored as either correct (score of 1) or incorrect (score of 0).
Differential item functioning (DIF)	Refers to the phenomenon where test takers of a similar ability but who are members of different groups (e.g. gender, language background) are not equally likely to answer a particular item correctly. DIF is a property of items, and statistical evidence of DIF may possibly indicate that a test item is biased in favour of one group compared to another, and unrelated to test takers' actual ability in the domain.
Digital footprint	The record or trail left by the activities a person does online, including use of digital tools, which is referenced in the context of privacy and safety.
Digital Technologies	Digital Technologies is a subject in The Australian Curriculum: Technologies Foundation to Year 10, in which students use computational thinking and information systems to define, design and implement digital solutions for authentic problems.
Digital tools	Digital hardware, software, platforms and resources used to develop and communicate learning, ideas and information.

Term	Definition
Effect size	The difference between group means divided by the standard deviation. Effect size provides a comparison of the difference in average scores between 2 groups with reference to the degree in which the scores vary within the groups. When the effect size is large, it means that the difference between average scores is large relative to the spread of the scores. The difference could therefore be considered “important”. Conversely, when the effect size is small, it means that the observed difference is relatively small compared with the spread of the scores and thus arguably less “important”.
Equating	Refers to the process of constructing scores that are directly comparable across different test forms containing different test items. In the context of NAP, this involves using item response theory methods to place scores for different test forms onto a single established NAP scale.
Exempt	Students with very limited English language proficiency and students with significant intellectual or functional disabilities may be exempted from NAP sample testing.
Geographic location	The Australian Statistical Geography Standard (ASGS) Remoteness Structure is used to classify relative geographic remoteness across Australia. In this report, the 5 classes (major cities, inner regional, outer regional, remote and very remote) are collapsed into 3 classes (major cities, regional and remote) for the purposes of classifying the remoteness of individual schools.
ICT literacy	The ability to use ICT appropriately and safely to access, manage and evaluate information; develop new understandings; apply computational, design and systems thinking to create solutions; communicate and collaborate with others; and engage productively with emerging and future technologies.
Indigenous status	A student’s Indigenous status refers to whether a student identifies as being of First Nations Australian Aboriginal and/or Torres Strait Islander origin. The term “origin” is considered to relate to people’s First Nations Australian Aboriginal and/or Torres Strait Islander descent and for some, but not all, their cultural identity. A student who identifies as a First Nations Australian student is also considered to be of Aboriginal and/or Torres Strait Islander origin.
Item response theory	The Rasch model of item response theory is a psychometric model for analysing categorical data. It is the chosen model of analysis for cognitive and contextual data across all NAP sample assessments.
Jurisdiction	For the purposes of this report, jurisdiction refers to all 3 educational sectors (government, Catholic and independent) that sit within an Australian state or territory. The state/territory level is the most granular level of analysis undertaken for the purposes of NAP sample reporting.
Language other than English spoken at home	A language other than English spoken in the home by a student. If a student speaks more than one language other than English at home, the language other than English the student speaks most often is reported.

Term	Definition
NAP–ICT Literacy Assessment Framework	The overarching assessment design that describes the content to be assessed, the cognitive engagement that is expected of students, the types of assessment tasks, contextual information and overall structure of the assessment.
NAP–ICT Literacy scale	A continuous scale that provides a measure of student achievement in ICT literacy.
Parental education	The highest level of parental school or non-school education that a parent/guardian has completed. This includes the highest level of primary or secondary school completed or the highest post-school qualification attained. For the purposes of this report, where a student has parental education data for 2 parents/guardians, the higher of the 2 values is used.
Parental occupation	The occupation group that includes the main work undertaken by the parent/guardian. If a parent/guardian has more than one job, the occupation group that reflects their main job is reported. For the purposes of this report, where a student has parental occupation data for 2 parents/guardians, the higher of the 2 values is used.
Partial credit item	An assessment item in which different categories of student responses can be scored according to the degree of knowledge, skill or understanding they demonstrated. For partial credit items, students can receive a score between the minimum and maximum score points, instead of being limited to only correct or incorrect (dichotomous) scoring.
Percentage	A number or ratio that can be expressed as a fraction of 100. In this report, the percentages of students represented in the tables have been rounded and may not always sum to 100.
Plausible values	The estimates of student ability designed to be used to calculate group-level statistics such as averages. Multiple plausible values for each student's ability are drawn randomly from a distribution of scores based on the test data.
Percentage point	The unit of measurement used to describe the difference between 2 percentages.
Proficiency level	A defined range of the NAP–ICT Literacy scale that describes the knowledge and competencies that students at that level are capable of successfully demonstrating.
Proficient standard	A point on the scale that represents a "challenging but reasonable" expectation of student achievement at that year level.
Response rate	The percentages of sampled students that participated in the assessment. Response rates are calculated as the number of assessed students from whom data were recorded as a percentage of the total number of sampled students in the year level.
Sample	A subset of a population selected so that reliable and unbiased estimates of statistics for the full population can be inferred.
Sampling weight	The numbers associated with each individual student record in a data set (the "sample"). The weights are designed to be combined with test results such that the statistics calculated from the sample

Term	Definition
	will be representative of the wider Australian student population, rather than only applicable to the specific sample of students tested.
Scale score	A numerical value given to a student whose achievement has been measured by completing a NAP–ICT Literacy assessment. A student's scale score lies at a point somewhere on the NAP–ICT Literacy scale, and it indicates that student's level of achievement. The higher the scale score, the higher the student's ability.
Sector	The 3 educational sectors of government, Catholic and independent. All schools throughout Australia belong to one of these 3 school sectors. It is important to note that student responses for NAP sample assessments, in their most disaggregated form, are not analysed or reported by sector but are instead examined at the jurisdictional level.
Severe functional disability	A moderate to severe permanent physical disability that severely limits a student's capacity to participate in the test.
Severe intellectual disability	A mental or emotional disability and/or cognitive delay that severely limits a student's capacity to participate in the test.
Significant	In this report, the term "significant" refers only to differences that are statistically significant. The significant difference is the likelihood of a difference being a true reflection of the measured outcomes rather than the result of chance. Once a difference has been identified as statistically significant, the size of this difference (ranging from a small to very large effect size) can be considered.
Standard deviation	A measure of variability or dispersion in student scores from the mean (or average).
Standard error	A measure of uncertainty of the value of an estimated statistic, such as an average, a correlation or a proportion. The standard errors of statistics are used in the calculation of confidence intervals around statistics.
Test form	A collection of selected items sequenced, balanced and grouped together to measure a student's knowledge, skills and understanding of a subject area.
Trend module/item	A module (unit of items) or item (test question) used in at least one of the previous NAP–ICT Literacy assessment cycles.
Vertical link modules	Assessment modules designed to be used across multiple year levels to enable direct comparison.
Very limited assessment language proficiency	The student is unable to read or speak the language of the assessment and would not be expected to overcome the language barrier in the assessment situation. Typically, a student who had received less than one year of instruction in the language of the assessment would be excluded.
Weighted likelihood estimate	A statistical method used to estimate an individual student's achievement on the NAP–ICT Literacy scale.

Chapter 1: Introduction

The National Assessment Program

The National Assessment Program (NAP) was established to evaluate student achievement and track progress towards Australia's educational goals, first set out in the 1999 Adelaide Declaration on National Goals for Schooling in the 21st Century. As part of the NAP, ministers for education in Australia agreed to collect nationally comparable data across jurisdictions in 5 key domains: literacy, numeracy, science literacy, information and communication technology (ICT) literacy, and civics and citizenship.

Student achievement within NAP is measured and reported in the following ways.

Literacy and numeracy: assessed annually through NAPLAN, which includes all Australian students in Years 3, 5, 7 and 9.

Science literacy, civics and citizenship, and ICT literacy: assessed through NAP sample assessments, administered to representative samples of students in Years 6 and 10. Each of these domains is assessed on a rolling 3-year cycle.

These assessments are developed and managed by the Australian Curriculum, Assessment and Reporting Authority (ACARA), under the oversight of the Education Ministers Meeting. The NAP–ICT Literacy assessment, alongside NAP–Science Literacy (NAP–SL) and NAP–Civics and Citizenship (NAP–CC), supports ongoing measurement of progress towards the national education goals established in the Adelaide Declaration, and reaffirmed in the Melbourne Declaration (MCEETYA 2008) and the Alice Springs (Mparntwe) Education Declaration (2019). These declarations continue to underpin the NAP sample assessments.

Background to the NAP–ICT Literacy 2025 assessment

The NAP–ICT Literacy assessment was first conducted in 2005, with subsequent cycles in 2008, 2011, 2014, 2017, 2022, and 2025. The 5-year gap between 2017 and 2022 was due to disruptions caused by the COVID-19 pandemic.

The 2025 cycle marks the seventh national assessment of ICT literacy. Notably, the 2025 assessment was administered in May, a shift of 5 months from previous cycles, which were held in October. For this reason, changes in achievement between 2025 and previous cycles of the NAP–ICT Literacy assessment should be interpreted with some caution.

Sample

The NAP–ICT Literacy 2025 assessment was based on a nationally representative sample of 641[2] participating schools with 10,251 participating students, of which 5,498 were from Year 6 and 4,753 were from Year 10. The weighted national school response rate when including substitute schools was 90% for Year 6 and 82% for Year 10.

Sampling followed a 2-stage cluster sampling design to ensure that each eligible student had an equal chance of being selected in the sample. In the first stage of sampling, schools were selected from a list of all schools in each jurisdiction with a probability proportional to the number of students

[2] A total of 628 unique schools participated in the assessment. Of these, 16 schools administered the assessment to both Year 6 and Year 10 cohorts. For reporting purposes, each instance of a school participating at both year levels is counted separately – once for Year 6 and once for Year 10 – resulting in a total of 644 school entries. After excluding 3 schools that did not meet the required participation threshold, the final count of participating schools used for reporting is 641.

in the relevant year level enrolled at that school. In the second stage, 20 students[3] from each sampled school were selected with equal probability from a list stratified by gender for each target year level.

Stages of assessment development and implementation

For any large-scale assessment, careful planning is required to ensure the assessment is delivered effectively, and that the data collected can be accurately analysed and reported. For the NAP–ICT Literacy 2025 assessment, the process was organised into 6 clear stages.

1. **Review and revision of the assessment framework:** updating and refining the framework that underpins the assessment and specifies what is assessed.
2. **Development of assessment and questionnaire materials for trialling:** developing the contexts and content to be assessed to create the test modules to be used in a field trial. Student questionnaire content is also developed for trialling.
3. **Field trial implementation:** conducting a field trial in selected schools to test the assessment and questionnaire materials, as well as associated operational procedures.
4. **Analysis of field trial data and selection of final content:** using psychometric analysis to evaluate the field trial data and select the content for the main study assessment.
5. **Main study implementation:** administering the finalised assessment and questionnaire to a scientific sample of schools and students across Australia.
6. **Analysis and reporting of main study data:** analysing the results from the main study, preparing summary reports for schools and developing public reports to share the findings.

A description of, and approximate timeframe for, each of the 6 stages is provided in Table 1.1.

Table 1.1: Stages of NAP–ICT Literacy 2025 development

Stage	Description	Timeframe
Assessment framework review	• ACER, ACARA and the NAP–ICT Literacy Working Group worked together to review, revise and enhance the NAP–ICT Literacy assessment framework. • The framework is connected to AC: ICT Capability and AC: Digital Technologies v8.4 and is also coherent with developments in v9.0.	Nov 2023 – Apr 2024
Test development	• Eight new modules comprising a range of items and item types were developed to complement the inclusion of 4 secure trend modules[4] that had been used in previous cycles. • With input and guidance from ACARA and the working group, ACER reviewed the previous student questionnaires. Where possible, questions were retained without changes. However, given the rapidly evolving subject matter, certain edits were required to update wording and retain relevance to a 2025 audience. Other	Jan – Sep 2024

[3] Or up to 20 students when schools had fewer than 20 students in the year level.
[4] While all 4 trend modules were used for the 2025 main study, the field trial used only one of these trend modules, which was vertically linked between year levels (that is, the module was given to both Year 6 and Year 10 students).

Stage	Description	Timeframe
	questions were added so that themes such as students' internet reliability and use of AI tools could be explored. • Both the assessment and questionnaire content were authored in the assessment platform. Extensive quality assurance (QA) and user acceptance testing (UAT) was then performed across a variety of device types.	
Field trial	• A field trial was conducted in sampled schools to trial both the assessment/student questionnaire instruments and related operational procedures. • In total, 824 Year 6 students and 776 Year 10 students from 70 schools (35 for Year 6, 35 for Year 10) participated in the trial. • Schools in NSW, Vic, Qld, WA and SA were selected to participate to avoid burdening the comparatively oversampled schools from the smaller jurisdictions. • Trained Quality Monitors attended over 5% of test sessions in schools to provide feedback on adherence to test protocol, occurrence of technical issues and levels of student engagement. • A centre-based marking operation was implemented to score the extended response items or interactive items that could not be auto-marked. A total of 37 items – including the large task items, which consisted of several independently-scored components – were marked by a team of trained markers with rigorous quality assurance processes implemented.	**Test administration:** 16 Oct – 1 Nov 2024 **Marking operation**: 30 Oct – 11 Nov 2024

Item analysis and instrument revision	• All field trial data were consolidated, cleaned and processed in line with agreed data processing protocol.
	• All cognitive (assessment) and contextual (questionnaire) data were psychometrically analysed to determine the success of each item.
	• The NAP–ICT Literacy Working Group met to review the item analysis and discuss ACER's module- and item-level exclusion recommendations.
	• Main study item and module selection was confirmed, and final test forms were constructed. Test forms were designed to ensure:
	  ○ inclusion of vertical and historical links
	  ○ broad equity of content and difficulty
	  ○ rotation of module positions so every module appeared in each of the module positions (1 to 4) across the test design.
		Nov 2024 – Feb 2025

Stage	Description	Timeframe
Main study	• In total, 641 schools from across Australia participated in the main study. This included 328 schools at a Year 6 level and 313 at a Year 10 level.[5] • A total of 7 trialled modules[6] and 4 trend modules were incorporated into the main study instrument and administered across 16 test forms. • Trained quality monitors attended 36 test sessions in schools across all states and territories in Australia. Again, they reported back on test protocol adherence, technical issue occurrence and the level of student engagement in the assessment. • Trained centre-based markers marked all main study items that could not be auto-marked. A total of 43 items – including the large task items, which consisted of several independently-scored components – were marked, with rigorous quality assurance processes implemented.	**Test administration:** 5–30 May 2025 **Marking operation**: 25 May – 13 Jun 2025
Data analysis and public reporting	• All cognitive and contextual data were collated, cleaned, processed and analysed by psychometricians. • School summary reports were developed and distributed to participating schools at the beginning of Term 3. • Two reports were developed for publication. The NAP–ICT Literacy 2025 Public Report contains findings from the 2025 cycle including comparisons, where appropriate, with findings from previous assessment cycles. This NAP–ICT Literacy 2025 Technical Report provides more detailed information about the technical processes and analytical procedures applied in the study.	Jun 2025 – Feb 2026

Reporting the NAP–ICT Literacy 2025 results

The empirical scale

The empirical foundation of the NAP–ICT Literacy reporting scale was established using an item response theory (IRT) approach, specifically the Rasch model. The scale was initially developed in 2005, drawing on data from the first NAP–ICT Literacy assessment. For this inaugural cycle, the Year 6 cohort was assigned a mean scale score of 400 and a standard deviation of 100 scale score units. The corresponding Year 10 parameters were determined relative to the Year 6 cohort's achievement.

To ensure continuity and comparability across assessment cycles, the 2025 NAP–ICT Literacy assessment incorporated modules used in previous cycles. Common-item equating procedures, applied to these trend module items, enabled the recoding of 2025 results onto the original scale established in 2005. As a result, outcomes from the 2025 assessment are comparable with those from all prior cycles (2022, 2017, 2014, 2011, 2008 and 2005).

[5] For the purposes of reporting, schools that were sampled and participated at both year levels were included in both the Year 6 and Year 10 figures (that is, they were counted twice).
[6] During a field trial, some attrition is expected; occasionally, a module may not move forward to the main study if its item statistics fall below an acceptable level. This was the case for the field-trialled "Home Automation" module, which was excluded from the main study.

The proficiency levels and the proficient standard

One of the ways that student achievement in NAP–ICT Literacy is described is in terms of proficiency levels. Six proficiency levels were defined in 2005, based on the content and difficulty of assessment tasks. These levels are spaced at regular intervals across the reporting scale and characterise typical student performance at each stage. The introduction of new assessment modules in 2025 provided additional examples of ICT literacy achievement, which were incorporated into the progress map without necessitating substantial changes to the established scale descriptions.

Proficient standards were also set in 2005 for both Year 6 and Year 10. These standards represent points on the achievement scale that "represent a 'challenging but reasonable' expectation of student achievement at a year level with students needing to demonstrate more than elementary skills expected at that year level" (ACARA 2025, p. 5). Specifically, the Year 6 proficient standard is defined as the boundary between levels 2 and 3, while the Year 10 proficient standard is set at the boundary between levels 3 and 4.

In 2025, 50% of Year 6 students met or exceeded the Year 6 proficient standard, compared to 37% of Year 10 students who achieved or surpassed the Year 10 standard. Further details on student achievement and longitudinal comparisons are available in the NAP–ICT Literacy 2025 Public Report.

Purpose and structure of the technical report

This technical report serves as a companion to the NAP–ICT Literacy 2025 Public Report. While the public report provides a summary of the cognitive and contextual analysis of data collected in the NAP–ICT Literacy 2025 sample assessment, the primary purpose of this technical report is to detail the technical aspects of the assessment. It outlines the key activities undertaken in the design, sampling, data collection, analysis, and reporting phases.

The structure of this report is as follows:

Chapter 1 introduces the NAP–ICT Literacy 2025 assessment and provides an overview of the report's content.

Chapter 2 summarises the development of the assessment framework, and describes the processes involved in item development and instrument construction.

Chapter 3 outlines the sample design and sampling process, including the weighting procedures used to derive population estimates and calculate response rates.

Chapter 4 details the data collection, processing, and management procedures, including the implementation of strict data security protocols and the various methods of data capture employed before, during, and after assessment administration. It also describes the procedures for data transfer, tracking, verification, cleaning, and transformation.

Chapter 5 describes the scaling model and procedures, item calibration, the creation of plausible values and the standardisation of student scores. It also discusses the procedures for horizontal equating across assessment cycles and the estimation of equating errors.

Chapter 6 outlines the NAP–ICT Literacy 2025 proficiency levels and proficient standards.

Chapter 7 describes the reporting of student results, including the procedures used to estimate sampling and measurement variance for NAP–ICT Literacy 2025.

Chapter 2: Assessment framework and instrument design

The primary aim of the NAP–ICT Literacy assessment is to systematically monitor, measure and report on trends in ICT literacy achievement among Year 6 and Year 10 students nationwide. The findings from this assessment serve as a key resource for understanding the extent of Australian students' knowledge, skills and capabilities in the domain of information and communication technology. It is designed to assess students' cognitive proficiency in ICT by examining both their foundational knowledge and their ability to apply this knowledge in practical, real-world digital contexts.

Beyond measuring students' technical understanding, the NAP–ICT Literacy assessment also evaluates a range of skills essential for students in the contemporary world. These include the capacity to critically analyse, assess and make informed decisions about digital information, tools and emerging technologies.

In addition to the assessment of ICT knowledge and skills, students complete a questionnaire that explores their attitudes towards, and engagement with, digital tools both within and outside the school environment. The analysis of student achievement in ICT literacy is supported by incorporating background data such as demographic characteristics, geographic location and school size – factors that are carefully considered during the sampling process. This approach enables a nuanced examination of the contextual influences that shape students' educational outcomes in ICT literacy.

The NAP–ICT Literacy assessment framework

The NAP–ICT Literacy 2025 Assessment Framework provides the conceptual, technical and operational basis for assessing ICT literacy in Years 6 and 10. Developed collaboratively by ACER and ACARA, the framework specifies the construct to be measured; organises content into strands and aspects; establishes links to the Australian Curriculum; and sets out the design parameters for items, modules, scoring and reporting. It preserves continuity with prior cycles while incorporating updates that reflect technological change and curriculum developments, including the collection of contextual data via the student questionnaire to support robust national and jurisdictional reporting.

Defining ICT Literacy

For the purposes of NAP–ICT Literacy, ICT literacy is defined as:

> The ability to use ICT appropriately and safely to access, manage and evaluate information; develop new understandings; apply computational, design and systems thinking to create solutions; communicate and collaborate with others; and engage productively with emerging and future technologies.
>
> ACARA 2024:9

This definition adopts a contemporary, broad view that encompasses technical proficiency, higher-order thinking, creativity, collaboration and ethical practice, and is one that reflects the Australian Curriculum: ICT Capability and Australian Curriculum: Digital Technologies.

What does NAP–ICT Literacy measure?

NAP–ICT Literacy measures how effectively students apply ICT knowledge and skills in realistic, problem-focused contexts. The assessment uses modules that emulate tasks such as creating digital products, analysing and visualising data, designing and refining algorithms or interfaces, and responding to scenarios involving online safety and responsible use. Performance is summarised on a 6-level proficiency scale and is complemented by questionnaire-based contextual information (for example, access to devices, patterns of use, attitudes and experiences). This enables analysis of trends and subgroup differences at national and jurisdictional levels.

NAP–ICT Literacy strands and aspects

NAP–ICT Literacy content is organised into 4 interrelated strands that reflect the conceptual structure of ICT literacy as articulated in the 2025 framework. These strands are coherent with the approach used in previous cycles and provide stable anchors for longitudinal reporting.

Strand 1. Understanding ICT and digital systems

- **Aspect 1.1: Managing information and operating ICT**
  Involves knowledge of software interface conventions, file systems, databases, productivity software and networked communication. Students demonstrate the ability to operate digital tools, manage information and use software features to complete tasks.
- **Aspect 1.2: Understanding digital systems**
  Focuses on understanding how digital systems operate at different levels of abstraction, including the principles of data representation, algorithms, and the functioning of software and hardware components.

Strand 2. Investigating and planning solutions with ICT

- **Aspect 2.1: Accessing and evaluating information**
  Involves identifying information needs, locating and evaluating sources, and understanding how digital information is created, distributed and consumed.
- **Aspect 2.2: Collecting and representing data**
  Covers protocols for collecting, validating, organising and storing data, as well as representing data in various forms (for example, tables, graphs, simulations).
- **Aspect 2.3: Formulating problems and planning solutions**
  Includes decomposing problems, planning solutions and establishing criteria for evaluating outcomes, with attention to user needs and context.

Strand 3. Implementing and evaluating digital solutions

- **Aspect 3.1: Communicating with digital information products**
  Encompasses the creation of digital products (documents, presentations, websites, videos) for specific audiences and purposes, integrating information, design and communication skills.
- **Aspect 3.2: Developing algorithms, programs and interfaces**
  Involves designing and implementing algorithms, programs and user interfaces to solve problems or optimise solutions, including evaluation against requirements and user needs.

Strand 4. Applying safe and ethical protocols and practices when using ICT

- **Aspect 4.1: Safe and responsible information consumption with ICT**
  Focuses on personal safety, data security and responsible use of digital information, including understanding risks such as phishing, privacy breaches and algorithmic bias.
- **Aspect 4.2: Responsible digital solution and information production with ICT**
  Addresses social, legal and ethical issues in digital production, such as cyberbullying, copyright, attribution, and the responsible design and testing of digital solutions.

Together, the strands and aspects ensure comprehensive coverage of ICT literacy and **links with the Australian Curriculum, supporting valid measurement and interpretation across cycles.**

Assessment instrument

The NAP–ICT Literacy assessment instrument, first developed in 2005, has maintained a consistent design across all assessment cycles. Delivered entirely online, the assessment comprises interactive modules that simulate authentic ICT use, mirroring how students engage with digital tools in both educational and everyday contexts.

Each module is built around a single, relevant theme to maximise student engagement. Modules begin with a series of simulated performance tasks, multiple-choice and short constructed response items. Each concludes with an integrated "large task" requiring students to use a simulated software application to produce a digital solution. Solutions may include information products (for example, presentations, posters, videos) or programmatic outputs (for example, algorithms, visual coding, simulations). The software interfaces are designed to reflect familiar digital environments, enhancing authenticity for students.

In 2025, the assessment included 11 distinct modules. Each student completed 4 modules, assigned using a balanced design to ensure equal representation of each module and position across the sample. Students were allocated up to 20 minutes per module, with timing managed by the assessment platform.

Modules were classified as either "ICT" (Information and Communication Technology) or "DT" (Digital Technology), based on the nature of the problem-solving required. ICT modules focused on information literacy and communication, while DT modules addressed real-world problems requiring the design and implementation of digital solutions. All modules required students to investigate, plan, execute and evaluate their digital responses to defined problems.

New and trend modules

Seven new modules were developed for the 2025 cycle to ensure alignment with current technological trends and educational priorities. These modules broadened the scope of ICT literacy assessment, incorporating diverse contexts, digital processes, and software applications reflective of contemporary developments in ICT and DT.

To enable longitudinal analysis, 4 modules in the 2025 assessment were trend modules, reused from previous cycles. Two were specific to either Year 6 or Year 10, while 2 served as vertical link modules, administered at both year levels.

Whilst the contexts and content of the modules selected for use as trend were checked for continued relevance to a 2025 audience, psychometric analysis of student responses to the School Website module showed that some of the tasks performed differently in 2025 when compared to previous cycles. For this reason, this module was not used for equating across cycles. This is discussed further in Chapter 5.

Each of the modules used in the 2025 assessment instrument is outlined in Table 2.1.

Table 2.1: Summary of assessment modules used in NAP–ICT Literacy 2025

Module name	Year level	Domain	New or trend	Module content and context
RoboDog	Y6 only	DT	Trend	• Simulate and test robotic components and control systems • Design web forms for user feedback • Operate a digital remote controller
Water Quality	Y10 only	DT	Trend	• Analyse data using flowcharts and charts • Infer missing values and classify data with formulas and algorithms
Fundraiser	Y6 & Y10	ICT	Trend	• Manage and evaluate online information • Conduct and interpret surveys • Create presentations from multiple sources
School Website	Y6 & Y10	ICT	Trend	• Analyse website analytics and recommend navigation improvements • Build a promotional webpage and event registration form
Restaurant Design	Y6 only	DT	New	• Configure a point-of-sale (POS) system for a restaurant • Design a digital sales interface and customise a floor plan
Tech on the Go	Y6 only	ICT	New	• Use a tablet for travel-related digital tasks • Apply privacy, security, and online safety settings • Edit and improve a blog post using built-in tools
Canteen Congestion	Y10 only	DT	New	• Collect, organise, and store canteen data digitally • Present data using icons, graphs, flowcharts, or video simulations
Web Survey	Y10 only	DT	New	• Conduct and validate a web-based survey • Analyse and format survey data using spreadsheets
Getting There	Y6 & Y10	ICT	New	• Use online maps to plan routes and search locations • Apply map features to solve location-based tasks
Digital Photography	Y6 & Y10	ICT	New	• Access, edit, and share photos using ICT tools • Edit images with a simplified photo-editing program
Outdoor Adventures	Y6 & Y10	DT	New	• Evaluate website navigation and design • Analyse user data and propose improvements to site structure

Response formats and types of assessment tasks

The 2025 assessment modules outlined in Table 2.1 use a broad range of response formats including:

- multiple-choice
- drag-and-drop (matching information)
- simple software commands (such as saving a file to a location)
- short constructed text responses
- construction of information products
- development of algorithms
- simulation experiments.

Table 2.2 outlines the different types of tasks used within the 2025 modules along with their typical response formats and deployment context within the instrument.

Table 2.2: NAP–ICT Literacy assessment task types

Task type	Description
Information-based response tasks	• Use multiple-choice, short constructed response and drag-and-drop formats. • Assess understanding of ICT concepts (e.g. credibility of a webpage, software features, algorithmic processes). • Based on non-interactive digital scenarios or systems. • Focus on cognitive understanding, not technical execution. • Autoscoring for multiple-choice and drag-and-drop. • Constructed responses marked by trained human markers using detailed scoring rubrics.

Skills tasks	• Delivered through simulated software environments.
	• **Linear skills tasks:**
	  ○ require commands in a fixed sequence
	  ○ assess point-in-time knowledge
	  ○ Limited to one retry, with no feedback
	  ○ give full credit for correct execution using any valid method.
	• **Nonlinear skills tasks:**
	  ○ allow multiple valid approaches
	  ○ emphasise planning, judgement and problem-solving
	  ○ No confirmation or system feedback provided

Authoring tasks	• Use live software tools (e.g. word processors, spreadsheets, databases, presentation or multimedia software). • Require students to create or modify digital content. • Tasks involve selecting, integrating and reframing information for a defined communicative purpose. • Real-time system feedback and full software functionality available.

- Students manage their own time, with guidance to reserve a certain amount of time for the authoring task.

Visual coding tasks	• Use a drag-and-drop coding interface similar to popular visual programming tools.
	• Code execution is shown visually (e.g. line graphics, avatars, user interface elements).
	• Block types include:
	  ○ action commands (e.g. *change background*)
	  ○ conditionals (*if–do*, *if–else*)
	  ○ comparison operators (*greater than*, *equal to*)
	  ○ logical operators (*AND*, *OR*, *NOT*),

Questionnaire

Understanding the contexts in which students interact with ICT, both within and beyond the school environment, is essential for interpreting ICT literacy outcomes. To address this, the NAP–ICT Literacy assessment has incorporated a student questionnaire since its inception in 2005. The questionnaire is designed to collect data on students' experiences, behaviours and attitudes relating to ICT use for both educational and personal purposes.

The original questionnaire, introduced in 2005, was developed to align with the NAP–ICT Literacy Assessment Framework and focused on gathering contextual information about students' ICT experience, frequency and types of use, and attitudes towards ICT. Since then, the questionnaire has been periodically reviewed and updated by ACER, in collaboration with the NAP–ICT Literacy Working Group and ACARA curriculum experts, to ensure ongoing relevance and responsiveness to evolving patterns of ICT use.

Over successive assessment cycles, the questionnaire has expanded to capture information on:

- length of time students have used digital tools
- types of digital tools used at school and outside school
- access to and provision of portable digital tools at school
- frequency of digital tool use in different settings
- attitudes towards the importance of using digital tools
- confidence in completing tasks using digital tools
- frequency of ICT use for study, entertainment and communication
- engagement in technological tasks and ICT-related learning activities
- participation in school-related digital tool activities.

The 2025 questionnaire introduced several significant updates to reflect contemporary developments and terminology:

- the term "ICT devices" was replaced with "digital tools" to align with Australian Curriculum v9.0
- software references were updated to reflect current usage

- social media–related content was removed for Year 6 students, recognising age restrictions on major platforms[7]
- new items were added to collect data on:
    - ICT access and internet reliability at home
    - student use of AI tools, evaluation of AI-generated content and referencing digital content
    - engagement with app creation and text-based programming
    - awareness of privacy concerns and managing a digital footprint
    - use of varied presentation methods
    - responsible use of social media (Year 10 only)
    - teacher adoption of new technologies and apps.

The questionnaire is administered to all participating Year 6 and Year 10 students immediately following the assessment. It is designed to be completed in approximately 15–20 minutes but is untimed to accommodate individual student needs.

A copy of the student questionnaire can be found in Appendix A.

[7] Social media items for Year 10 students were retained in the 2025 questionnaire instrument as, at the time of the assessment, the proposed Australian legislation to restrict social media access for individuals under the age of 16 had not yet come into effect.

Chapter 3: Sampling and weighting

This chapter describes the sample design and implementation phases of the NAP–ICT Literacy 2025 main study. It outlines the procedures used to select participating schools and students, describes the characteristics of the achieved sample, and explains the methods applied to calculate sampling weights. These sampling and weighting procedures were designed to ensure that the assessment data accurately represent achievement outcomes for Australian Year 6 and Year 10 student populations. Information regarding the sampling approach used for the field trial is presented separately in Chapter 4.

Sampling

The target populations for NAP–ICT Literacy 2025 were Year 6 and Year 10 students enrolled in schools across Australia. To ensure robust and representative estimates, a two-stage stratified cluster sampling design was employed, consistent with methodologies used in other Australian national sample assessments and international studies such as the Trends in International Mathematics and Science Study (TIMSS).

First sampling stage: school selection

Schools were selected from ACARA's Australian Schools List, which is a comprehensive and quarterly updated register of all schools and campuses in Australia. Both the field trial and main study samples were draw in April 2024, with the most up to date version of the list provided to ACER by ACARA. The sampling frame was explicitly stratified by state or territory and school sector, with independent samples drawn for each stratum. Within each explicit stratum, schools were implicitly stratified by the following variables:

- school type (primary, secondary, combined)
- NAPLAN performance quintile (from lowest to highest fifth)
- Socio-Economic Indexes for Areas – Index of Education and Occupation (SEIFA–IEO) [8]
- Australian Statistical Geography Standard (ASGS) remoteness classification (Major Cities, Inner Regional, Outer Regional, Remote, Very Remote) [9]
- enrolment size at the target year level (Year 6 or Year 10).

School exclusions

At the time of sampling, students from excluded schools accounted for 2.4% of the Year 6 student population and 3.4% of the Year 10 student population. School exclusions from the target population included:

- very remote schools in all jurisdictions except the Northern Territory
- schools with fewer than 5 students in the target year level
- non-mainstream schools.[10]

Very remote schools were included in the Northern Territory sample due to their substantial representation in the population, a procedure consistent with previous NAP–ICT Literacy cycles. In total, very remote schools comprised 20.1% of the Year 6 population and 14.1% of the Year 10

[8] This is a measure of the socio-economic status based on the socio-economic conditions, such as education and employment, of the geographic location of the school.
[9] This is a measure of geographic location of the school.
[10] "Non-mainstream" includes schools such as correctional schools, schools with a non-English curriculum (for example, French immersion schools), language schools, special schools, schools for distance education (including Schools of the Air), hospital schools, short-term provision (for example, environmental education support centre), mature age and preschools (all enrolments below year 0).

population in the Northern Territory. The inclusion of these very remote schools had a negligible impact on national and state/territory estimates.

After the initial school sample was drawn, any schools meeting exclusion criteria (and their substitutes) were removed from the sample and excluded from response rate calculations. For NAP–ICT Literacy 2025, this resulted in the removal of 3 Year 6 schools and 4 Year 10 schools, with these exclusions accounted for in the exclusion rates reported earlier.

School sampling method

Sample sizes for both Year 6 and Year 10 were determined to ensure precise estimates of achievement outcomes for all states and territories. In advance of data collection, the expected 95% confidence intervals for estimated means in the larger states were targeted to fall within approximately ±0.15 to ±0.2 of the population standard deviation. This level of precision was selected to balance the analytical requirements of the study, the burden placed on participating schools and the overall costs of implementation.

To achieve this precision, an effective sample size of approximately 100–150 students[11] per large state was required. For smaller states and territories, proportionally smaller sample sizes were considered sufficient due to their relatively small student populations.

The sample design for NAP–ICT Literacy 2025 was a stratified cluster sample. Prior to sampling, schools were explicitly stratified by state and sector, resulting in 24 explicit strata for both Year 6 and Year 10. Within each stratum, schools were ordered by school type, NAPLAN performance quintile, SEIFA–IEO, ASGS remoteness classification, and enrolment size at the target year level. Systematic selection of schools ensured these variables functioned as implicit stratifiers.

Schools were selected using a systematic probability-proportional-to-size (PPS) method. For large schools, the measure of size (MOS) was equal to the enrolment at the target year level. To minimise variation in sampling weights, the MOS for very small schools (5–9 students) was set to 10, and for small schools (10–19 students) was set to 20.

After sorting the sampling frame according to the implicit stratification variables, the PPS selection process involved:

- accumulating the MOS across schools to calculate the total population size
- dividing the total cumulative MOS by the number of schools to be sampled to determine the sampling interval
- selecting the first school using a random number within the sampling interval and subsequently selecting additional schools by incrementally adding the sampling interval to the previous selection number, resulting in a PPS sample of the required size.

An analysis of small schools (those with fewer than 20 students in the target year level) was conducted prior to sampling. Based on this analysis, the school sample size in some strata was increased to ensure the number of students sampled closely matched expectations. As a result, the final number of schools sampled was 332 for Year 6 and 320 for Year 10. In each instance, these are referred to as the “target sample”.

Table 3.1 and Table 3.2 present the total student enrolment, target school populations and target school samples for each state and territory in Year 6 and Year 10, respectively.

[11] The effective sample size is the sample size of a simple random sample that would produce the same precision as that achieved under a complex sample design.

Table 3.1: Year 6 target population and target samples by state and territory

State/territory	Y6 enrolment	Y6 schools in population	Y6 target sample
NSW	99,672	2,122	51
VIC	79,243	1,705	51
QLD	68,087	1,178	51
SA	21,405	540	48
WA	34,482	763	47
TAS	6,472	201	42
NT	3,198	111	22
ACT	5,927	102	20
Aust.	318,486	6,722	332

Table 3.2: Year 10 target population and target samples by state and territory

State/territory	Y10 enrolment	Y10 schools in population	Y10 target sample
NSW	97,111	821	50
VIC	78,198	581	50
QLD	66,467	501	50
SA	21,680	201	50
WA	32,722	266	50
TAS	6,357	82	35
NT	2,616	51	15
ACT	5,703	43	20
Aust.	310,854	2,546	320

Substitute schools

As each school was selected for the sample, the next school in the sampling frame was designated as the first substitute, to be included if the originally sampled school did not participate. Where possible, the adjacent school immediately preceding the sampled school in the frame was designated as the second substitute,[12] and was used if neither the sampled school nor the first substitute participated. Due to the stratified sampling design, both substitute schools aim to be as similar as possible to the originally sampled school in terms of geographic location, socio-economic status, NAPLAN performance and enrolment size, ensuring broad comparability within the sample.

Second sampling stage: student selection

The second stage of sampling involved the systematic selection of 20 students within each participating school from a list of all eligible students at the target year level, sorted by gender. This approach ensured that the gender distribution of sampled students reflected the distribution within the school. In cases where fewer than 20 eligible students were enrolled in the target year level – such as in smaller schools – all students in that year level were selected to participate.

[12] Substitute schools must be adjacent to the sampled schools but also cannot be themselves sampled schools. That is why in some cases (such as primary schools in the Northern Territory), there were not enough schools available for 2 substitutes to be drawn, or no schools at all. In these cases, only one substitute school, or no substitutes, were allocated.

Student exclusions

In each of the sampled schools, individual students were exempted from the assessment if they met any one of the following criteria:

- severe functional disability: a moderate to severe permanent physical disability that severely limits a student's capacity to participate in the test
- severe intellectual disability: a mental or emotional disability and/or cognitive delay that severely limits a student's capacity to participate in the test
- very limited assessment language proficiency: The student is unable to read or speak English proficiently and would not be expected to overcome the language barrier in the assessment situation. Typically, a student who had received less than one year of instruction in English would be excluded.

Table 3.3 and Table 3.4 present the numbers and percentages of students excluded from the NAP–ICT Literacy 2025 assessment, classified by the reason for their exclusion. In total, 140 student-level exclusions occurred at Year 6 and 196 student exclusions occurred at Year 10, corresponding to weighted exclusion rates of 1.9% for sampled Year 6 students and 3.2% for sampled Year 10 students.

Table 3.3: Year 6 breakdown of student exclusions according to reason by state and territory

State/territory	Functional disability	Intellectual disability	Limited language proficiency	Not specified	Total	Weighted proportion of Y6 sampled students
NSW	1	16	2	3	22	1.6%
VIC	2	7	2	2	13	1.4%
QLD	5	7	2	3	17	1.4%
SA	5	12	7	4	28	2.6%
WA	5	5	1	1	12	1.3%
TAS	3	12	1	8	24	2.9%
NT	1	2	3	5	11	2.9%
ACT	1	4	1	7	13	3.4%
Aust.	23	65	19	33	140	1.9%

Table 3.4: Year 10 breakdown of student exclusions according to reason by state and territory

State/territory	Functional disability	Intellectual disability	Limited language proficiency	Not specified	Total	Weighted proportion of Y10 sampled students
NSW	4	13	5	18	40	5.1%
VIC	7	7	7	3	24	3.0%
QLD	3	6	4	7	20	1.7%
SA	8	25	6	7	46	5.1%
WA	1	7	6	1	15	1.1%
TAS	2	13	2	1	18	2.2%
NT	0	12	3	5	20	10.5%
ACT	8	4	0	1	13	2.3%
Aust.	33	87	33	43	196	3.2%

Weighting

The two-stage stratified cluster sampling design employed in NAP–ICT Literacy 2025 enabled efficient and effective data collection within the school environment. However, oversampling of specific sub-populations and non-response can result in differential probabilities of selection for individual students. As a consequence, each student in the assessment does not necessarily represent the same number of students in the population, unlike in a simple random sample.

To account for these differential probabilities and to ensure unbiased population estimates, a sampling weight was calculated for each participating student. The provision of accurate sampling weights is a critical feature of the sample design, as these weights are necessary for the computation of valid population estimates.

The overall sampling weight assigned to each student is the product of 2 components:

First stage: the inverse of the probability of selection of the school

Second stage: the inverse of the probability of selection of the student within the sampled school.

First-stage weight

The first-stage sampling weight is calculated as the inverse of the probability of selection of the school, with an adjustment for school non-response within each explicit stratum.

The probability of selection for a school is determined by dividing its measure of size (MOS) by the sampling interval (SINT) or set to one if the MOS exceeds the sampling interval. Thus, schools with a MOS greater than the SINT have a selection probability of one.

The sampling interval is calculated at the time of sampling, and for each explicit stratum it is equal to the cumulative MOS of all schools in the stratum, divided by the number of schools to be sampled from that stratum.

The first factor of the first-stage weight, or the school base weight (BW_{sc}), was the inverse of this probability:

$$BW_{sc} = \frac{SINT}{MOS}$$

Following data collection, counts of the following categories of schools were made for each explicit stratum:

- the number of schools that participated (n_p^{sc})
- the number of schools that were sampled but should have been excluded (n_x^{sc})
- the number of non-responding schools (n_n^{sc}).

Note that $n_p^{sc} + n_x^{sc} + n_n^{sc}$ equals the total number of sampled schools from the stratum.

Examples of the second category (n_x^{sc}) were:

- a sampled school that no longer exists
- a school that, following sampling, was discovered to fit one of the criteria for school-level exclusion (for example, very remote, for schools outside the Northern Territory, or very small), but which had not been removed from the frame prior to sampling.

In the case of the non-responding schools (n_n^{sc}), neither the originally sampled school nor its substitutes participated. Schools with a student response rate of less than 25% were also considered to be non-responding schools.

Within each explicit stratum, an adjustment was made to account for school non-response. This non-response adjustment (ASC) for a stratum was equal to:

$$ASC_{strt} = \frac{\left(n_p^{sc} + n_{nr}^{sc}\right)}{n_p^{sc}}$$

The first-stage weight, or the final school weight, was the product of the base weight of the school and the school non-response adjustment:

$$FW_{sc} = BW_{sc} \times ASC_{strt}$$

Second-stage weight

Following data collection, counts of the following categories of students were made for each sampled school:

- the number of students at the relevant year level (n_{tot}^{st})
- the number of students who participated (n_p^{st})
- the number of sampled students who were exclusions (n_x^{st})
- the number of non-responding sampled students (n_n^{st}).

Note that $n_{samp}^{st} = n_p^{st} + n_x^{st} + n_n^{st}$ equals the total number of sampled students from the sampled school.

The first factor in the second-stage weight was the inverse of the probability of selection of the student from the sampled school.

$$BW_{st} = \frac{n_{tot}^{st}}{n_{samp}^{st}}$$

The student-level non-response adjustment was calculated for each school as:

$$AST_{sc} = \frac{\left(n_p^{st} + n_n^{st}\right)}{n_p^{st}}$$

The final student weight was:

$$FW_{st} = BW_{st} \times AST_{sc}$$

Overall sampling weight

The overall sampling weight (FWTOT) was the product of the weights calculated at each of the 2 sampling stages:

$$FWTOT = FW_{sc} \times FW_{st}$$

After computation of the overall sampling weights, the weights were checked for outliers that would have a large effect on the computation of the standard errors. A weight was regarded as an outlier if the value was more than 4 times the median weight within an explicit stratum. Weights exceeding this threshold were trimmed to 4 times the median weight. The final, trimmed weight was:

$$WT2025 = FWTOT_{trimmed}$$

Response rates

For the purposes of response rate calculation, a school was considered to be participating if it achieved a student response rate of at least 50%. Schools with student response rates of less than 50%, as well as students within those schools, were assigned a weight of zero for response rate calculations.[13]

To provide a comprehensive picture of school and student participation, response rates were calculated in 2 ways.

1. **Including substitute schools:** substitute schools that replaced originally selected schools were counted as participants.
2. **Excluding substitute schools:** only the originally selected schools were counted as participants; substitute schools were not included.

Each of these rates was calculated using both unweighted and weighted counts. Regardless of the method used, school and student response rates were computed, and the overall response rate was defined as the product of these 2 rates. The differences in the computation of the 4 response rates are described below. These procedures are consistent with the methodology used in TIMSS (Olson, Martin and Mullis 2013) and other international large-scale surveys.

Unweighted response rates including substitute schools

The unweighted school response rate, where substitute schools were counted as participating schools, was computed as follows:

$$RR_1^{sc} = \frac{n_s^{sc} + n_{r1}^{sc} + n_{r2}^{sc}}{n_s^{sc} + n_{r1}^{sc} + n_{r2}^{sc} + n_{nr}^{sc}}$$

where n_s^{sc} is the number of responding schools from the original sample, $n_{r1}^{sc} + n_{r2}^{sc}$ is the total number of responding substitute schools and n_{nr}^{sc} is the number of non-responding schools that could not be replaced.

[13] While schools with within-school response rates of less than 50% were deemed to be non-participants for the purposes of response rate calculation, students from schools with response rates of between 25% and 50% were still retained in the data set for analysis.

The student response rate was computed over all responding schools. Of these schools, the number of responding students was divided by the total number of eligible, sampled students:

$$RR_1^{st} = \frac{n_s^{st} + n_{r1}^{st} + n_{r2}^{st}}{n_s^{st} + n_{r1}^{st} + n_{r2}^{st} + n_{nr}^{st}}$$

where n_s^{st} is the total number of responding students in sampled schools, $n_{r1}^{st} + n_{r2}^{st}$ is the total number of responding students in substitute schools and n_{nr}^{st} is the total number of eligible, non-responding, sampled students in all participating schools.

The overall response rate is the product of the school and the student response rates.

$$RR_1 = RR_1^{sc} \times RR_1^{st}$$

Unweighted response rates excluding substitute schools

The difference of the second method from the first is that the substitute schools were counted as non-responding schools.

$$RR_2^{sc} = \frac{n_s^{sc}}{n_s^{sc} + n_{r1}^{sc} + n_{r2}^{sc} + n_{nr}^{sc}}$$

This difference had an indirect effect on the student response rate because fewer schools were included as responding schools, and student response rates were only computed for the responding schools.

$$RR_2^{st} = \frac{n_s^{st}}{n_s^{st} + n_{r1}^{st} + n_{r2}^{st} + n_{nr}^{st}}$$

The overall response rate was again the product of the 2 response rates.

$$RR_2 = RR_2^{sc} \times RR_2^{st}$$

Weighted response rates including substitute schools

For the weighted response rates, sums of weights were used instead of counts of schools and students. School and student base weights (BW) are the weight values before correcting for non-participation, so they generate estimates of the population being represented by the responding schools and students. The final weights (FW) at the school and student levels are the base weights corrected for non-participation.

School response rates are computed as follows:

$$RR_3^{sc} = \frac{\sum_i^{s+r1+r2}\left(BW_{SCi} \times \sum_j^{r_i}\left(FW_{STij}\right)\right)}{\sum_i^{s+r1+r2}\left(FW_{SCi} \times \sum_j^{r_i}\left(FW_{STij}\right)\right)}$$

where i indicates a school, $s + r1 + r2$ all responding schools, j a student and ri the responding students in school i. First, the sum of the student final weights FW_{ij} for the responding students from each school was computed. Second, this sum was multiplied by the school's base weight (numerator) or the school's final weight (denominator). Third, these products were summed over the responding schools (including substitute schools). Finally, the ratio of these values was the response rate.

The numerator of the school response rate (RR_3^{sc}) is the denominator of the student response rate (RR_3^{st}):

$$RR_3^{st} = \frac{\sum_i^{s+r1+r2}\left(BW_{SCi} \times \sum_j^{r_i}\left(BW_{STij}\right)\right)}{\sum_i^{s+r1+r2}\left(BW_{SCi} \times \sum_j^{r_i}\left(FW_{STij}\right)\right)}$$

The overall response rate is the product of the school and student response rates:

$$RR_3 = RR_3^{sc} \times RR_3^{st}$$

Weighted response rates excluding substitute schools

Practically, substitute schools were excluded by setting their school base weight to zero for computation of the school response rates and applying the same computation as above. More formally, the parts of the response rates are computed as follows:

$$RR_4^{sc} = \frac{\sum_i^s \left(BW_i \times \sum_j^{r_i} (FW_{ij}) \right)}{\sum_i^{s+r1+r2} \left(FW_i \times \sum_j^{r_i} (FW_{ij}) \right)}$$

$$RR_4^{st} = \frac{\sum_i^{s+r1+r2} \left(BW_i \times \sum_j^{r_i} (BW_{ij}) \right)}{\sum_i^{s+r1+r2} \left(BW_i \times \sum_j^{r_i} (FW_{ij}) \right)}$$

$$RR_4 = RR_4^{sc} \times RR_4^{st}$$

Reported response rates

Weighted response rates provide a more accurate measure of the representativeness of the sampled population, since they measure the real effect of the participation of schools and students as representatives of the target population as a whole. For the 2025 cycle, the weighted national overall response rate for Year 6 was 90% when including substitute schools and remained at 90% when excluding substitute schools. For Year 10, the respective rates were 82% and 81%.

Unweighted overall response rates for Year 6 were 89%, both with substitute schools included and with substitute schools excluded. For Year 10, the unweighted rates were 81% when including substitute schools and 80% when excluding substitute schools.

Table 3.5 and Table 3.6 present the Year 6 and Year 10 response rates for all 4 response rate calculation methods described in this section.

Table 3.5: Overall, school and student response rates in Year 6

	Unweighted, including substitute schools			Unweighted, sampled schools only			Weighted, including substitute schools			Weighted, sampled schools only		
State/territory	Overall	School	Student	Overall	School	Student	Overall	School	Student	Overall	School	Student
NSW	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91
VIC	0.90	1.00	0.90	0.90	1.00	0.90	0.91	1.00	0.91	0.91	1.00	0.91
QLD	0.87	0.98	0.89	0.87	0.98	0.89	0.88	0.98	0.89	0.88	0.98	0.89
SA	0.90	1.00	0.90	0.90	1.00	0.90	0.90	1.00	0.90	0.90	1.00	0.90
WA	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.91
TAS	0.89	1.00	0.89	0.89	1.00	0.89	0.89	1.00	0.89	0.89	1.00	0.89
NT	0.78	0.91	0.86	0.78	0.91	0.86	0.79	0.91	0.86	0.79	0.91	0.86
ACT	0.89	1.00	0.89	0.84	0.95	0.89	0.89	1.00	0.89	0.85	0.96	0.89
Aust.	0.89	0.99	0.90	0.89	0.99	0.90	0.90	0.99	0.90	0.90	0.99	0.90

Table 3.6: Overall, school and student response rates in Year 10

	Unweighted, including substitute schools			Unweighted, sampled schools only			Weighted, including substitute schools			Weighted, sampled schools only		
State/territory	Overall	School	Student	Overall	School	Student	Overall	School	Student	Overall	School	Student
NSW	0.82	1.00	0.82	0.82	1.00	0.82	0.82	1.00	0.82	0.82	1.00	0.82
VIC	0.84	1.00	0.84	0.81	0.96	0.84	0.83	1.00	0.83	0.80	0.96	0.83
QLD	0.80	0.96	0.84	0.80	0.96	0.84	0.80	0.96	0.83	0.80	0.96	0.83
SA	0.84	0.98	0.85	0.81	0.96	0.85	0.83	0.98	0.85	0.82	0.97	0.85
WA	0.84	0.98	0.86	0.84	0.98	0.86	0.84	0.98	0.86	0.84	0.98	0.86
TAS	0.77	0.94	0.82	0.77	0.94	0.82	0.77	0.94	0.81	0.77	0.94	0.81
NT	0.55	0.67	0.83	0.55	0.67	0.83	0.54	0.64	0.84	0.54	0.64	0.84
ACT	0.83	1.00	0.83	0.83	1.00	0.83	0.83	1.00	0.83	0.83	1.00	0.83
Aust.	0.81	0.97	0.84	0.80	0.96	0.84	0.82	0.98	0.83	0.81	0.97	0.83

Chapter 4: Data collection, management and processing

The management of cognitive, contextual, and administrative data for NAP–ICT Literacy 2025 is governed by a comprehensive set of data handling protocols. These protocols are designed to uphold data quality and integrity while streamlining processes and minimising the administrative burden placed on participating schools. The longstanding role of the Australian Council for Educational Research (ACER), as delivery contractor for NAP sample assessments, has informed the evolution of these procedures.

This chapter provides an overview of the data management strategies adopted for NAP–ICT Literacy 2025. It describes the full data lifecycle, from initial collection through to post-assessment processing, and details the mechanisms for data transfer, monitoring, validation and transformation.

Data management plan

For each NAP sample project, a tailored data management plan is developed that addresses the collection, movement, processing and storage of all relevant data. The plan for NAP–ICT Literacy 2025 was built upon established frameworks from previous cycles, ensuring continuity and reliability. The plan systematically catalogued all information assets associated with the project, specified their storage locations and outlined the security measures in place throughout the project's duration. Regular reviews and updates to the plan ensured alignment with current best practices and project needs.

Data security

Recognising the critical importance of data security to schools, education authorities and the broader community, the NAP–ICT Literacy 2025 team implemented stringent safeguards for all personal and sensitive information. All data assets containing personally identifiable information were classified as protected, in accordance with ACER's internal data governance and cryptographic standards. The project's Information Security Management System was designed to meet the requirements of ISO 27001: 2013 and ISO 27002: 2015. It also adhered to the Australian Government's Information Security Manual and Protective Security Policy Framework. All technical and procedural aspects of the project were required to comply with these standards, ensuring secure handling of data at every stage.

Data identification

To facilitate accurate tracking and management of data throughout the NAP–ICT Literacy 2025 project, a robust identification system was established. Each sampled school received a unique 7-digit identifier at the time of sampling, constructed from codes representing year level, state/territory, sector, substitution status, and a sequential sampling frame number. This system enabled precise monitoring of data assets and supported efficient data management across the project lifecycle. The coding structure for these identifiers is illustrated in Figure 4.1.

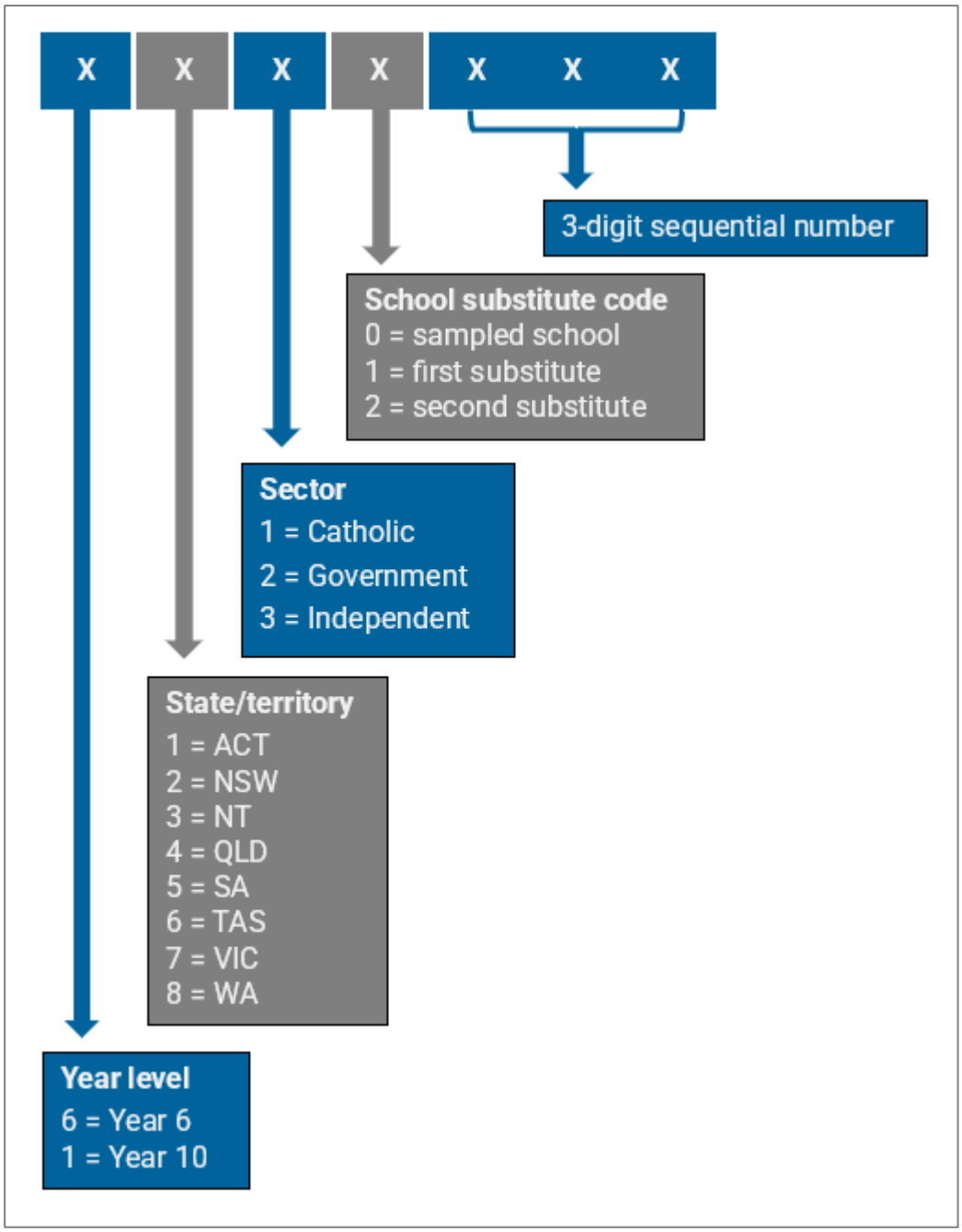

Figure 4.1: Unique school ID coding structure

Each student that was sampled for the assessment was also assigned a unique identifier. This student ID consisted of the 7-digit school identifier described previously, followed by a 2-digit student number (ranging from 01 to 20). This ensured each sampled student within a school could be distinctly recognised and tracked throughout life cycle of the assessment. These IDs were embedded in all cognitive, contextual and background data files, enabling data matching and monitoring throughout the collection, cleaning, and analysis phases. In addition, 5 spare IDs (21–25) were generated for each school to accommodate any need for additional test logins. The use of these anonymised student identifiers allowed for the assessment data to be analysed without reliance on personally identifiable information, such as student names.

Data collected from schools and jurisdictions

Data collection for NAP–ICT Literacy 2025 involved close collaboration between ACER, educational authorities and participating schools. Each jurisdiction appointed a liaison officer to facilitate communication and support school participation. Within schools, key roles were assigned to streamline administration. These were:

- **School Contact Officer (SCO):** the main point of contact at the school who coordinated logistics and data provision
- **School Technical Support Officer (STSO):** performed a series of device checks prior to the assessment to ensure technical readiness
- **Test Administrator (TA):** conducted and invigilated the assessment in line with the standardised administration procedures outlined in the TA Handbook.

This structured approach helped achieve high participation rates while maintaining adherence to assessment protocol so that as uniform a testing experience as possible could be achieved among the participating students.

A summary of these processes is provided in Table 4.1.

Table 4.1: School liaison and data collection processes

Stage	Jurisdictional activity	ACER project team activity	School activity
Initial contact with sampled schools	Educational authorities inform sampled schools of their selection in the assessment. If the jurisdiction confirms that a sampled school is unable to participate, the relevant substitute school is contacted.	ACER contacts principals of sampled schools to request the nomination of a SCO and STSO.	Principals of contacted schools supply requested contact information via a secure online form.
Administrative data collection		ACER contacts nominated SCOs and requests preferred assessment dates and student lists for target year level (Year 6 and/or Year 10 cohort).	SCOs submit preferred assessment dates and student list via a secure school administration website.
Technical readiness		ACER contacts nominated STSOs and provides technical check instructions. ACER provides technical support and troubleshooting	STSOs undertake technical checks to ensure the school's computer resources are test-ready.

Stage	Jurisdictional activity	ACER project team activity	School activity
		advice to STSOs via the helpdesk.	
Date and student sample confirmation	ACER notifies SCOs of finalised assessment date and selected students via the school administration website.	SCOs make relevant school-level test day arrangements (including room bookings and informing sampled students of their selection).	
Student background data collection	Educational authorities provide SBD for students in schools for which this information is held centrally.	Where SBD cannot be provided by the jurisdiction, ACER requests this information from SCOs for all sampled students.	SCOs provide SBD for all sampled students via the school administration website.
Test administration and helpdesk support		ACER provides detailed test administration manual and test login credentials to all nominated test administrators. ACER continues to provide support to schools via the Helpdesk.	Test administrators familiarise themselves with the processes and procedures outlined in the test administration manual and consult with ACER Helpdesk staff to confirm understanding of protocol and circumvent any perceived issues prior to the scheduled assessment date.

The NAP–ICT Literacy online school administration website

All information from School Contact Officers (SCOs) was submitted via a secure online portal. This website reduced administrative workload for schools and served as a central, secure location for all study-related data. Schools could download materials and submit required information, such as SCO details, assessment dates and student lists. Access required a secure, school-specific login. Figure 4.2 provides a screenshot of the school administration website homepage.

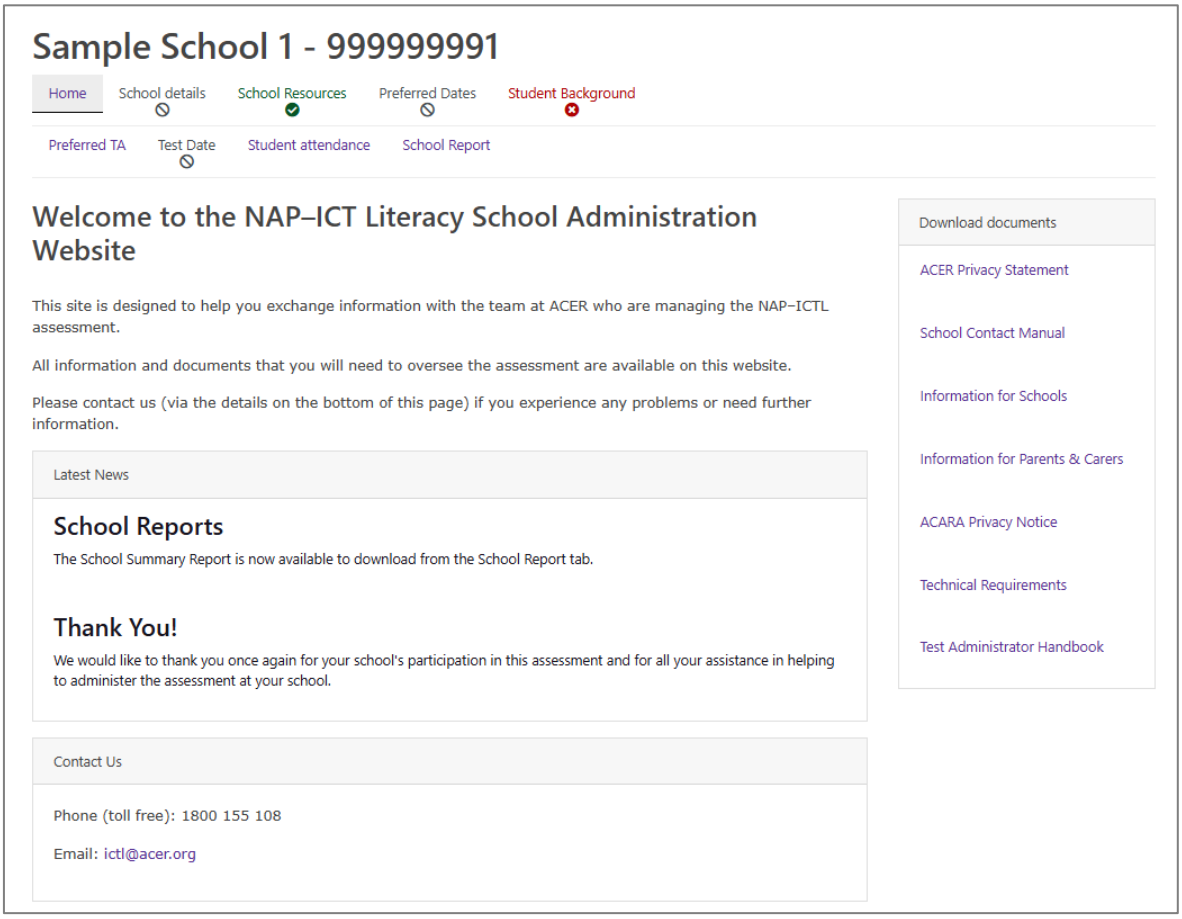

Figure 4.2: Homepage of the school administration website

The STSO technical checks

School Technical Support Officers (STSOs) conducted device compatibility checks and reported results via a feedback questionnaire. ACER worked directly with STSOs to resolve any technical issues, sometimes involving system engineers or education authorities as needed. The minimum technical requirements and the associated STSO checklist are included in Appendix B.

Helpdesk provision and online support

A dedicated helpdesk (phone and email) was available throughout the main study period to assist schools with administrative, technical and operational queries. Support was provided during extended hours to accommodate all Australian time zones.

Collection of student background information

Background data (age, gender, Indigenous status, parental education and occupation, language spoken at home) were collected for all participating students and matched to assessment responses for analysis. Where possible, education authorities provided this data directly, minimising school workload. If not available centrally, schools submitted data using a provided

template uploaded to the secure website. Missing or unknown values were coded accordingly. Data sources by jurisdiction are shown in Table 4.2, while variable definitions for the student background data are provided in Table 4.3.

Table 4.2: Student background data provision

State/Territory	Sector	Source
NSW	Government	NSW DET
NSW	Catholic	School
NSW	Independent	School
VIC	Government	VIC DoE
VIC	Catholic	School
VIC	Independent	School
QLD	Government	QLD DoE
QLD	Catholic	School
QLD	Independent	School
SA	Government	SA DoE
SA	Catholic	SA CEO
SA	Independent	School
WA	Government	WA DoE
WA	Catholic	WA DoE
WA	Independent	WA DoE
TAS	Government	Tas DECYP
TAS	Catholic	CE Tas
TAS	Independent	School
NT	Government	NT DET
NT	Catholic	School
NT	Independent	School
ACT	Government	ACT DET
ACT	Catholic	ACT DET
ACT	Independent	ACT DET

Table 4.3: Variable definitions for Student Background Data

Category	Description	Codes
Gender	Gender of student	F = Female M = Male O = Other 9 = Not stated/unknown
Age	Date of birth of student	DD-MM-YYYY
Indigenous status	A student is considered to be Indigenous if they identify as being of Aboriginal and/or Torres Strait Islander origin.	1 = Aboriginal but not Torres Strait Islander origin 2 = Torres Strait Islander but not Aboriginal origin 3 = Both Aboriginal and Torres Strait Islander origin 4 = Neither Aboriginal nor Torres Strait Islander origin 9 = Not stated/unknown.
Parental school education	The highest year of primary or secondary education a parent/ guardian has completed.	1 = Year 9 or equivalent or below 2 = Year 10 or equivalent 3 = Year 11 or equivalent 4 = Year 12 or equivalent 0 = Not stated/unknown/Does not have Parent 2.
Parental non-school education	The highest qualification attained by a parent/ guardian in any area of study other than school education.	5 = Certificate I to IV (including Trade Certificate) 6 = Advanced diploma/Diploma 7 = Bachelor's degree or above 8 = No non-school qualification 0 = Not stated/unknown/Does not have Parent 2.
Parental occupation	The occupation group that includes the main work undertaken by the parent/guardian.	1 = Senior management and professionals 2 = Other manager and associate professionals 3 = Tradespeople & skilled office, sales and service staff 4 = Machine operators, labourers, hospitality, related staff 8 = Not in paid work in last 12 months 9 = Not stated/unknown/Does not have Parent 2.
Student/ Parent language spoken at home	The main language spoken in the home by the respondent.	1201 = English Codes for all other languages as per the Australian Standard Classification of Languages (ASCL) Coding Index 4th Edition

Assessment administration

Field trial

The NAP–ICT Literacy 2025 field trial took place from 16 October to 1 November 2024. In total, 824 Year 6 students and 776 Year 10 students from 70 schools across New South Wales, Victoria, Queensland, Western Australia and South Australia participated. The sample included students from major cities, regional and remote areas. The students also came from a range of socio-economic backgrounds, and included a mix of government, Catholic and independent schools.

The purpose of the field trial was to test the assessment instruments and associated operational procedures. Fifteen test forms – 8 for Year 6 and 7 for Year 10 – were rotated across the participating students so that module coverage was evenly distributed.

As a result of the findings, decisions were made as to which items and modules would be used in the main study assessment instrument. The coverage and content of the assessment instrument is described in Chapter 2.

Main study

The main study assessment was conducted across Australia during Term 2, 2025. Schools were permitted to schedule the assessment on a day that suited them within the official assessment period. The scheduled assessment window for all states and territories was Monday 5 May to Friday 30 May 2025.

For participating students, the NAP–ICT Literacy assessment consisted of an introductory tutorial, 4 assessment modules and a student questionnaire. All components were to be administered on the same day, with the test session timing outlined in Table 4.4.

Table 4.4: NAP–ICT Literacy assessment session timing

Activity	Time
Introductory tutorial	10 minutes (untimed)
Module 1	20 minutes
Break	5 minutes (untimed)
Module 2	20 minutes
Break	5 minutes (untimed)
Module 3	20 minutes
Break	5 minutes (untimed)
Module 4	20 minutes
Questionnaire	15–20 minutes (untimed)

Assessment platform

All participating schools undertook the NAP–ICT Literacy 2025 assessment via ACER's Online Assessment and Reporting System (OARS). Students accessed the assessment on school-provided or personal desktop, laptop or tablet devices, connected via wired or wireless internet.

Since the first NAP–ICT Literacy assessment in 2005, the test interface has been periodically updated to ensure it continues to reflect authentic and contemporary digital practices. These updates were necessary to maintain relevance as digital environments, software conventions and user expectations evolved.

While visual design and functional elements were refreshed over time, careful attention was given to preserving a consistent user experience across cycles. Core interface components – including navigation controls, a central information area and a dedicated response section – were retained to support continuity and comparability of student interaction with the assessment. Major interface

updates were implemented in 2014 and 2022. In 2025, the assessment was migrated to the OARS platform, while maintaining the established interaction model underpinning previous cycles.

The assessment delivery system managed test form allocation and timing, while test administrators guided students through the tutorial, supervised the session, and provided progression passwords as needed. As in previous cycles, the assessment items were presented to students in a linear sequence and students were not permitted to return to previously completed items, which could potentially inform later items.

Flexible administration

Flexible administration was introduced in NAP–ICT Literacy 2011 for a small number of very remote schools. The approach was designed to better target the assessment instrument to local contexts and to maximise student participation in settings where standard administration conditions may present challenges. Flexible administration involved modifications to both the assessment design and the method of delivery.

For NAP–ICT Literacy 2025, the flexible administration model comprised the following adjustments to the standard delivery model:

- the number of assessment modules completed by each student was reduced from 4 to 2
- the module timer was removed for each module, providing additional time for task completion
- test administrators were permitted to read all instructions and test questions aloud to students, consistent with existing provisions available in all schools for students requiring additional support.

Although flexible administration was made available to a small subset of schools in the 2025 sample, no schools ultimately elected to implement this administration model.

Follow-up test sessions

To maximise student participation, schools were asked to administer follow-up sessions in cases where a significant proportion (more than 20%) of students were absent on the scheduled assessment day. This helped ensure a minimum student participation rate of 80% at most participating schools.

Quality monitor visits

To support quality assurance, trained quality monitors visited 5% of participating schools across all states and territories. Their role was to observe test administration and ensure procedures were applied consistently. After each visit, monitors submitted structured reports to ACER. The report template is provided in Appendix C.

Scoring student responses

Students completed assessment modules using a mix of simulated and live software applications. Responses were either automatically scored by the system or marked by trained markers using detailed scoring guides**.** The different types of tasks and items, together with their associated scoring procedures, are summarised below.

Single-step simulation items

Single-step software simulation items required students to perform a single action – such as to “copy”, “paste” or “click on a link” – to elicit a response from the system. These items were automatically scored by the assessment platform using a simple rubric: 0 for incorrect, 1 for correct and 9 for non-attempt. After each attempt, students could choose to “Try Again”, with only the final attempt recorded for scoring. This process, including the opportunity to practise both initial and repeated attempts, was introduced to students during the introductory tutorial.

Multiple-step simulation items

Multiple-step software simulation items required students to execute a sequence of actions, often with several possible solution paths. Examples included configuring software settings through menu navigation or selecting queries to create and execute an algorithm. These workspaces allowed students to use features such as an "undo" icon to revert changes. Unlike single-step items, students needed to indicate "I've Finished" for their response to be recorded. This was to allow students to navigate and explore the software to complete their response.

Scoring for these items was either dichotomous (0 = incorrect, 1 = correct, 9 = non-attempt) or used partial credit (0 = incorrect, 1 = partially correct, 2 = fully correct, 9 = non-attempt). Partial credit was awarded when students demonstrated partial understanding, such as reaching the correct interface but applying an incorrect setting, or partially completing an algorithm. As with single-step items, once students had selected "I've Finished", they were given the option to "Try Again". There was no limit for these items on how often a student could elect to try again.

Multiple-choice items

For the purposes of test item analysis, in multiple-choice items, the selection made by a student was recorded by the assessment platform and later coded as 0 for incorrect or 1 for correct. A code of 9 was recorded for a non-attempt.

Constructed response items

Some items required students to respond using 1 or 2 sentences. These responses were captured by the assessment platform and later delivered to markers, using a purpose-built online scoring system. Some of these items had scoring guides that allowed for dichotomous scoring (correct/incorrect), whereas others had scoring guides with partial credit scoring in which different categories of student responses could be scored according to the degree of knowledge, skill or understanding they demonstrated.

Tasks completed using live applications

Students completed tasks on computers, using live software applications. The outputs generated by students as responses to these tasks were stored automatically by the administration system and delivered to markers using the online scoring system. Typically, these information products (such as a map, an edited website or a presentation) were assessed using a set of criteria. These criteria broadly reflected either elements of the information literacy demonstrated by students (such as selection of relevant information or tailoring information to suit the audience) or the use of the software features by students to enhance the communicative effect of the product (such as use of colours, transitions or text formatting). The criteria had between 2 and 4 score categories (including zero) that reflected different levels of sophistication with reference to the ICT literacy framework and the elements of the task.

Centre-based marking operation

For the 43 assessment items that could not be automatically scored, responses were evaluated by a team of trained markers at the ACER Sydney Marking Centre, using the ACER Marking System (AMS) online platform. The main study marking operation involved 23 markers, including 2 group leaders, who were selected for their extensive experience with NAP–ICT Literacy assessments.

ACER employed a continuous training approach, with item-specific training delivered immediately before marking each item to ensure consistency and accuracy. A "train the trainer" model was used: professional leaders trained the 2 group leaders, who then trained their respective marking teams. Professional leaders remained available throughout the process to provide clarification as needed.

Quality assurance during the marking process

Experienced group leaders spot-checked a random sample of approximately 10% of all responses scored by markers. A high degree of accuracy was noted, with higher than 95% agreement between marker and group leader scores when spot checking results were compared.

Control scripts for each item were pre-selected by the professional leaders and configured as unidentifiable in the system for the markers to score as part of their allocated packet of responses. In total, 1,165 control scripts were scored by the 23 markers across the 43 items that were marked. For the majority of deployed control scripts, there was almost complete agreement of the assigned score and marker score, denoting a high level of marker accuracy. In instances where discrepancies occurred, they were typically limited to a difference of one score point. Overall, marker accuracy as captured by the control script results was, on average, 92%.

Data cleaning and verification

Data cleaning and verification are processes essential to ensuring the integrity of the data collected for NAP–ICT Literacy 2025. A comprehensive series of data cleaning steps was applied to all student background data collected from jurisdictions, schools and students. These steps are outlined below:

- **Correction of student names:** student names were reviewed and corrected in cases of obvious first name/surname reversal or the presence of foreign characters (such as ?, !, %). Where necessary, corrections were confirmed directly with the relevant school.
- **Attribution of missing gender:** where gender information was missing, it was inferred based on school type (for example, single-sex schools). Some cases required confirmation with the school.
- **Standardisation of dates of birth:** all dates of birth were converted to the standard dd/mm/yyyy format. Any auto-formatting issues caused by spreadsheet templates that rendered dates illegible were identified and corrected.
- **Coding of free text and abbreviations:** any free text or abbreviated entries were coded according to the variable coding schema specified in Table 4.3.
- **Validation of data values:** out-of-range, implausible or missing values were double-checked with the school or jurisdiction that provided the data. Where possible, correct values were entered; if no further information was available, the data were recoded as missing.

In addition, student background variables were derived for reporting achievement outcomes. The derived variables and the transformation rules used to recode them are presented in Table 4.5.

Table 4.5: Transformation rules to derive student background variables for reporting

Variable	Label	Transformation rule
School location	ASGSRemote	The geographical classification of the school location according to the ABS remoteness classification (1 = major cities, 2 = inner regional, 3 = outer regional, 4 = remote, 5 = very remote).
Gender	GENDER	Classified by response; missing data treated as missing unless the student was present at a single-sex school.
Age	AGE	Derived from the difference between the date of assessment and the date of birth, transformed to whole years.
Indigenous status	INDIG	Coded as Indigenous (1) if response was “yes” to Aboriginal OR Torres Strait Islander OR Both. Coded as non-Indigenous (0) otherwise.

Language spoken at home	LBOTE	Each of the 3 Language spoken at home questions (student, Parent 1 or Parent 2) were recoded to "LBOTE" (1) or "Not LBOTE" (0) according to ASCL codes. The reporting variable (LBOTE) was coded as "LBOTE" (1) if response was "LBOTE" for any of student, Parent 1 or Parent 2. If all 3 responses were "not LBOTE", then the LBOTE variable was designated as "not LBOTE" (0). If any of the data were missing, then the data from the other questions were used. If all of the data were missing, then LBOTE was coded as missing.
Parental education	PARED	Parental education equalled the highest education level (of either parent). Where one parent had missing data, the highest education level of the other parent was used. Only if parental education data for both parents were missing would parental education be coded as "missing" (0).
Parental occupation	POCC	Parental occupation equalled the highest occupation group (of either parent). Where one parent had missing data or was classified as "not in paid work", the occupation group of the other parent was used. Where one parent had missing data and the other was classified as "not in paid work", parental occupation equalled "not in paid work". Only if parental occupation data for both parents were missing would parental occupation be coded as "missing" (9).

For the student cognitive and questionnaire data, the following preliminary data cleaning procedures were applied.

- **Investigation and correction of invalid IDs:** instances of invalid student IDs were identified and, following consultation with the test administration team, corrected where possible. If correction was not feasible, the records were removed from the dataset.
- **Matching and recoding of spare IDs:** spare IDs were matched with valid student IDs and recoded accordingly. This process often required confirmation and cross-checking with attendance roll data and notes from the test administration team.
- **Exploration and recoding of missing values:** patterns of missing values were examined. Where appropriate, missing data were recoded as follows: "9" for embedded missing, "r" for not reached (cognitive data only) or "n" for not administered.[14]

Further details regarding the scaling procedures implemented for cognitive achievement data and student questionnaire data are provided in Chapter 5 of this report.

Student eligibility for reporting

Psychometric analysis of student cognitive and questionnaire data requires that each student record meets a minimum threshold of valid responses to be included in the database for scaling. Specifically, a student must satisfy all of the following criteria.

- **Valid response requirement:** the student must have at least 3 valid attempts on cognitive items, or at least one valid attempt in the student questionnaire. Valid responses exclude missing, not reached and not administered.
- **Attendance status:** the student must have an appropriate attendance status. Attendance status is selected from pre-determined categories.

[14] In cases where a technical issue interfered with the recording of data, data were recoded as "t" and treated as missing data.

- **Exemption status:** the student must not be listed with an exemption code. The 3 exemption codes are as follows:

  Code 1: severe functional disability. A moderate to severe permanent physical disability that severely limits a student's capacity to participate in the test.

  Code 2: severe intellectual disability. A mental or emotional disability and/or cognitive delay that severely limits a student's capacity to participate in the test.

  Code 3: very limited assessment language proficiency. The student is unable to read or speak English proficiently and would not be expected to overcome the language barrier in the assessment situation. Typically, a student who had received less than one year of instruction in English would be excluded.

Students who do not meet the minimum valid attempt criterion are flagged as "Ineligible" and subsequently classified as a "Non-respondent". Students who do meet the minimum valid attempt criterion are flagged as "Eligible" for consideration as a "Respondent". To be marked as a "Respondent", the student's attendance status must not list any of the following: "Exempt", "Left school" or "Parent refusal".

Only students flagged as a "Respondent" are retained for scaling and analysis, provided that the school response rate meets the minimum requirement as outlined in Chapter 3. The rules for flagging are summarised in Table 4.6.

Table 4.6: Rules for flagging eligible students as respondents

Student attendance category	Exemption code not stated	Exemption code* stated
Participated	Respondent	Non-respondent
Absent	Respondent	Non-respondent
Exempt	Non-respondent	Non-respondent
Left school	Non-respondent	Non-respondent
Parent refusal	Non-respondent	Non-respondent
Chronic absentee	Respondent	Non-respondent
Other	Respondent	Non-respondent

** Code 1 = severe functional disability; Code 2 = severe intellectual disability; Code 3 = very limited assessment language proficiency*

Data processing for school reporting

Once all student responses had been marked, a series of data processing steps were undertaken to generate the school summary reports distributed to participating schools.

- **Collation of data:** all marked student response data were compiled, and a single data file was created for each year level.
- **Data cleaning:** introductory practice items were removed for each student. Student questionnaire data were separated, as these were not included in the analysis for the school summary reports.
- **Data validation:** the student response data files were checked against the codebook to identify and resolve any major data anomalies.

- **Computation of item per cent correct:** for each item, the weighted per cent correct was calculated, excluding responses classified as “not reached”.
- **Partial credit item analysis:** for items scored with partial credit, the per cent correct was computed for each item using the standard NAP sample format (for example, a score of 75,23 indicates that for an item scored 0, 1, 2, the facility for scores of 1 and 2 is 75, and for a score of 2 only is 23).
- **Formatting for reporting:** the data files were formatted according to the required specifications for export into school-specific Microsoft Excel reports.

Providing the school summary reports to schools

After all test data had been collected, cleaned, marked and analysed, ACER provided participating schools with access to interactive Excel summary reports via the NAP–ICT Literacy 2025 school administration website. These reports included:

- descriptions of each item included in the assessment, including item references to the Australian Curriculum and NAP–ICT Literacy 2025 Assessment Framework
- details indicating which students were administered each item
- the level of credit each student received for each administered item
- summary information showing the weighted percentage of students receiving different levels of credit for each item.

The school summary reports were developed as interactive Microsoft Excel files, generated using the R open-source software environment. This format enabled schools to conduct detailed analyses of their data using familiar Excel features.

Reports were securely hosted on the school administration website, allowing schools to access them alongside other NAP–ICT Literacy 2025 administrative resources, using their existing login credentials.

Schools were advised to evaluate their summary report in conjunction with the NAP–ICT Literacy 2025 School Report Instructions, provided in Appendix D of this report. These instructions described each field in the report and outlined how to interpret the data presented. An example of a school summary report is provided in Appendix E.

Chapter 5: Scaling procedures

Both cognitive and questionnaire items were scaled using item response theory (IRT) scaling methodology. The cognitive items were used to derive a one-dimensional NAP–ICT Literacy achievement scale, while a number of scales were constructed based on different sets of questionnaire items.

This chapter outlines the procedures implemented to create these scales as well as providing a description of the associated processes of DIF analysis, item calibration, horizontal equating and the creation of plausible values.

The scaling model

Test items were scaled with the one-parameter model (Rasch 1960). In the case of dichotomous items, the model predicts the probability of selecting a correct response (value of one) instead of an incorrect response (value of zero), and is modelled as:

$$P_i(\theta_n) = \frac{\exp(\theta_n - \delta_i)}{1 + \exp(\theta_n - \delta_i)}$$

where $P_i(\theta_n)$ is the probability of person n scoring 1 on item i, θ_n is the estimated ability of person n, and δ_i is the estimated location of item i on this dimension. For each item, item responses are modelled as a function of the latent trait θ_n.

For items with more than 2 categories (in general k categories) – Likert-type items, for instance – the more general Rasch partial credit model (Masters and Wright 1997) was applied, which takes the form of:

$$P_{x_i}(\theta_n) = \frac{exp \sum_{k=0}^{x}(\theta_n - \delta_i + \tau_{ik})}{\sum_{h=0}^{m_i} exp \sum_{k=0}^{h}(\theta_n - \delta_i + \tau_{ik})} \quad x_i = 0,1, \dots, m_i$$

where $\mathrm{P_{x_i}(\theta_n)}$ denotes the probability of person n scoring x on item i, θ_n denotes the person's ability, the item parameter δ_i gives the location of the item on the latent continuum, τ_{ik} denotes an additional step parameter for each step k between adjacent categories and m_i denotes the maximum score attainable on item i.

The analysis of item characteristics and the estimation of model parameters were carried out with the ACER ConQuest software package (version 5.40.0; see Adams, Wu, Cloney, Berezner and Wilson 2024).

Scaling cognitive items

This section outlines the procedures for analysing and scaling the cognitive test items. The procedures are somewhat different from scaling the questionnaire items, which are discussed later in the chapter.

The model fit of cognitive test items was assessed using a range of item statistics. The weighted mean-square statistic (infit), which is a residual-based fit statistic, was used as a global indicator of item fit. Infit statistics were reviewed both for item and step parameters.

In addition to this, item characteristic curves (ICCs) were also used to review item fit. ICCs provide a graphical representation of item fit across the range of student abilities for each item (including dichotomous and partial credit items). The functioning of the partial credit items was further analysed by reviewing the proportion of responses in each response category and the correct ordering of mean abilities of students across response categories.

Final decisions on removing test items were based on a range of different criteria. Generally, items were flagged for review if first item calibrations showed a considerably higher infit statistic (for example, infit > 1.2) as well as low item-rest[15] correlation (0.2 or lower). The ACER project team considered both item-fit criteria as well as the content of the item before making a decision about removing or retaining flagged items for scaling.

Of the 165 items in the test, 3 were removed from the scale due to poor psychometric characteristics at Year 10 (NI20M5Q04, NI20M5Q10, NI24M8Q05); no items were removed at Year 6. Consequently, these items were not used to estimate student achievement.

Differential item functioning

The quality of the items was also explored by assessing differential item functioning (DIF) by gender. DIF occurs when groups of students with the same ability have different probabilities of responding correctly to an item. For example, if boys have a higher probability of success than girls with the same ability on an item, the item shows DIF in favour of boys. This constitutes a violation of the Rasch model, which assumes that the probability is only a function of ability and not of any other variable.

Substantial item DIF with respect to gender may result in bias of performance estimates across gender groups. The assessment of item DIF by gender involves consideration of both statistical evidence and the judgement of content experts regarding the presence of biased content within the item. Items would be considered for removal if, in addition to a large statistical difference, the judgement of experts was that the item content was biased. No items met both criteria for substantial gender DIF, and so no items were removed for this reason.

Item calibration and vertical equating

Missing student responses that were likely caused by issues with test length (“not reached” items)[16], were omitted from the calibration of item parameters but were treated as incorrect for the scaling of student responses. In cases where a technical issue was identified as preventing students from validly responding to an item, the invalid responses were omitted from both the calibration of item parameters and from the scaling of responses (for the affected students only) – this is discussed below. All other missing responses were included as incorrect responses for the calibration of items (except for the ones that were not administered).

In 2025, it was discovered that students who attempted the cognitive assessment on an Apple iPad device encountered a problem of being unable to register their responses on the online platform for any item from 2 trend modules: Robodog (NI20M4) and Water Quality (NI20M5). This issue was resolved for the fourth day of the testing period, but for the first 3 days of the testing period, the data collected from students using iPads was affected by this online platform issue.

It was decided to recode the responses for all items in these 2 modules to the default code “t”, which was designed to remain unrecognised during calibration and scoring. This was applicable to all students identified by the system as having (i) used an iPad, (ii) been administered either of these 2 modules and (iii) participated during one of the first 3 days of testing. This resulted in 135 students in Year 6 having their responses to all 10 items from module NI20M4 Robodog recoded to “t”, and 11 students in Year 10 having their responses to all 11 items from module NI20M5 Water Quality recoded to “t”. Recoding these responses in this way prevented these missing responses due to a technical problem being erroneously interpreted as students having had the opportunity to respond to these items but then not doing so.

[15] Item-rest correlation is an index of item discrimination, which is computed as the correlation between the scored item and the raw score of all other items in a test form. It indicates how well an item discriminates between high- and low-performing students.

[16] “Not reached” items were defined as all consecutive missing values at the end of the test except the first missing value of the missing series, which was coded as “embedded missing”, like other items that were presented to the student but which did not receive a response.

In addition, it was discovered that students who attempted the cognitive assessment on an Apple iPad device encountered a problem of being unable to register their responses on the online platform for 10 specific items from the trend module School Website (NI17M2).[17] This issue was only identified after the conclusion of the testing period, and so was deemed to have affected all students who (i) used an iPad and (ii) had been administered the School Website module, at any point during the testing period. Again, it was decided to recode the responses to these items in School Website to the default code "t", for all affected students.

Note that affected students' responses to the remaining 11 non-problematic items in the School Website module were retained for calibration and scoring. This resulted in 598 students in Year 6 and 98 students in Year 10 having their responses to the 11 problematic items in NI17M2 School Website recoded to "t". Again, recoding these responses in this way prevented these missing responses due to a technical problem being erroneously interpreted as students having had the opportunity to respond to these items but then not doing so.

The impact of this recoding was examined by calibrating the items using the response data before any recoding, and calibrating the items using the response data after applying the recoding. The comparison of item calibrations revealed that in general, the affected items had higher facilities (of a few percentage points) and thus lower difficulties after recoding, but other item statistics remained similar across the calibrations.

Item parameters were calibrated using all sampled student data, except for students who were identified as non-respondents. The student weights were rescaled to ensure that each state or territory was equally represented in the sample. The overall reliability of the test, as obtained from the scaling model, was 0.93 for Year 6 and 0.94 for Year 10 (ACER ConQuest EAP/PV reliability estimate).

In the first stage of the scaling procedures, items were calibrated separately for Year 6 and Year 10. After removing items with unsatisfactory scaling characteristics, 162 items remained, of which 41 were Year 6-only items and 41 were Year 10-only items. The other 80 items were used for both year levels. Of the 80 common items, 64 were used as vertical link items and 16 were regarded as different items in the 2 year levels. The difficulties of these 64 link items are plotted in Figure 5.1, with Year 6 estimates on the horizontal axis and Year 10 estimates on the vertical axis.

For each set of 64 items, their respective difficulties were centred to having a mean of zero for this graph. The grey unbroken line running diagonally from the lower left to the top right is the identity line—items which sit on this line have no observed difference in their relative difficulty between Year 6 and Year 10. The pair of black broken lines represent the 95% confidence interval bounds around the identity line. The red broken line is the line of best fit for the items on the scatter plot. For each of the 64 vertical link items, the difference between their 2 relative difficulties was less than half a logit.

[17] The 10 items from module School Website (NI17M2) specifically affected by the technical issue for iPad users were NI17M2Q1, NI17M2Q2, NI17M2Q13, NI17M2Q16A, NI17M2Q16B, NI17M2Q16D, NI17M2Q16E, NI17M2Q16F, NI17M2Q16G and NI17M2Q16H.

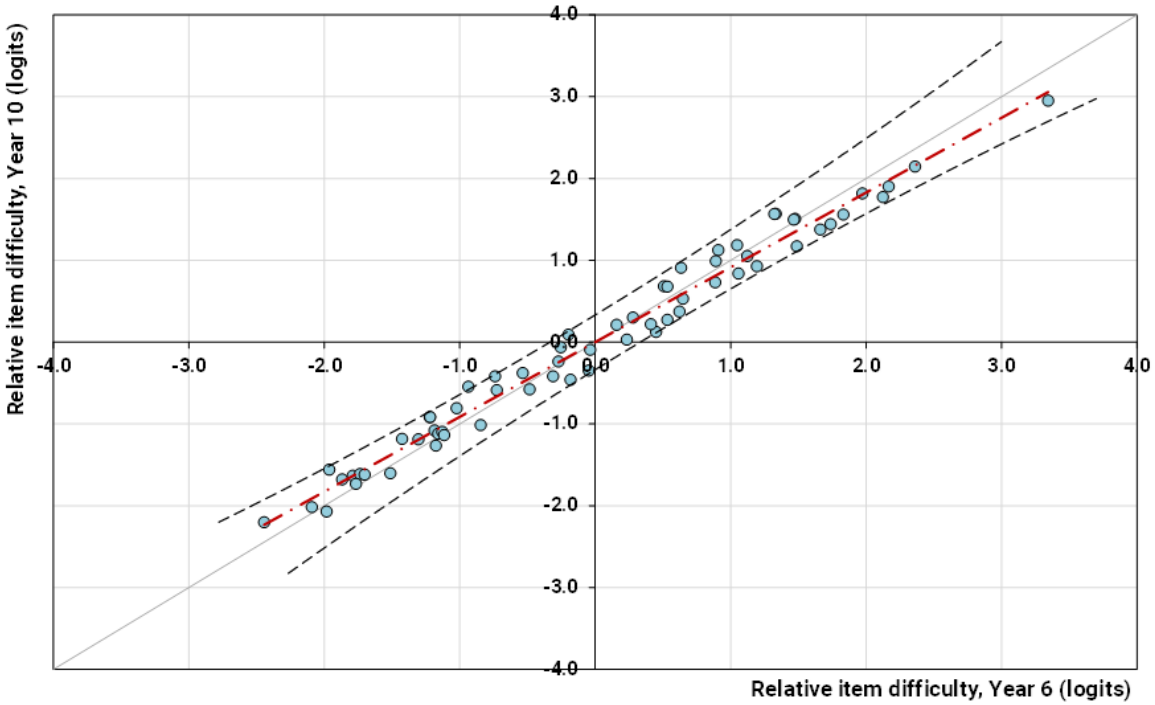

Figure 5.1: Scatter plot of relative item difficulties for Year 6 and Year 10

Figure 5.2 presents item maps for the 2 year levels. The crosses represent students while the numbers represent items. In the case of a partial credit item, the threshold is included. The vertical line represents the measured ICT literacy scale with high-performing students and difficult items at the top, and low-performing students and easy items at the bottom. The two scales are not directly comparable because they have been calibrated separately, but they have been lined up approximately for this report.

The response probability in this figure is 0.5, which means that students with an ability equal to the difficulty (or threshold) of an item have a 50% chance of responding correctly to that item. The figure shows that at each year level, the distribution of item difficulties did not extend as far as the lower tail of the distribution of student abilities, but did extend slightly above the upper tail.

At Year 6, the peak of the item difficulty distribution coincided with the upper half of the student ability distribution. At Year 10, the peaks of both item difficulties and student abilities were better aligned with each other. These results indicate good coverage over the upper distributions of student abilities, but a lack of very low difficulty items in the test forms, which would have been suitably matched to the students towards the bottom of the lower tails.

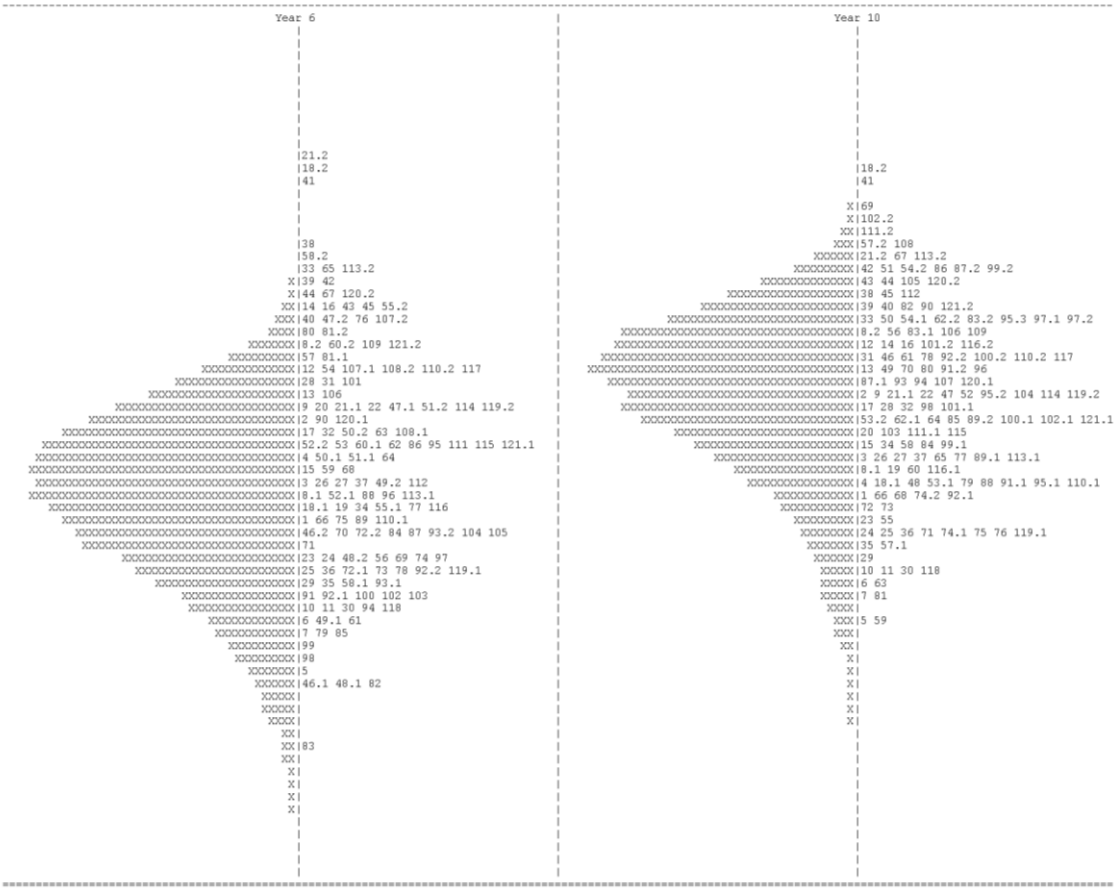

Figure 5.2: Item maps for Year 6 and Year 10

In the second stage of the scaling procedure, the Year 6 data was scaled first. The Year 10 data was scaled second, with the 64 vertical link items anchored to their respective Year 6 item parameter estimates. This placed both year levels on the same scale.

In the 2022 cycle, an additional scaling analysis was performed to quantify the effect of the position of the Digital Technology (DT) modules within each test form on estimates achieved. This analysis was not performed in 2025, and no adjustments for test form were applied to estimates.

Appendix F shows a table listing the item difficulties on the NAP–ICT Literacy scale with a response probability of 0.62 in logits on the reporting scale. It also shows the respective percentages of correct responses for each year sample (giving equal weight to each jurisdiction). The weighted fit statistics for each item are included in the final 2 columns. In addition, the fourth column indicates if an item was used as a horizontal link (trend) item.

Horizontal equating

Test forms at both year levels consisted of newly developed modules and trend modules. The trend modules were developed for, and used in, previous assessment cycles. As they had been kept secure, they could be used as horizontal link items to equate the results of the 2025 assessment with the established NAP–ICT Literacy scale. To ensure that the link items had the same measurement properties across cycles, the relative difficulties in 2025 and 2022 were compared.[18] Note that one item in Fundraiser (NI20M1Q16) and one item in Water Quality (NI20M5Q10) were found to have substantially changed in their implementation and behaviour on

[18] The item difficulty estimates from 2022 that were used for the purposes of equating with 2025 were those from the scaling analysis previously mentioned, which modelled the position effect of the DT modules within each test form.

the online platform between 2022 and 2025 in such a way that they were not suitable as link items. These two items were excluded from horizontal equating considerations.

There are general principles for investigating the quality of a set of link items, which include comparisons of facility, item-rest correlation and weighted MNSQ error. Initial comparisons indicated that the performance of items in the School Website trend module found a clear change between 2022 and 2025, at both year levels, but especially at Year 6.

The change in performance was not observed to the same extent in the other trend modules. This is summarised in Table 5.1 for Year 6 and Table 5.2 for Year 10. At Year 6, there was a pronounced decrease in average item facility for the School Website module between 2022 and 2025, by nearly 7 percentage points. The decreases in facilities for Fundraiser and RoboDog were much smaller in magnitude, suggesting an issue in the School Website module specifically.

Table 5.1: Average item-rest correlations and average senate-weighted facilities (%) for each trend module at Year 6, 2022 and 2025. The change in the averages between 2022 and 2025 is shown for both statistics.

Trend Module	Num. items	Average item-rest correlation 2022	Average item-rest correlation 2025	Change in average item-rest correlation	Average facility 2022	Average facility 2025	Change in average facility
Fundraiser	23	0.36	0.37	0.01	37.08	34.86	-2.22
RoboDog	10	0.45	0.44	-0.01	45.59	44.02	-1.58
School Website	21	0.43	0.43	0.01	50.13	43.22	-6.90

Note: due to rounding, the reported change values may not match the differences between averages calculated directly from results in this table

Table 5.2: Average item-rest correlations and average senate-weighted facilities (%) for each trend module at Year 10, 2022 and 2025. The change in the averages between 2022 and 2025 is shown for both statistics.

Trend Module	Num. items	Average item-rest correlation 2022	Average item-rest correlation 2025	Change in average item-rest correlation	Average facility 2022	Average facility 2025	Change in average facility
Fundraiser	23	0.42	0.46	0.04	53.55	48.63	-4.92
Water Quality	9	0.36	0.34	-0.02	44.87	41.54	-3.33
School Website	21	0.46	0.49	0.03	65.05	60.27	-4.79

Note: due to rounding, the reported change values may not match the differences between averages calculated directly from results in this table.

A review of content of the School Website module found that, in the context of ICT literacy, the content of School Website and its presentation were relatively old and outdated, and had likely become less familiar to students (especially those at Year 6). The result of this review was the decision that this module was no longer working in the same way as in the previous cycle and so was not suitable for retaining in the horizontal equating calculation. Thus, horizontal equating comparisons were based on the remaining trend modules. The omission of the School Website module meant that there were 33 horizontal link items at Year 6 across trend modules Fundraiser and Robodog, and 32 horizontal link items at Year 10 across trend modules Fundraiser and Water Quality.

Horizontal equating evaluations were carried out for each year level separately. Figure 5.3 shows a pair of scatter plots of item difficulties for the horizontal link items at Year 6 in 2022 and 2025. The average difficulty of each set of link items was set to zero and each dot represents one link item. The expected location under the assumption of complete measurement equivalence across both assessments is the identity line (y = x), represented by the grey, unbroken diagonal line on the plot. The pair of black broken lines represent the 95% confidence interval bounds around the identity line. Items outside of these lines had statistically significant deviations from the identity line.

The original standard errors provided by ACER ConQuest were adjusted by multiplying them by the square root of 7, the approximate design effect in 2025. This correction was made because data were collected from a cluster sample design, whereas the scaling software assumes simple random sampling of data (see also Chapter 3 for more information on sampling). Historical items were not used as link items if the difference between relative item difficulties was significant and more than 0.5 logits. Using this criterion, 3 items at Year 6 were excluded from equating, and 30 items were retained.

The top scatter plot shows all 33 plausible horizontal link items; the bottom scatter plot shows just the 30 retained link items after link selection. Additionally, as a check of differences in item discrimination, the 2022 and 2025 values of the item-rest correlations at Year 6 for the horizontal link items are plotted in Figure 5.4, before (top) and after (bottom) link selection.

The equating evaluation was also carried out for Year 10. Figure 5.5 shows the scatter plots of relative item difficulties between 2022 and 2025 before and after link selection. Figure 5.6 shows the scatter plots of item-rest correlations between 2022 and 2025 before and after link selection. At Year 10, out of 32 plausible link items, 3 showed large differences. Twenty-nine items were retained.

The 2 equating evaluations at Year 6 and Year 10 yielded 2 different equating shifts: 0.005 logits at Year 6 and 0.378 logits at Year 10. The difference between these shifts was 0.373 logits. In comparison, the 2025 vertical equating shift (the result of the equating evaluation shown in Figure 5.1) was 0.444 logits.

There was a discrepancy of 0.071 logits between the difference between Year 6 and Year 10 implied by the horizontal equating, and the difference between Year 6 and Year 10 calculated from the vertical equating. In addition, Figure 5.6 shows a difference in item-rest correlations between 2022 and 2025 at Year 10, a difference that was not observed at Year 6.

Given the discrepancy between the 2 equating methods and the supporting evidence of the item discrimination statistics, after careful deliberation a decision was made on the most appropriate course of action: (i) use only the Year 6 item locations for horizontal equating and (ii) apply the resulting Year 6 equating shift of 0.005 logits to put the 2025 results onto the NAP–ICT Literacy scale for both Year 6 and Year 10.[19]

In previous cycles of this assessment domain, horizontal equating shifts and errors were always calculated using items from both Year 6 and Year 10. Therefore, choosing to base the horizontal equating on the results of Year 6 alone was a departure from the procedure used in previous cycles, although there is precedent from other NAP sample assessment domains.

[19] Note that the Year 6 shift was based on some items that were also administered to Year 10 students in 2025: the items from the trend module Fundraiser. However, the item parameters for these items used in the horizontal equating were based on the Year 6 item calibration alone.

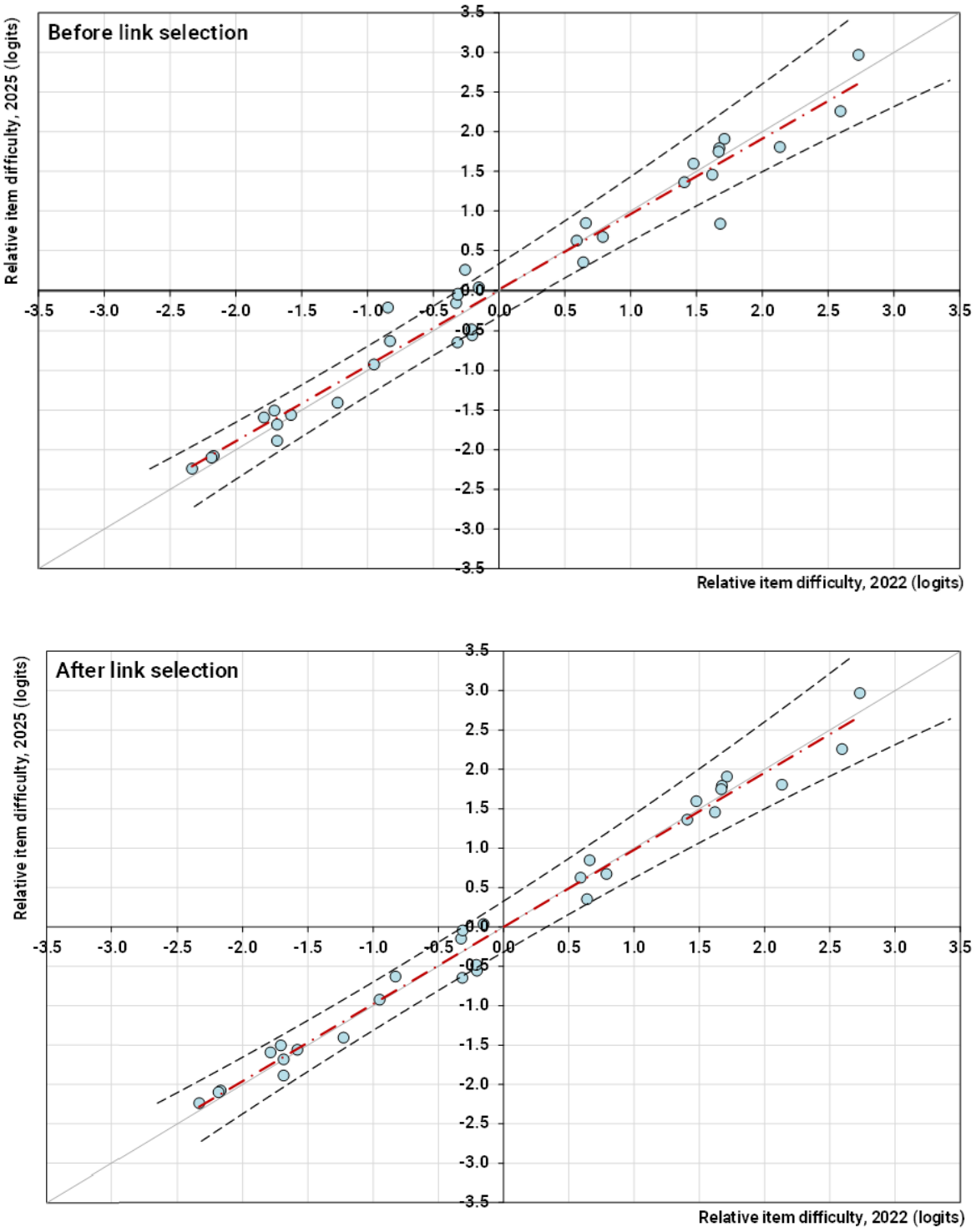

Figure 5.3: Scatter plots comparing relative item difficulties of trend module items from 2022 and 2025 at Year 6, for (top) before link selections were made and (bottom) after link selections were made, removing 3 out of 33 items as horizontal links, leaving 30 remaining links.

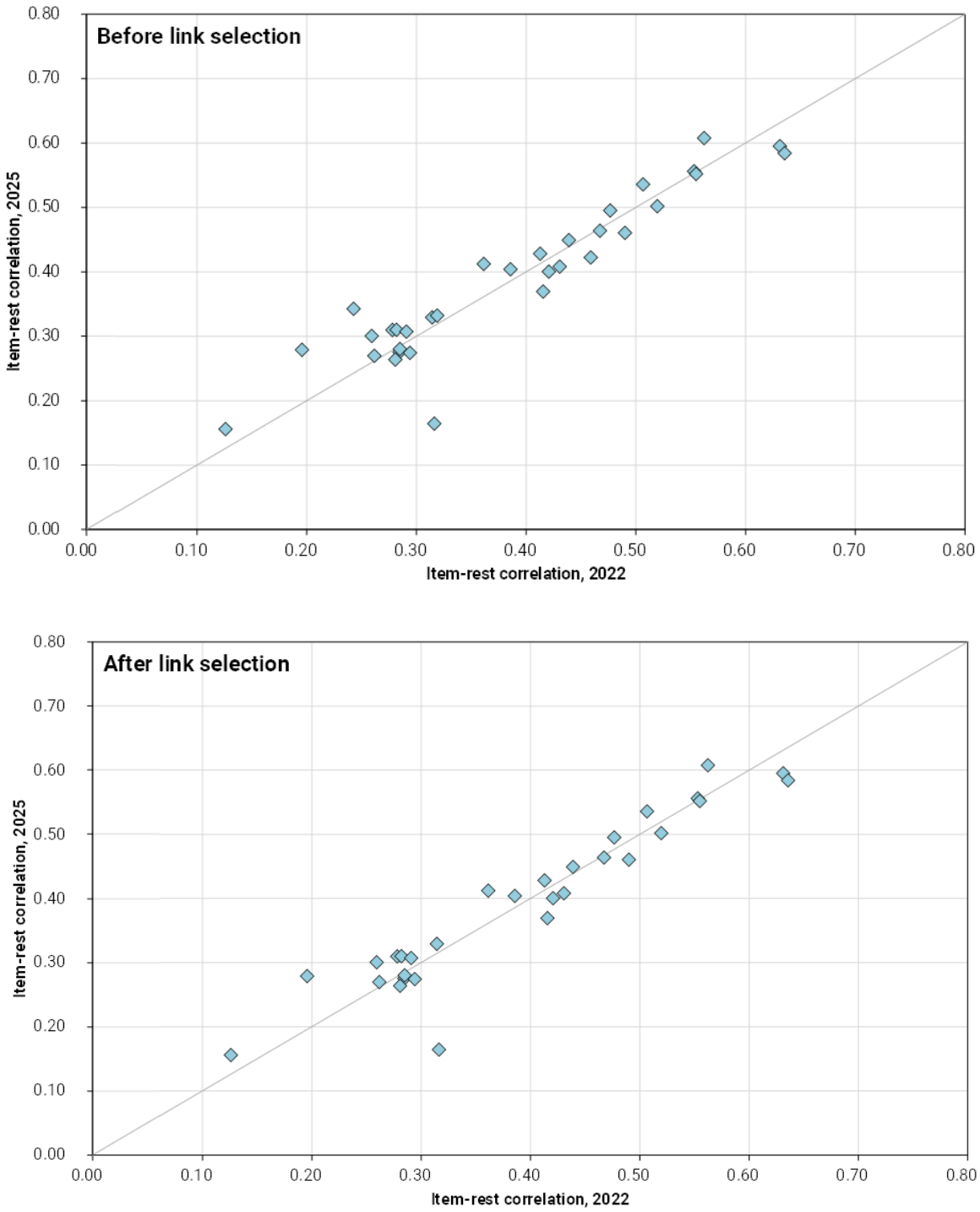

Figure 5.4: Scatter plots comparing item-rest correlations of trend module items from 2022 and 2025 at Year 6, for (top) before link selections were made and (bottom) after link selections were made, removing 3 out of 33 items as horizontal links, leaving 30 remaining links.

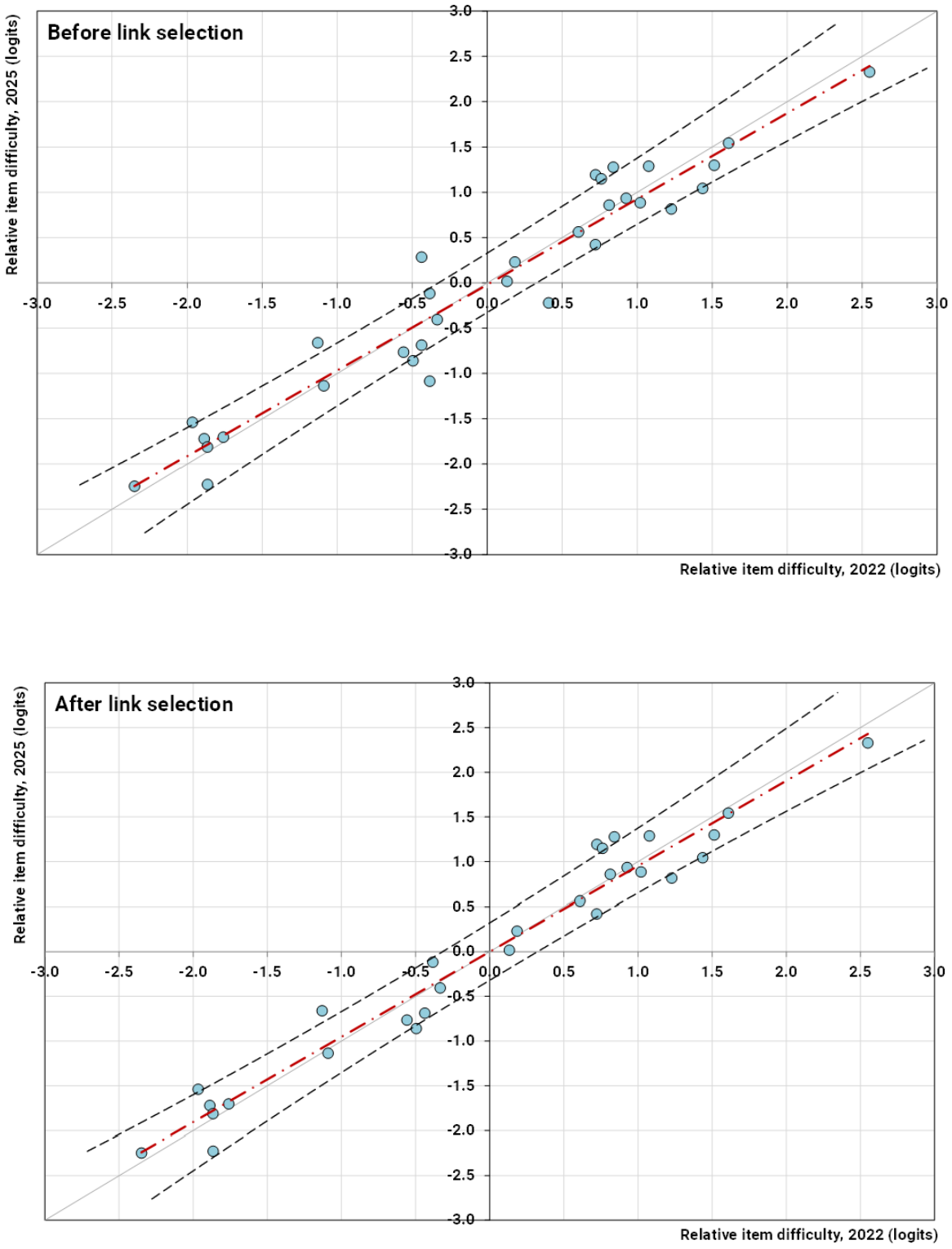

Figure 5.5: Scatter plots comparing relative item difficulties of trend module items from 2022 and 2025 at Year 10, for (top) before link selections were made and (bottom) after link selections were made, removing 3 out of 32 items as horizontal links, leaving 29 remaining links.

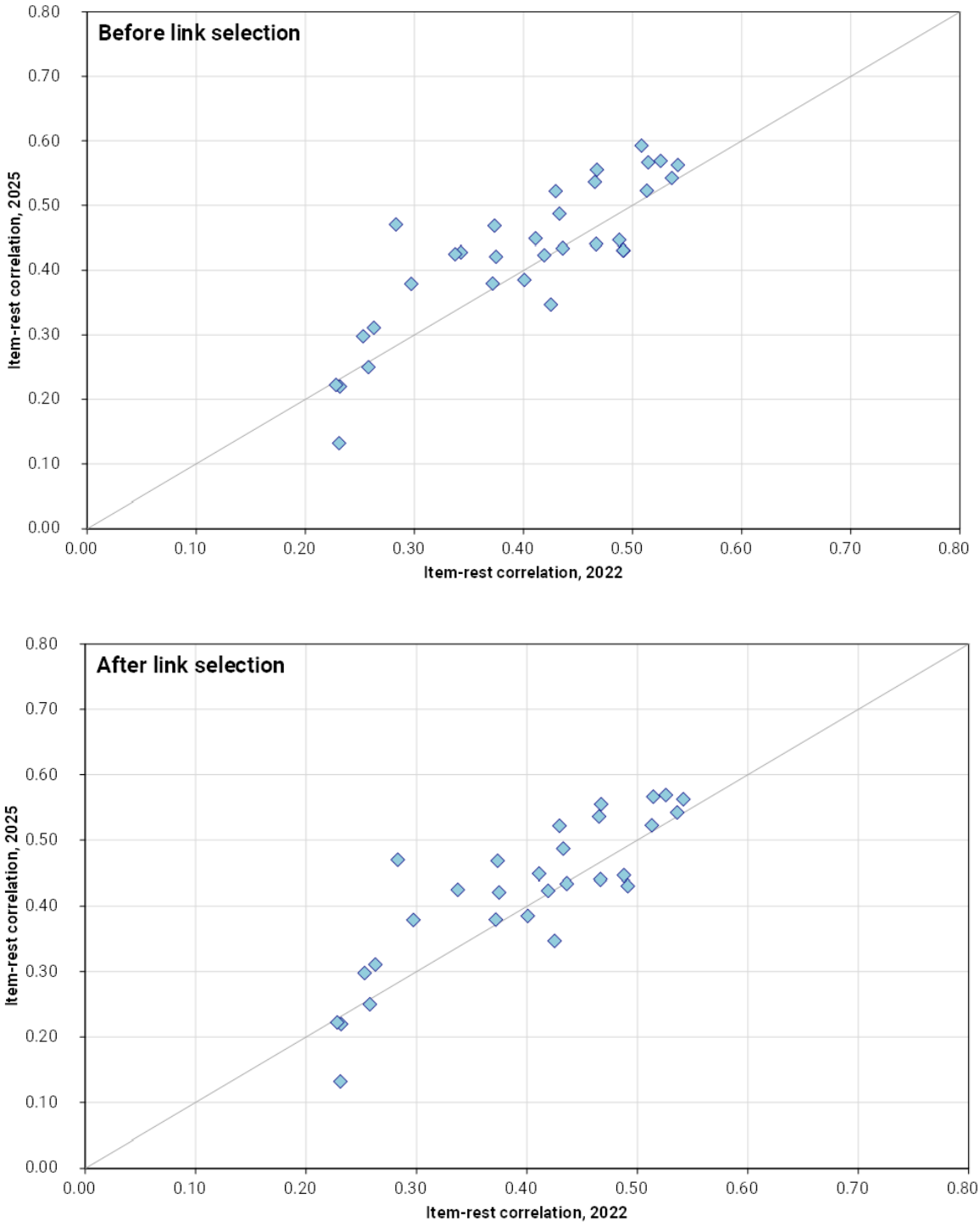

Figure 5.6: Scatter plots comparing item-rest correlations of trend module items from 2022 and 2025 at Year 10, for (top) before link selections were made and (bottom) after link selections were made, removing 3 out of 32 items as horizontal links, leaving 29 remaining links.

After final selection of link items and the decision to base horizontal equating on Year 6 only, common item equating was used to shift the 2025 scale onto the historical scale. The value of the shift is the difference in average difficulty of the link items between 2022 and 2025 at Year 6 (0.005). After applying this shift, the same transformation was applied as in 2022. Original scale scores (logits) were converted as:

$$\theta_n^* = \{(\theta_n + 0.005 + 0.007 - 0.167 - 0.039 + 0.210 - 0.032 - \bar{\theta}_{05})/\sigma_{05}\} \times 100 + 400$$

where θ_n^* is the transformed achievement estimate for student n, θ_n is the original achievement estimate for student n in logits, each numeric term is the equating shift between each adjacent pair of previous cycles, $\bar{\theta}_{05}$ is the mean ability in logits of the Year 6 students in 2005 (−0.34197) and σ_{05} is the standard deviation in logits of the Year 6 students in 2005 (1.04072).

Uncertainty in the link

The shift that equates the 2025 data with the 2022 data depends upon the change in difficulty of each of the individual link items. As a consequence, the sample of link items that have been chosen will influence the estimated shift. This means that the resulting shift could be slightly different if an alternative set of link items had been selected (most pertinently in 2025, if horizontal link items from Year 10 had been selected rather than being omitted). As a result, there is an uncertainty associated with the equating that is due to the choice of link items, similar to the uncertainty associated with the sampling of schools and students.

The uncertainty that results from the selection of a subset of link items is referred to as a linking or equating error. This error should be considered when making comparisons between the results from different data collections across time. Just as with the error that is introduced through the process of sampling students, the exact magnitude of this equating error cannot be determined. We can, however, estimate the likely range of magnitudes for this error and take this error into account when interpreting results. As with sampling errors, the likely range of magnitude for the combined errors is represented as a standard error of each reported statistic.

The following approach has been used to estimate the equating error. Suppose we have a total of L score points across N link items arranged into K units. Use i to index items within a unit and j to index units so that $\hat{\delta}_{ij}^{y}$ is the estimated difficulty of item i in unit j for year y, and let:

$$c_{ij} = \hat{\delta}_{ij}^{2025} - \hat{\delta}_{ij}^{2022}$$

The size (number of score points) of unit j is m_j so that

$$\bar{m} = \frac{1}{K}\sum_{j=1}^{K} m_j$$

and

$$\sum_{j=1}^{K} m_j = L.$$

Further, let

$$c_{\cdot j} = \frac{1}{m_j}\sum_{i=1}^{m_j} c_{ij}$$

and

$$\bar{c} = \frac{1}{N}\sum_{j=1}^{K}\sum_{i=1}^{m_j} c_{ij},$$

where $c_{.j}$ is the average of the item difference between cycles for a unit, and $\bar{c}$ is the mean of the differences of all N link items.

The equating error, taking into account the unit clustering, is calculated as follows:

$$\text{EquatingError}_{2022-2025,\text{Y6}} = \sqrt{\frac{\sum_{j=1}^{K} m_j^2 \, (c_{.j} - \bar{c})^2}{K(K-1)\bar{m}^2}} = \sqrt{\frac{\sum_{j=1}^{K} m_j^2 \, (c_{.j} - \bar{c})^2}{L^2} \frac{K}{K-1}}.$$

Using this approach, the equating error between 2022 and 2025, which as discussed above was based on Year 6 link items only, is 0.79 scale score points.[20] This equating error applies to comparisons of Year 6 results between 2022 and 2025 only.

The equating error for Year 6 results between 2025 and 2017 is the sum of the 2 equating errors between adjacent cycles. The equating error between 2022 and 2017 was 4.87 scale score points, and thus for Year 6:

$$\text{EquatingError}_{2017-2025,\text{Y6}} = \sqrt{0.79^2 + 4.87^2} = 4.93$$

The equating error for Year 6 results between 2025 and earlier cycles is calculated by including the relevant adjacent cycle equating error into the sum:

$$\text{EquatingError}_{2014-2025,\text{Y6}} = \sqrt{0.79^2 + 4.87^2 + 5.52^2} = 7.40$$

$$\text{EquatingError}_{2011-2025,\text{Y6}} = \sqrt{0.79^2 + 4.87^2 + 5.52^2 + 4.01^2} = 8.42$$

$$\text{EquatingError}_{2008-2025,\text{Y6}} = \sqrt{0.79^2 + 4.87^2 + 5.52^2 + 4.01^2 + 5.712^2} = 10.17$$

$$\text{EquatingError}_{2005-2025,\text{Y6}} = \sqrt{0.79^2 + 4.87^2 + 5.52^2 + 4.01^2 + 5.712^2 + 4.300^2} = 11.05.$$

In previous cycles, the same equating error value has applied to both Year 6 and Year 10. The change to horizontal equating in 2025 means that, for the first time in NAP–ICT Literacy, a separate equating error was calculated for comparing Year 10 results to previous cycles. The horizontal equating error between 2022 and 2025 for Year 10 incorporates the Year 6–Year 10 vertical equating error found in the 2025 cycle:

$$\text{EquatingError}_{2022-2025,\text{Y10}} = \sqrt{\text{EquatingError}_{2022-2025,\text{Y6}}{}^2 + \text{EquatingError}_{\text{Y6-Y10,2025}}{}^2}$$

The vertical equating error for 2025 was calculated using the same procedure as outlined here for the horizontal equating error, and was found to be 1.98 scale score points. Thus, the horizontal equating error between 2022 and 2025 for Year 10 was:

$$\text{EquatingError}_{2022-2025,\text{Y10}} = \sqrt{0.79^2 + 1.98^2} = 2.13$$

The equating errors for comparing Year 10 results between 2025 and earlier cycles were as follows:

$$\text{EquatingError}_{2017-2025,\text{Y10}} = \sqrt{2.13^2 + 4.87^2} = 5.31$$

[20] This equating error value at Year 6 is noticeably smaller in magnitude compared with the equating errors calculated in previous cycles. The 2022—2025 equating error for Year 6 is calculated using the item parameters from only 2 modules, both calibrated using Year 6 data only. As mentioned, this departs from previous cycles, where 3 modules from both Year 6 and Year 10 were used in the calculation. An examination of the calculation indicates that the $(c_{.j} - \bar{c})^2$ term within the sum is particularly small for both modules, compared with previous cycles. This suggests that the equating error is small because the 2 modules that remained available for equating happened to have a particularly close alignment between the 2022 and 2025 item parameters at Year 6.

$$\text{EquatingError}_{2014-2025,\text{Y10}} = \sqrt{2.13^2 + 4.87^2 + 5.52^2} = 7.66$$

$$\text{EquatingError}_{2011-2025,\text{Y10}} = \sqrt{2.13^2 + 4.87^2 + 5.52^2 + 4.01^2} = 8.65$$

$$\text{EquatingError}_{2008-2025,\text{Y10}} = \sqrt{2.13^2 + 4.87^2 + 5.52^2 + 4.01^2 + 5.712^2} = 10.37$$

$$\text{EquatingError}_{2005-2025,\text{Y10}} = \sqrt{2.13^2 + 4.87^2 + 5.52^2 + 4.01^2 + 5.712^2 + 4.300^2} = 11.22.$$

Plausible values

Plausible values methodology was used to generate estimates of students' ICT literacy. Using item parameters anchored at their estimated values from the calibration process, plausible values were randomly drawn from the marginal posterior of the latent distribution (Mislevy 1991; Mislevy and Sheehan 1987; von Davier, Gonzalez and Mislevy 2009). Here, item responses that had been coded as "not reached" missing responses during the calibration were now scored as incorrect responses, just like other (embedded) missing responses (but not responses affected by technical issues).

Estimates are based on the conditional item response model and the population model, which includes the regression on background and questionnaire variables used for conditioning (see a detailed description in Adams and Wu 2002). Again, the ACER ConQuest software package was used for drawing plausible values. Plausible values were drawn nationally by year level.

Some variables were used as direct regressors in the conditioning model for drawing plausible values. The variables included dummy variables of explicit strata of jurisdiction by sector, school mean performance adjusted for the student's own performance,[21] the school's geolocation and the student-level variables of gender, Indigenous status, language background other than English (LBOTE), highest parental education (PARED) and highest parental occupation group (POCC).

Principal component analysis (PCA) was used to extract component scores from all other student-background variables and responses to questions in the student questionnaire. The principal components were estimated separately by year level. Subsequently, the components that explained 99% of the variance in the original variables were included as regressors in the final conditioning model for each year level. Details of the coding of variables included directly in the conditioning model or included in the PCA are listed in Appendix G.

Scaling questionnaire items

The student questionnaire included 11 questions relating to 17 constructs that broadly captured information about the use of digital tools for different applications (in a school or out-of-school setting), attitudes and self-efficacy in the use of these tools, and classroom instruction for different aspects of ICT literacy.

The questionnaire scaling procedures remain the same as for the 2022 cycle. While there is a high degree of overlap in the content of constructs, the scales were derived separately across each cycle and are not deemed equivalent.

Before estimating student scale scores for the questionnaire indices, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were carried out for all scales to evaluate the dimensionality of each set of items. The CFA largely confirmed the expected dimensional structure and the resulting scales had satisfactory reliabilities. For example, there are 6 items designed to measure students' perceptions on the importance of using digital tools (Q07) and 13 or 14 items, for Year 6 and Year 10 respectively, reflecting confidence (self-efficacy) in using digital tools (Q12). The analyses confirmed the expected one-dimensional factor structure of each of these item sets.

[21] Weighted likelihood estimates (WLEs) were used as ability estimates in this case (Warm 1989).

Table 5.3 shows the description, name and number of items for each scale in the Year 6 questionnaire. If the Year 10 questionnaire differs, the number of items is indicated in parentheses. In addition, the table includes the scale reliabilities (Cronbach's alpha) as well as the correlations with student achievement for each year level.

Table 5.3: Description of questionnaire scales

Scale name	Scale description	Question number	Number of items	Cronbach's alpha		Correlation with achievement	
				Year 6	Year 10	Year 6	Year 10
IMPDIG	Importance of using digital tools	QN07	6	0.67	0.83	0.15	0.24
UTILSCH	Students' frequency of using study utilities on digital tools – at school	QN08	8	0.80	0.83	-0.11	0.00
UTILOUT	Students' frequency of using study utilities on digital tools – outside of school	QN08	8	0.73	0.76	-0.18	-0.07
COMSCH	Students' frequency of using digital tools for communication activities – at school	QN09	4 (5)	0.62	0.76	-0.25	-0.18
COMOUT	Students' frequency of using digital tools for communication activities – outside of school	QN09	4 (5)	0.67	0.63	-0.07	-0.02
TECSCH	Students' frequency of completing technological tasks using digital tools – at school	QN10	6 (7)	0.76	0.87	-0.27	-0.30
TECOUT	Students' frequency of completing technological tasks using digital tools – outside of school	QN10	6 (7)	0.74	0.84	-0.13	-0.23
EFFICACY	Students' digital tools self-efficacy	QN12	13 (14)	0.89	0.90	0.26	0.39
ICTLRNT	Students reports of learning about traditional ICT literacy concepts at school	QN13	10	0.76	0.83	0.18	0.14
ICTLRND	Students reports of learning about digital safety concepts at school	QN14	12 (14)	0.84	0.89	0.21	0.13
SCHACT	Student participation in digital learning activities at school	QN15	7	0.73	0.86	-0.14	-0.15
TOOLSSTD	Use of standard digital tools for schooling	QN16	6	0.78	0.77	0.06	0.24
TOOLSSPE	Use of specialised digital tools for schooling	QN16	13 (15)	0.94	0.96	-0.22	-0.22
CLASSREG	Regular classroom integration of digital tools	QN17	10	0.91	0.92	0.09	0.23
CLASSEXT	Extended classroom integration of digital tools	QN17	7 (9)	0.88	0.91	-0.16	-0.13
INSTCOD	Reports about receiving instructions on coding principles	QN18	6 (7)	0.91	0.95	-0.24	-0.24
INSTCOM	Reports about receiving instructions on computational thinking principles	QN18	4	0.78	0.79	0.12	0.10

Student and item parameters were estimated using the ACER ConQuest software. Items were scaled using the Rasch partial credit model (Masters and Wright 1997). Item difficulty parameters and students' attitudes or attributes were jointly estimated, giving equal weights to states and territories.

The weighted likelihood estimation (WLE) was used to obtain individual student scale scores. The scales were then converted to a metric with a mean of 50 and a standard deviation of 10 for the Year 6 sample. This metric for these scales was used in the public report to signify differences in student questionnaire outcomes by subgroups of the population (for example, by gender and by student achievement).

Chapter 6: Proficiency levels and the proficient standard

One of the primary objectives of NAP–ICT Literacy 2025 is to systematically monitor and report trends in students' information and communication technology (ICT) literacy achievement over time. Consistent with established practice in NAP sample assessments, 2 summary measures of student achievement are reported in addition to the average scale score. These are:

- **Proficiency level achievement**
  For NAP–ICT Literacy 2025, 6 proficiency levels were defined, each corresponding to a specific range on the reporting scale and accompanied by detailed descriptions of the skills and competencies demonstrated at that level. The distribution of students across these proficiency levels provides a nuanced measure of student achievement, enabling the identification of performance patterns within the population.
- **Proficient standard achievement**
  The proficient standards are defined as specific points on the NAP–ICT Literacy scale that represent a "challenging but reasonable" expectation of proficiency for students in Year 6 and Year 10. The percentage of students who meet or exceed the proficient standard serves as an additional indicator of student performance. Notably, the proportion of students achieving at or above the proficient standard is designated as the national key performance measure (KPM) in the Measurement Framework for Schooling in Australia (ACARA 2025).

This chapter details the development and application of these 2 summary measures for NAP–ICT Literacy 2025.

Proficiency levels

The NAP–ICT Literacy scale forms the basis for empirical comparisons of student achievement. In addition to the scale, a set of 6 proficiency levels with substantive descriptions was established in 2005. These levels were developed as syntheses of the item content within each level. The scale level descriptions have been reviewed following each cycle of the assessment, including most recently in 2025, to ensure they accurately reflect the NAP–ICT Literacy assessment content.

Comparing student achievement against the proficiency levels provides an empirically and substantively robust way of describing profiles of student achievement. As the scale is developmental, each proficiency level (1 to 6) represents a progression in the complexity of skills and tasks students are likely to complete successfully. Within each level, students near the top typically demonstrate more advanced skills and understanding, while those near the bottom of a level typically demonstrate fewer or less complex skills.

Creating the proficiency levels

The proficiency levels for NAP–ICT Literacy were originally established in 2005. They drew on methodological approaches developed for the OECD's Programme for International Student Assessment (PISA) and were in line with the approach used for the previously established proficiency levels for NAP–Science Literacy in 2003 and NAP–Civics and Citizenship in 2004. Like these other studies, the approach was designed to ensure that the concept of proficiency levels could be interpreted consistently, recognising that the achievement scale represents a continuum. This approach provides a common understanding of what it means for a student to be "at a level" and ensures that the interpretation of being "at a level" remains consistent across the scale.

Similar to the approach taken in the PISA study (OECD 2005, p.255), this method considers the following 3 variables:

- the expected success of a student at a given proficiency level when presented with test items targeted at that level
- the width of each proficiency level on the achievement scale
- the probability that a student whose ability is at the midpoint of a proficiency level would correctly answer an item of average difficulty for that level.

For NAP–ICT Literacy, 2 key parameters were adopted to operationalise these principles:

- the response probability for the analysis of data was set at $p = 0.62$
- the width of each proficiency level was set at 1.25 logits.

With these parameters in place, the following statements can be made regarding student achievement relative to the proficiency levels:

- a student at the lowest boundary of a proficiency level is expected to answer correctly approximately 50% of items that are uniformly distributed in difficulty across that level. Thus, any student performing within a given level is regarded as being able to demonstrate the skills required to answer items at that level
- a student at the lowest boundary of a proficiency level is likely to answer correctly 62% of items that are similar in difficulty to the easiest items within that level
- a student at the upper boundary of a proficiency level is likely to answer correctly 85% of items that are similar in difficulty to the easiest items within that level.

Proficiency level cut-points

Six proficiency levels were generated for reporting student achievement. The positioning of the proficiency levels on the NAP–ICT Literacy scale was done together with a standards setting exercise in 2005, the details of which are outlined later in this chapter.

Table 6.1 shows these levels and shows the percentage of Year 6 and Year 10 students in each level in NAP–ICT Literacy 2025.

Table 6.1: Proficiency level cut-points and percentage of Year 6 and Year 10 students in each level in 2025

Proficiency level	Lower-level boundary (logits)	Lower-level boundary (scale points)	Y6%	Y6 CI	Y10%	Y10 CI
Level 6	3.5	769	0*	(±0.0)	0*	(±0.1)
Level 5	2.25	649	0*	(±0.1)	3	(±0.8)
Level 4	1	529	8	(±1.2)	34	(±2.5)
Level 3	-0.25	409	41	(±2.2)	41	(±2.2)
Level 2	-1.5	289	35	(±1.8)	16	(±1.9)
Level 1	-	-	15	(±1.6)	6	(±1.5)

*Confidence Intervals (1.96 * SE) are reported in brackets.*
**There are too few observations to provide reliable estimates (i.e. fewer than 30 students or fewer than 5 schools with valid data).*

Describing proficiency levels

Summary descriptions for all 6 proficiency levels were initially established in 2005, informed by expert judgements regarding the content and cognitive demands of items situated within each level. As part of the ongoing quality assurance process, these proficiency level descriptors are systematically reviewed during each NAP–ICT Literacy assessment cycle to ensure alignment with

newly developed item content, and are revised as necessary. In 2022, the descriptors were expanded to incorporate the newly introduced Digital Technology (DT) test content (ACARA 2020). For the 2025 cycle, the descriptors were reviewed in the context of the latest assessment content and were confirmed as remaining appropriate; no substantive changes were required. However, as in previous cycles, new examples of student achievement at each level were added to reflect the most recent assessment tasks.

Across all 6 proficiency levels, the descriptors are anchored in the 4 strands articulated in the NAP–ICT Literacy 2025 Assessment Framework:

- Understanding ICT and digital systems
- Investigating and planning solutions with ICT
- Implementing and evaluating digital solutions
- Applying safe and ethical protocols and practices when using ICT.

This structure ensures that the descriptors remain relevant and applicable to the demonstration of ICT literacy achievement, even as software contexts and digital applications evolve across assessment cycles. While the assessment modules and associated tasks are periodically updated to reflect contemporary digital environments, the NAP–ICT Literacy assessment is intended and designed to maintain a stable conceptualisation of ICT literacy. This approach is consistent with best practice in longitudinal assessment programs, where maintaining the integrity of the construct is essential for valid measurement of change over time, even as assessment methods and content are adapted to remain current (von Davier and Mazzeo 2009).

The full set of proficiency level descriptors is provided in Appendix H.

Setting the proficient standards

The proficient standards in NAP–ICT Literacy 2025 are defined as “challenging but reasonable” expectations of student achievement at each year level, requiring students to demonstrate more than the elementary skills typically expected at that stage (ACARA 2025, p. 5). Importantly, these standards are distinct from benchmarks or national minimum standards, which are designed to indicate minimum competence.

The methodology for setting proficient standards in domains such as primary science, information and communications technologies, civics and citizenship, and secondary (15-year-old) reading, mathematics and science was endorsed by the Performance Measurement and Reporting Taskforce (PMRT) at its meeting on 6 March 2003 (PMRT 2003).

For NAP–ICT Literacy, the proficient standards for Year 6 and Year 10 were established during the inaugural assessment in 2005, following extensive consultation with ICT experts and representatives from all states, territories and school sectors. The standards-setting group comprised practising teachers with ICT expertise, ICT curriculum specialists and educational assessment experts. The procedures adopted by this group are documented in the NAP–ICT Literacy Public Report (MCEETYA 2007, pp. 46–47).

On the NAP–ICT Literacy scale, the proficient standard for Year 6 is set at 409 scale points, corresponding to the boundary between proficiency levels 2 and 3. For Year 10, the proficient standard is set at 529 scale points, marking the boundary between levels 3 and 4. Accordingly, Year 6 students performing at level 3 or above, and Year 10 students performing at level 4 or above, are considered to have met or exceeded the relevant proficient standard.

Chapter 7: Reporting of results

The students assessed in NAP–ICT Literacy 2025 were selected using a 2-stage cluster sampling procedure. At the first stage, schools were sampled from a sampling frame with a probability proportional to their size as measured by student enrolments in the relevant year level. In the second stage, 20 students at each year level were randomly sampled within schools (see Chapter 3 for further information on sampling and weighting).

Applying cluster sampling techniques is an efficient and economical way of selecting students in educational research. However, as these samples were not obtained through (one-stage) simple random sampling, standard formulae to obtain sampling errors of population estimates are not appropriate. In addition, NAP–ICT Literacy estimates were obtained using plausible value methodology (see Chapter 5 on scaling procedures), which allows for estimating and combining the measurement error of achievement scores with their sampling error.

Reporting of results by subgroups of interest becomes more limited as group sizes decrease due to the increase in error that accompanies this. For this cycle of NAP–ICT Literacy, the gender category "other" is not reported because there are fewer than 30 students with valid data.

This chapter describes the method applied for estimating sampling as well as measurement error. In addition, it contains a description of the types of statistical analyses and significance tests that were carried out for reporting of results in the NAP–ICT Literacy 2025 Public Report.

Computation of sampling and measurement variance

Unbiased standard errors from studies should include both sampling variance and measurement variance. One way of estimating sampling variance on population estimates from cluster samples is by using the application of replication techniques (Wolter 1985, Gonzalez and Foy 2000). The sampling variances of population means, differences, percentages and correlation coefficients in NAP–ICT Literacy studies were estimated using the jackknife repeated replication (JRR) technique.

The other component of the standard error of achievement test scores, the measurement variance, can be derived from the variance among the 5 plausible values for NAP–ICT Literacy. In addition, for comparing achievement test scores with those from previous cycles (2005, 2008, 2011, 2014, 2017 and 2022), an equating error was added as a third component of the standard error.

Replicate weights

When applying the JRR method for stratified samples, primary sampling units – in this case schools – are paired into pseudo-strata, also called sampling zones. The assignment of schools to these sampling zones needs to be consistent with the sampling frame from which they were sampled (to obtain pairs of schools that were adjacent in the sampling frame) and zones are always constructed within explicit strata of the sampling frame. This procedure ensures that schools within each zone are as similar to each other as possible.[22] For NAP–ICT Literacy 2025, there were 173 sampling zones in Year 6 and 164 sampling zones for Year 10.

Within each sampling zone, one school was randomly assigned a value of 2, whereas the other school received a value of zero. To create replicate weights for each of these sampling zones, the jackknife indicator variable was multiplied by the original sampling weights of students within the corresponding zone so that one of the paired schools had a contribution of zero and the other school had a double contribution, whereas schools from all other sampling zones remained unmodified.

[22] In the case of an odd number of schools within an explicit stratum on the sampling frame, the remaining school is randomly divided into 2 halves and each half assigned to the 2 other schools in the final sampling zone to form *pseudo-schools*.

At each year level, 173 replicate weights were computed. At Year 10, which only had 164 sampling zones, 9 of the 173 replicate weights were assigned the final weight. This was done to have a consistent number of replicate weight variables for each year level in the final database, and does not affect calculations, as mentioned in the following section.

Standard errors

In order to compute the sampling variance for a statistic t, t is estimated once for the original sample S and then for each of the jackknife replicates J_h. The JRR variance is computed using the formula:

$$Var_{jrr}(t) = \sum_{h=1}^{H} [t(J_h) - t(S)]^2$$

where H is the number of replicate weights, $t(S)$ is the statistic t estimated for the population using the final sampling weights, and $t\ (J_h)$ is the same statistic estimated using the weights for the hth jackknife replicate.[23] For all statistics that are based on variables other than student test scores (plausible values), the standard error of t is equal to:

$$\sigma(t) = \sqrt{Var_{jrr}(t)}$$

The computation of JRR variance can be obtained for any statistic. However, many standard statistical software packages such as SPSS® do not generally include any procedures for replication techniques. Therefore, specialist software, the SPSS® Replicates Add-in, was used to run tailored SPSS® macros to estimate JRR variance for means and percentages.[24]

Population statistics for NAP–ICT Literacy scores were estimated using all 5 plausible values, with standard errors reflecting both sampling and measurement error. If t is any computed statistic and t_i is the statistic of interest computed on one plausible value, then:

$$t = \frac{1}{M}\sum_{i=1}^{M} t_i$$

with M being the number of plausible values.

The sampling variance U is calculated as the average of the sampling variances U_i , where U_i is the JRR variance (computed as $Var_{jrr}(t)$ as shown above) for each plausible value i:

$$U = \frac{1}{M}\sum_{i=1}^{M} U_i$$

Using 5 plausible values for data analysis allows the estimation of the error associated with the measurement of NAP–ICT Literacy due to the lack of precision of the test instrument. The measurement variance or imputation variance B_m was computed as:

$$B_m = \frac{1}{M-1}\sum_{i=1}^{M} (t_i - t)^2$$

[23] When replicate weights are the same as the final weights for a jackknife replicate h, the term $t(J_h) - t(S)$ will be equal to 0, and thus not impact the total of the sum. Thus, the padding of the Year 10 replicate weights with 9 values equal to the final weight does not affect the variance calculation.

[24] Conceptual background and application of macros with examples are described in the *PISA Data Analysis Manual SPSS®*, 2nd ed (OECD 2009).

To obtain the final standard error SE applicable to population statistics for NAP–ICT Literacy scores, the sampling variance and measurement variance were combined as:

$$SE = \sqrt{U + \left(1 + \frac{1}{M}\right) B_m}.$$

The 95% confidence interval, as presented in the NAP–ICT Literacy 2025 Public Report, was computed as 1.96 times the standard error. The bounds of the 95% confidence interval of a statistic are calculated from the value of the statistic *minus* 1.96 times the standard error, to the value of the statistic *plus* 1.96 times the standard error.

Reporting of mean differences

The NAP–ICT Literacy 2025 Public Report includes comparisons of achievement between different groups; that is, means (averages) of scale scores were compared in graphs and tables. Each population estimate was accompanied by its 95% confidence interval. In addition, tests of significance for the difference between estimates were provided, in order to describe the probability that differences were a result of sampling and measurement errors.

The following types of significance tests for differences in average achievement population estimates were reported:

- between states and territories
- between year levels 6 and 10
- between student background subgroups
- across the 7 assessment cycles (2005, 2008, 2011, 2014, 2017, 2022 and 2025).

Mean differences between states and territories and year levels

Pairwise comparison charts allow the comparison of population estimates between one state or territory and another, or between Year 6 and Year 10. Differences in means were considered significant when the test statistic t was outside the critical values ±1.96 ($\alpha = 0.05$). The t value is calculated by dividing the difference in means by its standard error, which is given by the formula:

$$SE_{\text{diff}_{ij}} = \sqrt{SE_i^2 + SE_j^2},$$

where $SE_{\text{diff}_{ij}}$ is the standard error of the difference, and SE_i and SE_j are the standard errors of the means i and j. This computation of the standard error was only applied for comparisons between 2 samples that had been drawn independently from each other (for example, jurisdictions or year levels).

Mean differences between dependent subgroups

The formula for calculating the standard error provided above is only suitable when the subsamples being compared are independent (see OECD 2009 for more detailed information). In the case of dependent subgroups, the covariance between the 2 standard errors needs to be taken into account and the jackknife repeated replication (JRR) technique should be used to estimate the sampling error for average differences.

As subgroups other than “state or territory” and “year level” are dependent subsamples (for example, gender and language background subgroups), the difference between statistics for subgroups of interest and the standard error of the difference were derived using the specialist SPSS® Replicates Add-in software that runs macros to apply JRR. Differences between subgroups were considered significant when the test statistic t was outside the critical values ±1.96 ($\alpha = 0.05$). The value t was calculated by dividing the average difference by its standard error.

Mean differences between assessment cycles

This report also includes comparisons of assessment results across cycles. As the process of equating the tests across the cycles introduces some additional error into the calculation of any test statistic, an equating error term was added to the formula for the standard error of the difference (between cycle averages, for example). In the 2025 cycle, there are separate equating errors for Year 6 and Year 10.

The value of the equating error between 2025 and 2022 is 0.79 units of the NAP–ICT Literacy scale for Year 6 and 2.13 for Year 10. When testing the difference of a statistic between the 2 assessments, the standard error of the difference is computed as follows:

$$SE(\mu_{2025} - \mu_{2022}) = \sqrt{SE_{2025}^2 + SE_{2022}^2 + \text{EquatingError}_{2022-2025}^2}$$

where μ can be any statistic (with the exception of percentages) in units on the NAP–ICT Literacy scale (average, percentile, gender difference), SE_{2025} is the respective standard error of this statistic in 2025, SE_{2022} is the respective standard error of this statistic in 2022, and $\text{EquatingError}_{2022-2025}$ is the equating error for comparing 2025 with 2022 results (note that in 2025, the equating error value used for this calculation differs between Year 6 and Year 10, as described in the section Horizontal equating in Chapter 5 of this report).

When comparing population estimates between 2025 and 2017, 2 equating errors (between 2025 and 2022, and between 2022 and 2017) had to be taken into account. This was achieved by applying the following formula for the calculation of the standard error for differences between statistics from 2025 and 2017:

$$SE(\mu_{2025} - \mu_{2017}) = \sqrt{SE_{2025}^2 + SE_{2017}^2 + \text{EquatingError}_{2017-2025}^2}$$

The formula is similar for comparisons with earlier cycles. The equating errors for comparing averages between 2025 and each previous NAP–ICT Literacy cycle are provided in Table 7.1.

Table 7.1: Equating errors for comparing mean scores between NAP–ICT Literacy 2025 and each previous assessment cycle

Equated assessment cycles	Y6 equating error (scale points)	Y10 equating error (scale points)
2025-2022	0.79	2.13
2025-2017	4.93	5.31
2025-2014	7.4	7.66
2025-2011	8.42	8.65
2025-2008	10.17	10.37
2025-2005	11.05	11.22

Differences in percentages between assessment cycles

To report the significance of differences between percentages at or above proficient standards, the equating error for each year level could not be applied directly. Therefore, the following replication method was applied to estimate the equating error for percentages at proficient standards.

For each year level cut-point that defines the corresponding proficient standard (409 for Year 6 and 529 for Year 10), 5,000 replicate cut-points were generated by adding a random error component with an average of 0 and a standard deviation equal to the relevant estimated equating error from Table 7.1. Percentages of students at or above each replicate n cut-point (ρ_n) were computed and an equating error for each year level was estimated as:

$$\text{EquatingError}(\rho) = \sqrt{\frac{\sum_{n=1}^{5000}(\rho_n - \rho_o)^2}{n}}$$

where ρ_o is the reported percentage of students at or above the proficient standard at the appropriate year level. The standard errors for the differences between percentages at or above proficient standards were calculated as:

$$SE(\rho_{2025} - \rho_{2022}) = \sqrt{SE(\rho_{2025})^2 + SE(\rho_{2022})^2 + \text{EquatingError}(\rho)^2}$$

ρ_{2022} and ρ_{2025} are the percentages at or above the proficient standard in 2022 and 2025, respectively.

The equating errors for comparing percentage achievement between 2025 and each previous NAP–ICT Literacy cycle are provided in Table 7.2 and Table 7.3 for Year 6 and Year 10 respectively.

Table 7.2: Equating errors for comparing subgroup percentages between NAP–ICT Literacy 2025 and each previous assessment cycle (Year 6)

Year	Subgroup	2025-2022	2025-2017	2025-2014	2025-2011	2025-2008	2025-2005
6	All	0.26	1.77	2.61	2.97	3.61	3.94
6	NSW	0.29	1.95	2.68	3	3.59	3.9
6	VIC	0.2	1.47	2.31	2.68	3.33	3.66
6	QLD	0.2	1.93	2.87	3.24	3.88	4.21
6	SA	0.4	2	2.95	3.36	4.07	4.43
6	WA	0.59	1.8	2.69	3.09	3.81	4.17
6	TAS	0.26	1.19	1.91	2.25	2.87	3.18
6	NT	0.39	2.11	2.78	3.04	3.49	3.71
6	ACT	0.18	2.21	3.25	3.64	4.29	4.6
6	Female	0.3	1.99	2.89	3.25	3.89	4.21
6	Male	0.24	1.58	2.37	2.73	3.37	3.69
6	Non-Indigenous students	0.25	1.76	2.62	2.99	3.65	3.98
6	Indigenous students	0.99	1.97	2.36	2.53	2.84	3.02
6	English	0.29	1.9	2.77	3.14	3.79	4.12
6	Language other than English	0.2	1.54	2.34	2.68	3.29	3.61
6	Major cities	0.22	1.63	2.47	2.84	3.49	3.82
6	Regional	0.39	2.21	3.04	3.39	4	4.31
6	Remote	2.34	3.15	3.89	4.18	4.66	4.89
6	Senior managers and professionals	0.28	1.77	2.57	2.93	3.57	3.91
6	Other managers and associate professionals	0.27	1.74	2.54	2.9	3.54	3.88
6	Tradespeople & skilled office, sales and service staff	0.21	1.89	2.9	3.31	4.03	4.38
6	Machine operators, labourers, hospitality, and related staff	0.33	1.65	2.34	2.64	3.17	3.45
6	Not in paid work in last 12 months	0.23	1.55	2.41	2.75	3.31	3.59
6	Not stated or unknown	1.05	2.88	3.71	4.04	4.6	4.87
6	Year 11 or equivalent or below	0.34	1.78	2.46	2.75	3.26	3.53
6	Year 12 or equivalent	0.22	1.33	2.23	2.6	3.23	3.55
6	Certificate I to IV (inc trade cert)	0.32	1.83	2.66	3.01	3.62	3.94
6	Advanced diploma/diploma	0.34	2.22	3.3	3.75	4.51	4.88
6	Bachelor degree or above	0.24	1.65	2.43	2.77	3.4	3.72
6	Not stated or unknown	1.23	4.17	5.03	5.35	5.9	6.18

Table 7.3: Equating errors for comparing subgroup percentages between NAP–ICT Literacy 2025 and each previous assessment cycle (Year 10)

Year	Subgroup	2025-2022	2025-2017	2025-2014	2025-2011	2025-2008	2025-2005
10	All	0.98	2.47	3.49	3.91	4.63	4.98
10	NSW	0.9	2.38	3.48	3.91	4.62	4.97
10	VIC	1.15	2.66	3.72	4.16	4.91	5.28
10	QLD	0.88	2.47	3.42	3.82	4.51	4.85
10	SA	1.37	2.67	3.68	4.11	4.87	5.24
10	WA	0.95	2.38	3.3	3.7	4.41	4.77
10	TAS	1.04	2.16	2.87	3.17	3.72	3.99
10	NT	0.9	2.09	3.05	3.42	4.01	4.28
10	ACT	1.3	3.39	4.61	5.06	5.79	6.14
10	Female	1	2.54	3.61	4.05	4.81	5.18
10	Male	0.96	2.39	3.38	3.78	4.46	4.79
10	Non-Indigenous students	1.03	2.58	3.64	4.08	4.83	5.19
10	Indigenous students	0.35	1.1	1.54	1.72	2.01	2.16
10	English	0.98	2.5	3.54	3.96	4.69	5.04
10	Language other than English	1.03	2.48	3.47	3.88	4.57	4.9
10	Major cities	0.98	2.51	3.6	4.05	4.82	5.19
10	Regional	1.05	2.52	3.41	3.77	4.37	4.67
10	Remote	0	0.14	0.56	0.74	1.18	1.38
10	Senior managers and professionals	1.09	2.74	3.82	4.26	5	5.36
10	Other managers and associate professionals	1.28	2.89	4.06	4.56	5.4	5.81
10	Tradespeople & skilled office, sales and service staff	0.9	2.28	3.26	3.67	4.37	4.71
10	Machine operators, labourers, hospitality, and related staff	0.55	1.75	2.59	2.92	3.5	3.78
10	Not in paid work in last 12 months	0.56	1.76	2.4	2.65	3.08	3.3
10	Not stated or unknown	1.08	2.26	3.01	3.33	3.91	4.19
10	Year 11 or equivalent or below	0.46	1.53	2.19	2.45	2.9	3.13
10	Year 12 or equivalent	0.59	1.71	2.39	2.67	3.19	3.45
10	Certificate I to IV (inc trade cert)	1.21	2.67	3.57	3.93	4.54	4.83
10	Advanced diploma/diploma	1.11	2.48	3.49	3.91	4.62	4.98
10	Bachelor degree or above	0.99	2.66	3.85	4.34	5.19	5.6
10	Not stated or unknown	0.8	1.51	2.37	2.73	3.31	3.58

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Appendices

Appendix A: Student questionnaire

All questions are for both Year 6 and Year 10 unless otherwise stated.

NAP–ICTL 2025 Main Study Student Questionnaire

INSTRUCTIONS

This questionnaire is about your use of digital tools. In this questionnaire digital tools are:

- desktop computers
- laptop computers
- tablets
- smartphones (to access the internet and use apps)
- other devices to access the internet and use apps (including smart watches, virtual reality (VR) headsets).

1. How long have you been using digital tools?

(Select one response.)

Never or less than one year	☐
At least one year but less than three years	☐
At least three years but less than five years	☐
At least five years but less than seven years	☐
Seven years or more	☐

2. What type of digital tools do you use in the following places?

(Select as many responses as are relevant to you for each place.)

	At school	Outside of school
Desktop computer	☐	☐
Portable devices (laptop, tablet)	☐	☐
Smartphone	☐	☐
Other digital tools (including smart watch, VR headsets)	☐	☐
None	☐	☐

3. Do you have your own portable digital tool(s) for use in class?

(Select one response for each tool.)

	Laptop computer	Tablet
No	☐	☐
Yes, my school provides me with the device	☐	☐
Yes, my school tells me what brand or model of device I may bring	☐	☐
Yes, I can bring any brand or model of device to school	☐	☐

4. How often do you use each type of digital tool in the following places?

(Select one response for each place.)

	Several times every day	Once a day	Almost every day	A few times each week	Once a week or less	Never
Desktop computer – At school	☐	☐	☐	☐	☐	☐
Desktop computer – Outside of school	☐	☐	☐	☐	☐	☐
Portable devices (laptop, tablet) – At school	☐	☐	☐	☐	☐	☐
Portable devices (laptop, tablet) – Outside of school	☐	☐	☐	☐	☐	☐

5. Do you have access to a computer or tablet at home?

(Select one response.)

- ☐ Yes, I have access to my own device
- ☐ Yes, but I have to share it with others
- ☐ No, I do not have access to any device

6. How reliable is your internet access at home?

(Select one response.)

- ☐ The internet access is fast and reliable
- ☐ The internet access is not fast, but it is reliable
- ☐ The internet access is not reliable
- ☐ I do not have internet access at home

7. To what extent do you agree or disagree with each of the following statements on why you might enjoy using digital tools?

(Select one response in each row.)

	Strongly agree	Agree	Disagree	Strongly disagree
a) They help me improve the quality of my work.	☐	☐	☐	☐
b) They make work easier.	☐	☐	☐	☐
c) They help me to work with others.	☐	☐	☐	☐
d) They enable me to work alone.	☐	☐	☐	☐
e) They help me communicate with my friends.	☐	☐	☐	☐
f) They help me find new ways to do things	☐	☐	☐	☐

8. How often do you use digital tools to do each of the following?

*(Use the drop down menu to select one option for each of **At school** and **Outside of school**.)*

		At least once every day	Almost every day	A few times each week	Between once a week and once a month	Less than once a month	Never
A1	Search the internet for information for study or school work – At School	☐	☐	☐	☐	☐	☐
A2	Search the internet for information for study or school work – Outside of School	☐	☐	☐	☐	☐	☐
B1	Use word processing software or apps to create documents – At School	☐	☐	☐	☐	☐	☐
B2	Use word processing software or apps to create documents – Outside of School	☐	☐	☐	☐	☐	☐
C1	Enter data in a spreadsheet – At School	☐	☐	☐	☐	☐	☐
C2	Enter data in a spreadsheet – Outside of School	☐	☐	☐	☐	☐	☐
D1	Use mathematics, language or other learning programs – At School	☐	☐	☐	☐	☐	☐
D2	Use mathematics, language or other learning programs – Outside of School	☐	☐	☐	☐	☐	☐
E1	Use spreadsheets to create a graph or perform calculations – At School	☐	☐	☐	☐	☐	☐
E2	Use spreadsheets to create a graph or perform calculations – Outside of School	☐	☐	☐	☐	☐	☐
F1	Create presentations for school projects – At School	☐	☐	☐	☐	☐	☐
F2	Create presentations for school projects – Outside of School	☐	☐	☐	☐	☐	☐
G1	Watch online videos to support your own learning – At School	☐	☐	☐	☐	☐	☐
G2	Watch online videos to support your own learning – Outside of School	☐	☐	☐	☐	☐	☐
H1	Use artificial intelligence tools (e.g. ChatGPT, Microsoft Copilot) to assist with your school work – At School	☐	☐	☐	☐	☐	☐
H2	Use artificial intelligence tools (e.g. ChatGPT, Microsoft Copilot) to assist with your school work – Outside of school	☐	☐	☐	☐	☐	☐

9. How often do you use digital tools to do each of the following?

*(Use the drop down menu to select one option for each of **At school** and **Outside of school**.)*

		At least once every day	Almost every day	A few times each week	Between once a week and once a month	Less than once a month	Never
A1	Use email – At School	☐	☐	☐	☐	☐	☐
A2	Use email – Outside of School	☐	☐	☐	☐	☐	☐
B1	Chat or text through apps – At School	☐	☐	☐	☐	☐	☐
B2	Chat or text through apps – Outside of School	☐	☐	☐	☐	☐	☐
C1	Participate in online discussions on community platforms – At School	☐	☐	☐	☐	☐	☐
C2	Participate in online discussions on community platforms – Outside of school	☐	☐	☐	☐	☐	☐
D1	Use video call tools to communicate with people online – At School	☐	☐	☐	☐	☐	☐
D2	Use video call tools to communicate with people online – Outside of School	☐	☐	☐	☐	☐	☐
E1	Create and share content with others on social media – At School (Y10 only)	☐	☐	☐	☐	☐	☐
E2	Create and share content with others on social media – Outside of School (Y10 only)	☐	☐	☐	☐	☐	☐

10. How often do you use digital tools to do each of the following?

*(Use the drop down menu to select one option for each of **At school** and **Outside of school**.)*

		At least once every day	Almost every day	A few times each week	Between once a week and once a month	Less than once a month	Never
A1	Create code with a visual programming tool (e.g. Makecode, Scratch, Blockly, Lego WeDo, Spike Prime, Mindstorms) – At School	☐	☐	☐	☐	☐	☐
A2	Create code with a visual programming tool (e.g. Makecode, Scratch, Blockly, Lego WeDo, Spike Prime, Mindstorms) – Outside of School	☐	☐	☐	☐	☐	☐
B1	Create text-based code or programs (e.g. JavaScript, Swift, Python, Visual Basic, .NET) – At School	☐	☐	☐	☐	☐	☐
B2	Create text-based code or programs (e.g. JavaScript, Swift, Python, Visual Basic, .NET) – Outside of School	☐	☐	☐	☐	☐	☐
C1	Publish media you have created to an online account (e.g. to YouTube, SoundCloud) – At School (Y10 only)	☐	☐	☐	☐	☐	☐
C2	Publish media you have created to an online account (e.g. to YouTube, SoundCloud) – Outside of school (Y10 only)	☐	☐	☐	☐	☐	☐
D1	Create an app – At School	☐	☐	☐	☐	☐	☐
D2	Create an app – Outside of School	☐	☐	☐	☐	☐	☐
E1	Use drawing, painting, design or graphics programs or apps – At School	☐	☐	☐	☐	☐	☐
E2	Use drawing, painting, design or graphics programs or apps – Outside of School	☐	☐	☐	☐	☐	☐
F1	Change application settings to suit your purposes (e.g. adjusting display or privacy settings) – At School	☐	☐	☐	☐	☐	☐
F2	Change application settings to suit your purposes (e.g. adjusting display or privacy settings) – Outside of School	☐	☐	☐	☐	☐	☐
G1	Combine different types of digital content (e.g. music, video, images) into one product – At School	☐	☐	☐	☐	☐	☐
G2	Combine different types of digital content (e.g. music, video, images) into one product – Outside of School	☐	☐	☐	☐	☐	☐

11. How often do you use digital tools to do each of the following outside of school?

(Select one response in each row.)

	At least once every day	Almost every day	A few times each week	Between once a week and once a month	Less than once a month	Never
a) Watch videos or live streams for entertainment	☐	☐	☐	☐	☐	☐
b) Play games (including console, mobile and online games)	☐	☐	☐	☐	☐	☐
c) Use software or apps to create sounds/music, movies, animations or artwork	☐	☐	☐	☐	☐	☐
d) Listen to music for entertainment	☐	☐	☐	☐	☐	☐
e) Listen to podcasts, audiobooks or internet radio for entertainment	☐	☐	☐	☐	☐	☐
f) Search for online information about things you are interested in	☐	☐	☐	☐	☐	☐
g) Use coding or programming to create games or control robotic devices	☐	☐	☐	☐	☐	☐

12. How well can you do each of these tasks using digital tools?

(Select one response in each row.)

		I can do this easily by myself	I can do this with a bit of effort	I know what this means but I cannot do it	I don't know what this means
a)	Edit digital photographs or other graphic images	☐	☐	☐	☐
b)	Create a database (e.g. using Microsoft Access, FileMaker, SQL)	☐	☐	☐	☐
c)	Enter data in a spreadsheet (e.g. using Microsoft Excel, Google Sheets, Apple Numbers)	☐	☐	☐	☐
d)	Create a graph using spreadsheet software (e.g. using Microsoft Excel, Google Sheets, Apple Numbers)	☐	☐	☐	☐
e)	Download or stream music from the Internet	☐	☐	☐	☐
f)	Create a multimodal presentation (with sound, pictures, video)	☐	☐	☐	☐
g)	Create or edit websites	☐	☐	☐	☐
h)	Post content (e.g. comments, images, videos) on social media (e.g. Instagram, Snapchat, Facebook or similar) (Y10 only)	☐	☐	☐	☐
i)	Use a collaborative workspace (e.g. Google Classroom, Google Workspace, Microsoft Teams, Microsoft Office 365) to work with others on a shared project	☐	☐	☐	☐
j)	Use videoconferencing software (e.g. Zoom, Microsoft Teams, Google Meet) for communication purposes	☐	☐	☐	☐
k)	Use an online learning management system (e.g. Moodle, Google Classroom)	☐	☐	☐	☐
l)	Use artificial intelligence tools (e.g. ChatGPT, Microsoft Copilot, DALL-E) to generate content	☐	☐	☐	☐
m)	Evaluate the quality of information generated using artificial intelligence tools (e.g. ChatGPT, Microsoft Copilot)	☐	☐	☐	☐
n)	Reference digital content that I use in my work (e.g. image captions or bibliography)	☐	☐	☐	☐

13. In your schooling, have you learnt about the following issues?

(Select one response in each row.)

		Yes	No
a)	The need to provide references to content from webpages and internet-based sources that you include in your schoolwork (e.g. in image captions or bibliography)	☐	☐
b)	The need to know whether you have copyright permission to share music or video	☐	☐
c)	The problems of using illegal copies of games or videos for free (e.g. copyright, viruses, malware)	☐	☐
d)	Reading licence or usage agreements before you click on 'I agree' to install new software or apps	☐	☐
e)	How to decide where to look for information about an unfamiliar topic	☐	☐
f)	How to look for different types of digital information on a topic	☐	☐
g)	How to judge the relevance of information to include in schoolwork	☐	☐
h)	How to judge whether information on the internet can be trusted	☐	☐
i)	How to judge whether information produced with artificial intelligence tools (e.g. ChatGPT, Microsoft Copilot) is accurate	☐	☐
j)	Understanding when it is appropriate to use artificial intelligence generated content for schoolwork	☐	☐

14. In your schooling, have you learnt about the following issues?

(Select one response in each row.)

		Yes	No
a)	Opening email attachments from safe sources	☐	☐
b)	Checking where a message is from before clicking on links	☐	☐
c)	Reporting spam to an authority (such as a teacher or parent)	☐	☐
d)	How to create secure passwords	☐	☐
e)	Security risks when using the internet (e.g. viruses, scams, malware, phishing)	☐	☐
f)	Responsible use of social media (Y10 only)	☐	☐
g)	Respectful online relationships	☐	☐
h)	How to spot cyberbullying	☐	☐
i)	How to report cyberbullying or image-based abuse	☐	☐
j)	Where you can get reliable information and help about dealing with cyberbullying and/or suspicious online contact	☐	☐
k)	How to protect your personal safety when communicating online	☐	☐
l)	How to protect the privacy of your own data that you enter online	☐	☐
m)	How your online actions can impact negatively on your reputation and future opportunities	☐	☐
n)	How to update privacy settings on social media (Y10 only)	☐	☐

15. During the current school year, have you participated in any of the following activities at school?

(Select one response in each row.)

		Yes	No
a)	Creating code with a visual coding tool (e.g. Alice, GameMaker, Kodu, Makecode, MIT App Inventor, Scratch)	☐	☐
b)	Creating a digital game	☐	☐
c)	Working with others to create a digital solution to a problem	☐	☐
d)	Designing a program to control a digital or robotic device (e.g. drone).	☐	☐
e)	Using a virtual reality (VR) program	☐	☐
f)	Learning about the components of a digital system	☐	☐
g)	Examining the way data are being used to inform decisions	☐	☐

16. How often do you use the following tools for school-related purposes?

(Select one response in each row.)

		At least once a week	At least once a month but not every week	Less than once a month	Never
a)	Word processing software (e.g. Microsoft Word, Apple Pages, Google Docs)	☐	☐	☐	☐
b)	Spreadsheet software (e.g. Microsoft Excel, Apple Numbers, Google Sheets)	☐	☐	☐	☐
c)	Presentation software (e.g. Microsoft PowerPoint, Apple Keynote, Google Slides)	☐	☐	☐	☐
d)	Software for capturing and editing media (e.g. Apple iMovie, Audacity)	☐	☐	☐	☐
e)	Graphic design or drawing software (e.g. Microsoft Paint, Adobe Photoshop, Sketch)	☐	☐	☐	☐
f)	Text-based information websites (e.g. Wikipedia)	☐	☐	☐	☐
g)	Artificial intelligence tools for generating written content (e.g. ChatGPT, Microsoft Copilot, Gemini, Claude)	☐	☐	☐	☐
h)	Artificial intelligence tools for generating images (e.g. Dall-E, Adobe Firefly, Microsoft Copilot)	☐	☐	☐	☐
i)	Video-based information resources (e.g. YouTube, Kahn Academy)	☐	☐	☐	☐
j)	Digital journals (e.g. to reflect on your learning)	☐	☐	☐	☐
k)	Data collection or monitoring tools	☐	☐	☐	☐
l)	Concept or mind mapping software (e.g. Inspiration, Lucidchart) (Y10 only)	☐	☐	☐	☐
m)	Simulations and modelling software (e.g. FlexSim, Labster, Matlab, Tinkercad, Makecode) (Y10 only)	☐	☐	☐	☐
n)	Social media (e.g. Instagram, Snapchat, TikTok, Facebook) (Y10 only)	☐	☐	☐	☐
o)	Robotic devices (e.g. Sphero, Lego Mindstorms)	☐	☐	☐	☐
p)	3D printers or laser cutters	☐	☐	☐	☐
q)	Computer-aided drawing (CAD) software (e.g. TinkerCAD, Fusion360, FreeCAD)	☐	☐	☐	☐
r)	3D design software (e.g. SketchUp, Blender, Maya, 3ds Max)	☐	☐	☐	☐
s)	Block coding or visual programming tools (e.g. Alice, GameMaker, Kodu, Makecode , MIT App Inventor, Scratch)	☐	☐	☐	☐
t)	Programming languages involving object-oriented programming (e.g. Python, Java, C++)	☐	☐	☐	☐
u)	Scanners (either 2D or 3D)	☐	☐	☐	☐
v)	Video creation equipment	☐	☐	☐	☐

17. How often do the following activities take place in your lessons?

(Select one response in each row.)

		At least once a week	At least once a month but not every week	Less than once a month	Never
a)	My teacher uses digital tools to present information to the class.	☐	☐	☐	☐
b)	We use digital tools to present information to the class.	☐	☐	☐	☐
c)	My teacher uses digital tools to provide feedback on our work.	☐	☐	☐	☐
d)	We use digital tools to collaborate with each other on projects.	☐	☐	☐	☐
e)	We use digital tools to collaborate with students from other schools on projects.	☐	☐	☐	☐
f)	We use digital tools to complete tests.	☐	☐	☐	☐
g)	We use digital tools to work on short assignments (i.e. within one week).	☐	☐	☐	☐
h)	We use digital tools to work on extended projects (i.e. projects that last longer than one week).	☐	☐	☐	☐
i)	We use the internet or digital tools to contact students from other schools as part of our learning. (Y10 only)	☐	☐	☐	☐
j)	We use the internet or digital tools to contact experts outside the school. (Y10 only)	☐	☐	☐	☐
k)	We use digital tools to collect data for a project.	☐	☐	☐	☐
l)	We use digital tools to analyse data.	☐	☐	☐	☐
m)	We use digital tools to produce or edit audio.	☐	☐	☐	☐
n)	We create or edit visual products (e.g. animations, videos, 3D drawings).	☐	☐	☐	☐
o)	We create or program robotic devices (e.g. Bee-Bots Lego robotics, Sphero or similar).	☐	☐	☐	☐
p)	We use digital tools to submit assessments and gather feedback from my teacher.	☐	☐	☐	☐
q)	We use artificial intelligence (e.g. ChatGPT, Microsoft Copilot, DALL-E) to generate content	☐	☐	☐	☐
r)	My teacher(s) uses and demonstrates new technology or apps	☐	☐	☐	☐
s)	We present to the class in a variety of ways (e.g. videos, podcasts or demonstrations of games) as the presentation method	☐	☐	☐	☐

18. **In your lessons in the current school year, to what extent have you received instruction on how to do the following tasks?**

(Select one response in each row.)

		To a large extent	To a moderate extent	To a small extent	Not at all
a)	Breaking a complex problem into smaller parts	☐	☐	☐	☐
b)	Planning tasks by setting out the steps needed to complete them	☐	☐	☐	☐
c)	Developing algorithms (e.g. instructions for a program like Scratch or Python)	☐	☐	☐	☐
d)	Using digital tools to present information to the class	☐	☐	☐	☐
e)	Creating code or programming	☐	☐	☐	☐
f)	Developing applications (apps)	☐	☐	☐	☐
g)	Making changes to code to improve efficiency (Y10 only)	☐	☐	☐	☐
h)	Use artificial intelligence tools to generate or improve your code	☐	☐	☐	☐
i)	How to refine prompts in artificial intelligence tools to improve the quality of your output	☐	☐	☐	☐
j)	Debugging code	☐	☐	☐	☐
k)	Creating visual displays of information or processes (such as graphs, flow charts and decision trees)	☐	☐	☐	☐

19. **To what extent have you learnt how to use digital tools from the following sources?**

(Select one response in each row.)

		To a large extent	To a moderate extent	To a small extent	Not at all
a)	My school	☐	☐	☐	☐
b)	Members of my family	☐	☐	☐	☐
c)	My friends	☐	☐	☐	☐
d)	Learning myself (e.g. by researching online)	☐	☐	☐	☐

Appendix B: NAP–ICT Literacy assessment technical requirements

Students will sit the NAP–ICTL assessment via a web browser using ACER's online assessment and reporting system. This is a web-based platform that does not require you to install any software.

Compatible devices

PC, Mac, Google Chromebook, iPad or Android tablet.

Note: tablets must have a minimum 10.2-inch display and be in landscape orientation. Ideally, an external keyboard should be used.

Operating system and browser requirements

Browser (latest version)	Operating system				
	Windows 10/11	Mac OS (minimum OS 12)	iOS (minimum iOS 15)	Android	Chrome
Google Chrome	Yes	Yes	Yes	Yes	Yes
Mozilla Firefox	Yes	Yes	Yes	Yes	Yes
Safari	No	Yes	Yes	No	No
Microsoft Edge	Yes	No	No	No	No
Internet Explorer, Opera and Brave	No	No	No	No	No

Browser settings and features
Minimum browser resolution (non-tablets): 1280 width × 800 height Minimum browser resolution (tablets): 1080 width × 800 height Cookies and JavaScript must be enabled within students' browsers. These settings can be updated from within the browser's Settings or Options menu.

Internet

Recommended speed = 256 kilobytes per second (KB/s) per student
A group of 20 students will require an internet connection speed of approximately 5Mbps.

Network

The following domains must be whitelisted/permitted by the network firewall or security settings:

oars.acer.edu.au; acer.org; acer.edu.au; delivery.acer.edu.au; delivery2.acer.edu.au

STSO requirements checklist

- ☐ Whitelist the 5 domains (listed above), if necessary.
- ☐ Confirm with your School Contact Officer which Y6 or Y10 students have been selected by ACER to participate in the NAP–ICTL assessment.
- ☐ Conduct device check on devices using a profile students will use on test day.
- ☐ Update device settings, if necessary, to "pass" all elements of device check.
- ☐ Complete STSO questionnaire (link provided in email sent to you).

Appendix C: Quality Monitor report template

Quality Monitor			
School Name			
State/Territory		**Sector**	
Year Level		**Date**	
Number of Students Present			

1. Staff Present

Who was present for the assessment session? (Please check all that apply and indicate whether they were present for all or part of the test session)

Staff Member	Present for all of session (X)	Present for part of session (X)
Test Administrator		
School Contact		
School Technical Support Officer		
Principal		
Other (please specify) _____		

Were the School Contact and Test Administrator roles held by the same person?

☐ Yes, same person ☐ No, different people

2. Timing

Room Set Up and Logging in

How long did it take for the computers to be switched on and logged into? _____ (mins)

Did the STSO or other school staff member assist the TA in setting up the computers?

☐Yes ☐ No

Was the room suitably set up for the assessment and for students' optimal participation?

☐ Yes ☐ No

If No, please provide further comment.

_____
_____
_____

Introductory TA script

How long did it take the TA to lead students through the initial assessment instructions, before the practice questions? _____ (mins)

Please detail any issues that were experienced during the introductory process.

_____
_____
_____

How long did it take the students to complete the practice questions, on average?

_____ (mins)

Please provide further comment if actual time for any student was **significantly** different to expected time of 10 mins.

_____
_____
_____

Assessment Session

Students are given a set time allowance to complete the assessment (20 minutes for each module). For the majority of students in this test session, was this time allowance:

☐ Too generous ☐ Just right

☐ Too short ☐ Some modules were too generous while others were too short

Please provide further comment on which modules were too generous or too short, if needed.

_____
_____
_____

How many students were able to complete a module in the allocated time?

☐ No students were able to complete their modules in time
☐ A minority of students were able to complete their modules in time
☐ The majority of students were able to complete their modules in time
☐ All students were able to complete their modules in time

Questionnaire **(untimed, but suggested time of 15 mins)**

How long did it take most of the students to complete the questionnaire? _____ (mins)

How long did it take the slowest student to complete the questionnaire? _____ (mins)

Please provide further comment on questionnaire timing, if needed.

_____
_____
_____

3. Test Instructions

Was the script followed according to the Test Administrator Handbook?

☐ Yes ☐ No

If changes were made, were they

☐ Major ☐ Minor

Why do you think the TA made changes to the script?

_____
_____
_____

Do you think the variation to the script affected the performance of students?

☐ Yes ☐ No

If Yes, please provide further comment.

_____
_____
_____

4. Assistance Given

Were there any particular test questions that students asked for clarification about?

☐ Yes ☐ No

Please provide a general description of the item and a brief description of the issue/clarification requested:

_____
_____
_____

In your opinion, did the Test Administrator follow the instructions in the TA Handbook when assisting students with their questions?

☐ Yes ☐ No

If No, please provide further comment.

_____
_____
_____

Was any extra assistance given to any students with special needs?

☐ Yes ☐ No

If Yes, please provide further comment.

_____
_____
_____

5. Technical Matters

What devices did students use to sit the assessment? (Check all that apply)

☐ Windows desktop ☐ Mac desktop
☐ Windows laptop ☐ Mac laptop
☐ iPad or tablet ☐ Chromebook

If iPads were used, did students use an external keyboard?

☐ Yes, all iPad users had an external keyboard.
☐ No, no iPad users had an external keyboard. They used the onscreen ("pop up") keyboard instead.
☐ Amongst iPad users, there was a mix of external keyboards and onscreen ("pop up") keyboard use.

Were any technical issues or issues viewing or completing assessment questions experienced at this school?

☐ Yes ☐ No

If Yes, were they

☐ Major ☐ Minor

Please indicate the type of technical issue experienced. (Select all that apply)

☐ Logging in
☐ Viewing pictures or animations
☐ Navigating through the test
☐ Needing to scroll excessively
☐ Difficulty manipulating interactive questions (e.g. resizing an image did not work)
☐ Internet connectivity or speed
☐ Other (e.g. laptop battery or device issues)

Please describe what technical issues were experienced. **Include the module name (found at the top of the screen) and the username (found on the student login slip)** if the technical issue is related to viewing or completing an assessment question.

Module Name _____

Username _____

Technical Issue _____
_____
_____

Were the technical issues experienced exclusive to one device type or equally across all device types?

☐ One device type ☐ Multiple device types ☐ All device types

Please select the device type technical issues were experienced on. (Select all that apply)

☐ Windows desktop ☐ Mac desktop
☐ Windows laptop ☐ Mac laptop
☐ iPad or tablet ☐ Chromebook

Do you think the technical issues affected the performance of students?

☐ Yes ☐ No

If Yes, please provide further comment.

_____
_____
_____

6. Student Behaviour	No students	Some students	Most students
a) How many students appeared to be engaged in the test material?	☐	☐	☐
b) How many students made noise or moved around, causing disruption to other students during the session?	☐	☐	☐
c) How many students attempted to navigate to other websites or access their mobile phones during the session?	☐	☐	☐
d) How many students appeared to struggle with understanding how to navigate the test interface?	☐	☐	☐

7. Outside Interruptions

Were the students distracted or impacted by any outside interruptions? For example:

- Announcements over the PA or intercom system
- Noise from other classes in the school
- Distractions from other students not participating in the test session within the classroom
- Students or teachers visiting the testing room

☐ Yes ☐ No

If yes, please specify the disruption:

_____
_____

8. School Receptiveness

How receptive was the school towards participating in NAP–ICTL?

☐ Receptive ☐ Somewhat receptive ☐ Not receptive

What do you perceive to be the school's overall attitude and level of commitment towards the assessment?

_____
_____

As a visitor, were you made to feel welcome by the school?

☐ Yes ☐ No

Please provide further comment, if needed.

_____
_____

9. Other Comments

Please provide any other comments that you feel would help us improve this assessment and its administration.

_____
_____

Appendix D: School summary report instructions

The NAP–ICT Literacy 2025 School Summary Report is provided on the “Report” tab of this spreadsheet.

Below is a brief description of the contents of each of the fields shown in this report.

Field	Content description
Module name	The name of the module, or unit, the task belongs to. Each module has a central theme and a variety of related tasks. Every student is randomly assigned a set of 4 modules in total.
Descriptor	A description of what students need to do to complete a task. Each row refers to a single task in the assessment.
Assessment framework strand	The NAP–ICT Literacy assessment framework strand that is assessed by each task. There are 4 strands in total. Hovering over the data cell will display the strand.
Assessment framework aspect	The NAP–ICT Literacy assessment framework aspect that is assessed by each task. There are 9 aspects in total. Hovering over the data cell will display the aspect.
AC:ICT GC sub-element	The Australian Curriculum: ICT general capability (v8.4) sub-element that is aligned with the content assessed by each task.
Max score possible	The highest possible score a student can achieve for each task.
National per cent correct	An estimate of the national percentage of students who responded to the task correctly. This value can be used as an indicator of task difficulty, with higher percentages denoting easier tasks and lower percentages denoting harder tasks. For tasks with a maximum score of more than 1, more than one percentage is listed. Each percentage denotes the number of students that reached each score or higher. For example, if a task has a maximum score of 2, the first number is the percentage of students that received a score of 1 or 2, the second number is the percentage of students that received a score of 2.

The scores for each task are listed under the names of each student. There are 4 possible displays of the score for each task:

Blank	The task was not in a module assigned to that student.
Red (0)	The student provided an incorrect response to the task.
Green (1,2,3 …)	The student provided a correct (or partially correct) response to the task. The number refers to the score the student received for their response to the task. This can be compared to the maximum score possible for that task.
Grey (N)	The task was assigned to the student, but the student did not provide a response.

The report has a set of clickable filters, so you can manipulate how you would like to view the data. For example, view students grouped by content area, task difficulty or score awarded.

Note: The school and student sampling design used for all NAP sample assessments means that results are representative at a state/territory or national level. This design means that the sample of students participating from your school may not necessarily be representative of your school's student cohort. Results for your school therefore need to be interpreted with caution. For this reason, school-level results are not reported publicly or to your jurisdiction; they are for your school's reference only.

Appendix E: Excerpt from a sample school summary report

Module Name	Descriptor	Assessment framework strand	Assessment framework aspect	AC:ICT GC sub-element	Max Score	National per cent correct	Student 01 ID: 111012401	Student 02 ID: 111012402	Student 03 ID: 111012403
Digital Photography	Clicks on an appropriate icon to access a smartphone feature	Strand 1	Aspect 1.1	Select and use hardware and software	1	68	1	1	N
Digital Photography	Identifies ways that an “undo” button can be helpful when editing a photo	Strand 1	Aspect 1.1	Select and use hardware and software	1	20	1	0	0
Digital Photography	Changes the shape of a photo in a photo editing app	Strand 1	Aspect 1.1	Select and use hardware and software	2	71,7	0	1	1
Digital Photography	Explains the benefits of having freedom to determine the size and shape of an image when adjusting its aspect ratio	Strand 1	Aspect 1.1	Select and use hardware and software	1	43	0	0	1
Digital Photography	Identifies how to transfer a photo from a smartphone to a laptop	Strand 1	Aspect 1.2	Manage digital data	1	12	0	0	0
Digital Photography	Creates a folder and correctly assigns a specified name to the folder	Strand 1	Aspect 1.1	Select and use hardware and software	1	80	1	N	1
Digital Photography	Selects and moves image files from one folder to another	Strand 1	Aspect 1.1	Select and use hardware and software	1	40	1	0	0
Digital Photography	Understands right-click functionality for accessing file information	Strand 1	Aspect 1.1	Select and use hardware and software	1	36	0	0	1
Digital Photography	Understands that image resolution relates to clarity on screen	Strand 1	Aspect 1.2	Manage digital data	1	43	1	0	0

Module Name	Descriptor	Assessment framework strand	Assessment framework aspect	AC:ICT GC sub-element	Max Score	National per cent correct	Student 01 ID: 111012401	Student 02 ID: 111012402	Student 03 ID: 111012403
Digital Photography	Understands that ALT Text is used to make online images more accessible	Strand 3	Aspect 3.1	Identify the impacts of ICT in society	1	9	0	0	0
Digital Photography	Applies a given aspect ratio to an image	Strand 1	Aspect 1.1	Generate solutions to challenges and learning area tasks	1	60	0	1	1
Digital Photography	Identifies and uses an image editing feature correctly to brighten an image	Strand 1	Aspect 1.1	Generate solutions to challenges and learning area tasks	1	11	0	0	0
Digital Photography	Applies a black and white effect to an image	Strand 1	Aspect 1.1	Generate solutions to challenges and learning area tasks	1	45	1	1	0
Digital Photography	Applies a specified visual effect to an image	Strand 1	Aspect 1.1	Generate solutions to challenges and learning area tasks	1	67	1	1	1
Outdoor Adventures	Identifies the part of a URL that signals a trustworthy/secure website	Strand 3	Aspect 3.1	Apply digital information security practices	1	17	0	0	0
Outdoor Adventures	Explains the purpose of a trustworthy website in the context of an e-commerce business	Strand 3	Aspect 3.1	Apply digital information security practices	2	58,20	2	1	1
Outdoor Adventures	Organises drop-down menu items into their appropriate locations	Strand 3	Aspect 3.1	Understand computer mediated communications	1	40	0	0	0
Outdoor Adventures	Identifies design features on a user interface that increase usability and inclusivity	Strand 3	Aspect 3.1	Collaborate, share and exchange	1	47	0	0	0
Outdoor Adventures	Identifies an image that depicts a scene that is both relevant and inclusive, and describes how it does so	Strand 3	Aspect 3.1	Generate ideas, plans and processes	2	51,6	2	1	1

Module Name	Descriptor	Assessment framework strand	Assessment framework aspect	AC:ICT GC sub-element	Max Score	National per cent correct	Student 01 ID: 111012401	Student 02 ID: 111012402	Student 03 ID: 111012403
Outdoor Adventures	Identifies three features of a website used to navigate between pages within the site	Strand 3	Aspect 3.1	Understand computer mediated communications	1	30	1	0	1
Outdoor Adventures	Determines the most appropriate form of data collection to identify how people find a website	Strand 2	Aspect 2.2	Collaborate, share and exchange	1	41	0	0	0
Outdoor Adventures	Identifies a problem with the user experience by analysing a screen recording of a user interacting with a website	Strand 2	Aspect 2.3	Locate, generate and access data and information	1	56	1	0	1
Outdoor Adventures	Determines an appropriate survey question to identify user navigation patterns	Strand 2	Aspect 2.2	Define and plan information searches	1	21	0	0	0
Outdoor Adventures	Analyses a heatmap of user click data	Strand 2	Aspect 2.2	Locate, generate and access data and information	1	77	1	1	1
Outdoor Adventures	Proposes a new menu structure (using the user study interface)	Strand 2	Aspect 2.3	Generate ideas, plans and processes	2	56,24	2	2	1
Outdoor Adventures	Selects relevant user tasks and a matching task purpose for each task, to test the proposed navigation structure	Strand 2	Aspect 2.3	Define and plan information searches	2	30,7	1	0	0
Outdoor Adventures	Selects survey questions that will provide additional information from test users about how they use the website	Strand 2	Aspect 2.3	Select and evaluate data and information	2	38,11	0	1	0

Appendix F: Item difficulties

Table A 1: NAP–ICT Literacy 2025 item difficulties

Item code	Score	Score type	Year level	Vertical link	Horizontal link	Difficulty (RP=0.5)	Difficulty (RP=0.62)	Difficulty (ICTL scale)	Threshold 1 (RP=0.5)	Threshold 1 (ICTL scale)	Threshold 2 (RP=0.5)	Threshold 2 (ICTL scale)	Threshold 3 (RP=0.5)	Threshold 3 (ICTL scale)	Correct Y6 (%)	Correct Y10 (%)	Weighted fit (MNSQ) Y6	Weighted fit (MNSQ) Y10
NI17M2Q01	1	Auto	6/10	Yes	No	-0.66	-0.17	415	-0.66	415					57	68	1.05	1.07
NI17M2Q02	1	Auto	6/10	Yes	No	0.61	1.1	537	0.61	537					32	55	1.12	1.11
NI17M2Q03	1	Human	6/10	Yes	No	-0.12	0.37	467	-0.12	467					46	58	1.05	1.08
NI17M2Q04	1	Auto	6	Broken	No	0.09	0.58	487	0.09	487					42		0.9	
NI17M2Q04	1	Auto	10	Broken	No	-0.56	-0.07	424	-0.56	424						71		0.89
NI17M2Q05	1	Auto	6/10	Yes	No	-2.37	-1.88	251	-2.37	251					84	90	0.85	0.77
NI17M2Q06	1	Auto	6/10	Yes	No	-1.79	-1.3	306	-1.79	306					77	85	0.97	0.88
NI17M2Q07	1	Auto	6/10	Yes	No	-1.91	-1.42	295	-1.91	295					78	89	0.88	0.79
NI17M2Q08	2	Human	6/10	Yes	No	0.58	1.07	534	-0.29	450	1.46	619			33	47	1.09	1.1
NI17M2Q09	1	Human	6/10	Yes	No	0.7	1.19	545	0.7	545					30	53	0.92	0.89
NI17M2Q10	1	Auto	6/10	Yes	No	-1.66	-1.17	319	-1.66	319					75	84	0.88	0.88
NI17M2Q11	1	Auto	6/10	Yes	No	-1.69	-1.2	316	-1.69	316					75	86	0.94	0.87
NI17M2Q12	1	Auto	6/10	Yes	No	1.27	1.76	600	1.27	600					21	42	0.97	1.02
NI17M2Q13	1	Auto	6/10	Yes	No	0.98	1.47	573	0.98	573					26	38	1.1	1.15
NI17M2Q14	1	Human	6	Broken	No	1.96	2.45	667	1.96	667					13		1.05	
NI17M2Q14	1	Human	10	Broken	No	1.34	1.83	607	1.34	607						35		1.07
NI17M2Q16A	1	Human	6/10	Yes	No	0.03	0.52	481	0.03	481					44	67	0.8	0.75
NI17M2Q16B	1	Human	6	Broken	No	1.91	2.4	662	1.91	662					14		0.91	
NI17M2Q16B	1	Human	10	Broken	No	1.38	1.87	611	1.38	611						35		0.85
NI17M2Q16D	1	Human	6/10	Yes	No	0.53	1.01	529	0.53	529					34	58	0.89	0.84

Item code	Score	Score type	Year level	Vertical link	Horizontal link	Difficulty (RP=0.5)	Difficulty (RP=0.62)	Difficulty (ICTL scale)	Threshold 1 (RP=0.5)	Threshold 1 (ICTL scale)	Threshold 2 (RP=0.5)	Threshold 2 (ICTL scale)	Threshold 3 (RP=0.5)	Threshold 3 (ICTL scale)	Correct Y6 (%)	Correct Y10 (%)	Weighted fit (MNSQ) Y6	Weighted fit (MNSQ) Y10
NI17M2Q16E	2	Human	6/10	Yes	No	1.56	2.05	629	-0.47	433	3.6	824			28	41	0.88	0.85
NI17M2Q16F	1	Human	6/10	Yes	No	-0.41	0.08	439	-0.41	439					53	71	0.86	0.76
NI17M2Q16G	1	Human	6	Broken	No	0.76	1.25	552	0.76	552					30		0.82	
NI17M2Q16G	1	Human	10	Broken	No	0.1	0.59	488	0.1	488						60		0.76
NI17M2Q16H	2	Human	6	Broken	No	2.28	2.77	697	0.71	546	3.85	848			16		1.06	
NI17M2Q16H	2	Human	10	Broken	No	1.54	2.03	626	0.61	537	2.46	715				32		0.87
NI20M1Q01	1	Auto	6/10	Yes	No	0.71	1.2	547	0.71	547					30	40	0.96	0.98
NI20M1Q02	1	Auto	6/10	Yes	Yes	-1.05	-0.56	377	-1.05	377					64	76	0.85	0.84
NI20M1Q04a	1	Auto	6/10	Yes	Yes	-1.11	-0.62	372	-1.11	372					65	76	1.01	0.9
NI20M1Q04b	1	Auto	6/10	Yes	Yes	-1.23	-0.74	360	-1.23	360					67	78	1.02	0.94
NI20M1Q05	1	Auto	6/10	Yes	Yes	-0.2	0.29	460	-0.2	460					47	63	1.01	0.98
NI20M1Q06	1	Auto	6/10	Yes	Yes	-0.18	0.31	461	-0.18	461					47	59	0.99	0.99
NI20M1Q07	1	Human	6	Broken	Yes	1.08	1.57	582	1.08	582					24		1.07	
NI20M1Q07	1	Human	10	Broken	No	0.49	0.97	525	0.49	525						50		1.02
NI20M1Q08	1	Auto	6/10	Yes	Yes	-1.44	-0.95	340	-1.44	340					71	83	0.85	0.82
NI20M1Q09	1	Auto	6/10	Yes	Yes	-1.63	-1.14	322	-1.63	322					74	83	0.89	0.81
NI20M1Q10	1	Human	6/10	Yes	Yes	1.12	1.61	586	1.12	586					23	35	1.02	1.13
NI20M1Q11	1	Human	6/10	Yes	Yes	0.49	0.98	525	0.49	525					34	54	0.93	0.86
NI20M1Q13	1	Human	6	Broken	Yes	2.36	2.85	705	2.36	705					9		0.96	
NI20M1Q13	1	Human	10	Broken	No	1.57	2.06	629	1.57	629						30		0.95
NI20M1Q14	1	Auto	6	Broken	Yes	-0.47	0.02	433	-0.47	433					53		1.12	
NI20M1Q14	1	Auto	10	Broken	No	0.04	0.53	482	0.04	482						59		1.08
NI20M1Q16	1	Auto	6/10	Yes	No	-1.35	-0.86	349	-1.35	349					70	78	0.99	0.86

Item code	Score	Score type	Year level	Vertical link	Horizontal link	Difficulty (RP=0.5)	Difficulty (RP=0.62)	Difficulty (ICTL scale)	Threshold 1 (RP=0.5)	Threshold 1 (ICTL scale)	Threshold 2 (RP=0.5)	Threshold 2 (ICTL scale)	Threshold 3 (RP=0.5)	Threshold 3 (ICTL scale)	Correct Y6 (%)	Correct Y10 (%)	Weighted fit (MNSQ) Y6	Weighted fit (MNSQ) Y10
NI20M1Q17	1	Auto	6/10	Yes	Yes	-1.14	-0.65	369	-1.14	369					66	74	0.94	0.9
NI20M1Q18a	1	Human	6/10	Yes	Yes	-0.11	0.38	468	-0.11	468					46	67	0.93	0.84
NI20M1Q18b	1	Human	6	Broken	Yes	2.71	3.2	739	2.71	739					7		0.96	
NI20M1Q18b	1	Human	10	Broken	No	2.01	2.5	672	2.01	672						23		0.9
NI20M1Q18c	1	Human	6	Broken	Yes	2.26	2.75	695	2.26	695					10		0.98	
NI20M1Q18c	1	Human	10	Broken	No	1.76	2.25	647	1.76	647						27		0.91
NI20M1Q18d	1	Human	6/10	Yes	Yes	1.81	2.3	653	1.81	653					14	31	1	0.96
NI20M1Q18e	1	Human	6/10	Yes	Yes	3.42	3.91	807	3.42	807					4	10	1	1
NI20M1Q18g1	1	Human	6/10	Yes	Yes	2.24	2.73	694	2.24	694					10	23	0.99	0.9
NI20M1Q18g2	1	Human	6/10	Yes	Yes	2.05	2.54	675	2.05	675					12	24	0.96	0.92
NI20M1Q18g3	1	Human	6/10	Yes	Yes	2.2	2.69	690	2.2	690					11	25	0.96	0.9
NI20M1Q18g4	1	Human	6/10	Yes	Yes	1.91	2.4	662	1.91	662					13	29	1	0.94
NI20M4Q01	2	Auto	6	No	Yes	-1.65	-1.16	320	-2.54	234	-0.75	406			75		1.22	
NI20M4Q02	2	Human	6	No	Yes	1.3	1.79	603	0.73	548	1.87	658			18		1.09	
NI20M4Q03	2	Auto	6	No	Yes	-1.79	-1.3	307	-2.55	234	-1.02	380			78		1.16	
NI20M4Q04	2	Human	6	No	Yes	-0.95	-0.47	387	-1.76	309	-0.15	464			63		1.04	
NI20M4Q05	2	Human	6	No	Yes	0.3	0.79	507	0.11	489	0.49	526			35		0.91	
NI20M4Q06	2	Human	6	No	Yes	0.41	0.9	517	0.12	490	0.69	545			33		0.91	
NI20M4Q07	2	Human	6	No	Yes	-0.03	0.46	475	-0.36	444	0.3	507			45		0.95	
NI20M4Q08	1	Auto	6	No	No	0.24	0.73	502	0.24	502					40		1.07	
NI20M4Q09	1	Human	6	No	No	1.29	1.78	602	1.29	602					22		1	
NI20M4Q10	2	Auto	6	No	Yes	0.8	1.29	556	-0.41	439	2.02	672			32		1.47	
NI20M5Q01	1	Auto	10	No	No	1.13	1.62	587	1.13	587						38		1.18

Item code	Score	Score type	Year level	Vertical link	Horizontal link	Difficulty (RP=0.5)	Difficulty (RP=0.62)	Difficulty (ICTL scale)	Threshold 1 (RP=0.5)	Threshold 1 (ICTL scale)	Threshold 2 (RP=0.5)	Threshold 2 (ICTL scale)	Threshold 3 (RP=0.5)	Threshold 3 (ICTL scale)	Correct Y6 (%)	Correct Y10 (%)	Weighted fit (MNSQ) Y6	Weighted fit (MNSQ) Y10
NI20M5Q02	1	Auto	10	No	No	0.72	1.21	548	0.72	548						46		1.11
NI20M5Q03	1	Human	10	No	No	-0.44	0.05	436	-0.44	436						68		0.89
NI20M5Q05	1	Auto	10	No	No	0.94	1.43	569	0.94	569						42		1.04
NI20M5Q06	1	Auto	10	No	No	1.6	2.09	632	1.6	632						30		1.22
NI20M5Q07	1	Auto	10	No	No	2.26	2.75	695	2.26	695						19		0.94
NI20M5Q08	1	Auto	10	No	No	0.59	1.08	535	0.59	535						49		1.23
NI20M5Q09	2	Auto	10	No	No	-0.07	0.42	472	-0.46	434	0.33	510				64		1.15
NI20M5Q11	2	Auto	10	No	No	2.01	2.5	671	1.7	641	2.32	701				18		1.1
NI24M2Q01	1	Auto	6/10	Yes	No	-1.04	-0.55	379	-1.04	379					65	78	1.07	0.98
NI24M2Q02	1	Auto	6/10	Yes	No	1.4	1.89	613	1.4	613					20	29	1.04	1.11
NI24M2Q03	2	Auto	6/10	Yes	No	0.61	1.1	537	-1.33	351	2.54	723			39	47	1.06	1.06
NI24M2Q04	1	Human	6/10	Yes	No	0.04	0.53	482	0.04	482					43	61	0.97	1.03
NI24M2Q05	1	Human	10	No	No	-2.24	-1.75	263	-2.24	263						89		0.85
NI24M2Q06	1	Human	10	No	No	-0.31	0.18	449	-0.31	449						66		1.02
NI24M2Q07	1	Auto	10	No	No	1.13	1.62	587	1.13	587						39		1.21
NI24M2Q08	2	Human	6/10	Yes	No	0.96	1.45	571	0.34	511	1.58	631			24	45	1.13	1.1
NI24M2Q09	1	Human	6/10	Yes	No	-1.89	-1.4	297	-1.89	297					78	83	0.92	0.79
NI24M2Q10	1	Auto	6/10	Yes	No	0.35	0.84	512	0.35	512					37	54	1.08	1.05
NI24M2Q11	1	Auto	6	Broken	No	0.52	1.01	528	0.52	528					34		1	
NI24M2Q11	1	Auto	10	Broken	No	-0.18	0.31	461	-0.18	461						64		0.93
NI24M2Q12	1	Auto	6	Broken	No	0.09	0.58	487	0.09	487					43		1.09	
NI24M2Q12	1	Auto	10	Broken	No	-0.59	-0.1	422	-0.59	422						71		0.93
NI24M2Q13	1	Human	6/10	Yes	No	2.44	2.93	712	2.44	712					9	20	1.01	1

Item code	Score	Score type	Year level	Vertical link	Horizontal link	Difficulty (RP=0.5)	Difficulty (RP=0.62)	Difficulty (ICTL scale)	Threshold 1 (RP=0.5)	Threshold 1 (ICTL scale)	Threshold 2 (RP=0.5)	Threshold 2 (ICTL scale)	Threshold 3 (RP=0.5)	Threshold 3 (ICTL scale)	Correct Y6 (%)	Correct Y10 (%)	Weighted fit (MNSQ) Y6	Weighted fit (MNSQ) Y10
NI24M2Q14a	1	Auto	6/10	Yes	No	-0.65	-0.16	416	-0.65	416					58	70	1.02	1.03
NI24M2Q14b	1	Auto	6	Broken	No	2.19	2.68	688	2.19	688					11		1.09	
NI24M2Q14b	1	Auto	10	Broken	No	3.13	3.62	780	3.13	780						10		1.07
NI24M2Q14c	1	Auto	6	Broken	No	0.01	0.5	479	0.01	479					44		1.14	
NI24M2Q14c	1	Auto	10	Broken	No	0.97	1.46	571	0.97	571						42		1.26
NI24M2Q14d	1	Human	6/10	Yes	No	-1.08	-0.59	374	-1.08	374					66	78	0.83	0.83
NI24M3Q01	1	Auto	6/10	Yes	No	-0.77	-0.28	404	-0.77	404					58	76	1.01	0.97
NI24M3Q02	1	Auto	6/10	Yes	No	-0.86	-0.37	396	-0.86	396					60	69	1.17	1.17
NI24M3Q03	2	Auto	6/10	Yes	No	-0.95	-0.46	387	-1.16	367	-0.74	408			66	79	1.18	1.22
NI24M3Q05	1	Auto	6/10	Yes	No	-1.15	-0.66	368	-1.15	368					66	75	0.96	0.95
NI24M3Q06	1	Human	6/10	Yes	No	-1.1	-0.61	373	-1.1	373					65	80	0.98	0.92
NI24M3Q07	1	Auto	6	Broken	No	-0.67	-0.18	414	-0.67	414					57		1.07	
NI24M3Q07	1	Auto	10	Broken	No	-0.25	0.24	454	-0.25	454						65		1.05
NI24M3Q08	1	Human	6	Broken	No	1.79	2.28	650	1.79	650					14		0.98	
NI24M3Q08	1	Human	10	Broken	No	1.06	1.55	581	1.06	581						40		0.98
NI24M3Q09	1	Auto	6/10	Yes	No	-0.46	0.03	434	-0.46	434					52	66	1	0.96
NI24M3Q10_Y6	1	Auto	6	No	No	-1.16	-0.67	367	-1.16	367					66		0.91	
NI24M3Q10Y10a	1	Auto	10	No	No	1.04	1.52	578	1.04	578						40		1.01
NI24M3Q11a	1	Human	6/10	Yes	No	-2.02	-1.53	285	-2.02	285					80	88	0.97	0.87
NI24M3Q13a	1	Auto	6/10	Yes	No	1.74	2.23	645	1.74	645					15	32	1.02	1.05
NI24M3Q14a	2	Human	6/10	Yes	No	1.55	2.04	627	1.41	614	1.7	641			10	25	1.09	1.13
NI24M7Q01	1	Auto	10	No	No	0.04	0.53	483	0.04	483						59		0.97
NI24M7Q02	1	Auto	10	No	No	0.32	0.81	509	0.32	509						54		1.07

Item code	Score	Score type	Year level	Vertical link	Horizontal link	Difficulty (RP=0.5)	Difficulty (RP=0.62)	Difficulty (ICTL scale)	Threshold 1 (RP=0.5)	Threshold 1 (ICTL scale)	Threshold 2 (RP=0.5)	Threshold 2 (ICTL scale)	Threshold 3 (RP=0.5)	Threshold 3 (ICTL scale)	Correct Y6 (%)	Correct Y10 (%)	Weighted fit (MNSQ) Y6	Weighted fit (MNSQ) Y10
NI24M7Q03	1	Auto	10	No	No	2.33	2.82	703	2.33	703						18		1
NI24M7Q04	2	Auto	10	No	No	1.52	2.01	624	0.76	552	2.27	696				30		1.07
NI24M7Q05_Y10	1	Auto	10	No	No	-0.57	-0.08	423	-0.57	423						70		0.94
NI24M7Q06	2	Human	10	No	No	0.05	0.54	484	-0.19	461	0.29	506				62		1.19
NI24M7Q07	1	Auto	10	No	No	1.73	2.22	645	1.73	645						27		0.98
NI24M7Q08	2	Auto	10	No	No	0.25	0.74	502	-0.55	426	1.05	579				56		1.24
NI24M7Q10	2	Auto	10	No	No	0.25	0.74	502	-0.7	411	1.19	593				55		1.17
NI24M7Q11	1	Auto	10	No	No	0.73	1.22	549	0.73	549						46		1
NI24M7Q12a	1	Human	10	No	No	0.77	1.26	552	0.77	552						45		0.97
NI24M7Q12b	3	Human	10	No	No	0.6	1.09	536	-0.49	432	0.59	535	1.7	641		49		1.07
NI24M7Q12c	1	Human	10	No	No	0.92	1.41	567	0.92	567						42		0.93
NI24M7Q12d	2	Human	10	No	No	1.64	2.13	636	1.61	633	1.68	639				21		1.15
NI24M8Q01	1	Human	10	No	No	0.42	0.91	519	0.42	519						53		1.01
NI24M8Q02	2	Human	10	No	No	1.14	1.63	588	-0.02	476	2.31	700				40		1.09
NI24M8Q03	2	Human	10	No	No	0.72	1.21	548	0.32	509	1.13	587				47		1
NI24M8Q04	2	Human	10	No	No	0.84	1.33	559	0.41	518	1.27	600				45		1.12
NI24M8Q07	2	Auto	10	No	No	1.67	2.16	638	0.35	512	2.98	765				32		1.11
NI24M8Q09	1	Auto	10	No	No	0.17	0.66	495	0.17	495						58		0.94
NI24M8Q10a	1	Auto	10	No	No	0.64	1.13	540	0.64	540						49		0.97
NI24M8Q10b	1	Auto	10	No	No	2.09	2.58	680	2.09	680						22		0.93
NI24M8Q10c	1	Auto	10	No	No	1.42	1.91	615	1.42	615						34		0.88
NI24M8Q10d	1	Human	10	No	No	0.86	1.35	561	0.86	561						45		0.84
NI24M8Q10e	1	Human	10	No	No	2.67	3.16	735	2.67	735						15		0.88

Item code	Score	Score type	Year level	Vertical link	Horizontal link	Difficulty (RP=0.5)	Difficulty (RP=0.62)	Difficulty (ICTL scale)	Threshold 1 (RP=0.5)	Threshold 1 (ICTL scale)	Threshold 2 (RP=0.5)	Threshold 2 (ICTL scale)	Threshold 3 (RP=0.5)	Threshold 3 (ICTL scale)	Correct Y6 (%)	Correct Y10 (%)	Weighted fit (MNSQ) Y6	Weighted fit (MNSQ) Y10
NI25M4Q01a	1	Auto	6	No	No	-2.56	-2.07	232	-2.56	232					86		0.96	
NI25M4Q02a	1	Auto	6	No	No	-3.27	-2.78	164	-3.27	164					92		0.9	
NI25M4Q04	1	Auto	6	No	No	-0.81	-0.32	400	-0.81	400					60		1.05	
NI25M4Q05	1	Auto	6	No	No	-1.99	-1.5	287	-1.99	287					79		0.97	
NI25M4Q06	1	Human	6	No	No	0.28	0.77	505	0.28	505					39		1.16	
NI25M4Q07	1	Auto	6	No	No	-0.8	-0.31	401	-0.8	401					60		1.16	
NI25M4Q08	1	Human	6	No	No	-0.25	0.24	455	-0.25	455					49		1.03	
NI25M4Q09	1	Auto	6	No	No	-0.6	-0.11	420	-0.6	420					56		1.08	
NI25M4Q10	1	Auto	6	No	No	0.61	1.1	537	0.61	537					32		1	
NI25M4Q11	1	Auto	6	No	No	-1.48	-0.99	336	-1.48	336					72		0.85	
NI25M4Q12a	2	Auto	6	No	No	-1.37	-0.88	347	-1.51	333	-1.23	360			76		0.83	
NI25M4Q12b	2	Auto	6	No	No	-1.04	-0.55	379	-1.3	354	-0.78	403			69		0.97	
NI25M4Q12c	1	Auto	6	No	No	-1.72	-1.23	313	-1.72	313					76		0.75	
NI25M4Q12d	1	Human	6	No	No	0.25	0.74	502	0.25	502					39		0.87	
NI25M4Q12e	1	Auto	6	No	No	-0.36	0.13	444	-0.36	444					51		0.84	
NI25M5Q01	1	Auto	6	No	No	-1.08	-0.59	375	-1.08	375					64		1	
NI25M5Q02	1	Auto	6	No	No	-2.28	-1.79	259	-2.28	259					83		0.87	
NI25M5Q03	1	Human	6	No	No	-2.09	-1.6	277	-2.09	277					80		0.98	
NI25M5Q05	1	Auto	6	No	No	-1.51	-1.02	333	-1.51	333					72		0.96	
NI25M5Q06	1	Human	6	No	No	1.13	1.62	587	1.13	587					23		0.98	
NI25M5Q07	1	Auto	6	No	No	-1.54	-1.05	330	-1.54	330					72		0.9	
NI25M5Q07_2	1	Auto	6	No	No	-1.46	-0.97	338	-1.46	338					71		1.02	
NI25M5Q08	1	Auto	6	No	No	-0.73	-0.24	408	-0.73	408					58		1.1	

Item code	Score	Score type	Year level	Vertical link	Horizontal link	Difficulty (RP=0.5)	Difficulty (RP=0.62)	Difficulty (ICTL scale)	Threshold 1 (RP=0.5)	Threshold 1 (ICTL scale)	Threshold 2 (RP=0.5)	Threshold 2 (ICTL scale)	Threshold 3 (RP=0.5)	Threshold 3 (ICTL scale)	Correct Y6 (%)	Correct Y10 (%)	Weighted fit (MNSQ) Y6	Weighted fit (MNSQ) Y10
NI25M5Q09	1	Auto	6	No	No	-0.75	-0.26	407	-0.75	407					58		0.95	
NI25M5Q10a	1	Auto	6	No	No	0.9	1.39	565	0.9	565					27		0.94	
NI25M5Q10b	2	Human	6	No	No	1.51	2	623	1.17	591	1.84	655			12		1.04	
NI25M5Q10c	2	Human	6	No	No	0.83	1.32	558	0.4	517	1.26	600			24		1.14	
NI25M6Q01	1	Auto	6/10	Yes	No	1.54	2.03	626	1.54	626					17	30	1.05	1.14
NI25M6Q02	2	Human	6/10	Yes	No	0.31	0.8	508	-0.55	426	1.16	590			37	59	1.09	1.12
NI25M6Q03_Y10	2	Auto	10	No	No	1.44	1.93	617	0.09	487	2.79	747				35		1.23
NI25M6Q03_Y6a	1	Auto	6	No	No	0.33	0.82	510	0.33	510					37		1.03	
NI25M6Q04_Y10	1	Auto	10	No	No	1.89	2.38	660	1.89	660						25		0.98
NI25M6Q04_Y6	1	Auto	6	No	No	-0.1	0.39	469	-0.1	469					45		1.13	
NI25M6Q05	2	Human	6/10	Yes	No	1.13	1.62	587	-0.24	456	2.5	719			27	43	1.09	1.08
NI25M6Q06a	1	Auto	6/10	Yes	No	0.72	1.21	548	0.72	548					30	49	0.92	0.93
NI25M6Q07a	1	Auto	6/10	Yes	No	0.23	0.72	501	0.23	501					39	55	1.14	1.18
NI25M6Q08_Y10	2	Auto	10	No	No	0.48	0.97	525	-0.41	439	1.37	610				51		1.14
NI25M6Q08_Y6	1	Auto	6	No	No	-0.53	-0.04	428	-0.53	428					54		0.93	
NI25M6Q09	1	Auto	6/10	Yes	No	1.2	1.69	593	1.2	593					22	38	1.06	0.95
NI25M6Q10	1	Auto	6/10	Yes	No	-1.71	-1.22	314	-1.71	314					75	84	0.89	0.78
NI25M6Q11a	2	Auto	6/10	Yes	No	-0.24	0.25	456	-1.2	363	0.73	548			48	67	0.96	0.9
NI25M6Q11b	2	Auto	6/10	Yes	No	1.41	1.9	614	0.65	541	2.17	687			18	27	1.07	1.08
NI25M6Q11d	2	Auto	6/10	Yes	No	0.97	1.46	571	0.35	512	1.58	631			23	39	1.19	1.12

Certain item codes include a suffix, which may indicate one of the following:

- The vertical link was broken, reflecting independent item statistics for each year level.
- The item is a component of a larger task.
- The item represents a version with slight differences between Year 6 and Year 10.
- The item was separated on the technical platform following its initial construction.

Appendix G: Variables for conditioning

Table A 2: Variables for conditioning

Variable	Name	Values	Coding	Regressor
Adjusted school mean achievement	sch_adj_mn	Adjusted school mean	Logits	Direct
State and territory by sector	State, Sector	NSW, Government	00000000000000000000000	Direct
		NSW, Independent	10000000000000000000000	
		NSW, Catholic	01000000000000000000000	
		VIC, Government	00100000000000000000000	
		VIC, Independent	00010000000000000000000	
		VIC, Catholic	00001000000000000000000	
		QLD, Government	00000100000000000000000	
		QLD, Independent	00000010000000000000000	
		QLD, Catholic	00000001000000000000000	
		WA, Government	00000000100000000000000	
		WA, Independent	00000000010000000000000	
		WA, Catholic	00000000001000000000000	
		SA, Government	00000000000100000000000	
		SA, Independent	00000000000010000000000	
		SA, Catholic	00000000000001000000000	
		TAS, Government	00000000000000100000000	
		TAS, Independent	00000000000000010000000	
		TAS, Catholic	00000000000000001000000	
		ACT, Government	00000000000000000100000	
		ACT, Independent	00000000000000000010000	
		ACT, Catholic	00000000000000000001000	

Variable	Name	Values	Coding	Regressor
		NT, Government	00000000000000000000100	
		NT, Independent	00000000000000000000010	
		NT, Catholic	00000000000000000000001	
Gender	Gender	Male	00	Direct
		Female	10	
		Other	01	
School geolocation	Geolocation	Major Cities of Australia	0000	Direct
		Inner Regional Australia	1000	
		Outer Regional Australia	0100	
		Remote Australia	0010	
		Very Remote Australia	0001	
Indigenous status indicator	INDIG	Indigenous	10	Direct
		Non-Indigenous	00	
		Missing	01	
LOTE spoken at home	LBOTE	Yes	10	Direct
		No	00	
		Missing	01	
Parental highest occupation group	POCC	Mode of year level	00000	Direct
		Other category 1	10000	
		Other category 2	01000	
		Other category 3	00100	
		Other category 4	00010	
		Not stated or unknown	00001	
Highest level of parental education	PARED	Mode of year level	0000000	Direct

Variable	Name	Values	Coding	Regressor
		Other category 1	1000000	
		Other category 2	0100000	
		Other category 3	0010000	
		Other category 4	0001000	
		Other category 5	0000100	
		Other category 6	0000010	
		Not stated or unknown	0000001	
Age	AGE	Value	Copy, Mean	PCA
		Missing	0, 1	
Experience with digital tools	QN01	Never or less than one year	Five dummies with the year level mode as the reference category	PCA
		At least one year but less than three years		
		At least three years but less than five years		
		At least five years but less than seven years		
		Seven years or more		
		Missing		
Use of desktop computer – at school	QN02A1	Yes (Box checked)	One dummy for each variable with the year level mode as the reference category	PCA
Use of tablet, laptop – at school	QN02B1	No (Box not checked)		
Use of smartphone – at school	QN02C1			
Use of digital devices – other – at school	QN02D1			
Use of digital devices – none – at school	QN02E1			
Use of desktop computer – outside of school	QN02A2	Yes (Box checked)	One dummy for each variable with the year level mode as the reference category	PCA
Use of tablet, laptop – outside of school	QN02B2	No (Box not checked)		
Use of smartphone – outside of school	QN02C2			

Variable	Name	Values	Coding	Regressor
Use of digital devices – other – outside of school	QN02D2			
Use of digital devices – none – outside of school	QN02E2			
Own computer used in class	QN03A	No	Four dummies for each variable with the year level mode as the reference category	PCA
Own tablet used in class	QN03B	Yes, my school provides me with the device		
		Yes, the school tells me what brand of model of device I may bring		
		Yes, I can bring any brand or model of device to school		
		Missing		
Frequency use of desktop computer – at school	QN04A1	Several times every day	Five dummies for each variable with the year level mode as the reference category	PCA
Frequency use of tablet, laptop – at school	QN04B1	Once a day		
Frequency use of desktop computer – outside of school	QN04A2	Almost every day		
Frequency use of tablet, laptop – outside of school	QN04B2	A few times each week		
		Once a week or less		
		Missing		
Access to computer or tablet at home	QN05	Yes, I have access to my own device	Three dummies for each variable with the year level mode as the reference category	PCA
		Yes, but I have to share it with others		
		No, I do not have access to any device		
How reliable is interest access at home	QN06	The internet access is fast and reliable	Four dummies for each variable with the year level mode as the reference category	PCA
		The internet access is not fast, but it is reliable		
		The internet access is not reliable		

Variable	Name	Values	Coding	Regressor
		I do not have internet access at home		
Help me improve the quality of my work	QN07A	Strongly agree	Four dummies for each variable with the year level mode as the reference category	PCA
Make work easier	QN07B	Agree		
Help me to work with others	QN07C	Disagree		
Prefer to work alone	QN07D	Strongly disagree		
Help me communicate with my friends	QN07E	Missing		
Find new ways to do things	QN07F			
Search the Internet – at school	QN08A1	At least once every day	Recode to 5,4,3,2,1,0; missing replaced by the year level mode; dummies for missing	PCA
Search the Internet – outside of school	QN08A2	Almost every day		
Use word processing software or apps – at school	QN08B1	A few times each week		
Use word processing software or apps – outside of school	QN08B2	Between once a week and once a month		
Use spreadsheets – at school	QN08E1	Less than once a month		
Use spreadsheets – outside of school	QN08E2	Never		
Use mathematics, language or other learning programs – at school	QN08D1	Missing		
Use mathematics, language or other learning programs – outside of school	QN08D2			
Enter data in a spreadsheet – at school	QN08C1			
Enter data in a spreadsheet – outside of school	QN08C2			
Create presentations – at school	QN08F1			
Create presentations – outside of school	QN08F2			
Watch online videos – at school	QN08G1			
Watch online videos – outside of school	QN08G2			

Variable	Name	Values	Coding	Regressor
Use AI tools – at school	QN08H1			
Use AI tools – outside of school	QN08H2			
Watch videos or live streams for entertainment	QN11A	At least once every day	Recode to 5,4,3,2,1,0; missing replaced by the year level mode; dummies for missing	PCA
Play games	QN11B	Almost every day		
Use software or apps to create sounds/music, movies, animations or artwork	QN11C	A few times each week		
Listen to music for entertainment	QN11D	Between once a week and once a month		
Listen to podcasts, audiobooks or internet radio for entertainment	QN11E	Less than once a month		
Search for online information about things you are interested in	QN11F	Never		
Use coding or programming to create games or control robotic devices	QN11G	Missing		
Use email – at school	QN09A1	At least once every day	Recode to 5,4,3,2,1,0; missing replaced by the year level mode; dummies for missing	PCA
Use email – outside of school	QN09A2	Almost every day		
Use chat or messaging apps – at school	QN09B1	A few times each week		
Use chat or messaging apps – outside of school	QN09B2	Between once a week and once a month		
Participate in online discussions on community platforms – at school	QN09C1	Less than once a month		
Participate in online discussions on community platforms – outside of school	QN09C2	Never		
Use voice or video calls to communicate with people online – at school	QN09D1	Missing		
Use voice or video calls to communicate with people online – outside of school	QN09D2			
Create and share content with others on social media – at school	QN09E1			

Variable	Name	Values	Coding	Regressor
Create and share content with others on social media – outside of school	QN09E2			
Create code with a visual programming tool – at school	QN10A1	At least once every day	Recode to 5,4,3,2,1,0; missing replaced by the year level mode; dummies for missing	PCA
Create code with a visual programming tool – outside of school	QN10A2	Almost every day		
Create text-based code or programs – at school	QN10B1	A few times each week		
Create text-based code or programs – outside of school	QN10B2	Between once a week and once a month		
Publish media you have created to an online account – at school	QN10C1	Less than once a month		
Publish media you have created to an online account – outside of school	QN10C2	Never		
Create an app – at school	QN10D1	Missing		
Create an app – outside of school	QN10D2			
Use drawing, painting or graphics programs – at school	QN10E1			
Use drawing, painting or graphics programs – outside of school	QN10E2			
Change application settings to suit your purposes – at school	QN10F1			
Change application settings to suit your purposes – outside of school	QN10F2			
Combine different types of digital content into one product – at school	QN10G1			
Combine different types of digital content into one product – outside of school	QN10G2			
Edit digital photographs or other graphic images	QN12A	I can do this easily by myself	Four dummies for each variable with the year level mode as the reference category	PCA
Create a database	QN12B	I can do this with a bit of effort		

Variable	Name	Values	Coding	Regressor
Enter data in a spreadsheet	QN12C	I know what this means but I cannot do it		
Plot a graph using spreadsheet software	QN12D	I don't know what this means		
Download or stream music from the Internet	QN12E	Missing		
Create a multimedia presentation	QN12F			
Create or edit websites	QN12G			
Post content on social media	QN12H			
Use a collaborative workspace to work with others on a shared project	QN12I			
Use videoconferencing software for communication purposes	QN12J			
Using an online learning management system	QN12K			
Use artificial intelligence tools	QN12L			
Evaluate the quality of information generated using artificial intelligence tools	QN12M			
Reference digital content that I use in my work	QN12N			
The need to provide references to content from webpages that you include in your schoolwork	QN13A	Yes	Two dummies for each variable with the year level mode as the reference category	PCA
The need to know whether you have copyright permission to share music or video	QN13B	No		
The problems of using software to illegally copy or download games or videos for free	QN13C	Missing		
Reading licence or usage agreements before you click on "I agree" to install new software	QN13D			
How to decide where to look for information about an unfamiliar topic	QN13E			

Variable	Name	Values	Coding	Regressor
How to look for different types of digital information on a topic	QN13F			
How to judge the relevance of information to include in school work	QN13G			
How to judge whether information on the internet can be trusted	QN13H			
How to judge whether information produced with artificial intelligence tools	QN13I			
Understanding when it is appropriate to use artificial intelligence generated content for schoolwork	QN13J			
Opening email attachments from safe sources	QN14A	Yes	Two dummies for each variable with the year level mode as the reference category	PCA
Checking where a message is from before clicking on links	QN14B	No		
Reporting spam to an authority	QN14C	Missing		
How to create secure passwords for internet services	QN14D			
Security risks when using the internet	QN14E			
Responsible use of social media	QN14F			
Respectful online relationships	QN14G			
How to spot cyberbullying	QN14H			
How to report cyberbullying or image based abuse	QN14I			
Where you can get reliable information and help about dealing with cyberbullying and/or suspicious online contact	QN14J			
How to protect your personal safety when communicating online	QN14K			
How to protect the privacy of your own data that you enter online	QN14L			

Variable	Name	Values	Coding	Regressor
How your online actions can impact negatively on your reputation and future opportunities	QN14M			
How to update privacy settings on social media	QN14N			
Creating code with a visual coding tool	QN15A	Yes	Two dummies for each variable with the year level mode as the reference category	PCA
Creating a digital game	QN15B	No		
Working with others to create a digital solution to a problem	QN15C	Missing		
Designing a program to control a digital or robotic device	QN15D			
Using a virtual reality (VR) program	QN15E			
Learning about the components of a digital system	QN15F			
Examining the way data are being used to inform decisions	QN15G			
Word processing software	QN16A	Never	Four dummies for each variable with the year level mode as the reference category	PCA
Spreadsheet software	QN16B	Less than once a month		
Presentation software	QN16C	At least once a month but not every week		
Software for capturing and editing media	QN16D	At least once a week		
Graphic design or drawing software	QN16E	Missing		
Text-based information websites	QN16F			
Artificial intelligence tools for generating written content	QN16G			
Artificial intelligence tools for generating images	QN16H			
Video-based information resources	QN16I			
Digital journals	QN16J			

Variable	Name	Values	Coding	Regressor
Data collection or monitoring tools	QN16K			
Concept or mind mapping software	QN16L			
Simulations and modelling software	QN16M			
Social media (e.g. Instagram, Snapchat, Twitter, Facebook)	QN16N			
Robotic devices	QN16O			
3D printers or laser cutters	QN16P			
Computer-aided drawing (CAD) software	QN16Q			
3D design software	QN16R			
Block coding or visual programming tools	QN16S			
Programming languages involving object-oriented programming	QN16T			
Scanners	QN16U			
Video creation equipment	QN16V			
My teacher uses digital tools to present information to the class	QN17A	Never	Five dummies for each variable with the year level mode as the reference category	PCA
We use digital tools to present information to the class	QN17B	Less than once a month		
My teacher uses digital tools to provide feedback on our work	QN17C	At least once a month but not every week		
We use digital tools to collaborate with each other on projects	QN17D	At least once a week but not every day		
We use digital tools to collaborate with students from other schools on projects	QN17E	At least once a day		
We use digital tools to complete tests	QN17F	Missing		
We use digital tools to work on short assignments (i.e. within one week)	QN17G			

Variable	Name	Values	Coding	Regressor
We use digital tools to work on extended projects (i.e. projects that last longer than one week)	QN17H			
We use the internet or digital tools to contact students from other schools as part of our learning	QN17I			
We use the internet or digital tools to contact experts outside the school	QN17J			
We use digital tools to collect data for a project	QN17K			
We use digital tools to analyse data	QN17L			
We use digital tools to produce or edit audio	QN17M			
We create or edit visual products	QN17N			
We create or program robotic devices	QN17O			
We use digital tools to submit assessments and gather feedback from my teacher	QN17P			
We use artificial intelligence to generate content	QN17Q			
My teacher(s) uses and demonstrates new technology or apps	QN17R			
We present to the class in a variety of ways as the presentation method	QN17S			
Breaking a complex problem into smaller parts	QN18A	To a large extent	Four dummies for each variable with the year level mode as the reference category	PCA
Planning tasks by setting out the steps needed to complete them	QN18B	To a moderate extent		
Developing algorithms	QN18C	To a small extent		
Using digital tools to present information to the class	QN18D	Not at all		
Creating code or programming	QN18E	Missing		

Variable	Name	Values	Coding	Regressor
Developing applications (apps)	QN18F			
Making changes to code to improve efficiency	QN18G			
Use artificial intelligence tools to generate or improve your code	QN18H			
How to refine prompts in artificial intelligence tools to improve the quality of your output	QN18I			
Debugging code	QN18J			
Creating visual displays of information or processes	QN18K			
My school	QN19A	To a large extent	Four dummies for each variable with the year level mode as the reference category	PCA
Members of my family	QN19B	To a moderate extent		
My friends	QN19C	To a small extent		
Learning myself	QN19D	Not at all		
		Missing		

Appendix H: Proficiency level descriptions

Table A 3: NAP–ICT Literacy 2025 proficiency level descriptions with examples

Proficiency level	Proficiency level description	Examples of student achievement at this level
Level 6	Students working at level 6 create information products that show evidence of technical proficiency, careful planning and review, and digital technologies skills. They use software features to organise information and to synthesise and represent data as integrated complete information products, and to develop algorithms and apply computational thinking. They design information products consistent with the conventions of specific communication modes and audiences. They use available software features to enhance the communicative effect of their work.	• Creates a sophisticated information product that demonstrates purposeful selection, synthesis, and integration of digital content, with highly effective flow, tone, and audience engagement. • Assesses the suitability of information using independent criteria and effectively presents relevant information for a particular audience • Uses graphics and text software editing features, such as font formats, colour, and positioning in ways that enhance the structure and communicative purpose of an information product • Selects and applies appropriate editing tools and techniques to improve visual quality of digital images and achieve specific design intentions.
Level 5	Students working at level 5 evaluate the credibility of information from electronic sources and select the most relevant information to use for a specific communicative purpose. They create information products that show evidence of planning and technical competence, and digital technologies understanding. They use software features to reshape and present information graphically, consistent with presentation conventions. They design information products that combine different elements. They accurately represent their source data and apply computational thinking to develop digital	• Creates an integrated and unified information product that combines content, media, and design elements effectively to engage the audience and achieve the intended purpose. • Applies a wide range of editing techniques with control and creativity to digital images to produce specific visual outcomes • Selects clearly relevant user tasks with well-matched, justified purposes that effectively test and inform improvements to a website's navigation structure • Redesigns an interface to optimise efficiency and user experience through purposeful organisation of interface elements and logical, thematic grouping of functions • Appropriately names and organises worksheets, and structures information across multiple worksheets including cleaning datasets to ensure accuracy, removing duplicate entries and inconsistencies

Proficiency level	Proficiency level description	Examples of student achievement at this level
	solutions. They use available software features to enhance the appearance of their information products and user interfaces. They employ file management practices to support workflow management when creating information products. They can explain how components of a digital system are connected to transmit data and interpret the data outputs.	• Uses spreadsheet software to manage, format, and evaluate data efficiently, including applying number formats and formulae • Recognises the advantages of spreadsheet tools for organising, visualising, and analysing complex data sets • Identifies interface design features that promote accessibility, usability, and inclusivity for all users, such as the purpose and use of ALT text • Organises digital interface elements, such as drop-down menus, logically and consistently to enhance user navigation • Evaluates search results critically, explaining why paid advertisements appear first and how ranking affects information visibility • Identifies key features of valid digital information, such as email address conventions or trusted data sources, to ensure accuracy • Explains how digital technologies, such as Wi-Fi connections and motion sensors, can be combined to automate or control systems like robotic devices.
Level 4	Students working at level 4 generate simple general search questions and select the best information source to meet a specific purpose. They retrieve information and interpret data reports from given electronic sources to answer specific, concrete questions. They can implement solutions to collect information from users. They assemble information in a simple linear and logical order to create information products. They use conventionally recognised software commands to edit and reformat information products, and begin to explore digital technologies concepts. They recognise common examples in	• Creates an information product that presents information clearly, logically, and cohesively, using consistent tone, style, and structure suited to the specified audience and purpose • Selects and combines appropriate editing tools to refine digital images and achieve clear design intentions • Selects mostly relevant user tasks and matches appropriate purposes that support evaluation of a website's navigation structure • Selects appropriate survey items to gather relevant, reliable feedback, demonstrating awareness of purpose, and user perspectives • Alters an interface to improve accessibility and usability by grouping related buttons and logical, thematic grouping of functions • Adds and descriptively names worksheets within a spreadsheet workbook and organises structured data by applying sorting functions to support clarity and efficient data use • Identifies and explains the roles of hardware, software, Wi-Fi, and sensors in controlling or automating digital systems

Proficiency level	Proficiency level description	Examples of student achievement at this level
	which ICT misuse may occur and suggest ways of avoiding them.	• Transfers and manages digital files across devices using appropriate tools such as upload functions or wireless connections • Creates captions and titles that enhance clarity and accessibility of visual and textual information • Recognises and explains website features that support effective navigation, engagement, and inclusivity • Identifies menus or controls within digital navigation tools to interact with user options and adjust routes • Configures and edits digital forms and surveys, selecting appropriate field types and adjusting settings for valid data collection • Explains the importance of trustworthy websites and ethical data practices in contexts such as e-commerce and online surveys • Selects or creates graphical representations that best communicate trends or patterns in tabulated data • Formats data in spreadsheets and applies appropriate presentation techniques, such as currency formatting or graph generation • Conducts targeted searches using specified criteria to locate accurate and relevant information, such as business opening hours including identifying trustworthy indicators in URLs and website features • Demonstrates awareness of social media protocols designed to protect personal information and privacy • Determines the most appropriate form of data collection or survey question type for gathering meaningful user insights • Understands that privacy protocols and controlled sharing protect users' data and maintains ethical digital communication.
Level 3	Students working at level 3 generate simple general search questions and select the best information source to meet a specific purpose. They retrieve information and interpret data reports from given electronic sources to answer specific, concrete questions. They can use simple digital forms and identify mistakes in software	• Creates an information product in which ideas and media are mostly clear and logically sequenced, showing emerging awareness of audience, purpose, and appropriate tone • Uses basic editing tools to enhance image quality and meet simple design goals • Selects simple survey items to collect basic feedback, with limited consideration of relevance, or user needs • Makes simple changes to an interface layout to improve ease of use by grouping some related buttons and placing frequently used actions in more convenient locations

Proficiency level	Proficiency level description	Examples of student achievement at this level
	tools used to collect information from users. They assemble information in a simple linear and logical order to create information products. They use conventionally recognised software commands to edit and reformat information products and begin to explore basic digital technologies concepts. They can correctly connect components of a simple digital system. They can use a range of communication tools for participating in collaborative online environments. They recognise common examples in which ICT misuse may occur and suggest ways of avoiding them.	• Understands how to use system functions such as right-click menus, file types, and bookmarks to access, open, and manage digital information efficiently • Identifies and distinguishes between hardware and software components in an ICT system and explains their roles in digital operations • Understands privacy protocols when sharing images online and explains risks such as password reuse or personal identification exposure • Explains the advantages and disadvantages of communication methods, such as sending links in group chats, in relation to security and accessibility • Explains how trustworthy websites and clear instructions contribute to ethical and safe online interactions • Identifies limitations in small or biased datasets and suggests ways to improve data quality • Evaluates data or user analytics (e.g. tables, recordings, simulations) to identify problems or trends in system performance or usability • Inserts and edits hyperlinks, custom link text, and embedded media within web-based editors • Identifies symbols, icons, and prompts (e.g. asterisks on forms, “find my location” buttons) and explains their purpose in guiding user actions • Identifies advantages and limitations of technical or data-collection solutions and proposes improvements to optimise performance.
Level 2	Students working at level 2 locate simple, explicit information from within a given electronic source. They add content to and make simple changes to existing information products when instructed. They edit information products to create products that show limited consistency of design and information management. They recognise and identify basic ICT electronic security and health and safety usage issues and practices, and gain exposure to basic digital technologies concepts. They can interpret data represented in a range of communication tools for participating in collaborative online environments. They	• Applies a limited range of editing tools to make minor improvements to digital images • Selects a limited range of user tasks and purposes to test a proposed navigation structure • Uses results from an online survey and recognises that hiding voter profiles can improve the fairness and reliability of the data collected • Understands basic digital security practices by recognising criteria for creating strong passwords and identifying confirmation emails as a method for verifying user information • Uses a simulated GPS system to enter locations accurately, interpret route options to identify the quickest path, and adjust settings through appropriate menus to determine a desired route • Selects appropriate icons, menus, or settings to access features in a digital interface • Identifies relevant displays or sections within an app or webpage to locate required information such as stock levels, dates, or terms • Recognises how organising or sectioning digital platforms into different applications supports clearer access to information and improves usability

Proficiency level	Proficiency level description	Examples of student achievement at this level
	examine the main components of familiar digital systems and identify their functions.	• Follows rules in a digital workspace to create and name folders appropriately for the storage of files • Uses tools such as heatmaps to interpret basic patterns of user activity or interaction data.
Level 1	Students working at level 1 perform basic tasks using computers and software. They implement the most commonly used file management and software commands when instructed. They recognise the most commonly used ICT terminology and functions and gain initial exposure to basic digital technologies concepts.	• Adjusts basic device settings and/or uses simple touch functions to view and locate information on digital displays • Recognises the importance of applying privacy protocols and seeking permission before sharing images online to protect personal information and respect others' rights • Recognises and selects the settings icon on a tablet device to access basic system or application controls • Selects an appropriate application to meet a specific user need or purpose, demonstrating awareness of the functions and features of different digital tools • Identifies some components of simple digital systems and categorises design features relating to appearance and function.